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Balancing and Settlement Code Modification Proposal 272 – draft impact assessment

Consultation

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Overview:

Under the electricity trading arrangements, the settlement process places incentives on suppliers to buy enough electricity to meet what their customers' consume. This process is set out in the Balancing and Settlement Code (BSC). Today, the settlement process estimates most consumers' consumption in each half hour.

From 6 April 2014, larger non-domestic consumers that are currently settled on estimates will have meters capable of recording half-hourly consumption. BSC Modification Proposal 272 would require that settlement uses actual half-hourly meter readings for these consumers. The original proposal would introduce this requirement in April 2014 and the alternative in April 2015.

Ofgem is responsible for deciding whether modifications to the BSC are implemented. This document sets out Ofgem's impact assessment on the modification for consultation. It also explains that, based on our analysis, we are minded-to approve the alternative modification.

Context

The roll-out of smart and advanced metering has the potential to transform energy markets, contributing to the achievement of a low-carbon energy sector, helping to maintain security of energy supplies and promoting quality and value for all consumers. However, this opportunity will not be realised without complimentary changes to the arrangements that underpin how market participants interact with each other and consumers. Ofgem has established the Smarter Markets Programme to help drive necessary changes.

One of the opportunities presented by the roll-out relates to the settlement process, which is set out in the Balancing and Settlement Code (BSC). This process charges suppliers for any difference between the amount of electricity they purchase and the amount that their customers' consume in each half hour of the day. At present, most consumers do not have meters that are capable of recording half-hourly consumption data. Instead, they are settled on an estimate of the energy they use in each half hour of the day.

Smart and advanced meters will be capable of recording half-hourly consumption and of being read remotely. Using more accurate and timely data from smart metering in settlement can help to lower bills and strengthen competition.

Larger non-domestic consumers that are currently settled on estimates will have advanced meters from 6 April 2014. BSC Modification Proposal 272 ('P272') proposes to mandate that these consumers are settled on actual half-hourly meter readings. In most circumstances, Ofgem is responsible for deciding whether modifications to the BSC are implemented. We also have a statutory duty to carry out an impact assessment concerning proposals that we consider are 'important' within the meaning of section 5A of the Utilities Act 2000. P272 meets the definition of an 'important' proposal because it would have a significant impact on suppliers and implications for bills and consumer engagement in the market. This document sets out our impact assessment and minded-to position on P272.

Associated documents

All documents are available at www.ofgem.gov.uk:

Third Party Intermediaries Programme: Initiatives for non-domestic consumers, October 2013

Impact Assessment Guidance, October 2013

Way forward on longer-term electricity settlement reform, March 2013

Creating the right environment for demand-side response, April 2013, Ref: 64/13

Guidance on Impact Assessments, December 2009, Ref: 151/09

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Executive Summary

The roll-out of smart and advanced metering presents an opportunity to make retail energy markets work better for consumers. The changes that will be brought about by the introduction of smart metering have the potential to support our key objectives of: contributing to the achievement of a low-carbon energy sector, helping to maintain security of energy supplies and promoting quality and value for all consumers.

One opportunity presented by smart metering relates to the electricity settlement process as set out in the Balancing and Settlement Code (BSC). As part of this process, it is necessary to determine the volume of electricity used by each supplier's customers in each settlement period (defined as a period of thirty minutes). Suppliers face charges for any difference between this volume and the amount of electricity they arrange to flow on to the network. In this way, settlement underpins the allocation of energy costs. In addition, the information on consumption that is generated through the settlement process is used to allocate the costs of the transmission and distribution networks.

Today, most consumers do not have meters capable of recording half-hourly consumption data. These consumers are assigned to Profile Classes and are settled in each half hour using estimates based on meter readings spanning longer periods. Smart and advanced meters present an opportunity to fundamentally reform these arrangements by giving easier access to more granular (including half-hourly) consumption data.

BSC Modification Proposal 272 ('P272') was raised by Smartest Energy and proposes that consumers in Profile Classes 5-8 should be settled using actual half-hourly meter readings from 1 April 2014. These consumers are larger non-domestic consumers that will have advanced meters by 6 April 2014. The industry workgroup responsible for assessing P272 developed an alternative proposal that is identical but delays implementation until 1 April 2015. The BSC Panel recommended rejection of the proposed modification and the alternative. The vote was unanimous, reflecting its view that the costs were significant and the benefits uncertain.

Ofgem is responsible for deciding whether modifications to the BSC are implemented. We also have a statutory duty to carry out an impact assessment concerning proposals that we consider are 'important' within the meaning of section 5A of the Utilities Act 2000. P272 meets the definition of an 'important' proposal because it would have a significant impact on suppliers and implications for bills and consumer engagement in the market.

This document sets out our impact assessment on P272. Our assessment suggests that settling consumers in Profile Classes 5-8 on actual half-hourly meter readings will enable suppliers to reduce the costs of purchasing and transporting energy to these consumers. The main way in which suppliers can reduce these costs is by encouraging demand-side response (DSR). This would require suppliers to innovate in the products and services they provide, helping to strengthen competitive pressure between them. Where consumers in Profile Classes 5-8 respond to these price signals, consumers can benefit from lower bills, stronger security of supply and a more sustainable electricity sector.

Suppliers incur costs in managing the settlement process, particularly in relation to the collection and processing of consumption data. Our analysis of evidence provided by existing suppliers suggests that overall their costs in managing the settlement process are likely to increase. This is because of the need to upgrade existing systems and handle larger volumes of half-hourly data. However, some of these cost increases would be offset by savings in other business activities related to the settlement process. In addition, the quality of consumption data submitted to settlement would be higher.

Where possible, we quantified the potential impacts of P272. For those impacts that we quantified, we find that P272 is broadly revenue neutral for consumers. However, we did not quantify all impacts. This includes the potential for greater efficiency across the market from stronger competition. Moreover, in quantifying the value of DSR, we only considered shifting of load from peak to off-peak periods. In addition, we did not take account of the potential for its value to be higher at critical periods when supply margins are tightest or if expectations relating to deployment of wind generation and rising demand are met.

On balance, we consider P272 would facilitate the objectives of the BSC and is consistent with our statutory duties. Specifically, we consider that the modification would promote effective competition in the generation and supply of electricity by exposing suppliers to the costs of their customers' actual consumption. Furthermore, it would promote efficiency in the implementation of the BSC by improving the quality of data that is used for settlement and hence the service it provides.

On this basis, we are minded to approve the alternative P272 proposal. We note that we cannot approve the original as there would not be time for the industry to implement the necessary changes for introduction in April 2014.

We recognise that, if we approve P272, consumers in Profile Classes 5-8 may not receive efficient price signals through the charge they pay for using the distribution network. This is because there is not currently a half-hourly distribution network tariff designed for these consumers. We note that Electricity North West has raised a modification to the Distribution Connection and Use of System Agreement that would create new half-hourly tariffs for consumers in Profile Classes 5-8. We expect this modification to be progressed in a timely manner. We will monitor the progress of this modification and, in reaching a decision on P272, we will take into account any further developments in this area.

Finally, we note that there is an interaction between P272 and the project we are taking forward under our Smarter Markets Programme on longer-term reform of electricity settlement. Our decision on P272 will have implications for this work, particularly whether consumers in Profile Classes 5-8 are within the scope of the project.

We are seeking responses to the consultation questions set out in this document – and any other comments – by 24 December 2013. We plan to publish our final decision in Q1 2014.

1. Introduction

Chapter Summary

Balancing and Settlement Code (BSC) Modification Proposal 272 would mandate that larger non-domestic consumers are settled using actual meter readings for each half hour of the day. The BSC Panel is responsible for overseeing the change process and recommended to Ofgem that this modification be rejected. Given the modification would have a significant impact on suppliers and consumers, we decided to undertake our own impact assessment to inform our decision on whether it should be approved.

1.1. The settlement process places incentives on suppliers to purchase enough electricity to cover the amount that their customers' consume. This process is set out in the Balancing and Settlement Code (BSC). BSC Modification Proposal P272 ('P272') would change the process for determining the consumption of larger non-domestic consumers for the purposes of settlement. This chapter describes P272, outlines the analysis undertaken by the industry and explains why Ofgem decided to undertake its own impact assessment.

Settlement process

1.2. One of the principles of the electricity market is that market participants should trade bilaterally to meet the needs of energy consumers. This principle is underpinned by an incentive scheme. This incentive scheme operates by charging each supplier for any difference between the volumes of energy that they buy and the volume that their customers' consume.[1] The process for comparing contracted and metered positions, and determining the charges to be paid for any imbalance, is called settlement. This process is set out in the BSC and is performed for every half-hour settlement period.

1.3. For each settlement period, bilateral trading between generators and suppliers continues until one hour before real time (called 'Gate Closure'). At this point, National Grid Electricity Transmission plc (NGET) in its role as the System Operator is responsible for managing any residual difference between supply and demand.

1.4. As part of the settlement process, it is necessary to allocate energy volumes to suppliers. This involves determining the amount of energy used by each supplier's customers in every settlement period. Table 1 shows how different types of consumers are settled.

[1] Other market participants including generators are also subject to settlement.

Table 1 – Breakdown of consumption sites (as of August 2012)

Type	Description	Number	Annual energy
Profile Classes 1-4	Domestic and smaller non-domestic sites settled using load profiles	29,528,337 (99%)	165 TWh (53%)
Profile Classes 5-8	Larger non-domestic sites settled using load profiles	155,568 (0.6%)	16 TWh (5%)
Half-hourly sites	Sites that are settled using actual HH meter readings	119,368 (0.4%)	130 TWh (42%)

1.5. Table 1 shows that a small number of sites must be settled half-hourly (HH) because their average maximum demand exceeds 100kW in circumstances defined by the BSC. However, the majority of consumers are settled non-half-hourly (NHH) using estimates of consumption. This involves grouping consumers into one of eight Profile Classes. Using sample data, load profiles are created that estimate the HH shape of consumption of the average consumer in each Profile Class. These load profiles are used to allocate to each half hour the total energy used by all consumers assigned to a Profile Class between two meter readings spanning longer periods (for example, one month). As a result, the energy allocated to a settlement period is an estimate of consumption in that half hour, but the total consumption settled between two meter readings is accurate.

Roll-out of smart and advanced metering

1.6. The Government has mandated that consumers in Profile Classes 5-8 must be supplied by advanced meters from 6 April 2014. Conventionally these consumers are considered to be larger non-domestic consumers. However, up to 60 per cent could be captured by Ofgem's revised definition of a micro-business consumer.[2] For the purposes of this document, we use 'larger non-domestic consumers' to refer only to those currently settled in Profile Classes 5-8. Advanced meters must be capable of recording HH consumption data. They must also provide suppliers with remote access to this data.

1.7. Domestic and smaller non-domestic consumers (those assigned to Profile Classes 1-4) will also receive smart or advanced meters by the end of 2020. Similar to advanced meters, a key feature of smart meters is that they can record the amount of energy used in each half hour. They must also be capable of remote two-way communications, thereby allowing them to be read or configured without the need to visit the customer premises.

[2] From 31 March 2014, the electricity supply licence will define a micro-business consumer as one which: has an annual consumption of not more than 100,000 kWh; or employs fewer than 10 employees (or their FTE equivalent) and their turnover or balance sheet is no greater than €2m. Our estimate shows the maximum number of consumers in Profile Classes 5-8 that are captured by this definition. This is because a consumer may have multiple sites that each have an annual consumption of less than 100,000 kWh but when added together exceed this threshold. In such cases, a consumer would not be classified as a micro-business.

Overview of modification

1.8. At present, there is no obligation on suppliers to settle HH larger non-domestic consumers that have HH capable advanced meters. Unless suppliers elect to move these consumers to HH settlement, they will continue to be settled using load profiles.

1.9. Smartest Energy, a smaller supplier to non-domestic consumers, raised P272 in May 2011. The original proposal ('P272 Proposal') would mandate that consumers in Profile Classes 5-8 are settled using actual HH meter readings from 1 April 2014. The proposer argued that P272 would be an improvement on the existing arrangements because, by mandating HH settlement, it would make the allocation of energy volumes to suppliers more accurate.

1.10. The BSC Panel ('the Panel') is responsible for overseeing changes to the BSC. It established a workgroup to assess the impacts of P272. During this process, the workgroup developed an alternative proposal (P272 Alternative). This is identical to P272 Proposed, except that it delays implementation by one year to 1 April 2015.

Industry assessment of P272

1.11. The workgroup undertook a cost-benefit assessment on P272 with support from ELEXON, the organisation responsible for managing the BSC. This focused on quantifying the total costs and benefits by the end of 2020.

1.12. The quantitative analysis suggested that the costs and benefits of P272 were highly uncertain. For P272 Proposal, the workgroup estimated that costs could range from £46m to £199m, while the benefits could range from £71m to £198m. For P272 Alternative, the workgroup's analysis suggested that costs could range from £41m to £182m, while the benefits could range from £63m to £176m. The wide spread in the cost estimates was due to the significant differences between the estimates submitted by suppliers. The uncertainty around the benefits was due to the sensitivity of the modelling to key assumptions. Taking the median of the cost estimates that were received and the central case for the benefits gives a net benefit by 2020 of £32m for P272 Proposed and £24.7m for P272 Alternative.

1.13. Members of the workgroup broadly agreed that the analysis conducted as part of the cost-benefit assessment helped to understand the potential impacts of P272. However, the majority disagreed with the central estimate that there would be net benefits for consumers of around £32m if P272 Proposed is approved and £24.7m if P272 Alternative is approved.

1.14. Any modifications to the BSC must better facilitate the applicable BSC Objectives when compared to the current arrangements.[3] The workgroup identified that two BSC Objectives were relevant to the assessment of P272, as follows:

- BSC Objective (c) - promoting effective competition in the generation and supply of electricity and (so far as consistent therewith) promoting such competition in the sale and purchase of electricity
- BSC Objective (d) – promoting efficiency in the implementation and administration of the balancing and settlement arrangements.

1.15. The majority of the workgroup argued that P272 would not facilitate these BSC Objectives. They argued that P272 would increase costs for the industry (and hence consumers). Noting the opportunity that the roll-out of smart metering presents to use more granular data in settlement, they also suggested that it would be more efficient to implement changes for all consumers together rather than reform the arrangements for Profile Classes 5-8 through P272 first. Specifically in relation to Objective (c), the majority of the workgroup expressed concerns that the way in which network charges are calculated and billed for HH consumers could increase costs for consumers in Profile Classes 5-8 if P272 is implemented.

1.16. The Panel recommended unanimously that P272 should be rejected, on the basis that neither P272 Proposed nor P272 Alternative would better facilitate the BSC Objectives. Their views reflect those of the majority of workgroup members who reached the same conclusions. Ofgem received the Final Modification Report in December 2012, which summarised the industry's analysis on P272 and the Panel's recommendation to Ofgem.[4]

Purpose of this document

1.17. In certain circumstances, Ofgem has a statutory duty to carry out an impact assessment concerning proposals that it considers are 'important' within the meaning of section 5A of the Utilities Act 2000. If approved, P272 would be an important change to the market arrangements as it would have a significant impact on suppliers, particularly the costs they incur in supplying larger non-domestic consumers. This in turn could impact bills and consumer engagement in the market.

1.18. While the industry assessment helped to identify many of the potential impacts of mandating HH settlement for Profile Classes 5-8, it is not sufficient to enable Ofgem to come to a view on whether P272 is in the interests of consumers. The results of the cost-benefit assessment are contested, particularly with regard to the benefits where there is significant uncertainty around their potential realisation and likely magnitude. There are also impacts that the industry did not consider, such as those relating to the costs incurred by NGET in balancing the system.

[3] The BSC Objectives are set out in Standard Condition C3(3) of NGET's electricity transmission licence.
[4] ELEXON, 2012. *P272 'Mandatory Half Hourly Settlement for Profile Classes 5-8' - Final Modification Report*.

1.19. This document describes Ofgem's draft assessment of the impacts of P272 for consultation. We also set out our minded-to position. We note that there is not sufficient time to implement P272 Proposal by 1 April 2014 if approved. Therefore, our assessment focuses on P272 Alternative. For the remainder of this document, 'P272' refers to P272 Alternative.

1.20. We are seeking responses to the consultation questions set out in this document – and any other comments – by 24 December 2013. Wherever possible, we ask that respondents provide evidence to support their views on the potential impacts of P272. This is particularly helpful where views are requested on the assumptions made to quantify costs and benefits.

Structure of document

1.21. The document is structured as follows:

- Chapter 2 provides context for the modification in terms of wider energy policy
- Chapter 3 explains our approach to assessing the impacts of P272, including the structure of our analysis and how this is reflected in the structure of this document
- Chapter 4 assesses the impact of P272 on the way that suppliers buy and sell energy as a result of a more accurate allocation of energy and network costs
- Chapter 5 examines the cost savings that suppliers can realise in managing the settlement process
- Chapter 6 assesses the upfront and ongoing costs that suppliers and distribution network operators (DNOs) could incur as a result of P272
- Chapter 7 presents the results of our quantitative analysis for those impacts that we quantified
- Chapter 8 considers issues relevant to P272 relating to distribution charging and the supply licence
- Chapter 9 presents our assessment of P272 against the relevant BSC Objectives and our statutory duties, as well as our minded-to position.

1.22. Appendix 1 summarises the questions on which we are seeking views through this consultation. Appendix 2 sets out the rationale behind our counterfactual. Appendix 3 explains in detail our methodology for quantifying some of the costs and benefits identified in our assessment. Appendix 4 provides a glossary of terms used in this document.

2. Wider context

Chapter Summary

The electricity sector is undergoing significant change, brought about by the transition to a low-carbon economy. This broader context is relevant to our impact assessment.

2.1. In taking a decision on P272, we will assess the modification on its own merits against the relevant BSC objectives and our wider statutory duties. However, we recognise that the modification sits within a broader context that is relevant to our assessment of the impacts. This chapter provides an overview of this context.

Transition to a low-carbon economy

2.2. The closure of ageing power plants, in part due to European environmental legislation, will require investment in new generation capacity. At the same time, consumption is expected to increase, particularly if more heating and transport is electrified over time to help decarbonise other sectors of the economy. To meet emissions targets, a signification proportion of new generation capacity must come from renewable sources. This will create a more intermittent and inflexible generation fleet. More generation will also connect at local level. These changes will pose new challenges for network companies, requiring innovative approaches to the design, construction and operation of their networks. Against this backdrop, the Department of Energy and Climate Change (DECC) estimated that up to £110 billion of investment in our electricity infrastructure will be required to meet carbon targets and secure energy supplies.[5]

2.3. Consumers can also play an important role in the transition to a low-carbon economy by using energy more efficiently. Government has put in place a package of measures to help realise this ambition, for example by mandating the roll-out of smart and advanced metering to all consumers. By providing ready access to easily-digestible information on consumption, smart metering can enable consumers to take control of their energy use. This could include taking steps to lower their overall consumption, which can help to lower or delay some of the investment in our electricity infrastructure.

2.4. Smart metering can also open up new opportunities for consumers to provide demand-side response (DSR). We define DSR as actions taken by consumers to change the amount of electricity they take off the grid at particular times in response to a signal. Like outright reductions in consumption, DSR can help to lower bills by avoiding investment in new infrastructure. It can also promote sustainability, for example by help managing intermittent generation from renewable sources.

[5] DECC, 2011. *Planning our electric future: a White Paper for secure, affordable and low‑carbon electricity*.

Smarter markets

2.5. Helping consumers to use electricity more efficiently is one way in which the roll-out of smart and advanced metering can transform retail energy markets. For example, the roll-out can promote competition by creating new opportunities for innovation in business models, products and services, as well by enabling faster and easier switching between suppliers. Moreover, accessible information on their consumption can help consumers to engage more effectively in the market, including in identifying the products and services that best meet their needs. Smart metering can also enable the streamlining of the systems and processes that support the operation of the competitive market, helping to reduce costs and barriers to entry.

2.6. Ofgem is committed to helping realise the opportunity that the roll-out presents to make retail energy markets work better for consumers. Our ambition is for 'smarter markets' that are more efficient, dynamic and competitive. This ambition will not be realised without changes to the arrangements that underpin how market participants interact with each other and consumers. We have established the Smarter Markets Programme ('the Programme') to help drive these changes. Following consultation with stakeholders, we identified four priority areas of reform that are now being progressed as the first projects in the Programme.[6] One of these projects concerns electricity settlement.

2.7. Our work under the Programme has important links with other changes to the regulatory framework that DECC, Ofgem and industry are progressing. For example, through the process for setting the next price control (RIIO-ED1) on DNOs, Ofgem is examining how DNOs should be able to use DSR. Industry is also taking forward modifications to industry codes that may help to promote smarter markets.[7] Examples include P272, as well as modifications to the methodology for charging consumers for using the distribution network.

Electricity settlement

2.8. The roll-out of smart and advanced metering presents an opportunity to improve the quality of the electricity settlement process. Our work under the Programme focuses on the one aspect of this process, namely the arrangements for allocating energy volumes to suppliers.

2.9. The settlement process is critical to the development of smarter markets. It is central to the allocation of costs (including energy and network costs) to suppliers and therefore has important implications for retail competition. This includes the incentives for suppliers to offer new products and services that reward consumers for DSR. Settlement is also relevant to the efficiency of market arrangements because there are costs involved in managing the process (for example from the collection and processing of consumption data).

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[6] Ofgem, 2012. *Promoting smarter energy markets: a work programme*.
[7] Industry codes set out the detailed rules that underpin the operation of the competitive market.

2.10. Our longer-term objective is to have in place arrangements for settlement that use the data from smart metering to allocate energy in an accurate, timely and cost-effective way. At present, we are working with stakeholders to scope out the approach to progressing work to help realise this longer-term objective.[8] We expect to conclude our scoping work in Q1 2014.

2.11. We recognise that P272, if approved, could have implications for the scope of our work under the Programme. We also note that many of the impacts of P272 relate to fundamental changes that are taking place in the transition to the low-carbon economy and the potential for smart metering to make retail energy markets work better for consumers.

2.12. While we recognise these interactions, we must assess P272 on its own merits against the BSC Objectives and our statutory duties. If the modification is in the interests of existing and future consumers as assessed against these criteria, we see no reason why it should be delayed in lieu of our work under the Programme. We note that some suppliers have argued that it could be cheaper to deliver reform to settlement for Profile Classes 5-8 as part of a holistic project under the Programme. However, we note that consumers in Profile Classes 5-8 have different characteristics to other NHH consumers, such that different reforms (with different system requirements) may be required.

[8] Ofgem, 2013. *Way forward on longer-term electricity settlement reform*.

3. Approach to assessment

Chapter Summary

P272 can affect suppliers' ability to buy and sell energy efficiently, as well as the costs they incur in managing the settlement process. It can also affect the costs DNOs incur in billing larger-non domestic consumers. We considered the impact of these changes on consumers and competition against a counterfactual that assumes suppliers move few larger non-domestic consumers to HH settlement on an elective basis. Where possible, we quantified the impacts of P272. We consider our quantitative analysis is conservative. Moreover, we did not quantify all impacts.

Question box

Question 1: Do you agree with our approach to assessing the impacts of P272?

Question 2: Are there any additional, material impacts that we should consider?

3.1. Our impact assessment has been designed to allow us to evaluate P272 against the BSC Objectives and our statutory duties. This chapter provides an overview of our approach to assessing the impacts of P272. It describes how we have structured our analysis and then explains the counterfactual against which we assess the impacts. Wherever possible we quantified the impacts of P272. The last section of this chapter describes our approach to quantification.

Structure of analysis

3.2. The structure of our analysis was informed by Ofgem's guidance on conducting impact assessments. Following consultation with stakeholders, Ofgem has recently updated its guidance.[9] Given that our assessment of P272 began prior to the conclusion of this work, we followed the previous guidance published in 2009.[10]

3.3. As a first step, we identified how P272 can affect market participants. We found that HH settlement of larger non-domestic consumers can:

- change suppliers' ability to buy and sell energy efficiently
- change suppliers' costs in managing the settlement process (especially in relation to the retrieval and preparation of consumption data) or in managing their relationship with these consumers (for example, in issuing bills)
- change the costs that DNOs incur in billing suppliers for using their networks.

3.4. We considered the impacts of all these changes on competition and consumers. The latter includes the impact on bills and sustainable development. Table 2 below shows how our analysis is structured. Our approach to structuring the analysis is reflected in the structure of this document, as indicated in the table.

[9] Ofgem, October 2013. *Impact Assessment Guidance*.
[10] Ofgem, December 2009. *Guidance on Impact Assessments*.

3.5. We also identified that P272 could have two further impacts. First, it could directly increase the costs that some larger non-domestic consumers incur where they have appointed an agent of their choice to maintain their meter or retrieve consumption data. We considered this impact as part of our overall assessment of the costs of P272. Second, we identified that P272 has interactions with other parts of the regulatory framework; specifically the supply licence and the methodology for levying distribution charges. We considered the implications of both for consumers.

Table 2 – Structure of analysis

Change from P272	Impact on consumers	Impact on competition	
Supplier buying and selling of energy	Where consumers respond to price signals, this can lower bills, strengthen security of supply and promote sustainability. However, there will also be a distributional impact on larger non-domestic consumers.	Accurate cost allocation will drive suppliers to encourage DSR, which can promote innovation and strengthen competition.	CHAPTER 4
	More accurate forecasting of demand can improve efficiency of balancing.	Easier forecasting of demand could reduce risks of market entry.	
Supplier management of settlement process and consumer relationship	Suppliers can realise cost savings in managing settlement for larger non-domestic consumers (from faster allocation of energy volumes, better data quality and removal of profiling) and existing HH consumers.	Ability to manage aspects of the settlement process more efficiently can reduce costs of entry.	CHAPTER 5
	Suppliers will incur upfront costs in moving larger non-domestic consumers to HH settlement. While they can realise some cost savings in managing aspects of the settlement process for larger non-domestic consumers, they could incur costs in relation to other activities (for example, retrieval of data). DNOs will incur both upfront and ongoing costs to manage more HH settled consumers.	Potential for higher costs of entry.	CHAPTER 6
DNO billing	DNOs will incur upfront and ongoing costs in billing suppliers for larger non-domestic consumers.	Potential for higher costs of entry.	

Counterfactual

3.6. Our assessment of P272 (both qualitative and quantitative) must consider its impacts against a counterfactual that holds other factors constant. In our counterfactual, we assumed no change to the existing market arrangements. This is in line with our duty to consider, among other things, whether a proposed modification better facilitates the achievement of the BSC Objectives and meets out statutory duties as compared to the existing arrangements. Our counterfactual assumes that all consumers in Profile Classes 5-8 have advanced meters. This is because suppliers have a licence obligation to complete the roll-out before the modification would take effect (if it is approved).

3.7. At present, the BSC allows a supplier to elect to move any consumer with appropriate metering equipment to HH settlement. The extent to which this will happen once consumers in Profile Classes 5-8 have advanced meters is a key assumption in our counterfactual because many of the benefits of P272 could be realised by suppliers moving these consumers electively to HH settlement at lower cost. To assess the potential for elective HH settlement of larger non-domestic consumers, we examined historical data on the number of sites that have been moved to HH settlement. We also assessed the incentives on suppliers to move consumers to HH settlement on an elective basis.

3.8. We concluded that current low levels of elective HH settlement would remain in the counterfactual, primarily for two reasons. First, estimates from larger suppliers suggest that they incur higher costs managing this process for HH as compared to NHH consumers. Second, while settling consumers in this way enables suppliers to reduce the costs of buying energy, suppliers will need to invest to realise this opportunity. In addition, not all the benefits of such investment will flow fully to suppliers, such as benefits relating to security of supply. We explain our rationale in more detail in Appendix 2.

3.9. Where suppliers do elect to move consumers to HH settlement, we consider that they are most likely to move those consumers that have a flatter consumption profile compare to the estimated load profile against which they are settled NHH. This is because suppliers can realise cost savings without needing to help consumers use energy more efficiently. While these consumers might see lower energy charges, the volume of energy used by all consumers would not change. Moreover, suppliers do not need to innovate in the products and services they offer. Therefore, there is no net benefit for consumers.

Quantitative analysis

3.10. Wherever possible, we quantified the impacts of P272. In chapters 4, 5 and 6, we identify where we sought to quantify an impact and provide an overview of the key assumptions we use. Table 3 lists the impact we quantified. Appendix 3 provides a detailed description of how we quantified these impacts.

Table 3 – Quantified impacts

Change from P272	Impact	Quantified
Supplier buying and selling of energy	Shifting of load from system peak to off-peak periods	• Lower average generation costs • Avoided investment in network and generation capacity
	Permanent reduction in consumption at peak	• Lower long-run variable cost of energy supply • Lower carbon emissions • Better air quality
	Better forecasting of demand	• Costs of balancing the system
Supplier management of settlement process and customer relationship	Cost savings for suppliers in management of settlement process	• Lower cost of agent services • Reduction in size of data quality teams • Value of improved cash flow from faster settlement • Lower administration costs from 'freezing' of Profile Classes 5-8
	Upfront costs of implementing P272	• Changing the Measurement Class[11] of the affected sites • Changes to internal processes, for example billing or settlement processes • Upgrades to internal systems • Provision, hosting and security of new IT infrastructure • Provision or development of Supplier Agent roles • Other costs, eg costs of changing Supplier Agents
	Ongoing costs of implementing P272	• Collecting and aggregating HH consumption data • Meter maintenance • Meter rental • Data Transfer Network (DTN)[12] charges for HH sites • Other costs, including resources for validation of settlement invoices
DNO billing	Upfront costs of implementing P272	• Upgrades to billing systems • Provision, hosting and security of IT infrastructure • Updates to other internal systems • Updates to registration systems • Implementation of process changes
	Ongoing costs of implementing P272	• Processing larger volumes of HH data • Billing activity • DTN charges for HH sites • Other costs, eg costs of dealing with site-specific queries from customers and suppliers on matters other than billing

[11] For the purposes of the settlement process, all sites are assigned to a Measurement Class based on their type (metered or unmetered) and how they are settled (HH or NHH)
[12] The DTN provides a managed data transfer process for market participants.

3.11. For those impacts that we quantified, we used a modelling period of 20 years. This is an accepted standard for the period of time over which a policy assessment takes place. It is also reasonable to assume that the change proposed by P272 could last for the full duration of the modelling period.

3.12. Our quantitative analysis drew on the cost-benefit assessment conducted by the industry workgroup. We used the cost estimates submitted by suppliers and DNOs in response to a consultation issued by the workgroup.[13] We also used some of the assumptions made by the workgroup in quantifying the benefits of P272. Our quantification of some of the impacts of P272 differed from the workgroup. Appendix 3 identifies where we used a different methodology.

3.13. One reason that the BSC Panel recommended rejection of P272 was the uncertainty around the potential magnitude of the impacts. For those elements that we have been able to quantify, we have sought to address this issue in two ways.

3.14. First, we used a Monte-Carlo analysis to test sensitivities of results to a broad range of input data. We are committed to an open and transparent process of consultation. Stakeholders who are interested in having sight of our model should contact us using the following email address: smartermarkets@ofgem.gov.uk. Second, we conducted a scenario analysis to assess the impact of potential future changes in the market. Our analysis was not designed to explore the likelihood of such changes, but rather their potential impact on our base case results.

3.15. We did not quantify all the potential benefits of P272. In the context of a competitive market, it is difficult to anticipate and quantify the innovation and the full range of benefits that this sort of change might drive. In this document, we explain in qualitative terms the areas where we see scope for wider benefits. For the impacts we quantified, our approach is conservative in a number of respects. For example, we have not modelled how the consumption of consumers in Profile Classes 5-8 may change. Most studies expect electricity demand to rise over time, which could increase the value of DSR.

[13] ELEXON, July 2012. *P272 Assessment Consultation July 2012 on Costs*.

4. Impacts from changes to how suppliers buy and sell energy

Chapter Summary

P272 will change how suppliers buy and sell energy. It will enable them to reduce costs by encouraging DSR among larger non-domestic consumers. Competition creates incentives on suppliers to pursue this opportunity, driving them to innovate in the products and services they offer. This in turn will further increase competitive pressure between suppliers and, where consumers respond to price signals, can lower bills, strengthen security of supply and promote sustainability. Moreover, if P272 is implemented, suppliers can forecast more accurately consumption for larger non-domestic consumers, thereby improving the efficiency of system balancing.

Question box

Question 3: Do you agree that P272 would drive suppliers to encourage DSR among their customers?

Question 4: Do you agree with our approach to quantifying the value of load shifting and load reduction, including the assumptions we made? Is there any evidence we have not identified that could inform our analysis?

Question 5: For those impacts stemming from suppliers reducing the costs of supplying energy (for example, by promoting DSR) that we did not quantify, do you have any suggestions on how we might do so?

Question 6: Do you agree with our approach to quantifying the value of improved forecasting, including the assumptions we made?

Question 7: Could the costs of investing in forecasting capability for HH demand impact disproportionately on smaller suppliers or on new entrants?

4.1. The settlement process drives suppliers' decisions about how much energy to buy and is an important factor in determining how they price it to end consumers. More accurate allocation of the energy used by consumers in Profile Classes 5-8 will change how suppliers buy and sell energy in two ways:

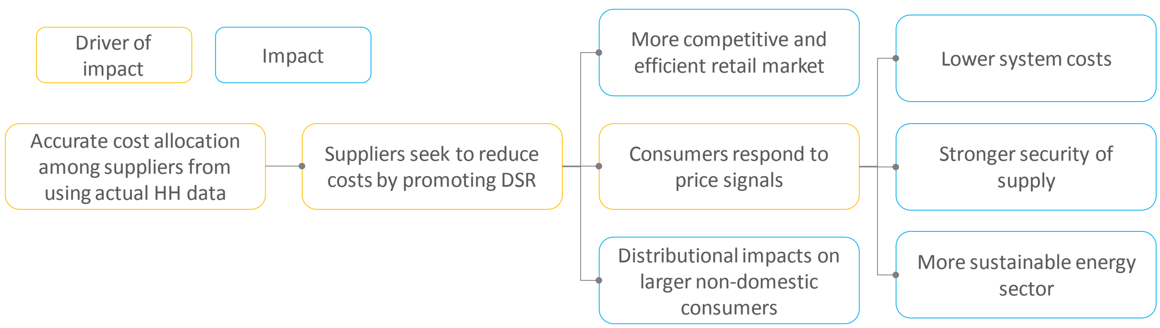
- by driving suppliers to reduce the costs of purchasing and transporting sufficient energy, particularly by promoting DSR
- by improving suppliers' capability to forecast energy demand accurately, such that their purchases more closely match the amount that their customers use.

4.2. This chapter explains why P272 will drive these changes and then discusses the impact of each on consumers and competition. Where we quantified impacts, we outline the key assumptions used and our findings.

Driving suppliers to reduce the costs of supplying energy

4.3. If P272 is implemented, larger non-domestic consumers will be settled on actual meter readings. This will expose suppliers fully to the difference in costs across the day of purchasing and transporting energy for these consumers. As a result, suppliers will be able to realise the financial benefits of reducing their actual costs by encouraging consumers to use energy more efficiently. The environment of competition will drive suppliers to work with consumers to realise this outcome. The main way in which they can do this is by encouraging DSR, for example by offering time-of-use (ToU) tariffs that charge different prices at different times of the day. This can impact on competition and consumers, as illustrated in Figure 1 below.

Figure 1 – Impact on consumers and competition



4.4. To encourage DSR, suppliers will need to innovate in the products and services they provide and sell these to consumers. This will increase the competitive pressure between them, helping to deliver a more competitive and efficient retail market that delivers better outcomes for consumers.

4.5. Suppliers will need to financially reward consumers for shifting load. The rewards suppliers offer will reflect the costs savings they can realise in purchasing and transporting energy from DSR. Larger non-domestic consumers that respond to price signals can benefit directly from lower bills. In the longer term, their actions can also help reduce electricity prices for all consumers. Moreover, DSR among larger non-domestic consumers can strengthen security of supply and promote sustainability. However, there will also be a distributional impact of exposing consumers in Profile Classes 5-8 to stronger price signals.

4.6. This section explains why P272 will drive suppliers to encourage more efficient use of energy. It then discusses in detail the impact on competition and consumers.

More accurate allocation of consumption

4.7. The settlement process places incentives on suppliers to purchase enough energy to meet the amount that their customers use (because their exposure to imbalance charges reflects the difference between the two). In this way, it drives suppliers' decisions about how much electricity to buy and hence the costs they incur in sourcing energy for consumers. As part of the settlement process, it is necessary to determine the amount of energy used by each supplier's customers in each settlement period. The consumption data generated is used for settlement and also to allocate other costs to suppliers, including the costs of using the transmission and distribution networks to transport energy to the end consumer.

4.8. At present, consumers in Profile Classes 5-8 are settled using estimates of consumption. This means that the volume of energy that a supplier's larger non-domestic consumers are assumed to use will not reflect their actual consumption in each settlement period.

4.9. As a result, the allocation of the costs of purchasing energy and transporting it to end consumers is not fully accurate. In any settlement period, a supplier may be insulated from the costs they impose (where they are allocated less than their customers actually consumed). Alternatively, a supplier may be exposed to costs for which they are not responsible (where they are allocated more than their customers actually consumed). This may be particularly pronounced for smaller suppliers. Due to the size of their portfolio, their NHH consumers' consumption in aggregate is less likely to reflect the national load profiles that are used for settlement.

4.10. In particular, suppliers cannot realise the financial benefits of encouraging consumers to change when they use energy. Within the NHH arrangements, it is possible to adjust the standard profiles to accommodate static ToU tariffs. These tariffs allow suppliers to reduce purchasing costs by encouraging consumers to move consumption from periods of higher demand ('peak periods') to periods of lower demand ('off-peak periods'). They are static because the peak and off-peak periods and the prices applied at these times are fixed in advance. Unless a consumer in Profile Classes 5-8 is settled in this way (on an adjusted profile), its supplier is prevented from saving money by encouraging its customers to use energy at off-peak times. Even where adjustments are made to the profile, settlement does not take account of how consumption varies within the time bands over time. Therefore, the full cost saving of any shifting of consumption would not be realised. This is explained in more detail in the box on page 19.

4.11. P272 would improve the accuracy of the allocation of energy costs for larger non-domestic consumers. Network costs could also be allocated more accurately because settlement data is used to calculate distribution and transmission charges. If P272 is implemented, we recognise that changes may be required to the distribution charging methodology if suppliers (and hence ultimately consumers) are to receive efficient price signals through these charges for larger non-domestic consumers. We discuss this issue in Chapter 8.

4.12. In the competitive market, more accurate allocation will drive suppliers to reduce their energy and network costs. If suppliers do not work with their customers to help them use energy more efficiently, they risk losing market share to their competitors.

4.13. The type of DSR of most value may vary between suppliers. For example, some suppliers may seek to shift load to off-peak periods. This would enable them to reduce their costs in purchasing and transporting energy to these consumers because the wholesale cost of energy and the charges for using the network are higher during peak periods. Alternatively, suppliers may use DSR to manage unexpected mismatches in their supply and demand close to real time, because this may be cheaper than contracting with generators or being exposed to imbalance charges. A supplier may also seek to shift demand to coincide with output from its generation assets, including wind farms. This is because it can avoid costs that would be incurred in going to market, either to sell unused energy (when it is producing more than it needs) or buy additional energy (when it is not producing sufficient energy to cover what its customers need).

Impact on competition

4.14. By driving suppliers to work with consumers in Profile Classes 5-8 to reduce costs, P272 will change the competitive dynamics in the retail market for these consumers. To realise cost savings, suppliers would need to innovate in the products and services they provide and sell to these consumers. These could include new ToU tariffs that offer lower prices to consumers if they change how and when they use energy. Such innovation can also enable suppliers to distinguish themselves from their competitors, which can help them to attract new customers.

Offering ToU tariffs to NHH consumers

Suppliers can offer ToU tariffs where a consumer has a meter with two or more registers that can be configured to record consumption for different time periods. Under the current arrangements, to realise the benefits of offering such a tariff to a consumer in Profile Classes 5-8 a supplier must notify the specific configuration associated with a tariff to settlement. For this reason, only static ToU tariffs can be offered to these consumers. The supplier must also identify which consumers have this configuration. When the meter is read, allocation of volumes across the load profile reflects the amount used in different time periods as recorded on the meter registers.

While adjusting profiles to accommodate static ToU tariffs allows suppliers to realise some of the benefits of consumers shifting load, their incentives to offer such tariffs remain limited. This is in part because profiling serves to insulate suppliers from the true costs, as described above. In particular, for a ToU tariff offered through profiling the meter registers are configured to record consumption in time bands, rather than in each settlement period and to record cumulative consumption in these time bands between meter readings spanning periods longer than a half hour (and most likely at least one month).

As a result, settlement does not take account of how consumption varies within the time bands on different days. Therefore, the saving from any shifting of consumption will not reflect the actual costs incurred.

4.15. Innovation in products and services, together with more active selling of these offerings, would increase the competitive pressure on suppliers, helping to create a market that delivers better outcomes for larger non-domestic consumers, including better customer service and more competitive pricing.

4.16. In particular, HH settlement enables suppliers to offer dynamic ToU tariffs. These tariffs provide for price or pricing structures to vary at short notice in response to market events, subject to contractual terms.[14] While basic forms of such tariffs are available to some NHH consumers through dynamic teleswitching, we understand that they are not offered to consumers in Profile Classes 5-8.[15] Some suppliers and other market participants have argued that HH settlement will be necessary to provide them the incentive to offer dynamic ToU tariffs. Such tariffs, potentially combined with direct load control or other automation, could allow suppliers to unlock more of the value of DSR and hence pass on larger cost savings to consumers.

4.17. The offer of new products and services to the market could pose challenges to effective consumer engagement in the market. For example, an increase in the number, variety and sophistication of tariffs on offer may make it harder for consumers to find one that is suited to their needs.

4.18. We consider that the majority of consumers in Profile Classes 5-8 are in a position to understand and manage their consumption. As part of the Retail Market Review (RMR)[16], Ofgem conducted research into engagement in the market among smaller and larger non-domestic consumers.[17] This suggested that some of these consumers can be deterred by complex or opaque information, including information related to tariffs. The research also found that non-domestic consumers with higher consumption do not face the same issues in terms of complexity. Furthermore, discussions with representatives of non-domestic consumers have not identified material concerns regarding engagement in the market if P272 is implemented.[18]

4.19. Ofgem has taken steps to address issues around complexity through the RMR for micro-business consumers. Among consumers assigned to Profile Classes 5-8, these measures can help those who are most likely to face challenges in engaging in the market if P272 is implemented. Furthermore, there is an active Third Party Intermediary (TPI) market that could be expected to help larger non-domestic consumers should P272 be approved. TPIs are organisations that engage with domestic or non domestic consumers to assist them with their energy supply needs. They are not energy suppliers. TPIs can offer services that help consumers to make

[14] Critical-peak pricing is one form of dynamic tariff, whereby the price communicated to the customer is signalled in real time, where that is day-ahead price alerts or intra-day price differentials.
[15] ELEXON, 2012. *Consultation on Dynamic Switching in the Smart World*.
[16] The RMR was an Ofgem project with the aim of making the energy market work better at serving the interests of consumers and enable individual consumers to get a better deal from energy suppliers.
[17] Opinion Leader Research, December 2012. *Research Findings on the Experiences of Non-Domestic Customers*.
[18] We discussed the impacts of P272 with Ofgem's Small and Medium Users Group. This is a forum for engaging with representatives of businesses that are small and medium users of energy.

better choices about how they buy and use energy. Ofgem is taking steps that will enhance the consumer experience of engaging with TPIs.[19]

Impacts on consumers from more efficient consumption

4.20. If approved, P272 will drive suppliers to encourage DSR among larger non-domestic consumers. As a result, a wider range of consumers could take up products and services that encourage them to use energy more efficiently, including ToU tariffs. Where consumers are already on such tariffs, they may move to new tariffs that send sharper price signals.

4.21. Where larger non-domestic consumers respond to price signals by shifting load, this can deliver benefits for all consumers. Benefits can also be realised by larger non-domestic consumers reducing load outright in response to price signals. In this section, we consider load shifting and load reduction and then the distributional impacts of stronger price signals for larger non-domestic consumers.

Load shifting

4.22. Where larger non-domestic consumers shift load in response to price signals this can deliver benefits for all consumers through: lower short-term generation costs; avoided investment in generation, transmission and distribution assets; strengthening security of supply; and promoting sustainability.

4.23. Shifting demand from peak to off-peak periods could reduce the average costs of generation because at times of peak demand, the average cost of plant used during peak periods tends to be higher than plants used at off-peak periods. Also, by flattening the pattern of electricity usage over time, load shifting can increase the operating efficiency of existing generation plant; allowing them to run at higher load factors.[20]

4.24. Load shifting to off-peak periods can also reduce the need for, or delay, investment in generation and network assets. As electricity cannot be stored in any significant quantity, sufficient generation and network capacity must be in place to meet peak demand. By moving load to off-peak periods, DSR can reduce the requirements for additional network and generation capacity. In relation to distribution networks, we note that suppliers need DSR at times of peak prices, whereas network operators need it most at times of peak local demand. In the longer term, these periods may not coincide. Our recent consultation on the regulatory and commercial framework around DSR explored this issue.[21]

4.25. There is some evidence that shifting of load to off-peak periods can also reduce carbon emissions. For example, in a study spanning six European countries

[19] Ofgem, 2013. *Third Party Intermediaries Programme: Initiatives for non-domestic consumers*.
[20] Load factor refers to the proportion of output that a power station produces relative to the output it would produce if it could be operated at maximum output 100 per cent of the time.
[21] Ofgem, 2013. *Creating the right environment for demand-side response*.

including Great Britain (GB), Darby, Strömbäck and Wilks found that both static and dynamic peak shifting can reduce emissions without an overall reduction in demand.[22] However, given limited evidence we have not incorporated carbon savings into our quantitative analysis.

4.26. DSR can also help to accommodate increasing amounts of intermittent, low-carbon generation on the system, particularly wind farms. Wind farms are more variable and less predictable than coal or gas generation. Currently, this can be managed by curtailing wind farms (for example, when wind levels are high) or by bringing on thermal generation (when wind levels are lower than expected). DSR could provide an alternative way of managing this variability by raising or lowering demand depending on the wind conditions. This could reduce costs for consumers. It would also promote sustainability by enabling greater use of low-carbon forms of generation. DSR availability also has the potential to provide spare capacity to the system, which could reduce the volume of generation capacity which needs to be available to maintain any given security-of-supply level.

4.27. As part of our quantitative analysis, we assessed some of the potential benefits of DSR relating to lower short-term generation costs and avoided investment in generation and network assets. However, the analysis adopts a simple approach to valuing these savings. For example, we do not take into account the potential for DSR to deliver much greater savings at critical periods when supply margins are tightest and to cope with intermittent supply. Moreover, we only consider shifting of load from peak to off-peak periods. Further, our analysis does not look at the wider impacts of load shifting on sustainability and security of supply, as well as the impacts of innovation on driving efficiency through stronger competition.

4.28. The value of DSR is likely to increase over time but this is not reflected in our quantitative analysis. The increasing contribution of low-carbon intermittent generation to the generation mix will reduce the flexibility and predictability of supply. At the same time, if expectations are met regarding the electrification of heating and transport, overall electricity consumption is expected to rise as well as consumption at peak times. If consumers can be more flexible about how and when they consume electricity, this can help avoid the costs of upgrading the electricity system to manage these developments.

4.29. There is limited evidence available on the potential for consumers in Profile Classes 5-8 to respond to price signals by moving load to off-peak periods. The majority of the research on the potential for DSR has been conducted in North America or concerns domestic consumers. We discuss the evidence we found in Appendix 3. While this evidence is not directly applicable to Profile Classes 5-8, it provides a reasonable basis for making assumptions regarding the potential for shifting of load to off-peak periods among these consumers.

[22] Darby, S, Strömbäck, J and Wilks, M, 2013. 'Potential carbon impacts of smart grid development in six European countries', *Energy Efficiency*, 6(4), pp.725 – 739.

4.30. We assumed that if P272 is implemented, around 2.5 per cent of Profile Classes 5-8 consumption at system peak is shifted. This assumption is within the ranges in our evidence base. For the benefits we quantified, our analysis suggests that load shifting could realise benefits with an NPV on average of £55m over the modelling period. As set out above, we consider this to be a conservative estimate.

4.31. To put our estimate in context, we compared it to analysis undertaken by Pöyry on behalf of DECC to quantify the potential for DSR to reduce electricity system costs.[23] Pöyry found that by 2030, DSR could reduce overall electricity costs by £3 billion per annum. A basic estimate puts the contribution of larger non-domestic consumers at around £145m per year (based on this contribution being proportional to estimated 2030 market volumes). This is a simplification as potential for DSR also depends on other characteristics.

4.32. The significant difference between Pöyry's findings and our results is due to the different methodology for quantifying benefits. Unlike Pöyry's analysis, which assumed a future electricity sector characterised by high electrification, decarbonisation and intermittency, our assessment does not take account of the potential for the generation mix and consumption patterns to change over time. Furthermore, we modelled the potential value of a permanent shifting of load to off-peak periods. In contrast, Pöyry considered how DSR could be used to respond at short notice to changes in system conditions (including the potential to avoid curtailment of wind). These differences in approach underline that we have been highly conservative in estimating the potential value of DSR in the longer term.

Load reduction

4.33. There is evidence to suggest that DSR can indirectly lead consumers to reduce load outright at peak times (in addition to shifting consumption to off-peak periods).[24] Where larger non-domestic consumers respond to price signals in this way, they can save money on their bills. In addition, lower consumption can reduce carbon emissions and improve air quality.

4.34. Our quantitative analysis modelled the effect of lower prices and the benefits from lowering carbon emissions and improving air quality. While there is limited evidence on the potential carbon saving from load shifting, we can make reasonable assumptions about the plant that is not needed if demand is reduced outright during peak periods. We assumed around 0.4 per cent of Profile Classes 5-8 consumption at system peak is reduced outright. This gives benefits with an average NPV of £11m over the modelling period.

4.35. Our quantitative estimate of the benefits of load reduction is conservative. We note that participation in DSR activities can lead to an increase in awareness of

[23] Pöyry, November 2010. *Demand side response: Conflict between supply and network driven optimisation*.
[24] Owen, G, Ward, J and Pooley, M, October 2011. *GB Electricity Demand – Context and 2010 Baseline Data*.

energy issues, including a better understanding of energy usage patterns. This in turn can help consumers to reduce demand through energy efficiency.

Distributional impacts

4.36. To encourage DSR, suppliers can offer financial incentives to encourage consumers for shifting consumption. The rewards they offer will reflect the immediate savings they can make from moving consumption. Those larger non-domestic consumers who are able to respond to price signals can benefit immediately from lower bills and, in the longer term, all consumers will benefit from lower costs from avoided investment in network and generation capacity. Competitive pressure on suppliers means that we expect that they would pass these longer-term savings on to consumers. All consumers can also benefit from stronger security of supply and greater use of low-carbon forms of generation.

4.37. Consumer representatives have expressed concerns that not all larger non-domestic consumers will respond to price signals. One reason could be that energy bills are not a sufficient component of their operating costs to justify moving consumption. Another is that they are unable to move load for business reasons. This might be because of opening times or because working hours cannot be changed.

4.38. Those consumers who are not able to shift load may face higher costs. Moreover, some of those who can move consumption may not save money. This is most likely where a consumer uses significant energy at peak times. If P272 is implemented, suppliers would have incentives to encourage DSR by sending sharper price signals. In this way, P272 would unwind an existing cross-subsidy in the electricity market. At present, because of profiling consumers are isolated from the actual costs of their consumption (both the costs of purchasing energy and using the network). As a result, those who use less energy at peak than assumed by the profile are paying towards some of the costs of those who use more at peak.

4.39. As discussed above, we consider that the majority of consumers in Profile Classes 5-8 are in a position to understand their consumption and take informed decisions about how to respond to price signals. We note that there is an issue regarding the appropriateness of the price signals that distribution network charges would send if larger non-domestic consumers moved to HH settlement. We consider this further in Chapter 8.

Better forecasting of demand

4.40. If P272 is implemented, suppliers will be able to forecast more accurately the consumption of consumers in Profile Classes 5-8. As a result, the volume of energy that they buy will more closely match the amount that these consumers use. This will improve the efficiency of balancing the system, reducing costs for consumers. In addition, the ability to forecast better the consumption of HH consumers can also strengthen competition by reducing the risks of entering the market. This section explains the impact of better forecasting.

Ability to forecast demand

4.41. Suppliers have incentives to purchase enough energy to cover the volume of consumption they are allocated through the settlement process. For NHH consumers, suppliers need to forecast the amount of energy they will be allocated through profiling. HH consumers are settled using HH meter readings, such that suppliers need to forecast what these consumers will actually use in a settlement period.

4.42. However, supplier forecasting also needs to take account of error in the allocation of energy volumes at an aggregate level. The total volume of energy allocated to all suppliers based on profiling and actual HH meter readings may not match what was actually used. Where this occurs, Grid Supply Point Group Correction Scaling Factor (GGCSF) is used to adjust all suppliers' volumes up or down to ensure that all energy is allocated. Therefore, to avoid imbalance charges suppliers must purchase sufficient energy to cover the impact of GGCSF as well as their metered energy use. The most significant cause of error at aggregate level is profiling.[25] As a result, GGCSF mostly adjusts NHH consumption volumes to take account of error. Only a small adjustment is made to each supplier's HH volumes.

4.43. In assessing the impacts of P272, the workgroup agreed that suppliers can better forecast HH compared to NHH volumes. Suppliers highlighted that at present they do not collect HH consumption data for larger non-domestic consumers. On this basis, they argued that to improve forecasting they would need to obtain at least one year of data to enable them to understand the HH consumption of these consumers. They also argued that they would need to invest in forecasting engines. These costs were included in the estimates submitted to ELEXON and are considered in Chapter 6.

Impact on consumers from more efficient balancing

4.44. As a result of more accurate forecasting of demand, suppliers' purchases would more closely match the amount of energy that their customers consume in each settlement period. This would reduce the extent to which suppliers taken as a group are in imbalance in any given settlement period, which in turn would affect the balancing actions that NGET needs to take. These actions include energy balancing actions (to address imbalances in supply and demand) and system balancing actions (to manage the flow of power across the network).

4.45. For an individual supplier, more accurate forecasting will reduce its exposure to imbalance charges. However, any net over- or under-recovery of imbalance payments is redistributed to market participants via a mechanism called the Residual Cashflow Reallocation Cashflow. As a result, we consider that any overall reduction in imbalance charges from improved forecasting would be cost neutral for consumers. Instead, the benefit for consumers comes from the difference between the prices at which suppliers can contract forward for energy as a result of more accurate forecasting relative to the cost of NGET's balancing actions. The potential cost saving

[25] ELEXON, 2012. *Contributing Factors to GSPGCF*.

will depend on the behaviour of suppliers, whether the market is long or short and the difference between forward prices and the cost of NGET's balancing actions.

4.46. As part of our quantitative analysis, we assessed the potential cost savings for consumers from improved forecasting. The workgroup estimated that suppliers could achieve a 40 per cent improvement in the accuracy of forecasting HH as compared to NHH consumption. This figure was derived from forecasting experts.

4.47. Using the workgroup's estimate and historical data on imbalance volumes from April 2011 to March 2013, we calculated how HH settlement of Profile Classes 5-8 would have affected suppliers' purchasing costs and NGET's balancing costs (system and energy). Using this information, we estimated that over the 20-year modelling period P272 could deliver an average cost saving of £10m for consumers.

Impact on competition

4.48. The ability for suppliers to more accurately forecast demand would enable them to reduce imbalance risk. This in turn can reduce the risk and hence costs of entering the market for larger non-domestic consumers.

4.49. However, we note that profiling insulates suppliers from unexpected customer behaviour in any settlement period. In contrast, HH settlement of larger non-domestic consumers would fully expose suppliers to any errors in forecasting actual consumption. If suppliers are unable to forecast HH demand as accurately as NHH demand, this could increase their imbalance risk. Larger suppliers suggested they will invest in their forecasting systems to manage this risk. However, smaller suppliers may not have the necessary resources to make this investment. In addition, the higher costs incurred in building a more sophisticated forecasting system for HH consumers could potentially deter new entrants.

4.50. That said, we do not have any evidence to suggest that P272 would increase imbalance risk for smaller suppliers or new entrants that serve larger non-domestic consumers. No smaller supplier has raised these concerns in response to the workgroup's consultation. In addition, smaller suppliers have a larger share of the existing HH market compared to the NHH market. This suggests that they can manage imbalance risk for HH consumers effectively. We note that these consumers use the largest volumes and hence pose the largest risk. We welcome views on whether the costs of investing in forecasting capability for HH demand may impact disproportionately on smaller suppliers or on new entrants.

5. Cost savings in managing the settlement process

Chapter Summary

If P272 is implemented, suppliers can realise cost savings in the management of the settlement process. This can lower bills for consumers and reduce the costs of entering the market.

Question box

Question 8: Do you agree that we have correctly identified the cost savings that suppliers could realise in managing the settlement process?

Question 9: Do you agree with our assumption regarding the typical size of data quality teams employed by suppliers?

Question 10: Do you agree that meters of consumers in Profile Classes 5-8 are mostly read at the end of each month?

5.1. Mandating HH settlement for consumers in Profile Classes 5-8 would enable suppliers to realise cost savings in the management of the settlement process. We identified four business activities where these savings could be realised, as follows:

- Lower HH Supplier Agent costs - the costs that suppliers incur from charges for collecting and preparing consumption data from existing HH consumers for settlement could fall because P272 would increase the size of the HH market
- Improved data quality - the costs that suppliers incur as a result of errors in consumption data could fall because larger non-domestic consumers are settled using actual HH meter readings
- Faster settlement – suppliers could face less financial uncertainty in the allocation of imbalance charges as meter readings for larger non-domestic consumers would be submitted to settlement sooner
- Lower administration charges - if P272 is implemented, load profiles would not be necessary for Profile Classes 5-8.

5.2. Our expectation is that competition will push suppliers to pass through the costs savings they can realise to consumers by offering better services and lowering electricity bills. The following sections discuss each cost saving and where relevant describe how we have quantified their materiality.

Lower HH Supplier Agent costs

5.3. At present, around 120,000 sites are settled in the HH market. Under the current arrangements for HH settlement, suppliers (or in some cases consumers themselves) appoint Supplier Agents to perform a variety of tasks on their behalf:

- Meter Operators install and maintain electricity meters on behalf of suppliers
- Data Collectors retrieve and process meter readings
- Data Aggregators package up consumption data provided by the Data Collector.

Impact on consumers and competition

5.4. If P272 is implemented, the number of sites in the HH market would more than double to around 274,000 in one year. Increasing the size of the HH market could reduce the fees that Supplier Agents charge. This could reduce suppliers' operational costs and, providing they pass these savings on to their customers, consumer bills.

5.5. We focus particularly on the costs of Data Collectors and Data Aggregators appointed by either a supplier or a HH customer. The fees these agents charge could fall as result of economies of scale. As their cost base is made up of fixed costs (such as IT systems) and variable costs (such as communication contracts), increasing the size of the HH market could spread the costs of the former over a larger number of sites. This would reduce the cost per customer.

5.6. This benefit is limited to existing HH sites. Charges for consumers in Profile Classes 5-8 moved from NHH to HH settlement are likely to increase because of the need to retrieve and aggregate a greater volume of consumption data for these customers.

5.7. In addition, a larger number of HH sites could encourage new businesses to enter the market. For example, Data Collectors or Data Aggregators only qualified to operate in the NHH market may seek to enter the HH market. New entrants could increase competition between Supplier Agents in the HH market, driving further efficiency and hence lower charges for suppliers.

5.8. We quantified the potential cost savings that can be achieved by increasing the number of sites that are settled in the HH market. We used information provided by the workgroup and assumed that suppliers and customers who appoint their agents would be able to realise on average cost savings of around £20 per HH site. Our analysis concludes that suppliers could realise cost savings with an NPV of around £31m over the modelling period.

Better data quality

5.9. The quality of consumption data is critical to the accurate allocation of energy volumes through settlement. We define data quality in terms of the correct settlement of accurate meter readings. This is distinct from the granularity of the meter reading itself, which can also have implications for the accuracy of volume allocation. We discussed this in Chapter 4.

5.10. Errors undermine data quality and can arise for a variety of reasons, including a faulty meter not recording consumption accurately, inaccurate meter reads, or errors occurring at the time of processing meter reading data for settlement. Some of the errors can be attributed to processes specific to the NHH market. These processes relate to the NHH allocation process, whereby the total consumption between two meter readings is converted into HH consumption values. This process is complex and involves multiple steps, thereby creating many points of potential failure. This complexity also makes errors difficult to detect and remedy.

5.11. Errors in consumption data can impact suppliers in a number of ways. In particular, they can create a gap between the amount of energy that a supplier is allocated through settlement (its purchases) and the amount it has sold to its customers (its sales). In the NHH market, the total volume of energy settled is based on actual meter readings and hence should be accurate. However, failures in the NHH allocation process can create a discrepancy between the volume of energy that is settled and the meter reading (on which a customer is billed).[26]

5.12. There are other drivers of the discrepancy between purchases and sales that are not specific to the NHH market, for example if a customer submits a reading for billing purposes that is not used for settlement. This inconsistency is due to failings in internal business processes, rather than to NHH settlement. As set out above, the complexity of NHH allocation processes makes it difficult to identify and resolve such issues.

5.13. In addition to creating a mismatch between purchases and sales, errors can also affect a supplier's imbalance position. For example, where a faulty meter overstates consumption, the relevant supplier will be allocated more energy than it should have been.[27] A supplier may not have contracted forward to take account of this error, thereby exposing it to imbalance charges. While not the result of NHH settlement, the error may be more difficult to detect due to the complexity of the allocation process for this segment of the market.

5.14. The quality of consumption data used for settlement can also impact upon other processes. For example, errors in data history can lead to delays when a customer wants to change supplier.

5.15. Errors in consumption data create risks for suppliers. In the case of mismatches between purchases and sales, the risk is that suppliers will not collect sufficient revenues to cover their costs. Suppliers can respond to the potential risks by employing data quality teams with responsibility for errors in consumption data or by adding a premium on consumer bills to allow for differences that cannot be resolved by data quality teams. Both mitigating actions increase suppliers' costs to serve, which they pass on to consumers.

[26] The application of GGCSF can also create a discrepancy between purchases and sales. This is largely confined to the NHH market.
[27] The impact on the supplier's overall imbalance position will depend on the extent to which they have contracted sufficiently to meet the demand of the other customer's in their portfolio as well as their hedging strategy. For example, if a supplier tends to buy more energy than it needs the impact of a meter overstating consumption will be to reduce the extent to which the supplier is long.

Impacts on consumers and competition

5.16. If P272 is implemented, sites in Profile Classes 5-8 would be settled on actual HH meter readings. The process for preparing meter readings for settlement in the HH market is simpler in comparison to the NHH market. As such, errors are less likely to occur and, when they do arise, are easier to detect and remedy. We consider that the main benefit would be better matching of purchases and sales.

5.17. As a result, suppliers will face less risk around data quality. Therefore, there is the potential to realise costs savings from reducing the size of data quality teams. There is also the potential to lower the premium that is added to customer bills. By reducing risks for suppliers, there is also the potential to promote competition as the costs of operating in the electricity market would reduce.

5.18. In our quantitative assessment, we estimated the potential cost saving that can be achieved by reducing the size of data quality teams. Based on our best understanding of the typical size of these teams, we assumed that the resources allocated to data quality teams by all suppliers will reduce by between 50 and 60 employees (or full-time equivalent – FTEs). Our analysis concludes that, in this way, suppliers could realise cost savings of around £18m (NPV) on average.

Faster settlement

5.19. The process of comparing contracted and metered volumes for each settlement period and charging for any imbalance is repeated at set intervals called settlement runs.[28] The first of these runs (SF) happens around 3 weeks after a settlement period occurs.

5.20. If, at the time of a settlement run, a meter reading is not available from a NHH site that covers the relevant settlement period, an estimate of consumption is used. The volume of energy allocated to a supplier is later revised when an actual meter reading becomes available. This creates fluctuation in the allocation of energy volumes over time and hence the imbalance charges suppliers pay.

5.21. Our understanding is that historically sites in Profile Classes 5-8 have been read at the end of each month for billing purposes. As such, we would expect that in most cases they all are settled on actual meter readings at the settlement run that falls around six weeks after a settlement period occurs (called R1). Therefore, for Profile Classes 5-8, fluctuations in energy volumes occur between SF and R1.

[28] As explained in chapter one, for NHH consumers meter readings are not taken for each settlement period. Instead, these readings cover longer periods (for example, one month). The total consumption across these periods is then allocated across the relevant settlement periods using load profiles.

Impact on consumers and competition

5.22. P272 would require that 99 per cent of energy for larger non-domestic consumers is settled on actual meter readings at R1.[29] This standard is an important driver of some of the costs suppliers consider they will incur if P272 is implemented. To meet the standard introduced by P272, suppliers may read meters more frequently, thereby reducing fluctuations in energy volumes between SF and R1.

5.23. Reducing fluctuations in energy volumes for larger non-domestic consumers could in turn reduce the amount of cash reserves that a supplier would need to set aside as contingency to cover any changes in their exposure to imbalance charges. This could help to promote competition, by reducing the cash reserves that new entrants need to enter the market and to lower consumer bills.

5.24. In our quantitative assessment, we quantified the potential monetary benefit of reducing fluctuations in energy volumes between SF and R1. We used the assumption made by the workgroup that the benefit in credit and cash flow management would equate to £0.1/MWh and conclude that suppliers could realise average cost savings of around £1m (NPV) over the modelling period.

Lower administration charges

5.25. For sites settled NHH, profiles are created by recording and analysing HH consumption data from a representative sample of customers. The costs of this activity are shared across all suppliers according to market share.

Impact on consumers

5.26. If P272 is implemented, the load profiles for Profile Classes 5-8 will be 'frozen'. This means that load research for Profile Classes 5-8 will stop and new profiles will not be created. The frozen profiles will be used to settle customers who do not have an advanced meter installed and to settle sites that currently rely on the load profile tied to Profile Classes 5-8, such as NHH unmetered supplies.

5.27. By freezing the load profiles for Profile Classes 5-8, the costs of administering the BSC will reduce. This is due to lower costs in retrieving data from sites that previously would have made up the load profile sample for Profile Classes 5-8 and in analysing the data from the sample to create load profiles for these consumers. As a result, all suppliers will benefit from lower costs of retrieving and analysing data, which should be passed on to consumers in the form of lower bills. In our quantitative assessment, we used the estimates generated by ELEXON and assumed a saving of 1 FTE. We conclude that the impact of this benefit would deliver a cost saving of around £0.4m (NPV) on average over the modelling period.

[29] P272 would mandate that 99 per cent of energy for sites assigned to Measurement Class E must be settled on actual meter readings at R1. As a small number of sites are already settled in this Measurement Class, we note that the volume of energy settled on actual meter readings at R1 from larger non-domestic consumers assigned to this Measurement Class may be slightly less than 99 per cent.

6. Implementation costs

Chapter Summary

Suppliers will incur upfront and ongoing costs in managing the settlement process if P272 is implemented. DNOs will also incur costs in billing suppliers for use of their networks.

Question box

Question 11: Do you agree with our approach to quantifying the costs of P272 for suppliers and DNOs? If not, we encourage respondents to suggest alternative approaches.

Question 12: We welcome evidence from smaller suppliers of larger non-domestic consumers on the costs they could incur if P272 is implemented.

Question 13: We welcome information from suppliers on (1) how many consumers would need to move electively for them to incur upfront costs and (2) the costs that would be incurred, broken down by the cost categories listed in this chapter.

Question 14: Would consumers incur costs from termination of contracts with Supplier Agents? If so, we welcome information that could help us to assess these costs.

6.1. In this chapter, we assess the upfront and ongoing costs that suppliers and DNOs could incur as result of P272. We provide a detailed description of the methodology applied to estimating such costs in Appendix 2.

6.2. In assessing the costs, we used the information gathered as part of the workgroup's assessment of P272. Besides cost data submitted by DNOs, cost submissions are all from larger suppliers and therefore may not accurately reflect the scale of costs smaller supplier would incur if P272 is implemented. We seek views from smaller suppliers to larger non-domestic consumers on the costs they could incur.

6.3. This chapter also discusses other costs we have not included in our assessment. They are the costs for consumers of terminating contracts with NHH Supplier Agents, and the costs of qualifying for the Carbon Reduction Commitment Energy Efficiency Scheme (CRC). In relation to termination costs, we seek views from stakeholders on their scale to enable us to take a view on whether they should be included in the analysis. With regard to the CRC, this is an unintended consequence of the qualification rules and hence is not included in our impact assessment.

Suppliers' costs

Upfront costs

6.4. As part of the workgroup's assessment, the workgroup issued a consultation to seek data on the costs that suppliers would incur to implement P272. This identified six types of upfront costs relating to:

- the process for changing the Measurement Class of the affected sites
- changes to internal processes, for example billing or settlement processes
- upgrades to internal systems (including software development costs but excluding hardware costs) to manage the need to process more granular data
- provision, hosting and security of new IT infrastructure (hardware costs), for example for collection and aggregation of data
- provision or development of Supplier Agent roles (eg procurement costs)
- other costs, including costs of changing Supplier Agent should the existing NHH Supplier Agent not have HH accreditation.

6.5. We consider that these categories are the best view available of the costs suppliers would incur, based on our understanding of the evidence available. In our quantitative analysis, we applied the data provided by suppliers and made assumptions for those suppliers that have not provided data using evidence from others. We estimated that suppliers will incur average upfront costs of implementing P272 of around £25m in NPV over the implementation period (January 2014 – April 2015).

6.6. As part of our analysis, we considered the scope for assessing the impact of a higher uptake of elective HH customers. Should more Profile Classes 5-8 customers move electively to HH settlement, the positive impact of P272 could be lower. However, we would also expect the implementation costs of P272 to be lower. We do not have sufficient information to model the number of elective HH customers that would trigger new upfront costs, nor the magnitude of these costs. We welcome views and evidence to inform our assumptions on this matter.

Ongoing costs

6.7. The workgroup's consultation also identified five types of costs that suppliers would incur on an ongoing basis above what they would have done if sites in Profile Classes 5-8 remained NHH settled. These costs relate to:

- collecting and aggregating HH consumption data
- maintaining meters with communications suitable to collect HH consumption data for settlement
- rent of meters for HH settlement

- charges to use the DTN for HH sites
- Other costs, including resources for validation of settlement invoices.

6.8. We understand that some of these costs would materialise because suppliers currently do not collect HH consumption data from Profile Classes 5-8 customers. We consider that these categories are the best view available of the ongoing costs suppliers would incur, based on our understanding of the evidence available. Our assessment has used the data that suppliers provided to ELEXON in response to the workgroup's consultation.

6.9. Suppliers submitted widely diverging costs. We consider that competitive pressure would drive suppliers to seek to implement P272 as efficiently as possible. For example, they may seek to procure competitively agents to retrieve and process data for settlement. While some larger suppliers estimate charges for these services for sites in Profile Classes 5-8 will increase significantly if P272 is implemented, others do not. Over time, we expect the former would improve their procurement processes to obtain agent services at a cost comparable to their cheaper competitors.

6.10. We estimated the scale of ongoing cost taking into consideration the potential for efficiency gains and have assumed that suppliers would incur ongoing costs of around £45 per meter in Profile Classes 5-8 per year. Our analysis concludes that ongoing suppliers' costs will be on average around £100m (NPV) over the modelling period.

DNO costs

Upfront costs

6.11. The workgroup's consultation identified five types of upfront costs that DNOs might incur from:

- upgrades to billing systems (including software development costs but excluding hardware costs)
- provision, hosting and security of IT infrastructure (hardware)
- upgrades to other internal systems (for example, increasing space capacity and staff to manage increased volume of HH data processing)
- updates to registration systems (including costs from software development and changes to Measurement Class)
- implementation of process changes.

6.12. We consider that these categories are the best view available of the upfront costs DNOs would incur, based on our understanding of the evidence available. In our quantitative analysis, we applied the data provided by DNOs at the time of the workgroup impact assessment and made assumptions for those DNOs that have not provided data using existing evidence from others. We have estimated that DNOs will incur upfront costs of implementing P272 of around £1m over the implementation period.

6.13. We note that one of the drivers of upfront costs for DNOs comes from the way in which bills are charged. At present, DNOs bill suppliers on an aggregate basis for their NHH consumers and provide site-specific bills for HH consumers. Site-specific billing is the only means by which consumers can receive a price signal that is specific to them. If P272 is implemented, suppliers will receive site-specific bills for larger non-domestic consumers, thereby increasing the number of site-specific bills that are processed. We consider this issue further in Chapter 8.

Ongoing costs

6.14. The workgroup's consultation identified four types of ongoing costs that DNOs might incur from:

- processing larger volumes of HH data (including management of data flows and validation costs)
- billing activity
- charges to use the DTN for HH sites
- other costs, including costs of dealing with site-specific queries from customers and suppliers on matters other than billing.

6.15. As with upfront costs, some DNOs estimated that they would incur higher ongoing costs as a result of billing consumers in Profile Classes 5-8 on a site-specific basis if P272 is implemented.

6.16. We consider that the categories above are the best view available of the ongoing costs DNOs would incur, based on our understanding of the evidence available. Our assessment has used the data that DNOs provided to ELEXON in response to the workgroup's consultation to estimate an average cost to manage a single meter. In our quantitative analysis, we assumed that DNOs will incur in ongoing costs of around £1.6 per meter in Profile Classes 5-8 per year. Our analysis concludes that average ongoing costs for DNOs will amount to around £11m (NPV) over the modelling period.

Costs we have not included in our assessment

6.17. Our assessment does not take into consideration two costs the workgroup identified that might fall directly to consumers. These costs come from consumers terminating contracts with NHH Supplier Agents, and for qualifying for the CRC.

Termination of contracts

6.18. The workgroup highlighted that customers are able to appoint their own agents. Therefore, there may be instances where a customer in Profile Classes 5-8 needs to terminate an existing contract with a NHH Supplier Agent that is not qualified to operate in the HH market. While agents can qualify to operate in the HH market, we recognise that some of them may decide not to do so. Suppliers explained that these costs were not identified in their submissions to the workgroup's consultation.

6.19. The workgroup sought to ascertain the materiality of the potential cost. Suppliers indicated that over 25,000 in Profile Classes 5-8 appoint their own agents. However, it was difficult to assess the materiality of the costs because data is not available on:

- whether those customers appoint their own agents for all their meters or only a subset
- how many agents appointed by customers would not be qualified to operate in the HH market
- the charges associated with termination for affected contracts.

6.20. We seek views from stakeholders on the issues highlighted above to enable us to take a view on this matter.

Carbon Reduction Commitment

6.21. The CRC is a mandatory scheme aimed at improving energy efficiency and cutting emissions in large non-energy intensive public and private sector organisations. Qualifying organisations must report on their energy use and purchase allowances to cover their carbon emissions.

6.22. DECC announced changes to the qualification criteria for phase two of the CRC in December 2012 and the new scheme came into force in May 2013. Under the new qualification criteria for the scheme, an organisation will qualify if it uses at least 6,000MWh of electricity through HH meters settled in the HH market. DECC believe that around 1,700 organisations will qualify for the CRC from the beginning of phase 2 (2014-15). Typically, electricity bills for these companies are one to two per cent of total operating costs. The next qualifying year for assessing which organisations are liable for the CRC will be from 2017 to 2018.

6.23. P272 would not increase the number of organisations that qualify for the scheme in the short term. This is because the qualifying year for Phase 2 runs from April 2012 to March 2013. In the medium term, P272 might increase the number of qualifying organisations from 2018 onwards. This is because P272 may mean a company has more half-hourly settled meters and more sites contributing towards its qualifying volumes. We have no information on how many organisations would be affected. On this point, DECC estimated that most qualifying organisations comfortably exceed the threshold but they have not assessed the impact of P272.

6.24. Some representatives of non-domestic consumers have raised concerns around the potential for new businesses to become eligible for the CRC. This would be an unintended consequence of P272 but would not be a direct result of the modification. If P272 is implemented, we would encourage a review of the qualification criteria. On this point, we are aware that DECC plans to undertake a full review of the CRC in 2016. For this reason, we have not included the potential for businesses to become eligible for the CRC in our assessment.

7. Results of quantitative analysis

Chapter Summary

For the impacts that we quantified, our quantitative analysis suggests that P272 is cost neutral for consumers. However, we consider that our approach to quantifying impacts is conservative.

Question box

Question 15: Do you have any comments on the results of our quantitative analysis?

7.1. Chapter 3 describes our approach to assessing the impacts of P272. It set out how our quantitative assessment managed uncertainty, including by using a Monte-Carlo analysis and by developing scenarios. It also explained that we did not quantify all potential benefits and that we took a conservative approach for those impacts that we did quantify.

7.2. In chapters 4, 5 and 6, we explained the impacts of P272 and identified which we quantified. We also provided an overview of the key modelling assumptions for our base case. This chapter sets out the results of our quantitative analysis for our base case and the scenarios we modelled.

Base case results

7.3. Monte-Carlo analysis is a modelling technique that is useful where there is uncertainty around the exact value of input data. It requires specifying key inputs to the model as probability distributions within a range, rather than relying on single inputs. We set out the inputs we used in our modelling in Appendix 3. The model repeats the calculation a larger number of times (typically 1,000), each time combining different input values randomly selected from the distributions specified.

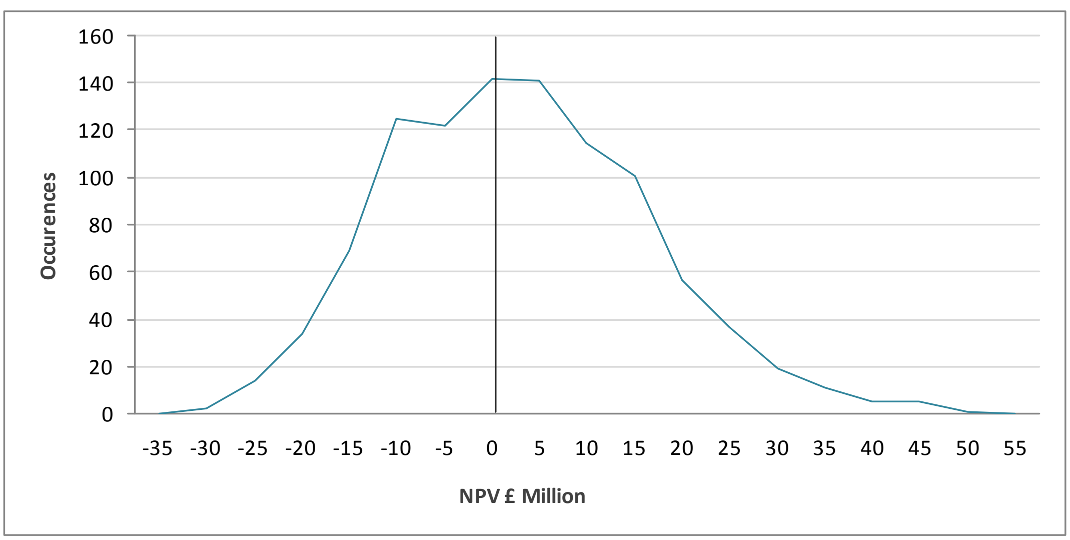
7.4. The results of our base case scenario show that for the impacts we quantified P272 would be cost neutral on average over the modelling period. The NPV for each of the quantified impacts is summarised in Table 4 below. Numbers are rounded to one decimal place and represent the average of 1,000 runs of the model. This table should be read alongside Table 3 in Chapter 3, which explains the benefits we quantified.

Table 4 – Base case results

Change from P272	Impact	Average £m NPV
Supplier buying and selling of energy	Shifting of load from system peak to off-peak periods	55.1
	Permanent reduction in consumption at peak	10.7
	Better forecasting of demand	9.8
Supplier management of settlement process and consumer relationship	Lower cost of agent services	31.2
	Reduction in size of data quality teams	17.6
	Value of improved cash flow from faster settlement	1.0
	Lower administration costs from 'freezing' of Profile Classes	0.4
	Upfront costs for suppliers of implementing P272	-23.9
	Ongoing costs for suppliers of implementing P272	-93.3
DNO billing	Upfront costs for DNOs of implementing P272	-1
	Ongoing costs for DNOs of implementing P272	-7.3
Total		**0.4**

7.5. Figure 2 below presents the results for each of the 1,000 runs and shows that in almost 50 per cent of cases the model returns a positive result. Also, when results are positive, the impact is larger than the impact of those cases where results are negative. The minimum result is a negative impact of -£35m (NPV), while the maximum result is a positive impact of £48m (NPV) over the modelling period.

Figure 2 – Occurrence of NPVs



7.6. As explained above, Monte-Carlo analysis works by selecting inputs randomly from within the distribution ranges specified. This relies on a set of random numbers. To test our base case results, we carried out 20 Monte-Carlo simulations, each using a different set of random numbers. This corresponds to undertaking 20,000 runs.

The average NPV of the 20 simulations is around £0.5 million. On this basis, we conclude that our base case provides a robust representation of the likelihood of the impacts of P272 for the impacts we quantified.

7.7. Given our conservative approach to quantifying the impacts of P272, we expect that our base case underestimates the potential benefits it could deliver. In particular, we note that our quantification of the value of DSR may significantly underestimate the benefits that could be realised. Therefore, we tested the extent of load shifting and reduction that would be required to deliver a positive NPV in 99 per cent of cases. Our analysis shows that this could be achieved if on average 2.63 per cent of Profile Classes 5-8 consumption is shifted and 0.67 per cent is reduced (both at peak), leaving all other assumptions from the base case unchanged. These assumptions around load shifting and load reduction would deliver an average NPV of around £30m. Although this exercise tests the impact of higher volumes of load shifting and load reduction, our estimate remains conservative because of the way we value DSR. Moreover, the volume of load that needs to be moved to off-peak periods does not exceed some of those in the research on the potential for load shifting in the non-domestic sector.

7.8. We note in Chapter 3 that if suppliers elect to move higher numbers of larger non-domestic consumers to HH settlement in the counterfactual, this could reduce the costs and benefits of P272. Our analysis suggests that suppliers are unlikely to move these consumers electively. However, our model does not allow us to explore the impact on our results of suppliers moving higher numbers of consumers across to HH settlement. For example, we have not explored the effect of suppliers electing to move consumers with the flattest consumption profiles to HH settlement. As explained in Chapter 4, these consumers do not need to shift load to save money and hence may not deliver cost savings from DSR.

Scenario analysis

7.9. We conducted scenario analysis to test the impact of wider changes in the energy market on our base case results. We developed two scenarios, which explore the impact of lower consumer responsiveness to price signals and higher energy prices. The assumptions underpinning these scenarios (and how they differ from the base case) are listed in Appendix 3.

Scenario 1 – Lower consumers' responsiveness to price signals

7.10. A number of factors will affect how consumers respond to price signals. Some of these are exogenous to P272. Recognising the uncertainty around the potential response of consumers in Profile Classes 5-8, we explored a scenario where consumers are less responsive to price signals. As a result, there is less innovation in new products and services and less energy shifted at peak. Reasons why larger non-domestic consumers might not provide DSR could include:

- electricity bills are only a small proportion of their cost base

- difficulties in understanding their consumption or in engaging in the retail electricity market
- the nature of their business makes it difficult to shift load.

7.11. Under these conditions, we assume fewer consumers take up DSR products and, of those that do, fewer respond to price signals. Under these new assumptions, we estimate that the impact of P272 would be on average -£18m (NPV) over the modelling period.

7.12. As we expect, if fewer larger non-domestic consumers provide DSR, P272 may not deliver cost savings for consumers. Many of the reasons why these consumers may not provide DSR relate to the costs they incur (for example, in proportion to their other costs or in engaging in the market) compared to the benefits they realise. This underlines the importance of P272 in creating the right conditions to enable efficient use of DSR by sharpening price signals.

Scenario 2 – Higher energy prices

7.13. This scenario explores the impact of higher energy prices (30 per cent higher than in the base case). In this scenario, suppliers would face a higher financial risk of being exposed to imbalance charges. Therefore, we assume suppliers would mitigate this risk by further improving their forecasting capability compared to the base case. Moreover, we assume that suppliers are more proactive in taking steps to encourage DSR among their customers and that their customers are more likely to respond as price signals would be sharper.

7.14. Under these new assumptions, we estimate that the impact of P272 would on average be around £9m in NPV over the modelling period. Our base case assumes that prices do not increase over time. This is highly conservative. As we would expect, higher energy prices change the behaviour of suppliers and consumers to a greater extent. It also increases the value of any DSR that occurs.

8. Interactions with other aspects of the regulatory framework

Chapter Summary

There are two interactions between P272 and other aspects of the regulatory framework. First, the obligation on suppliers to provide access to the consumption data provided by an advanced meter on request will no longer apply. We will shortly consult on this issue. Second, P272 creates a risk that larger non-domestic consumers will not receive appropriate price signals through distribution network charges. We will monitor the progress of ongoing work that is seeking to resolve this issue and, in reaching a decision on P272, we will take into account any further developments in this area.

8.1. This chapter discusses interactions between P272 and two others aspects of the regulatory framework that lie outside the BSC: the supply licence condition and the arrangements governing distribution network charging.

Interactions with the supply licence

8.2. Standard Licence Condition 12 of the electricity supply licence sets out obligations relating to the roll-out of advanced meters. It states that suppliers of non-domestic premises assigned to one of Profile Classes 5-8 must only supply electricity through an advanced meter from 6 April 2014 and must ensure that the consumer has timely access, on request, to the data provided by an advanced meter.

8.3. If P272 is approved, premises in Profile Classes 5-8 would be assigned to Profile Class 00 and settled using actual HH data. This would not affect the obligation to supply larger non-domestic consumers through an advanced meter. For a consumer to be settled HH, they need a meter that meets the requirements of an advanced meter (ie one that is capable of recording HH data and of being read remotely). Furthermore, by the time P272 would take effect in April 2015, suppliers must be supplying their larger non-domestic customers through advanced meters.

8.4. If P272 is approved, the obligation to provide access to consumption data would no longer apply because of the way in which the licence condition is drafted. This issue exists today if a consumer elects to move from one of Profile Classes 5-8 to HH settlement. P272 would mean that the licence condition does not apply to any larger non-domestic consumers because all these advanced meters would be settled HH. It is important that consumers are able to secure timely access to their consumption data on request. We will shortly issue an open letter seeking views on the impact of this obligation falling away if consumers move to HH settlement.

Interactions with distribution network charging

8.5. The consumption data generated through the settlement process is used to calculate the charges that suppliers pay for using the electricity distribution network. Consumers pay these charges as part of their electricity bills from their supplier. P272 has implications for two aspects of distribution network charging.

Site-specific billing

8.6. As set out in Chapter 6, in our quantitative analysis, we took into account the potential for site-specific billing to increase costs for DNOs and suppliers. The rules relating to distribution charging, including the charging methodology, are set out in the Distribution Connection and Use of System Agreement (DCUSA). A modification to the DCUSA has been raised that considers changes to the tariff structure for HH consumers and allows for aggregate billing to be considered. A change to the BSC would be required to allow aggregate billing. Any such change would need to consider the relative costs of site-specific billing compared to aggregate billing.[30] We will monitor progress of this change and update our analysis if it is approved.

Charging methodology

8.7. A HH consumer must be allocated to a HH distribution network tariff. At present, the HH tariff is designed for industrial consumers and not larger non-domestic consumers in Profile Classes 5-8. Therefore, if P272 is implemented, charges for larger non-domestic consumers will be calculated using a tariff that is not designed specifically for their consumption pattern and the costs they impose on the distribution network.

8.8. Suppliers have raised concerns that this could see distribution network charges for larger non-domestic consumers increase if P272 is implemented. We assessed this increase and estimated that across all larger non-domestic consumers, charges could increase by £10.6m in the first year after implementation of P272. This figure is indicative. In particular, our calculation relied on the existing load profiles that are used to allocate consumption to each settlement period. Actual HH consumption for individual consumers will not match these profiles exactly and this will impact on the distribution network charges that they pay.

8.9. For consumers as a whole (domestic and non-domestic), P272 will not increase the revenue that DNOs can collect through network charges. Ofgem establishes the price control framework that sets the revenue that DNOs can recover through charges to consumers. Based on the charging methodology, a DNO creates tariffs that allocate their costs between different types of consumers. The income they expect to receive from these tariffs should match their allowed revenue for the relevant year. If a DNO collects more than its allowed revenue in one year, this will

[30] The intent of DCUSA Change Proposal 179 is to amend the existing tariff structure within the common distribution charging methodology by introducing HH metered tariffs for current transformer metered consumers and whole current metered consumers whose average maximum demand does not exceed 100kW.

be taken into account in setting tariffs for the next year. Therefore, we did not include our estimate of the potential for distribution charges to increase in our quantitative analysis. Indeed, we note if DNOs take into account implementation of P272 (should it be approved) in setting tariffs for 2015/16, then they could avoid recovering more than their allowed revenue for that year.

8.10. We recognise that using existing HH distribution charges, which were not designed for larger non-domestic consumers, creates a risk that these consumers do not receive efficient price signals through their distribution charge. Reducing the effectiveness of price signals could reduce the long-term efficiency of the distribution network as investment on the network that could have been avoided may need to go ahead. As noted above, a modification to the DCUSA has been raised that, if approved, will create two new HH tariffs for larger non-domestic consumers. If an appropriate HH tariff is put in place, P272 could send more appropriate signals to facilitate DSR to avoid network investment. We will monitor the progress of this modification and, in reaching a decision on P272, we will take into account any further developments in this area.

9. Assessment against decision-making criteria

Chapter Summary

We agree with the BSC Panel that the applicable BSC Objectives for P272 are (c) and (d). In our initial assessment, we consider that it better facilitates these objectives. We have also undertaken an initial assessment against our statutory duties and consider that P272 could protect the interest of consumers by providing greater value for money and by promoting sustainability. On this basis and subject to responses to this impact assessment, we are currently minded-to approve P272 Alternative.

Question box

Question 16: If P272 is approved, would it be possible to implement the modification in less than fourteen months?

9.1. In deciding whether to approve P272, we must assess its merits against the relevant BSC Objectives and our statutory duties. This chapter describes our evaluation of the modification against these criteria, as informed by our impact assessment. We only consider P272 Alternative as there is not sufficient time to implement P272 Proposed. We also set out our minded-to position and next steps.

Assessment against BSC Objectives

9.2. We agree with the BSC Panel that for P272 the applicable BSC Objectives are (c) and (d).

Assessment against BSC Objective (c)

9.3. P272 would strengthen competition in the supply of electricity to larger non-domestic consumers in two ways. First, by driving suppliers to reduce the costs they incur in purchasing and transporting energy to these consumers. Second, by reducing some of the costs of entering the retail market. For these reasons, we consider P272 will better facilitate BSC Objective (c).

9.4. At present, the use of load profiles means that the energy volumes that suppliers are allocated through the settlement process do not reflect their customers' actual consumption in each settlement period. This creates inaccuracy in the allocation of energy and network costs. P272 will expose suppliers to the actual HH consumption of their customers in Profile Classes 5-8. This would enable them to reduce costs by helping their customers to use energy more efficiently, including through DSR. We anticipate that competition will drive suppliers to take such actions to avoid losing market share. This would require them to innovate in the products and services they provide, helping in turn to strengthen competitive pressure between them.

9.5. Suppliers incur costs in managing the settlement process. Overall, our quantitative analysis suggests that for existing suppliers these costs would likely be higher for Profile Classes 5-8 if P272 is implemented because of the need to manage larger volumes of consumption data. However, we consider that the assumptions underlying our estimates are conservative. Moreover, P272 could help to bring down the costs of these services for sites that are already settled HH. This would reduce the costs of entering this market.

Assessment against BSC Objective (d)

9.6. As described above, overall we expect existing suppliers to incur higher costs for managing the settlement process for customers in Profile Classes 5-8. This would make the BSC arrangements more costly to implement for suppliers. However, we believe that our assumptions are conservative. Furthermore, we note that using actual HH meter readings means that errors in consumption data are less likely to occur and, when they do, are easier to identify and remedy. This could improve the quality of the data that is used for settlement and hence the service it provides. Taking these two aspects of efficiency together (cost and quality), on balance we consider that P272 better facilitates Objective (d).

Assessment against statutory duties

9.7. Our principal duty is to protect the interests of consumers both present and future. This section sets out our current views against our statutory duties (in addition to the points discussed above in relation to the BSC Objectives).

9.8. One way in which we protect the interests of consumers is by promoting value for money. If P272 is implemented, we expect suppliers to work with consumers in Profile Classes 5-8 to realise DSR. Where these consumers respond to price signals, they can benefit from lower bills. This is because we expect suppliers to offer financial rewards to encourage load shifting, which reflect the savings they could realise from lower average generation costs and avoided or delayed investment in network and generation capacity. We consider that our quantitative analysis provides a conservative estimate of the potential cost savings that can be realised. In particular, we only considered shifting of load from peak to off-peak periods. Moreover, we did not take account of the potential for its value to change depending on when it is used and if expectations relating to deployment of wind generation and rising demand are met.

9.9. Not all consumers in Profile Classes 5-8 will benefit from lower bills. Consumers may face higher costs if their actual HH consumption makes them more costly to serve in comparison to settling them on an estimated load profile, particularly if they are not able to shift load. This is because P272 would unwind the cross-subsidy that arises today because of profiling. We consider that these consumers are in a position to understand their consumption patterns and take informed decisions about how to respond to price signals.

9.10. We recognise that if P272 is implemented, consumers in Profile Classes 5-8 may not receive efficient price signals through their distribution charge. We note that there is work underway to create new HH distribution tariffs for larger non-domestic consumers. We will monitor the progress of this work and, in reaching a decision on P272, we will take into account any further developments in this area.

9.11. We also protect consumers by promoting sustainability. DSR may help to lower carbon emissions and can give greater flexibility to the system, helping to accommodate low-carbon forms of intermittent generation. Load shifting can also enhance security of supply. This is because reducing consumption at peak would reduce the generating capacity needed to serve demand. Dynamic ToU tariffs can also play a role in maintaining security of supply in the context of more intermittent generation.

Minded-to position and next steps

9.12. In light of the assessment set out above, we are minded-to approve P272 Alternative. We will monitor progress of the work to create an appropriate HH distribution tariff for larger non-domestic consumers and, in reaching a final decision on P272, will take account of any further developments in this area. We plan to publish our final decision in Q1 2014, taking into account responses to this consultation.

9.13. We note that industry recommended that fourteen months would be required to implement P272, if it is approved. We understand that the main driver of this view was the need to collect twelve months of half-hourly data to support demand forecasting. We welcome view on whether the implementation period could be reduced.

Appendices

Index

Appendix 1 - Consultation Response and Questions

1.1. Ofgem would like to hear the views of interested parties in relation to any of the issues set out in this document. (In particular, we would like to hear from suppliers, distribution and transmission companies, consumers and their representatives, those with sustainable development interests, academics and other interested parties.

1.2. We would especially welcome responses to the specific questions which we have set out at the beginning of each chapter heading and which are replicated below.

1.3. Responses should be received by 24 December 2013 and should be sent to: **smartermarkets@ofgem.gov.uk**

1.4. Unless marked confidential, all responses will be published by placing them in Ofgem's library and on its website www.ofgem.gov.uk. Respondents may request that their response is kept confidential. Ofgem shall respect this request, subject to any obligations to disclose information, for example, under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004.

1.5. Respondents who wish to have their responses remain confidential should clearly mark the document/s to that effect and include the reasons for confidentiality. It would be helpful if responses could be submitted both electronically and in writing. Respondents are asked to put any confidential material in the appendices to their responses.

1.6. Next steps: Having considered the responses to this consultation, Ofgem intends to publish our decision on BSC modification proposals P272. Any questions on this document should, in the first instance, be directed to:

- Jonathan Amos
- Smarter Markets Team
- 9 Millbank, London, SW1P 3GE
- 0207 901 7000
- smartermarkets@ofgem.gov.uk

CHAPTER: Three

Question1: Do you agree with our approach to assessing the impacts of P272?

Question 2: Are there any additional, material impacts that we should consider?

CHAPTER: Four

Question3: Do you agree that P272 would drive suppliers to encourage DSR among their customers?

Question 4: Do you agree with our approach for quantifying the value of load shifting and load reduction, including the assumptions we made? Is there any evidence we have not identified that could inform our analysis?

Question 5: For those impacts stemming from suppliers reducing the costs of supplying energy (for example, by promoting DSR) that we did not quantify, do you have any suggestions on how we might do so?

Question 6: Do you agree with our approach to quantifying the value of improved forecasting, including the assumptions we made?

Question 7: Could the costs of investing in forecasting capability for HH demand impact disproportionately on smaller suppliers or on new entrants?

CHAPTER: Five

Question 8: Do you agree that we have correctly identified the cost savings that suppliers could realise in managing the settlement process?

Question 9: Do you agree with our assumption regarding the typical size of data quality teams employed by suppliers?

Question 10: Do you agree that meters of consumers in Profile Classes 5-8 are mostly read at the end of each month?

CHAPTER: Six

Question 11: Do you agree with our approach to quantifying the costs of P272 for suppliers and DNOs? If not, we encourage respondents to suggest alternative approaches.

Question 12: We welcome evidence from smaller suppliers of larger non-domestic consumers on the costs they could incur if P272 is implemented.

Question 13: We welcome information from suppliers on (1) how many consumers would need to move electively for them to incur upfront costs and (2) the costs that would be incurred, broken down by the cost categories listed in this chapter.

Question 14: Would consumers incur costs from termination of contracts with Supplier Agents? If so, we welcome information that could help us to assess these costs.

CHAPTER: Seven

Question 15: Do you have any comments on the results of our quantitative analysis?

CHAPTER: Nine

Question 16: If P272 is approved, would it be possible to implement the modification in less than fourteen months?

Appendix 2 – Rationale behind counterfactual

1.1. Our assessment of P272 must consider its impacts against a counterfactual. At present, the BSC allows a supplier to elect to move any consumer with appropriate metering equipment to HH settlement. Therefore, our counterfactual must take account of the potential for suppliers to move electively consumers in Profile Classes 5-8 HH settlement once they have an advanced meter.

1.2. We consider that current low levels of elective HH settlement will remain. This is based on an assessment of both historical data on the number of sites that have been moved to HH settlement and the incentives on suppliers to move consumers to HH settlement on an elective basis.

1.3. We conclude that current low levels of elective HH settlement will remain. This appendix sets out the analysis behind this conclusion.

Extent of elective HH settlement

1.4. Metered consumers that must be settled half-hourly are assigned to Measurement Class C. Those consumers that suppliers elect to be HH settled can be assigned to Measurement Class C or E. From 2009 to 2012, the number of sites registered to Measurement Class C increased by around two per cent per year. Over the same period, the number of sites assigned to Measurement Class E grew by around six per cent (from a low starting point of 2,395 sites).

1.5. However, there are difficulties in using this data to understand the take up of elective HH settlement. This is because some sites that suppliers move electively to HH settlement are assigned to Measurement Class C not E. In addition, some of the increase in the number of sites registered to Measurement Classes C and E will be due to new connections. On balance, we consider that historically there has been low take up of elective HH settlement. This aligns with the views of the workgroup that was established by the BSC Panel to consider the impacts of P272.

1.6. One potential reason for historically low levels of elective HH settlement is the cost of installing appropriate metering equipment. This will no longer apply to consumers in Profile Classes 5-8 from April 2014. Therefore, we examined whether suppliers would have the necessary incentives to elect to settle these consumers using actual HH data.

Incentives on suppliers

1.7. Our analysis suggests that suppliers do not have strong incentives to move larger non-domestic consumers to HH settlement on an elective basis for four reasons.

1.8. First, suppliers' responses to ELEXON's consultations argued that they will not consider moving consumers from Profile Classes 5-8 to HH settlement until issues around distribution charging are resolved. These issues are discussed in detail in Chapter 8. We will monitor the industry's work to resolve these issues. However, we do not consider their resolution will lead to higher levels of elective HH settlement given the other factors discussed below.

1.9. Second, cost estimates submitted to ELEXON as part of the industry assessment of P272 suggest that larger suppliers are likely to incur higher costs in managing the settlement process for larger non-domestic consumers. These suppliers serve the majority of consumers in Profile Classes 5-8. These costs may be incurred upfront, if the numbers moving across are enough to require system upgrades. (We note that some of these costs may not be incurred in the longer term if suppliers upgrade their systems and processes to handle more granular data from smart metering). On an ongoing basis, these costs mostly relate to the collection and processing of more granular consumption data.

1.10. Third, suppliers will need to invest to realise the benefits of HH settlement. For example, one of the primary benefits to suppliers of HH settlement is that it enables them to lower the costs of purchasing energy by contracting for DSR. To realise the benefits of DSR, suppliers may need to invest in systems to support new products, such as ToU tariffs. They may also need to invest in marketing these products to consumers and helping them to respond to price signals.

1.11. Fourth, not all the benefits of HH settlement flow to suppliers directly. Continuing with the DSR example, potential benefits include more cost effective delivery of lower carbon emissions and security of supply. These are benefits for consumers that will not flow to suppliers.

Appendix 3 – Methodology for quantifying impacts

1.1. As part of our assessment, we quantified some of the impacts of P272. This appendix sets out the detailed methodology we used to quantify these impacts. It should be read alongside Chapter 3, which explains at a high level our approach to assessing the impacts of P272.

1.2. The structure of this appendix broadly corresponds to the structure of this document. We set out:

- how we estimated the number of sites that suppliers would move electively from Profile Classes 5-8 to HH settlement in the counterfactual
- our approach to quantifying some of the impacts that derive from changes in the ability of suppliers to buy and sell energy efficiently
- our approach to quantifying some of the impacts that derive from reducing suppliers' costs in managing the settlement process
- our approach to quantifying some of the impacts that derive from upfront and ongoing costs that suppliers and DNOs are likely to incur in implementing P272
- the assumptions we used for our scenario modelling
- our rationale for not quantifying some of the impacts quantified by the workgroup.

1.3. In describing our approach to quantifying the impacts of P272, we note where relevant how our methodology differs from that of the workgroup.

1.4. As explained in Chapters 3 and 7, we quantified the impact of P272 through a Monte-Carlo analysis. This involves specifying inputs to the model as probability distributions within a set range. Typically these distributions are:

- a normal distribution, used where there is a high likelihood that the outcome will be around the average value within a range
- a triangular distribution (either symmetric or asymmetric), used where the most likely outcome falls within a range where lower and upper values are known.[31]

1.5. We identify below the probability distribution used for the impacts that we quantified.

[31] A triangular distribution is symmetric when the most likely value (ie the peak of the distribution) is equally distant from the minimum and the maximum of the range, while it is asymmetric when the most likely value is closer to either the minimum or the maximum of the range.

Counterfactual for quantitative analysis

1.6. We consider that current low levels of elective HH settlement would remain in the counterfactual. Table 4 summarises the key assumptions made.

Table 4 – Assumptions relating to counterfactual

Assumption	Input
Number of sites that suppliers move electively to HH settlement from Profile Classes 5-8 from 2014 to 2019 as a percentage of the total number of sites in Profile Classes 5-8	0.6%
Number of sites that suppliers move electively to HH settlement from Profile Classes 5-8 from 2019 onwards as a percentage of the total number of sites in Profile Classes 5-8	0.15%

1.7. To estimate current levels, we examined the increase in the number of sites assigned to Measurement Classes C and E from December 2009 to December 2012. (We refer to sites rather than consumers because one consumer may have multiple sites).

1.8. As set out in Appendix 2, the average increase in the number of sites assigned to Measurement Class C will include some that are required to move to HH settlement. In addition, some of the increase in sites registered to Measurement Classes C and E will be new connections to the network (rather than existing sites). To estimate the number of sites from Profile Classes 5-8 that move HH on an elective basis, we assumed that from December 2009 to December 2012:

- one quarter of the increase in the number of sites assigned to Measurement Classes C and E is from Profile Classes 5-8 (the rest being new connections)
- of the sites moving from Profile Classes 5-8 to Measurement Class C, one quarter do so on an elective basis (the rest are required to be settled HH).

1.9. These assumptions were informed by discussions at the workgroup, when suppliers suggested that they are moving few consumers to HH settlement electively. On the basis of these assumptions, we estimated that around 0.15 per cent of sites in Profile Classes 5-8 moved electively to HH settlement per year from 2010 to 2012.

1.10. One of the reasons that suppliers do not move consumers electively to HH settlement is the costs of installing a meter that is capable of recording consumption in each settlement period. By 6 April 2014, all consumers in Profile Classes 5-8 will have advanced meters that must be able to record HH consumption data. This could see a small increase in the number of larger non-domestic consumers that suppliers move electively to HH settlement. Therefore, for the first five years of the modelling period we assumed that current rates of movement increase, such that 0.6 per cent of sites in Profile Classes 5-8 move electively to HH settlement per year. For the remainder of the modelling period, we assumed that rates of movement follow current trends, such that 0.15 per cent of sites in Profile Classes 5-8 move electively to HH settlement per year.

1.11. In its assessment, the workgroup concluded that the impacts of P272 will depend on the number of larger non-domestic consumers that elect to be HH settled if the modification is not implemented. We agree, but also note that the type of consumers that move electively could be important. This is because some of the impacts of P272 relate to the shape and volume of consumption of individual consumers in Profile Classes 5-8. However, for the purposes of our quantitative modelling we did not model the type of consumers that move electively. This is because our assumption that movement to HH settlement remains low over the modelling period means that the type of consumer will not have a material impact on the overall assessment. Therefore, we made the same assumption as the workgroup that the impacts are proportional to the number of sites that would move electively to HH settlement in the counterfactual.

Impacts from changes to how suppliers buy and sell energy

1.12. This section explains how we quantified some of the impacts from P272 changing how suppliers buy and sell energy. Table 5 summarises the key assumptions made.

Table 5 – assumptions relating to how suppliers buy and sell energy

Impact	Assumption	Input	Distribution
Load shifting at peak	Size of discretionary load of Profile Classes 5-8 at peak	Min = 20% Max= 36% Peak = 25%	Triangular asymmetrical
	Percentage of consumers in Profile Classes 5-8 that take up DSR products	Min = 20% Max = 24% Mean = 22%	Normal
	Percentage of times that load is shifted at peak	Min = 25% Max = 50% Peak = 40%	Triangular asymmetrical
Load reduction	Percentage of load that is reduced outright at peak, as a percentage of amount that could be shifted	Min = 12% Max = 20% Mean = 16%	Normal
Improved forecasting	Ability of suppliers to better forecast HH volumes as compared to NHH volumes as a percentage of total allocated volumes	Min = 0.92% Max = 1.65% Peak = 1.29%	Triangular symmetrical

Load shifting

1.13. If approved, P272 will drive suppliers to encourage DSR among larger non-domestic consumers. Consumers may respond by shifting load to off-peak periods.

Workgroup analysis

1.14. The workgroup estimated the potential reduction in the wholesale cost of energy as a result of load reduction. They assumed that one per cent of energy will be shifted from the period of the day when wholesale prices are highest. This energy is evenly smeared across the rest of the day. The wholesale cost of the consumption profile created by load shifting from P272 was then compared to the wholesale cost of the consumption profile without P272.

1.15. The workgroup also estimated the potential to lower network investment. Assuming the same percentage of load is shifted, they calculated how distribution and transmission network charges would change. They assumed that changes in these charges reflect the cost savings network companies could realise.

Ofgem analysis

1.16. Our quantitative analysis focused on shifting of load from peak to off-peak times. We first estimated the potential for such load shifting among consumers in Profile Classes 5-8. We then quantified the costs savings this could deliver from: lowering average generation costs; avoided investment in generation capacity; and avoided investment in transmission and distribution network capacity. Our approach differs from that of the workgroup. We identified the factors that are likely to determine the amount of load shifting and drew on relevant research to inform the assumptions we made. We consider this is a more robust approach than that taken by the workgroup.

Potential for load shifting

1.17. The potential for shifting load from peak to off-peak periods as a result of P272 is a function of:

- the discretionary load that consumers in Profile Classes 5-8 could shift from peak periods
- the level of uptake of DSR products that encourage consumers to shift load
- the percentage of load that is actually shifted in response to price signals.

1.18. There is limited evidence available on the potential for consumers in Profile Classes 5-8 to respond to price signals by shifting load from peak to off-peak periods. Table 6 shows the evidence we found. In the third column, we present the information they provide in a format that can be used to inform our assumptions. This analysis assumed that on an average winter day, peak demand is 54GW and that the non-domestic sector (as a whole, not just Profile Classes 5-8) contributes around 30 per cent of this total. We recognise that peak demand varies across the year, but we consider that our approach is reasonable and is in line with data recently published in the National Grid Winter Outlook.[32]

Table 6 – Summary of evidence relating to load shifting

Report	Findings	Ofgem analysis
Redpoint, August 2012. *Electricity System Analysis – future system benefits from selected DSR scenarios*	•Assessed technical potential for DSR in the Small and Medium Enterprise (SME) sector (Profile Classes 3 and 4) over the period to 2030 and the likely response in the GB market •Peak period assumed to be 10am to 1pm (as this period coincides with highest demand of SME consumers) •Technical potential is 2GW and varies little from 2015 to 2030 •Based on research into effectiveness of time-of-use pricing in other jurisdictions, estimate that 25-50% of technical potential may be realised	•Redpoint estimated that the technical potential for SME sector corresponds to around 20 per cent of their consumption from 10am to 1pm •Assuming this potential is the same for all commercial customers, load reduction for SME sector could be around 7 per cent of total (domestic and non-domestic) peak demand
Element Energy, July 2012. *Demand-side response in the non-domestic sector*.	•Quantified technical potential for DSR in non-domestic buildings (excluding energy-intensive industrial businesses) •Analysis suggests that DSR measures could reduce winter peak demand in Britain from 1 – 4.5GW (or 0.6 – 2 GW if no flexibility can be provided from lighting)	•Technical potential corresponds to between 8 and 29 per cent of non-domestic demand at peak •This equates to between two and eight per cent of total (domestic and non-domestic) peak demand
Hesmondhalgh, S, February 2012. *GB Electricity Demand – 2010 and 2025. Initial Brattle Electricity Demand-Side Model – Scope for Demand Reduction and Flexible Response*	•Assessed technical potential for DSR among commercial consumers (Profile Classes 3-8 plus some HH consumers) in 2010 and in 2025 • In 2010, technical potential at evening peak (16.00 – 19.00) on a winter weekday totals 5GW In 2025, depending on changes to energy consumption, technical potential at evening peak on a winter weekday is between 6.4GW and 7.6GW	•Technical potential corresponds to between 28 and 36 per cent of non-domestic demand at peak •This equates to between 9 and 14 per cent of total (domestic and non-domestic) peak demand
IHS Global Insight, July 2009. *Demand Side Market Participation Report*.	•Analysis included estimating the amount of discretionary load in GB that can be moved to a different time period or foregone completely •At present, estimated that there is 5 – 7 GW of discretionary load in the commercial sector	•Technical potential corresponds to between 28 and 36 per cent of non-domestic demand at peak •This equates to between 9 and 14 per cent of total (domestic and non-domestic) peak demand

1.19. We recognise that some of the evidence listed in Table 6 is not directly relevant to consumers in Profile Classes 5-8. However, it provides a reasonable basis for making assumptions regarding the potential for load shifting from peak to off-peak periods among these consumers. This is because the evidence we found is concerned with GB and covers non-domestic consumers.

[32] National Grid, October 2013. *Winter Outlook 2013/14*.

1.20. From the evidence available, we estimated that discretionary load for larger non-domestic consumers corresponds to between 20 per cent and 36 per cent of their total consumption at peak. Our estimate puts more emphasis on three of the four studies that made similar conclusions on the potential discretionary load. The upper end of our estimate reflects the findings of the IHS Global Insight and Sustainability First studies. The lower end reflects the findings of the Redpoint analysis. We note that the Element Energy report found potential discretionary load could be as low as eight per cent. To take account of this analysis, we apply a triangular asymmetrical distribution, with a peak of 25 per cent. This puts a greater emphasis on the lower end of our estimate.

1.21. On the level of uptake of DSR products, we used the same assumptions as DECC in its impact assessment on the roll-out of smart metering to smaller and medium non-domestic consumers (Profile Classes 3-4).[33] Based on international evidence, DECC assume a take up of 20 per cent take up of static time-of-use tariffs, rising to 24 per cent by 2030. For our quantitative analysis, we assumed that between 20 and 24 per cent of larger non-domestic consumers take up DSR products. We applied a normal distribution to this range, with a peak of 22 per cent.

1.22. Finally, our assumption on the percentage of load that is shifted draws on Redpoint's analysis. Based on international evidence of consumer responsiveness to price signals, this study suggests that between 25 and 50 per cent of the technical potential could be realised. In our model, we used this to estimate the percentage of discretionary load that is shifted. Our assumptions are similar to DECC's estimates in its smart metering impact assessment. We assumed a normal distribution, with a peak of 40 per cent. Our peak falls at the upper end of our estimate because we consider that consumers in Profile Classes 5-8 are more likely to be able to respond to price signals than those in Profile Classes 3-4 (who were the focus of Redpoint's study).

1.23. Taken together, our estimates mean that we assumed that around 2.5 per cent of Profile Classes 5-8 consumption is shifted from peak. We assume that the peak runs from 16.30 to 19.00.

Quantifying cost savings

1.24. To quantify the potential for lower average generation costs, we adopted a similar approach to the workgroup. We assumed that the load shifted from peak is spread evenly across non-peak periods. We then calculated the difference in the wholesale cost of supplying Profile Classes 5-8 in the counterfactual and if load is shifted as a result of P272. We used wholesale prices for all settlement periods in 2012/13. This is a simplification that is likely to underestimate the value of DSR as we do not take account of potential increases in prices over time.

1.25. To quantify the potential for avoided investment in generation capacity, we assumed that investment in gas plant (specifically Combined Cycle Gas Turbine or

[33] DECC, January 2013. *Smart meter roll-out for the domestic and small and medium non-domestic sectors (GB)*

CCGT plants) is avoided if load is shifted. This is in line with recent trends that gas provides the marginal fuel at peak. We calculated the total energy that is reduced at peak from shifting over a year and then multiplied this by Mott MacDonald estimates of the costs of CCGT generation capacity.[34]

1.26. To quantify the potential for avoided investment in distribution and transmission capacity, we used capital expenditure estimates for the current price controls applicable to DNOs (DPCR5) and the transmission companies (RIIO-T1). We note that some of these estimates are likely to be conservative in the longer term given expected investment in the network (especially the distribution network). By estimating the proportion of peak consumption that is attributable to consumers in Profile Classes 5-8, we estimated the contribution they make to total capital expenditure on the transmission and distribution networks. We then calculated the cost saving from shifting some of the consumption of Profile Classes 5-8 to off-peak periods. We recognise this is a simplification. This is because the impact of load shifting on investment decisions may depend on where on the network consumers in Profile Classes 5-8 are located, as well as the amount of energy that is shifted.

Load reduction

1.27. There is evidence to suggest that DSR can indirectly lead consumers to reduce load outright at peak times (in addition to shifting consumption to off-peak periods).

Workgroup analysis

1.28. The workgroup quantified the cost saving from load reduction in the same way as that for load shifting, taking into account that consumption is reduced outright rather than moved to another period. They assumed that one per cent of load is reduced at peak. They also quantified the potential value of carbon savings by assuming that there is less call on coal plant at peak.

Ofgem analysis

1.29. Like the workgroup, we estimated the potential for load to be reduced outright at peak. We quantified the costs savings this could deliver from: lower bills; lower carbon emissions and better air quality. We used a different methodology to quantify these cost savings, drawing on guidance issued by DECC.

1.30. There is limited evidence available on which to make an assumption about the amount of energy that is reduced outright at peak. Trials do not often distinguish between the amount of load that is shifted from peak and the amount that is reduced at peak. For this reason, we made a conservative assumption that, of the load we estimated could be shifted at peak, between 12 and 20 per cent is actually reduced outright.

[34] Mott MacDonald, June 2012. *UK Electricity Generation Costs Update*.

1.31. To quantify the cost savings this reduction in consumption could deliver, we used DECC's guidance on valuing energy use and greenhouse gas emissions.[35] This recommends that changes in energy consumption should be valued using the long-run variable cost (LRVC) of supply. The LRVC consists of the wholesale price, plus the cost of government policies and variable transmission and distribution costs. We multiplied our estimate of the volume of consumption that is reduced by the LRVC of supply in each year of the modelling period.

1.32. We also applied DECC's guidance in valuing the carbon saving from load reduction. Alongside the guidance, DECC has published a toolkit that converts increases or decreases in energy consumption into changes in greenhouse gas emissions. We used this toolkit to estimate the potential reduction in carbon emissions for the reduction of consumption. We multiplied this estimate by the 2012 price of carbon dioxide under the European Union Emissions Trading Scheme (EU ETS). This is appropriate as carbon savings derived from electricity consumption are considered fully tradable in the EU ETS.

1.33. In relation to air quality, we again followed DECC's guidance. DECC has valued the air quality impacts of changes in electricity consumption. We multiplied this estimate by our estimate of the reduction in consumption.

Better forecasting of demand

1.34. If P272 is implemented, suppliers will be able to forecast the consumption of consumers in Profile Classes 5-8 more accurately. As a result, the volume of energy they buy will more closely match the amount that these consumers use. We quantified the extent to which this can improve the efficiency of balancing the system. Our methodology is explained below.

Workgroup analysis

1.35. The workgroup identified that better forecasting of demand could give rise to three cost savings, as follows:

- lower energy purchase costs, based on the difference between the costs a supplier incurs in contracting forward compared to the costs that NGET incurs in procuring energy after Gate Closure
- lower balancing costs, because less overall energy imbalance on the system will require NGET to take fewer balancing actions
- lower imbalance prices, because NGET takes fewer energy balancing actions.

1.36. The workgroup did not quantify the potential for lower balancing costs for NGET. However, their initial analysis did reveal that P272 could impact system as well as energy balancing costs.

[35] This approach follows guidance published by DECC. See DECC, September 2013, *Valuation of energy use and greenhouse gas (GHG) emissions – Background documentation.*

1.37. The workgroup's approach to calculating the cost savings from lower energy purchase costs and lower imbalance prices relied on the Profiling and Settlement Review Group's (PSRG) estimate of the percentage of annual energy for Profile Classes 5-8 that is allocated to the wrong settlement period as a result of profiling.[36] The workgroup responsible for assessing P272 used this figure as a proxy for the overall inaccuracy in supplier purchasing, to which they applied an estimate of the improvement in forecasting that suppliers could realise. After consultation with forecasting experts, the workgroup estimated that suppliers could achieve a 40 per cent improvement in forecasting HH as compared to NHH demand.

Ofgem analysis

1.38. As described in Chapter 4, our analysis suggests that the benefit for consumers of improved forecasting comes from the difference between the prices at which suppliers can contract forward for energy as a result of more accurate forecasting relative to the cost of NGET's balancing actions. We quantified this impact of better forecasting. This is the same benefit that the workgroup called 'lower energy purchase costs', except that we also consider NGET's system balancing costs as part of our assessment.

1.39. However, we did not use the same methodology as the workgroup. The PSRG's estimate of profiling error represents the difference between actual and profiled demand. Using this as a proxy for the accuracy of supplier purchasing is not appropriate because suppliers purchase against a forecast of the volumes they will be allocated through settlement. This is post the application of GGCSF that corrects for the energy that is misallocated by profiling.

1.40. Unlike the workgroup, we did not quantify the potential for 'lower imbalance charges'. This is because our view is that any change in imbalance charges will be cost neutral for consumers due to the redistribution of these charges among market participants.

1.41. Our methodology for calculating the potential cost saving from better forecasting involved six steps, each of which we describe below. All calculations are based on the same historical data set from 1 April 2011 to 31 March 2013, unless otherwise stated.

Step 1 - Assess supplier hedging strategies

1.42. As a first step, we assessed suppliers' hedging strategies. This is necessary to understand the extent to which supplier imbalance in a settlement period is due to inaccurate forecasting as opposed to an intentional strategy to manage imbalance risk. We recognise that a supplier's ability to forecast accurately the volumes it is allocated through settlement will impact on its hedging strategy. For this reason, we

[36] The PSRG reports to the BSC Panel and is responsible for maintaining the integrity of settlement in the short and medium term in the context of the roll-out of smart and advanced metering.

identified an upper and lower limit for the percentage of imbalance volume attributed to hedging.

1.43. We assessed historical data for consumption accounts to understand suppliers' hedging strategies.[37] This revealed that collectively:

- suppliers are long (whereby they purchase more energy than they are allocated through settlement) in 51 per cent of settlement periods; and are short (whereby they purchase less energy than what they are allocated through settlement) in 49 per cent of settlement periods
- supplier long imbalance volumes are approximately equal to supplier short imbalance volumes
- periods in which suppliers are long are more frequent during the day and the periods in which suppliers are short are more frequent during the night.

1.44. From this, we concluded that there is some hedging occurring, whereby suppliers trade to a long or short position (rather than a fully balanced position). This is particularly evident from the trend to go long during the day and short at night.

1.45. It is not possible to measure the extent of hedging directly, as we cannot determine what part of an imbalance volume is a deliberate hedge and what part is due to a forecasting error. To address this using the historical data set, we established an upper and lower case for the component of imbalance that is attributable to hedging.

1.46. For our lower limit, we assumed that there was no hedging and all suppliers were seeking to balance. For our upper limit, we assumed that, in any given settlement period, matched short and long supplier imbalance volumes is due to forecasting error and the unmatched imbalance volume is due to hedging. For example, if the imbalance volumes for the set of suppliers who were short totalled 60 units and the imbalance volumes for the set of suppliers who were long totalled 100 units, we would assume that 60 units were forecasting error and 40 from hedging. This is a simplification but is the best proxy we identified to establish the upper limit hedged volume. This analysis gave us a range for the percentage of purchased volumes that is a hedge of between 0 and 1.53 per cent.

1.47. We assumed that this range does not change if P272 is implemented. This is a simplification, given that a supplier's hedging strategy will be influenced by the extent to which it can accurately forecast demand.

Step 2 - Estimate forecasting accuracy

1.48. Using our estimates of the extent of supplier hedging, we determined the accuracy with which suppliers can currently forecast settlement allocated volumes for HH and NHH consumers. To do this, we calculated the overall percentage imbalance

[37] Consumption accounts are mostly used by suppliers and hence are a good proxy for their behaviour.

volume (the sum of long or short imbalance volume across all suppliers as a percentage of their purchased volumes) for each settlement period using the same data set from step one. On average, across the period under consideration, this came to 3.46 per cent. Taking account of supplier hedging, we concluded that suppliers, on average, can forecast accurately to within a range of between 3.46 per cent and 1.93 per cent of the volumes they will be allocated through settlement.

1.49. For each of these percentages, we calculated the proportion due to HH and NHH forecasting. To do this, we used the following information:

- the approximate percentage of the total volume in the market allocated to NHH and HH sites (60 per cent and 40 per cent of total volume respectively)
- the extent to which suppliers can better forecast HH as compared to NHH demand (derived from the workgroup estimate that HH error is 60 per cent of NHH error).

1.50. Using this information, we estimated that:

- a lower limit forecasting accuracy of 3.46 per cent would imply: NHH forecasting accuracy of 4.12 per cent; HH forecasting accuracy of 2.47 per cent; and a difference of 1.65 per cent
- an upper limit forecasting accuracy of 1.93 per cent would imply: NHH forecasting accuracy of 2.3 per cent; HH forecasting accuracy of 1.38 per cent; and a difference of 0.92 per cent.

Step 3 – Determine impact of P272 on supplier purchasing

1.51. Next, we calculated the impact of better forecasting of demand for larger non-domestic consumers on supplier purchasing for each settlement period. To do this, we first estimated the gross reduction in supplier imbalance volume in each settlement period across the data set. This required us to calculate the proportion of total energy supplied that can be attributed to Profile Classes 5-8 across the day. We did this by:

- calculating the average energy allocated to Profile Classes 5-8 in the same settlement period (for example, settlement period one that runs from midnight to 00:30) across all days in a year (in this case, 1 April 2012 to 31 March 2013)
- dividing this average by the average Grid Supply Point Group Take (adjusted for average distribution losses of six per cent) in the equivalent settlement period (to continue with the example above, the period from midnight to 00:30) across all days over the same year.

1.52. We then multiplied our estimate of the proportion of total energy supplied to Profile Classes 5-8 by the total volume purchased. This gives us the proportion of energy that was purchased for consumers in Profile Classes 5-8. We multiplied this figure by the difference between NHH and HH forecasting accuracy (as found in step two) to give the gross reduction in supplier imbalance volume in each settlement period.

1.53. In any settlement period, some suppliers may be long and others short. Therefore, we apportioned the gross reduction in imbalance volumes to long and short imbalances in proportion to give a revised long and a revised short imbalance volume for each settlement period. Netting these revised imbalance volumes gave a revised supplier net imbalance volume if P272 is implemented in all settlement periods covered by the data set. The difference (delta) between this figure and the net imbalance volume that actually occurred gave an estimate of the impact of P272 in each settlement period.

1.54. We undertook the calculation described above for all settlement periods for both estimates of the difference between NHH and HH forecasting accuracy (0.92 per cent and 1.65 per cent), plus two values equally spread in between. This gave us four supplier net imbalance volume deltas for each settlement period.

Step 4 – Determine impact on forward purchases

1.55. We multiplied the four supplier net imbalance volume deltas by the forward market price for each settlement period to determine the net cost or saving in forward market purchases. We used Market Index Data prices (established from trades conducted between three days and one day ahead). This assumes that better forecasting allows suppliers to fine tune their positions close to a settlement period occurring, rather than change how they purchase energy months or years in advance. We summed the net costs or savings for each settlement period across the data set and then scaled to determine an annualised figure.

Step 5 – Determine impact on energy and system balancing costs

1.56. We gave the four supplier net imbalance volume deltas for each settlement period over the duration of the data set to NGET, who calculated the impact each would have had on market net imbalance volume. They fed the output of these calculations into the Balancing Services Incentive Scheme model to determine how the revised market net imbalance volumes for each settlement period over the data set would have affected the energy balancing and system costs they incurred.[38]

Step 6 – Determine the benefit

1.57. For each of the four levels of forecasting improvement described in step three, we summed the annualised impact on: forward market purchases (step four), energy balancing and system balancing costs (both step five). This revealed a cost saving for consumers across the four levels of forecasting improvement.

[38] NGET is subject to a scheme that incentivises it to balance the transmission system efficiently. This is called the Balancing Services Incentive Scheme. Under this scheme, NGET has developed a suite of models to set a target for some of the costs it incurs, including energy and system balancing costs.

1.58. It also showed that there is a linear relationship between the improvement in forecasting and the costs savings that are realised. This allowed us, in the Monte-Carlo analysis, to set the improvement from 0.92 per cent to 1.65 per cent in a triangular distribution. When the model is run, it randomly selects a number within this range and then calculates the relevant benefit through an interpolation based on the linear relationship we identified.

Cost savings in managing the settlement process

1.59. This section explains how we quantified some of the impacts from P272 reducing the costs that suppliers incur in managing the settlement process. Table 7 below summarises the key assumptions made.

Table 7 – Assumptions for cost savings in managing the settlement process

Impact	Assumption	Input	Distribution
Lower HH Supplier Agent costs	Reduction per HH meter in the costs of Data Collection and Data Aggregation services	Min = £15 Max = £30 Peak = £20	Triangular asymmetrical
	Estimated increase in number of HH sites per year (excluding those moved to HH settlement as a result of P272)	1.5%	n/a
Better data quality	Reduction in size of data quality teams	Min = 50 FTEs Max = 60 FTEs Mean = 58 FTEs	Normal
	Average cost of an FTE in a data quality team per year	Min = £24,000 Max = £26,000 Mean = £25,000	Normal
Faster settlement	Monetary value (in terms of cash flow and credit cover) of settling energy on actual data at R1 as opposed to RF	Min = £0.09/MWh Max = £0.11/MWh Mean = 0.10/MWh	Normal
	Percentage of annual NHH energy attributable to larger non-domestic consumers that enters SF in counterfactual	Min = 2.07% Max = 2.53% Mean = 2.3%	Normal
	Percentage of annual energy of larger non-domestic consumers settled at SF if P272 is implemented	100%	n/a
Lower administration charges	Cost saving for ELEXON from 'freezing' of Profile Classes 5-8	£30,996	n/a

Lower HH Supplier Agent costs

1.60. P272 could reduce the fees that HH Data Collectors and Data Aggregators charge for sites that would be settled using actual HH data in the absence of P272.

Workgroup analysis

1.61. The workgroup estimated that there would be a saving of £20 per HH meter in the costs of Data Collector and Data Aggregator services. They multiplied this figure by the number of existing HH sites to give the total reduction in the costs of these services.

Ofgem analysis

1.62. We adopted a similar approach to the workgroup to quantifying the potential cost savings that can be achieved by P272 increasing the number of sites that are settled in the HH market.

1.63. We used their assumption that there would be a cost saving of £20 per HH meter. We note that the majority of respondents to the workgroup's consultation on their methodology for calculating the benefits of P272 agreed with the methodology. However, some respondents argued that the potential cost saving could be higher. Therefore, we assumed that the cost savings could range from £15 to £30, with the peak at £20 per HH meter.

1.64. As per the workgroup, we multiplied the £20 per HH meter estimate by the number of sites that are settled HH. However, we took account of the potential growth in the number of consumers that are settled HH over the modelling period (excluding larger non-domestic consumers who would move HH as a result of P272).

1.65. We assessed the increase in the number of sites assigned to Measurement Classes C and E from December 2009 to December 2012. We recognised that some of this increase could be from larger non-domestic consumers moving to HH settlement. These consumers must be excluded from our estimate of the potential increase in the number of consumers settled HH over the modelling period. This is because all larger non-domestic consumers would be settled HH if P272 is implemented. We applied the same assumptions as in the counterfactual to estimate the proportion of the increase in the size of Measurement Classes C and E that is due to larger non-domestic consumers moving to HH settlement. Removing these sites, we found that from December 2009 to December 2012, the HH market grew on average by 1.5 per cent per year. We assumed that the market would continue to grow at this rate for the duration of the modelling period.

Better data quality

1.66. If P272 is implemented, the costs that suppliers incur as a result of errors in consumption data for larger non-domestic consumers would fall because they are settled using actual HH meter readings.

Workgroup analysis

1.67. One way in which better data quality can reduce costs for suppliers is by reducing the mismatch between purchases and sales. In its cost-benefit analysis, the workgroup used the PSRG's estimate of the volume of energy for Profile Classes 5-8 that is allocated to the wrong settlement period as a proxy for the existing discrepancy between purchases and sales. They then estimated the opportunity cost of this mismatch.

Ofgem analysis

1.68. We did not use the same methodology as the workgroup to estimate the cost savings from a reduction in the gap between purchases and sales as a result of data quality. This is because using misallocation of energy as a proxy for this mismatch is not appropriate.

1.69. Our analysis suggests that the gap between the amount of energy that a supplier is allocated through settlement (purchases) and the amount it has sold to its customers (sales) is not the result of energy being allocated to the wrong settlement period. This is because settlement of NHH consumers is based on actual meter readings. Therefore, the total volume of energy settled should be correct. Mismatches arise because of errors caused by inaccurate meter readings (for example, because of a faulty meter) or because of errors in the processing of meter reading data for settlement. The problem of mismatches between purchases and sales is greater for NHH consumers because it is more difficult to detect and remedy such errors.

1.70. In our quantitative analysis, we focused on the cost saving for suppliers from a reduction in the size of data quality teams. Part of the purpose of these teams is to minimise the gap between purchases and sales for NHH consumers.

1.71. We understand that larger suppliers have data quality teams for the NHH market of around 100 FTEs. We estimated that 15 per cent of these FTEs are focused on managing errors relating to consumers in Profile Classes 5-8. While these consumers make up only ten per cent of the annual energy in the NHH market, we assumed that proportionally more FTEs are allocated to manage the quality of their consumption data because they are of higher value than consumers in Profile Classes 1-4. Across all smaller suppliers, we assumed that 15 FTEs are employed in managing errors for Profile Classes 5-8.

1.72. If P272 is implemented, we assumed that the number of FTEs required to manage data quality for larger non-domestic consumers would reduce by between a half and two thirds. This gives a total reduction in the size of data quality teams of between 50 and 66 FTEs. We assumed that the average cost of each FTE is between £24,000 and £26,000 per year. In both cases, we assume a normal distribution.

1.73. The estimates explained above are based on our best understanding of the typical size and costs of data quality teams in a supply business. We welcome views on these estimates.

Faster settlement

1.74. If P272 is implemented, suppliers could face less financial uncertainty in the allocation of imbalance charges as meter readings for larger non-domestic consumers would be submitted to settlement sooner.

Workgroup analysis

1.75. The workgroup quantified the cost saving for suppliers from reducing fluctuations in the allocation of energy volumes from R1 to the final reconciliation run called RF (that happens around 14 months after a settlement period occurs). They estimated that the monetary value (in terms of cash flow and credit cover) of settling energy on actual data at R1 as opposed to RF is equivalent to £0.1 per MWh. They multiplied this figure by the additional percentage of energy for larger non-domestic consumers that is settled on actual meter readings at R1 if P272 is implemented.

Ofgem analysis

1.76. As set out in Chapter 4, our understanding is that meters in Profile Classes 5-8 are read at the end of each month, such that the cost saving from P272 comes from reducing fluctuations in energy volumes between SF and R1.

1.77. To estimate the volume of energy for Profile Classes 5-8 that is settled on actual meter readings today at SF, we used existing performance data from 2012. This shows that for days in the first week of the month, 5.9 per cent of NHH energy is settled on actual meter readings at RF. It also shows that the average percentage of NHH energy that is settled at SF using actual meter readings is 8.2 per cent

1.78. Using these figures, we estimate that on average the percentage of annual energy from Profile Classes 5-8 that is settled on actual meter readings at SF today totals 2.3 per cent of the NHH market. This is equivalent to around 20 per cent of the energy used by Profile Classes 5-8. Our estimate assumed that SF runs for days in the first week of the month do not include any actual meter readings for consumers in Profile Classes 5-8. For all remaining days of the month, we also assumed that any change in the percentage of NHH energy settled on actual meter readings is due to suppliers reading meters of consumers in Profile Classes 5-8. In our model, we assumed the annual energy from Profile Classes 5-8 that is settled on actual meter readings at SF is between 2.07 per cent and 2.53 per cent of total NHH volumes (normal distribution).

1.79. If P272 is implemented, we assumed that suppliers will obtain actual meter readings for all consumers in Profile Classes 5-8 in time for the SF run. This is based on two observations. First we note that in the existing HH market, meters tend to be read daily. This may be because these consumers are the largest in a supplier's portfolio in terms of their consumption (and hence can have a significant bearing on its imbalance position). While Profile Classes 5-8 sites vary in size, it is reasonable to expect that the largest sites would be read according to the same regime as existing HH sites. Second, to enable suppliers to realise the R1 target in all cases if P272 is implemented, they would need to read meters more frequently than today. This is to allow them sufficient time to identify and resolve any errors that may occur.

1.80. The best available evidence on the value of earlier settlement of energy volumes comes from the workgroup. However, the group's estimate relates to earlier settlement of energy at R1 as opposed to RF. To enable us to use the workgroup's estimate, we expressed it as a £/MWh per day figure. This was done by dividing the estimate by the number of days between R1 and RF (around 380 days).

Lower administration charges

1.81. If P272 is implemented, the load profiles for Profile Classes 5-8 will be 'frozen'. This will lower the costs of administering the BSC.

Workgroup analysis

1.82. As part of the workgroup analysis, ELEXON estimated that they could reduce costs by £30,996 per annum from not needing to collect and analyse HH consumption data from a sample of consumers in Profile Classes 5-8. The large majority of respondents to ELEXON's consultation on the workgroup's methodology for calculating the benefits of P272 agreed with this approach.

Ofgem analysis

1.83. We used ELEXON's estimate in our impact assessment.

Implementation costs

1.84. The workgroup identified and consulted on the types of costs that suppliers and DNOs could incur if P272 is implemented. The cost categories they agreed are listed in Chapter 6. Five larger suppliers and four DNOs submitted cost estimates in response to the consultation. We explain in this section how we used this information to quantify the costs that could be incurred if P272 is implemented. The assumptions made are summarised in Table 8.

Table 8 – Assumptions relating to implementation costs

Impact	Assumption	Input	Distribution
Costs of implementing P272 for suppliers	Total upfront costs	Min = £23.1m Max = £28.7m Mean = £25.9m	Normal
	Ongoing costs per site in Profile Classes 5-8	Min = £39.67 Max = £44.54 Mean = £49.60	Normal
Costs of implementing P272 for DNOs	Total upfront costs	Min = £1.05m Max = £1.25m Mean = £1.15m	Normal
	Ongoing costs per site in Profile Classes 5-8	Min = £0.65 Max = £8.05 Mean = £1.65	Triangular asymmetrical

Suppliers' costs

1.85. Suppliers estimated they could incur upfront and ongoing costs from managing the settlement process for consumers in Profile Classes 5-8 if P272 is implemented.

Workgroup analysis

1.86. The workgroup adopted three approaches for quantifying suppliers' costs based on the estimates submitted by respondents, as follows:

- for their 'low' estimate, they took the lowest estimate in each cost category that was submitted in response to the consultation
- for their 'central' estimate, they took the median of the estimates in each category that were submitted in response to the consultation
- for their 'high' estimate, they took the weighted average of all the estimates in each cost category that were submitted in response to the consultation.

1.87. Where a supplier of consumers in Profile Classes 5-8 did not respond to the consultation, the workgroup estimated their costs based on the median of all submissions.

Ofgem analysis

1.88. We took a different approach to the workgroup to quantifying the costs of P272.

1.89. For the upfront costs, we used the actual costs submitted by suppliers who responded to the workgroup's consultation. Where no information was available for a supplier, we estimated their costs using the submissions of those that did respond to the consultation. We did this by converting the submissions received to a cost per meter format in each cost category. We then took the average of the lowest two and lowest three submissions in each cost category. We adopted this approach to avoid relying on data from a single supplier to estimate costs for those suppliers who did not respond to the workgroup's consultation. This gave us an estimate of the range of costs that could be incurred by suppliers that did not submit cost estimates, which we multiplied by the number of meters that are serviced by these suppliers.

1.90. Taking the actual costs submitted by those suppliers that did respond to the workgroup's consultation, plus our estimates of the costs that could be incurred by those who did not, we estimated that as a group suppliers of consumers in Profile Classes 5-8 would incur upfront costs of between £23 million and £29 million. We assumed a normal distribution with a peak of £26 million. We did not annuitise the upfront costs. Instead, we assumed that the costs will be incurred in full during the implementation period.

1.91. For the ongoing costs, we assume that competitive pressure will drive suppliers' to realise efficiency gains over time. Many of these costs relate to services that suppliers can procure competitively. While some larger suppliers estimate charges for these services for sites in Profile Classes 5-8 will increase significantly if P272 is implemented, other do not. Over time, we expect that the former would improve their procurement processes to obtain these services as a cost comparable to their competitors. Suppliers can also become more efficient by improving internal processes.

1.92. In line with our assumption, we did not use in our model the actual costs estimates provided by suppliers that responded to the workgroup's consultation. Instead, we converted all estimates received to a cost per meter format and then took the two lowest and three lowest submissions in each cost category. Using this approach, we estimated that suppliers would incur ongoing costs of between £40 and £50 per meter. We assumed a normal distribution with a peak of around £45 per meter per year. For each run, the model estimates ongoing costs by selecting a value within the estimate range and multiplying this by the number of meters in Profile Classes 5-8.

DNOs' costs

1.93. DNOs estimated they would incur upfront and ongoing costs from billing suppliers for transporting energy on their networks to consumers in Profile Classes 5-8 if P272 is implemented.

Workgroup analysis

1.94. The workgroup estimated DNOs' costs in the same way as they estimated suppliers' costs.

Ofgem's analysis

1.95. We took a different approach to quantifying DNOs' costs than the workgroup.

1.96. For upfront costs, we used the actual cost estimates submitted by the four DNOs that responded to the workgroup's consultation. For the two DNOs that did not respond, we assumed that they will incur costs of a similar magnitude to the DNO that did respond that is most similar in size in terms of the number of consumers served.

1.97. Some consumers are connected to networks operated by independent distribution network operators (IDNOs).[39] No IDNOs responded to the workgroup's consultation. As with suppliers, to estimate their costs we converted the estimates of the DNOs that did respond to the workgroup's consultation to a per meter figure and

[39] A company that is licensed by Ofgem to develop, operate and maintain small local electricity networks embedded within DNO networks.

then took the average of the two lowest and three lowest submissions. Using our approach, we estimated that DNOs and IDNOs would incur upfront costs in total of between £1.05 million and £1.25 million if P272 is implemented. We assumed a normal distribution with a peak of £1.15 million.

1.98. For ongoing costs, we converted all submissions to a cost per meter format. Considering the estimates of all DNOs that responded gave us a range from £0.65 to £8.05 per meter per year. While we used this range in our model, we note that three of the DNOs that responded estimated they would incur similar costs at the lower end of our range. Therefore, we modelled ongoing costs as an asymmetrical triangular distribution with a peak of £1.65 per meter.

Scenario analysis

1.99. We conducted scenario analysis to test the impact of wider changes in the energy market on our base case results. We explain these scenarios in Chapter 7. The first scenario explored the impact of lower consumer responsiveness to price signals. Table 9 sets out the assumptions used.

Table 9 – Assumptions used in scenario 1

Description of impact	Assumption
Percentage of consumers in Profile Classes 5-8 that take up demand-side response products	Min = 20% Max = 22% Mean = 21%
Percentage of times that load is shifted at peak	Min = 25% Max = 35% Peak = 30%

1.100. We also tested a scenario that explores the impact of higher energy prices. The assumptions made are set out in Table 10.

Table 10 – Assumptions used in scenario 2

Description of impact	Assumption
High energy prices (based on HM Treasury and DECC estimates)	7.7p/kWh
Higher upfront costs for suppliers from greater investment in demand-side response products	Mean = £27.5m
Percentage of consumers in Profile Classes 5-8 that take up DSR products	Mean= 24%
Percentage of times that load is shifted at peak	Peak = 43%
Ability of suppliers to better forecast HH volumes as compared to NHH volumes as a percentage of total allocated volumes	Peak = 1.65%

Impacts quantified by the workgroup but not included in Ofgem's analysis

1.101. The workgroup grouped together and quantified cost savings relating to lower operational costs for suppliers. We quantified some of these savings. This section explains those we did not include in our assessment and why. The workgroup also quantified the cost savings from lower central charges for HH settlement and the impact on DNOs of faster resolution of errors. We describe both below and explain why we excluded them from our analysis.

Lower operational costs

1.102. The workgroup quantified the extent to which HH settlement could lower operational costs for suppliers. These costs savings relate to the management of the settlement process and the customer relationship. We quantified some of these cost savings. However, we consider that others are not directly relevant to P272. We summarise our approach to each in Table 11 below.

Table 11 – Approach to quantifying impact of lower operational costs

Cost saving	Approach and rationale
Better matching of purchases and sales	We agree that better matching of purchases and sales could deliver cost savings for suppliers. As part of our assessment of the impact of better data quality, we quantified the potential reduction in the size of data quality teams. Part of the role of these teams is to minimise gaps between purchases and sales.
Better billing for consumers	The primary driver for better billing will be the roll-out of advanced meters that enable suppliers to take remote readings. We do not consider that this is dependent upon the implementation of P272. Therefore, we did not quantify this impact.
Reduced assurance costs	As part of the BSC, performance assurance techniques exist to address risks to settlement. For suppliers, performance assurance activity is largely focused on meeting targets specifying the volume of energy that must be settled on actual meter readings at different settlement runs. P272 may help suppliers to reduce the costs of meeting these targets by improving data quality for larger non-domestic consumes. As part of our assessment of the impact of better data quality, we quantified the potential reduction in the size of data quality teams.
Reduced costs due to faster settlement	We agree that faster settlement could reduce costs for suppliers and have quantified this benefit.
Reduces costs due to less change of supplier issues	We understand that NHH settlement can cause issues on change of supplier that do not arise in the HH market. We welcome views on how the costs that suppliers incur as a result could be quantified.

Lower central charges for settlement

1.103. ELEXON's costs in administering the BSC are paid for by parties signed up to the code. One mechanism for recovering these costs is the Supplier Volume Allocation (SVA) Specified Charge. This is designed to recover suppliers' share of the costs relating to HH settlement.

1.104. The workgroup argued that P272 could reduce the costs suppliers incur in managing the settlement process for existing HH consumers by spreading the SVA Specified Charge over a larger number of meters. This assumes that the BSC Panel will revise the SVA Specified Charge if P272 is implemented. However, it does not represent a cost saving for consumers as a whole. Therefore, we have not included it in our quantitative analysis.

Faster resolution of errors

1.105. To encourage DNOs to attain an efficient level of losses on their network, Ofgem introduced a losses incentive mechanism as part of our electricity distribution price control. The volume of losses on the network can be calculated using settlement data.

1.106. Volatility in settlement data has made it difficult for Ofgem to set fair targets for the incentive mechanism. This has also created uncertainty around the extent to which DNOs have been effective in reducing losses (and hence should be rewarded or penalised for their actions). If P272 is implemented, suppliers will be able to identify and resolve errors in consumption data earlier. This will improve the accuracy of settlement data and potentially the effectiveness of any output-based losses incentive mechanism.

1.107. We have not quantified this impact. This is because Ofgem decided in November 2012 not to activate the distribution losses mechanism for the current distribution network price control, which runs from 2010 to 2015. In March 2013, Ofgem stated in the RIIO-ED1 Strategy Decision document that there would be no outputs based losses reduction mechanism in the next price control, which runs from 2015 to 2023. This was largely due to concerns with the accuracy of available data to measure losses. As part of their losses reduction strategy, all DNOs are expected to set out how they propose to establish a reliable baseline of losses to support an outputs-based mechanism in the next price control.

Appendix 4 - Glossary

A

Advanced meter

The electricity supply licence defines an advanced meter as one that must be capable of recording HH consumption data and of providing suppliers with remote access to this data.

B

Balancing and Settlement Code (BSC)

The BSC contains the governance arrangements for electricity balancing and settlement in Great Britain.

Balancing and Settlement Code (BSC) Panel

The BSC Panel is established and constituted pursuant to and in accordance with Section B of the BSC. It is responsible for ensuring that the provisions of the BSC are given effect: fully, promptly, fairly, economically, efficiently, transparently and in such a manner as will promote effective competition in the generation, supply, sale and purchase of electricity. See also Balancing and Settlement Code.

C

Carbon Reduction Commitment (CRC)

The CRC is a mandatory scheme aimed at improving energy efficiency and cutting emissions in large non-intensive public and private sector organisations.

D

Data Collector

As part of the settlement process, the party appointed by an electricity supplier to retrieve and process meter readings to meet the requirements set out in the Balancing and Settlement Code.

Data Aggregator

As part of the settlement process, the party appointed by an electricity supplier to package up consumption data to meet the requirements set out in the Balancing and Settlement Code.

Data Transfer Network (DTN)

The DTN provides a managed data transfer process for market participants.

Demand-side response (DSR)

Changes in energy use by consumers at particular times in response to a signal, such as a price.

Department of Energy and Climate Change

Government department responsible for energy policy and climate change mitigation policy.

Distribution Network Operator (DNO)

The companies that are licensed by Ofgem to maintain and manage the electricity distribution networks in Great Britain.

Distribution Connection and Use of System Agreement (DCUSA)

A multi-party contract between the distribution network operators, suppliers and generators that relates to the connection to and use of the distribution networks. It includes the distribution network charging methodologies.

Dynamic time-of-use (ToU) tariff

A time-of-use tariff that provides for price or pricing structures to vary at short notice in response to market events, subject to contractual terms.

E

Electricity supplier

A company licensed by Ofgem to sell energy to and bill customers in Great Britain.

ELEXON

The organisation responsible for administering the Balancing and Settlement Code. The role and powers, functions and responsibilities of ELEXON are set out in Section C of the BSC.

G

Grid Supply Point Group Correction Scaling Factor (GGCSF)

As part of the settlement process, GGCSF is used to adjust all suppliers' volumes up or down to ensure that all energy is allocated.

H

Half-hourly (HH) settlement

As part of the settlement process, the arrangements for using actual HH meter readings to determine how much a supplier's consumers use in each settlement period.

I

Imbalance charge

The charges that suppliers (and other market participants) pay for any difference between contracted and metered volumes. See also settlement process.

M

Measurement Class

For the purposes of the settlement process, all sites are assigned to a Measurement Class based on their type (metered or unmetered) and how they are settled (half-hourly or non-half-hourly).

N

National Grid Electricity Transmission (NGET)

NGET is the system operator for the electricity transmission system in Great Britain, with responsibility for making sure that electricity supply and demand stay in balance and the system remains within safe technical and operating limits.

Non-half-hourly settlement

As part of the settlement process, the arrangements for estimating how much a suppliers' consumers use in each settlement period based on meter readings spanning longer intervals. These consumers are not settled using actual HH meter readings.

O

Ofgem

The Office of Gas and Electricity Markets (Ofgem) is responsible for protecting gas and electricity consumers in Great Britain. It does this by promoting competition, wherever appropriate, and regulating the monopoly companies that run the gas and electricity networks. Ofgem is governed by the Gas and Electricity Markets Authority.

P

Profile Class

Consumers that are not settled using actual meter readings for each settlement period are grouped into one of eight Profile Classes. For each Profile Class, a load profile is created that estimates the consumption shape of the average consumer. This load profile (or variations of it) is used to determine the consumption in each half hour for all consumers assigned to the Profile Class.

R

Retail Market Review (RMR)

The RMR was an Ofgem project with the aims of making the retail energy market work better at serving the interests of consumers and enabling individual consumers to get a better deal from energy suppliers.

S

Settlement period

The period over which contracted and metered volumes are reconciled. This is defined as a period of 30 minutes. See also settlement process.

Settlement process

Settlement places incentives on suppliers (and other market participants) to contract sufficiently to meet the needs of consumers. For suppliers, it operates by charging for any difference between the volume of electricity that they buy and the volume that their customers' consume.

Smarter Markets Programme

The Smarter Markets Programme is Ofgem's way of coordinating our work to use the opportunity that smart metering presents to make retail energy markets work better for consumers.

Static time-of-use (ToU) tariff

A time-of-use tariff that fixes in advance the peak and off-peak periods and the prices applied at these times.

Supplier Agent

A party appointed by a supplier to maintain a meter or to collect and prepare data for settlement. Some consumers agree with their supplier to appoint their own agents. See also Data Collector and Data Aggregator.

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Time-of-use (ToU) tariffs

Energy tariffs that charge different prices at different times of the day, week, month or year.

Appendix 5 - Feedback Questionnaire

1.1. Ofgem considers that consultation is at the heart of good policy development. We are keen to consider any comments or complaints about the manner in which this consultation has been conducted. In any case we would be keen to get your answers to the following questions:

1. Do you have any comments about the overall process, which was adopted for this consultation?
2. Do you have any comments about the overall tone and content of the report?
3. Was the report easy to read and understand, could it have been better written?
4. To what extent did the report's conclusions provide a balanced view?
5. To what extent did the report make reasoned recommendations for improvement?
6. Please add any further comments?

1.2. Please send your comments to:

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