

Discussion paper for electricity settlement expert group – analytical framework for electricity settlement project

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Audience: Electricity settlement expert group and other interested stakeholders

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1. Purpose of the paper

1.01 As part of the Smarter Markets Programme ('the Programme'), Ofgem has convened an expert group to support its work to examine how consumers can be settled against their half-hourly (HH) consumption data. This paper sets out the analytical framework for this work.

1.02 We are seeking views from the expert group on the following questions:

- Do you have any comments on the objectives that settlement needs to deliver to support our smarter markets vision?
- Do you agree with the evaluation criteria we will use to assess whether options for reform meet the objectives that settlement needs to deliver?
- Do you have any comments on the assumptions we plan to make? Are there others that we should include?

2. Structure of the paper

2.01 This paper contains the following sections:

- Section 3 – sets out the purpose of the analytical framework
- Section 4 – describes the analytical framework
- Section 5 – sets out our next steps.

3. Purpose of the analytical framework

- 3.01 As defined in the launch statement published in April 2014, Ofgem’s settlement project will examine how domestic and smaller non-domestic consumers can be settled against their half-hourly (HH) consumption data.¹ At the conclusion of this work, our ambition is to come to a view on whether there should be a mandate to settle all consumers in this way. When we refer to settlement, we are focused on the arrangements for allocating volumes in each half-hour settlement period to suppliers as set out in the Balancing and Settlement Code (BSC). These arrangements are called the Supplier Volume Allocation (SVA) arrangements.
- 3.02 Ofgem’s principal objective is to protect the interests of existing and future energy consumers. The purpose of the analytical framework is to describe how we will assess whether a requirement to settle against HH consumption data is in consumers’ interests.
- 3.03 The settlement project is divided into two stages. The framework is applicable to both.
- In the first stage, it allows for a comparative assessment of different options for using HH data in settlement.
 - In the second stage, it allows for a more detailed assessment of the shortlist of options identified in stage one against each other and the baseline of continuing to settle consumers non-HH (NHH) as at present.
- 3.04 The framework is designed to allow for both qualitative and quantitative analysis of options. We envisage that the first stage will rely largely on qualitative analysis. In the second stage, we plan to undertake an impact assessment on the shortlist of options. The framework aligns with Ofgem’s impact assessment guidance.

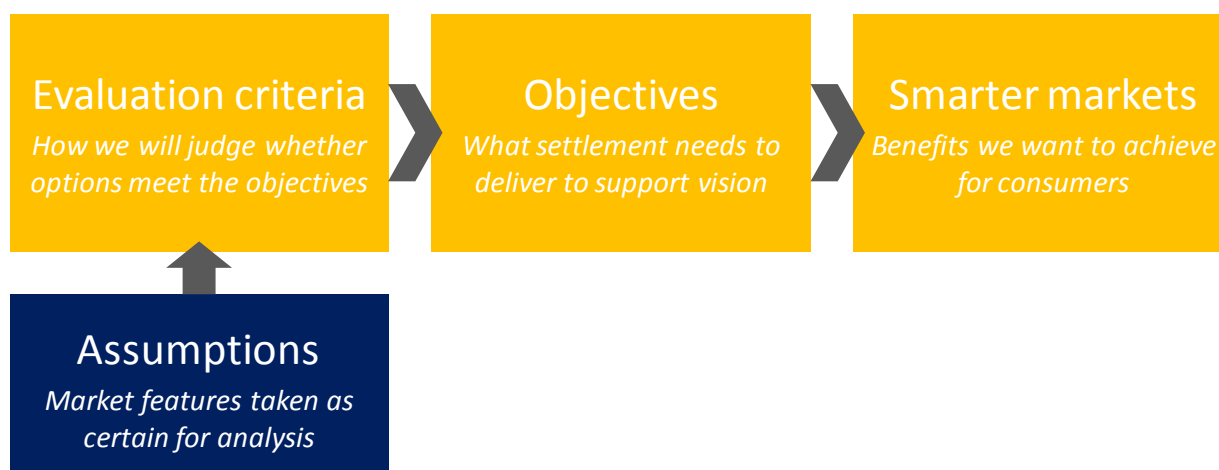
4. Analytical framework

4.1 Structure of the analytical framework

- 4.01 The framework consists of four parts.
- Smarter markets vision. A description of the benefits we want to help realise for consumers by using the opportunity that smart metering presents to make retail energy markets work better.
 - Objectives. A description of what settlement needs to deliver to support realisation of the benefits set out in our vision.
 - Evaluation criteria. The criteria we will use to judge whether an option will meet the objectives that settlement needs to deliver.
 - Assumptions. The features of the market that we will take as certain for the purposes of our assessment.
- 4.02 Figure 1 shows how the parts of the framework fit together. We discuss each in more detail below.

¹ *Electricity settlement reform – moving to half-hourly settlement*, Ofgem, April 2014. Available on the Ofgem website here: <https://www.ofgem.gov.uk/ofgem-publications/87053/electricitysettlementlaunchstatement.pdf>

Figure 1 – structure of the analytical framework



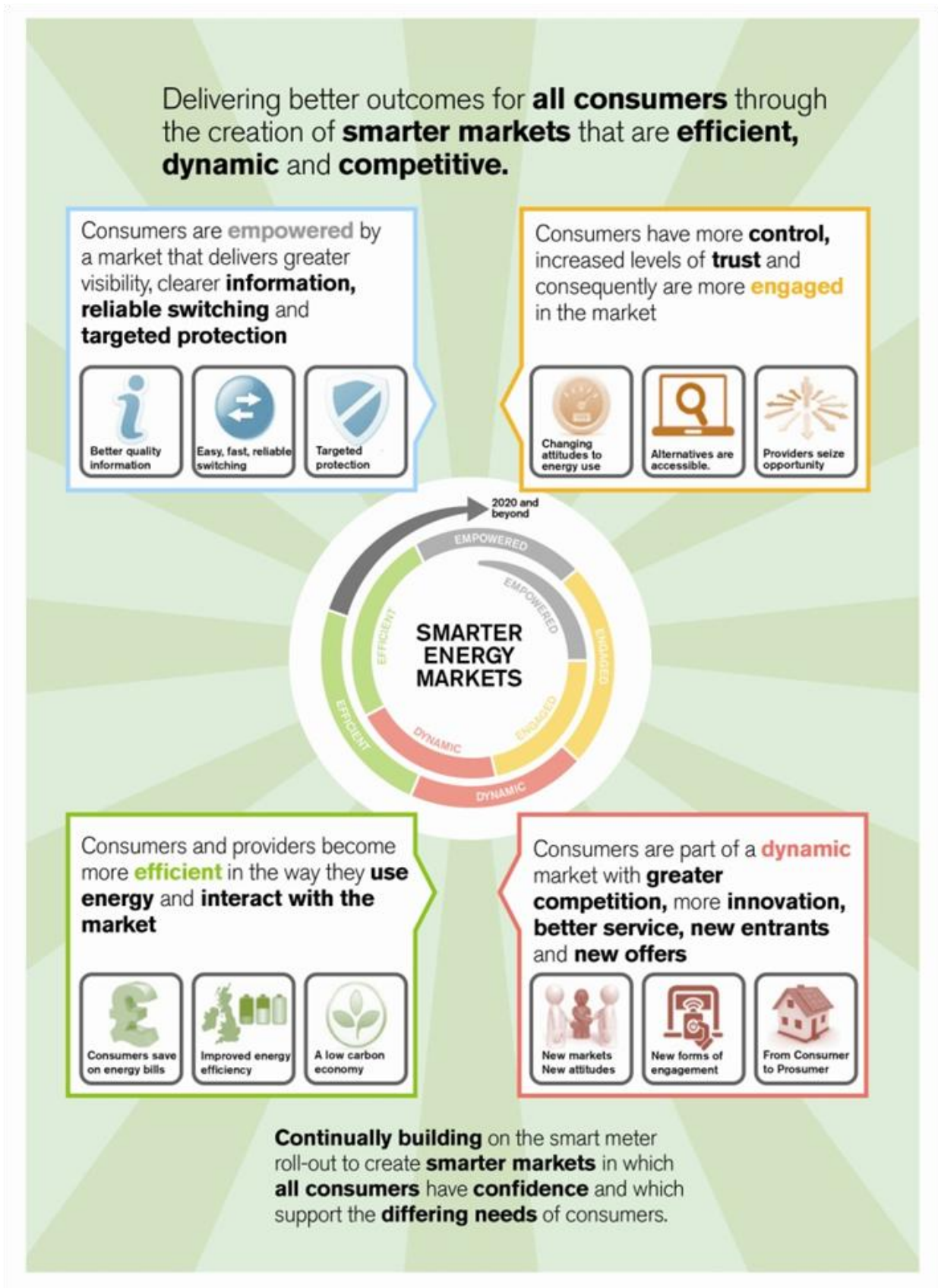
4.03 The framework set out in Figure 1 enables us to assess most of the impacts of using HH data in settlement. However, we have also identified that discrete analysis outside this framework on the distributional impact of time-of-use tariffs can also inform our assessment. This is discussed further in section 4.6.

4.2 Smarter markets vision

4.04 Ofgem is committed to playing its part to help realise the opportunity that smart metering presents to make retail energy markets work better for consumers. Our vision as summarised in Figure 2 is for smarter energy markets that are more efficient, dynamic and competitive. This vision describes the benefits that we want to help deliver for existing and future consumers.

4.05 The foundation of our vision is being established by reforms introduced through Ofgem’s Retail Market Review that aim to make the retail energy market simpler, clearer and fairer for consumers. Smart metering will help deliver the same objectives by giving consumers ready access to information on their consumption, enabling them to make better choices about how they consume energy and the products they buy. Greater consumer engagement, together with the potential that smart metering presents for innovation, can create a more dynamic market with better service, new products and services, and new entrants. Some of these products and services can help consumers to use energy more efficiently, lowering bills and helping the transition to a low-carbon economy.

Figure 2 – Ofgem’s vision for smarter energy markets



4.3 Objectives

- 4.06 Our vision will not be realised without changes to the arrangements that govern how market participants interact with each other and consumers. We established the Programme to help drive necessary changes. One of the projects under the Programme seeks to use the opportunity that smart metering presents to improve the settlement process.
- 4.07 In 2013-14, we scoped out how the settlement process may need to change to support realisation of the benefits for consumers set out in our vision for smarter markets. To inform our work, we conducted extensive stakeholder engagement. The conclusions of our thinking were set out in the launch statement.
- 4.08 Based on this work, we developed objectives that settlement needs to deliver to help realise smarter markets in the context of the roll-out of smart metering. We consider that settlement needs to:
- provide incentives to support efficient use of demand-side response
 - reflect actual demand as closely as possible, thereby providing incentives on suppliers to forecast accurately what their customers consume
 - provide an efficient process for determining how much each suppliers' consumers use in each half hour of the day
 - support market arrangements that rely on consumption data from settlement, including distribution network charging and government programmes designed to support low-carbon generation.
- 4.09 Table 1 describes the relationship between the objectives and settlement and explains how each helps to deliver our vision.

Table 1 – objectives of settlement

Objective	Relationship to settlement	Delivery of vision
Demand-side response	Settlement places incentives on suppliers to balance their positions. One tool they can use to do this is demand-side response. This requires that settlement recognises changes in consumption behaviour by consumers.	<p>At the heart of our vision is a more dynamic market in which consumers use energy more efficiently.</p> <p>By providing incentives to support efficient use of demand-side response, settlement can support innovation in the products and services that suppliers offer. It can also present new opportunities for third parties that can help suppliers to use demand-side response (for example, through aggregation of load).</p> <p>Where consumers engage with new products and services designed to encourage more efficient use of energy through demand-side response, this can help to lower bills, improve security of supply and connect low-carbon forms of generation.</p>
Accurate forecasting	To balance their positions, suppliers need to forecast the amount of energy that they will be allocated through settlement. If settlement reflects actual consumption, suppliers will have incentives to forecast and buy energy to meet what their customers actually use.	<p>In our vision, providers are more efficient in how they interact with the market.</p> <p>If suppliers have incentives to buy energy based on accurate forecasts of demand, the System Operator would need to take fewer balancing actions.² This can improve efficiency where it is cheaper for suppliers to contract forward for energy based on accurate forecasting compared to the costs of balancing actions taken by the System Operator.</p> <p>Forecasting of accurate demand may also reduce imbalance risk for some parties, especially new entrants who can face challenges in predicting error caused by profiling. Lower imbalance risk would support realisation of a more dynamic market by reducing costs of entry.</p>
Efficient process	In the context of settlement, efficiency refers to the costs of managing the process (including those stemming from its length) and the quality of its outputs.	<p>In our vision, providers are more efficient in how they interact with the market.</p> <p>An efficient settlement process can help to realise this outcome by improving the quality of consumption data used to determine how much each supplier's customers use in each settlement period.</p> <p>An efficient settlement process can also support realisation of a more dynamic market by reducing costs that new entrants and smaller suppliers may have less ability to absorb compared to larger suppliers. This includes costs stemming from the complexity and length of the settlement process, as well as data quality.</p>
Support market arrangements	Information on consumption generated through the settlement process is used by other market arrangements, for example distribution charging.	<p>In our vision, providers are more efficient in how they interact with the market.</p> <p>Market arrangements govern how market participants interact with each other and consumers. Some of these arrangements rely on data from settlement. Settlement has a role to play in supporting effective implementation of these arrangements and the outcomes they seek to</p>

² Suppliers and other market participants have incentives to balance their positions. National Grid Electricity Transmission, in its role as the System Operator for Great Britain, is responsible for managing any residual difference between supply and demand.

		deliver for consumers by providing accurate and timely consumption data.
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4.4 Evaluation criteria

4.10 The purpose of the evaluation criteria is to allow us to judge the extent to which an option would realise the objectives that settlement needs to deliver to help realise smarter markets. Table 2 below lists the evaluation criteria we will use and identifies their relevance to the objectives. This demonstrates that some criteria, such as accuracy, are relevant to more than one objective. Where this is the case, our assessment against the criterion will consider all ways in which an option can support the objectives of settlement.

Table 2 – evaluation criteria

Criterion	Description	Relevance to objectives
Accuracy	The accuracy of volumes allocated to suppliers through settlement in relation to the actual consumption of their customers.	<p>Accuracy in settlement affects the incentives on suppliers to encourage demand side response among their customers. This is because suppliers can only reduce their costs by encouraging this behaviour if it is reflected in the volumes they are allocated through settlement.</p> <p>To balance their positions, suppliers need to forecast and buy the amount of energy they are allocated through settlement. Accuracy in settlement will affect forecasting accuracy, in terms of the degree to which suppliers need to forecast actual demand to balance their positions and their ability to do so.</p> <p>Accuracy in settlement also refers to the identification and resolution of errors in consumption data and hence the efficiency of the settlement process.</p>
Speed	The speed with which volumes are allocated to suppliers through settlement.	The speed of volume allocation affects the efficiency of the settlement process . This is because suppliers put up capital with ELEXON to cover an estimate of imbalance charges for days not yet subject to the first reconciliation run. ³ They also set aside capital to mitigate subsequent changes in imbalance charges. The speed of the settlement process could be particularly relevant to smaller suppliers and new entrants because they have lower cash reserves compared to larger suppliers.
Coverage	The type and number of customers that would be settled against their HH consumption data.	Coverage is relevant to all objectives. Under any option for using HH data in settlement, the number and type of customers that are covered will affect the extent to which these objectives can be delivered.
Simplicity	The simplicity of the process for allocating volumes to suppliers, particularly in relation to retrieving and preparing consumption data.	Simplicity affects the costs new entrants incur in understanding market arrangements and the ability for suppliers to identify and resolve errors in consumption data. In these ways, it is relevant to the efficiency of the settlement process .
Cost	Upfront and ongoing costs for market participants in managing settlement, including the costs of central bodies.	The efficiency of the settlement process is in part a function of the costs incurred in managing it by market participants.

³ The process for comparing contracted and metered volumes for each settlement period and charging for any imbalance is repeated at set intervals called settlement runs. The first of these runs occurs three weeks after real time.

Flexibility	The ability to accommodate changes in the regulatory framework and the market, including new business models.	Once any new arrangements are in place for settling domestic and smaller non-domestic consumers, implementing changes may give rise to costs. Therefore, flexibility is relevant to the efficiency of the settlement process .
Integration	Compatibility with existing market arrangements, including those at European level.	Effective integration will allow settlement to support other market arrangements including those that rely on the information on consumption generated through the process of allocating volumes.
Implementation	Ease, risk and timing of implementation.	Implementation is relevant to all objectives as it will affect the timing of and preparation required for their realisation.
Consumer impact	The overall impact on consumers. This impact could be direct, for example where the consumer has contracted directly with a Supplier Agent. It could also be indirect, for example where an option delivers benefits for consumers by helping to strengthen the incentives on suppliers to encourage demand-side response.	The impact on consumers is determined by the extent to which an option will enable settlement to deliver the objectives.

4.11 In evaluating options against the criteria, we will use quantitative assessment to inform our work where appropriate. We envisage that this will be most relevant in the second stage.

4.12 Our evaluation of options against the criteria listed in Table 2 will also take account of the Department of Energy and Climate Change’s (DECC’s) impact assessment for the roll-out of smart metering. This will be particularly relevant in the second stage of our work when we will assess a shortlist of options against each other and the baseline defined by the current arrangements. We want to identify how our work may support realisation of the benefits identified in this impact assessment and avoid double counting of these benefits, as well as the costs DECC identified, where relevant.

4.5 Assumptions

4.13 In assessing options for using HH data against the evaluation criteria, we will need to make assumptions about features of the market. This is relevant both to qualitative and quantitative assessment. Table 3 describes and explains the assumptions that we plan to use.

Table 3 – assumptions for the settlement project

Assumption	Comments
<i>Roll-out of smart meters to domestic and smaller non-domestic consumers</i>	
Smart meters are installed in over 99 per cent of domestic premises by end of 2020.	Our work to identify options for using HH data in settlement should recognise that a small number of domestic premises retain traditional meters (or smart meters operating in dumb mode) at the end of roll-out. We use the same assumption as DECC in its impact assessment for the roll-out of smart meters, which notes that the Communication Service Providers ⁴ contracts include a binding commitment to deliver a minimum of 99.25% connectivity across their territories by the completion date. ⁵

⁴ The Communication Service Providers provide wide area communications to and from smart meters. DCC is responsible for the procurement and contract management of these service providers.

⁵ The contracts recognise that Wide Area Network (WAN) coverage may not be achieved at reasonable cost in all parts of GB by the completion date. This would mean a fully smart service, which requires two-way communications between the DCC and the meter and a fully operative Home Area Network that enables the customer to access up-to-date information about energy costs, may not be available in a small amount of domestic properties.

Smart meters are installed in 77 per cent of smaller non-domestic premises by end of 2020. The remainder of non-domestic premises have advanced meters.	Our work to identify options for using HH data in settlement will need to recognise that some smaller non-domestic premises retain advanced meters. Like smart meters, advanced meters can record HH consumption and can be remotely read. We use the same assumption as DECC in its impact assessment for the roll-out of smart meters.
<i>Access to data</i>	
HH consumption data is available for settlement.	For the purposes of our work to identify options, we will assume HH consumption data is available for settlement. As part of our work, we will assess how the options we identify interact with the Data Protection Act 1998 and the supply licence obligations relating to access to data.
<i>Data and Communications Company (DCC)</i>	
Data and Communications Company (DCC) will offer services from December 2015.	As per the Smart Metering Implementation Programme's joint industry level one plan dated 29 May 2014.
Suppliers will receive consumption data from domestic premises through the DCC.	DECC has expressed a minded-to position that all domestic smart meters with a compliant communications hub that meet the requirements of the second version of the common technical standards ('SMETS 2 meters') should be enrolled with the DCC. ⁶ For smart meters that are compliant with the first version of the technical standards ('SMETS 1 meters'), DECC's position is that all significant populations of meters should be enrolled in the DCC. ⁷
Suppliers will receive consumption data from 97.5 per cent of smaller non-domestic premises with smart meters through the DCC.	Suppliers are not obliged to receive consumption data from smart or advanced meters for smaller non-domestic premises through the DCC. However, DECC considers that larger suppliers will receive consumption data for these premises through the DCC. These suppliers supply the large majority of customers in the smaller non-domestic sector. We use the same obligation as DECC in its impact assessment for the roll-out of smart meters.
Suppliers will not receive consumption data for smaller non-domestic premises with advanced meters through the DCC.	Suppliers can choose whether to enrol advanced meters in DCC. As per DECC's assumption in its impact assessment for the roll-out of smart metering, we assume that no supplier uses DCC services for smaller non-domestic premises with advanced meters.

4.14 In addition to the assumptions listed in Table 3, we will assume no change to settlement processes that lie outside the scope of our work as defined in our launch statement of April 2014. This includes the way in which sites other than domestic and smaller non-domestic sites are settled. We will review this assumption if, outside of our project, the industry or Ofgem raises proposals to change existing settlement processes that are relevant to our work.

4.6 Supporting analysis

4.15 Using HH consumption data in settlement strengthens the incentives on suppliers to reduce costs by rewarding consumers for shifting consumption to periods when electricity is cheapest. For example, by offering time-of-use tariffs that charge different prices at different times of the day. Consumers who are

⁶ DECC (2013) Stage 1 of the Smart Energy Code: A Government response and supplementary consultation on updated draft legal text. Available at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/193074/20130424_Stage_1_SEC_Response_and_Consultation_on_Updated_legal_text.pdf

⁷ DECC (2014) Response and Further Consultation on the Regulatory Arrangements for Enrolment and Adoption of Foundation Meters.

Available at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/299369/govt_response_enrolment_adoption_foundation_meters.pdf

able to respond to price signals can benefit immediately from lower bills. However, some consumers may not be willing or able to shift load.

- 4.16 Assessing the distributional impacts on consumers of time-of-use tariffs is a priority for the Programme. We recently commissioned the Centre for Sustainable Energy to undertake analysis of domestic electricity usage patterns and to model the potential distributional impacts of time-of-use tariffs. We published their findings in April 2014.⁸
- 4.17 Building on the work to date, we will consider what analysis on the distributional impacts of time-of-use tariffs could inform our settlement project. We anticipate any analysis would be undertaken in the second stage of our project.

5. Next steps

- 5.01 Following the expert group meeting on 16 June 2014, we will review the analytical framework to take account of views raised. We expect this framework to continue to evolve as our thinking develops. We will inform the expert group of any changes and seek their views where appropriate.

⁸ Investigating the potential impacts of Time of Use (ToU) tariffs on domestic electricity customers: Smarter Markets Programme, Ofgem, April 2014. Available on the Ofgem website here: <https://www.ofgem.gov.uk/publications-and-updates/investigating-potential-impacts-time-use-tariffs-domestic-electricity-customers-smarter-markets-programme>