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Call for Evidence: Potential impacts on consumers following market-wide settlement reform

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Market-wide electricity settlement reform is a key facilitator of a smart and flexible future energy system. Where electricity is settled using actual half-hourly metered data, costs of supply will be attributed more accurately across the day, incentivising suppliers to offer new products and services to help consumers unlock multiple benefits. Consumers would be rewarded for using energy flexibly, for example by responding to time-based pricing signals that may enable them to reduce their energy bills.

Settlement reform will enable greater system flexibility, including through supporting the potential for better signals for the costs and benefits users confer on the network through network access and charging arrangements. We will all benefit from a more flexible energy system that will improve efficiency and reduce overall costs, including consumers' bills. In addition, a more flexible energy system will help further decarbonise the energy sector, aided by greater uptake of new technologies that facilitate deployment of renewable energy sources.

We recognise that the shift to a more flexible energy system will present different opportunities and risks to different groups of consumers, in particular for those who are unable to, or find it more difficult to, engage. We want to

better understand how the impact of these changes may get distributed across domestic and small non-domestic consumers and whether there are specific risks that might arise for some of these consumers in the future for which further consumer protection and engagement measures could be needed.

This document sets out the background to introducing market-wide electricity settlement reform and its potential impact on domestic and small non-domestic consumers. It also outlines options for reform of electricity network access and forward-looking charging arrangements, which could be facilitated through half-hourly settlement. We have set out the consumer impact themes against which we are seeking evidence. We welcome views, supplemented by relevant available evidence, from stakeholders who have an interest in the potential consumer impacts and their implications, including from those who work with and represent consumers, and other stakeholders interested in the future development of the energy system, eg suppliers, network companies and innovators.

Once this Call for Evidence closes, we will consider all the responses received and how the evidence provided can help inform the business case for market-wide electricity settlement reform, as well as any further work we may undertake subsequently on, for example, the consumer protection and engagement issues it may raise. Responses will also inform our ongoing review of network access and forward-looking charging arrangements.

We want to be transparent and so will publish non-confidential responses on our website.

If you want your response – in whole or in part – to be considered confidential, please tell us this in your response and explain why. Please clearly mark the parts of your response you consider to be confidential and, if possible, put the confidential material in separate appendices to your response.

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Executive summary

Background to this Call for Evidence

Ofgem is working alongside government to deliver reforms to the energy market, both on the retail side and in networks, that will encourage greater future system flexibility. Many of these reforms are interlinked – for example, smart metering and the smart meter rollout will enable market-wide settlement reform and potential reforms to electricity network access and charging arrangements, which should incentivise suppliers to innovate in the retail market. This, in turn, would allow consumers to offer flexibility to the broader energy system and help them realise a number of significant benefits (see the diagram in Appendix 1). These changes could affect the costs of future network development that we regulate through RIIO price controls and also how network costs and benefits are signalled and how those costs are recovered. At the same time, we are aiming to introduce faster, reliable switching for consumers in the retail market and considering the kind of retail market design arrangements that will help ensure the retail energy market works better for consumers today and tomorrow.[1]

A number of actions aimed at facilitating the transition to a smart and flexible future energy system are being taken through the Ofgem/BEIS Smart Systems and Flexibility Plan. We issued a Call for Evidence on our Smart Systems and Flexibility Plan in November 2016 in conjunction with Government, and issued our response in July 2017.[2] Whilst we recognise some potential for overlap between some aspects of the evidence requested then and information we are seeking to collect as part of this Call for Evidence, we would like to build on the information already received and understand new developments which have taken place in the intervening time.

Our draft Forward Work Programme 2019-21[3] sets out the outcomes we are seeking to achieve, including putting in place the foundations for a future energy market while delivering benefits to current consumers, and ensuring electricity networks are used efficiently and flexibly and have the right signals for future investment.

Which reforms are covered in this document?

Market-wide electricity settlement reform, enabled by the smart meter rollout[4], will play a key role in decarbonising the energy sector and facilitating a smart and flexible future energy system and is one of the key actions in the Ofgem/BEIS Smart Systems and Flexibility Plan.[5] We have already identified significant potential system-wide

[1] Following an announcement in November 2018, a joint BEIS/Ofgem Future Energy Retail Market Review will develop more fundamental options for reforming current retail market arrangements with a view to promoting competition and innovation, ensuring consumers remain protected from harm and all consumers share the benefits (for more, see: https://www.gov.uk/government/speeches/after-the-trilemma-4-principles-for-the-power-sector)

[2] Smart Systems and Flexibility Plan, Ofgem and Government response, July 2017, available here: https://www.ofgem.gov.uk/system/files/docs/2017/07/ssf_plan_-_summaries-responses.pdf. For the most recent progress update on the BEIS/Ofgem Smart Systems and Flexibility Plan (October 2018), see: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/748125/ssfp-progress-update.pdf

[3] Ofgem's Draft Forward Work Programme 2019-2021: https://www.ofgem.gov.uk/system/files/docs/2018/11/ofg1100_fwp_2019_21_programme_web.pdf

[4] Smart meters will separately record the amount of electricity consumed, and exported to the grid (eg in premises with small-scale renewable generation), in each half hour of the day.

[5] See footnote 2.

benefits of progressing with market-wide electricity settlement reform that can be passed through to all consumers. These are set out in our Outline Business Case[6] and suggest that our decision should centre on when and how, rather than whether, to introduce reform. Some of those benefits are enabled by consumers shifting their consumption patterns. Through this Call for Evidence, we are seeking to understand consumers' likely engagement with tools to help them do this, and the impacts, including distributional impacts, on different groups of consumers which may result.

The availability of actual metered data for settlement purposes from smart meters, instead of profiles of how 'average' types of consumers use electricity, will help expose suppliers[7] to the true cost of supplying electricity to their customers. This should provide suppliers with incentives to help their customers shift energy use to times of the day when electricity is cheaper to generate or transport, for example, by developing new products and services, in some cases supported by technological innovation, in the retail energy market. For instance, new smart Time of Use (ToU) tariffs are already emerging with lower off-peak prices to reward consumers (if they so choose) for shifting energy use to those off-peak times, for example by using their washing machine later in the evening. This will help them save money and better manage their energy costs. Another example would be flat tariffs but where the consumer allows their supplier, or another party, to control certain aspects of their demand to avoid system peaks and they share the financial benefits. In the future, we expect consumers will benefit financially from actively participating in the energy system. However, the choice of whether to take up new retail tariffs and opportunities will remain with the consumer.[8]

Network access and forward-looking charging arrangements will also play a key role in incentivising efficient use of the energy system. We recently decided to launch a ***review of electricity network access and forward-looking charging arrangements***, which will assess options to clarify access rights and improve choice for network users.[9] The review will consider how the costs and benefits users confer on the network are signalled through charges and access arrangements in meeting this objective.

This work aims to ensure that electricity networks are used efficiently and flexibly, reflecting users' needs and allowing consumers to benefit from new technologies and services while avoiding unnecessary costs on energy bills in general. Market-wide electricity settlement reform is a key enabler for a number of options we are considering in this review. Suppliers or others could receive a combined set of signals in relation to customers' usage, through cost-reflective charging arrangements and potential new access choices. These options may include more granular network charging signals (which could vary by time of day or throughout the year, or by location) and better definition and choice of options to access the network. These arrangements could reflect network constraints and help reduce the need for new network capacity.

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[6] See the draft economic case (Chapter 3) of our Outline Business Case (OBC) for our most recent work on costs and benefits of market-wide electricity settlement reform: https://www.ofgem.gov.uk/publications-and-updates/market-wide-settlement-reform-outline-business-case

[7] In this document, we are using the term 'supplier(s)' to refer to a broad range of future energy market participants, including incumbents, innovators and those with new business models that provide services to energy consumers.

[8] In this document, we use the term 'tariff' to refer to the end retail offering consumers face, and where we talk about network charges, we use the term 'charges'.

[9] In December 2018 we issued our decision to launch a review, including launching a Significant Code Review (SCR). Our decision letter and SCR launch statement are available here: https://www.ofgem.gov.uk/publications-and-updates/electricity-network-access-and-forward-looking-charging-review-significant-code-review-launch-and-wider-decision

To ensure small network users, particularly those who may be in vulnerable situations, are protected from taking up inappropriate products and/or tariff choices for their needs, there may need to be limits on the extent of this choice of access they are offered, and the granularity of charging signals.[10] Other protection mechanisms, such as principles-based supplier obligations, could also have a role and we will consider options to ensure consumers are protected in this review.

Domestic and small non-domestic consumers[11] will be affected by market-wide electricity settlement reform, and the potential access and charging changes it can facilitate, in different ways, depending on their individual circumstances and characteristics. Some consumers may have untapped potential for using energy flexibly that could be unlocked through settlement reform and the new products and services we expect market participants to develop. Other consumers, including some of those in vulnerable situations, those less able and/or willing to directly or indirectly participate in future developments within the energy market, or those less able to be flexible, may face greater barriers than others. They may find it difficult to respond to price signals and/or access innovative technology that could help them respond and save money.

We want to ensure all consumers, including those in vulnerable situations, the less engaged and less flexible, can share in the benefits that follow from market-wide electricity settlement reform. This includes the broader system-wide benefits, plus any specific benefits consumers may achieve individually by making the right choices for their circumstances and characteristics.

Consumers should be able to make informed choices about the most suitable tariff for them, both now and in the future, based on their particular circumstances at any time, including where they choose to delegate this choice to a third party. Our move to a principles-based regulation framework in the retail energy market[12] (applied through energy supply licences) provides strong consumer protection whilst also giving suppliers greater freedom to determine how they meet the diverse needs of their customers.

This framework applies to consumers making tariff choices, including from the range of new tariffs we anticipate suppliers will develop and offer now and in the future. Part of the aim of this Call for Evidence is to test the extent to which the framework is likely to cover potential consumer risks which may arise from introducing market-wide electricity settlement reform and/or potential reforms to network access and forward-looking charging, and whether there are risks which may need solutions beyond current rules.

Aim of this document

We are using this Call for Evidence to ask specific questions to help us build on work we have already undertaken (for example, research on distributional impacts of time of use tariffs[13]) and fill evidence gaps regarding the potential consumer impacts arising from

[10] For network access considerations we defined the term 'small users', referring to those users who do not have a specified capacity, as set out in our SCR launch statement. We expect the scope of these definitions to overlap with the consumers considered in this Call for Evidence.
[11] Domestic and small non-domestic consumers come within current settlement Profile Classes 1 to 4.
[12] The principles-based regulatory framework offers broad overarching protections for domestic consumers (informed tariff choice, vulnerability principles) alongside specific principles (customer communication principles) which will continue to apply in a world with new types of tariffs, like ToU tariffs. More information is here: https://www.ofgem.gov.uk/electricity/retail-market/market-review-and-reform/future-retail-market-regulation
[13] See the work we commissioned from Cambridge Economic Policy Associates (CEPA) on Distributional Impacts of ToU tariffs (July 2017): https://www.ofgem.gov.uk/publications-and-updates/distributional-impacts-time-use-tariffs

market-wide electricity settlement reform and the signals and options which these reforms may enable, including potential reforms to the network access and forward-looking charging framework.

Our questions are intended to help us better understand the likely response of and impacts on both domestic and small non-domestic consumers, which may differ due to individual consumers' specific circumstances and characteristics at any time. We are exploring these impacts through the following themes:

- Consumers' interest in, ability and/or willingness to personally, or through a third party, engage with their energy use and with the market. This could include acting on information about how the cost of their electricity use varies over time, or adopting suitable technologies and services to allow their engagement to be managed on their behalf

- Consumer flexibility - consumers' ability and willingness to shift their load

- Consumers' access to and ability (and/or willingness) to adopt smart or innovative technology that could support them with offering flexibility, and

- Consumer choices on tariffs and other options - the value to consumers of different tariff types and options, which may include potential new network access options or more cost-reflective signals reflecting network charges, the factors which may affect the type of tariffs which suppliers choose to develop and then offer to consumers to take up in the future, and the choice, as well as suitability, of available tariffs.

The responses we receive will help inform the economic case in our Full Business Case by testing the assumptions we are using to better understand the likely impact of settlement reform for consumers, and how this may potentially translate in terms of the distributional impacts across different consumers. They will also help us to consider and assess whether any regulatory interventions (further consumer protection and engagement measures) beyond the current framework might be needed.

They will also help us understand relevant implications for potential changes to the current network access and forward-looking charging arrangements, in our review of these arrangements. Across both projects, we are seeking views and evidence on the extent to which small users will be able to respond flexibly to unlock network and wider system savings, and to understand better what forms of support or additional protections may be needed.

Next steps

We are seeking responses by 29 March 2019. We will consider all non-confidential and confidential responses sent to us. We will then publish all the non-confidential responses and a summary of those responses alongside information about any next steps arising from this work. We expect to take a final decision on market-wide electricity settlement reform in the second half of 2019, with changes to fully implement reform to follow. With Electricity network access reform, we published our decision to launch a review of network access and forward-looking charging, including the launch of a Significant Code Review (SCR), in December 2018 and will consider responses to this call for evidence in developing our thinking as part of this review.

1. Introduction

Why are we issuing this Call for Evidence?

1.1 Energy suppliers are required to take all reasonable steps to roll out smart meters to all their domestic and some small business customers[14] by the end of 2020. Smart meters will provide consumers with a number of benefits including the end of estimated bills and, for domestic consumers, near real-time information about their energy use through an In-Home Display (IHD). They can also record electricity used (and exported to the grid) at half-hourly granularity. This usage data, subject to the regulatory framework[15], can be remotely accessed by suppliers, and will enable them to settle the electricity they supply on a half-hourly basis.

1.2 Market-wide electricity settlement reform enabled by smart meters will enable the realisation of a number of key benefits (see the diagram in Appendix 1), namely:

- increased system flexibility leading to less need for carbon-intensive generation and lower overall system costs through avoided or deferred investment in network reinforcement and new generation build. These savings could benefit all consumers
- consumers could be helped to use electricity flexibly by the offer of innovative (time-based) tariffs, products and services from suppliers, leading to reduced bills
- increased settlement process efficiency, with expected savings passed on to consumers, and
- increased competition and customer choice, as incumbents are challenged by new entrants (innovators and those with new business models) to the retail energy market. We expect that market participants will offer new products and services, including technology solutions, to engage and support consumers to use electricity flexibly.

Even consumers who are less able or willing to engage will still benefit when a significant demand shift across the grid reduces overall system costs, or prevents potential increases in future system costs.

1.3 However, not all consumers may choose to take a smart meter or, even with a smart meter, will want to engage with their energy usage (directly or indirectly) through new products and services such as ToU tariffs, or potential new network access options. Some consumers (including some in vulnerable situations) may

[14] Non-domestic consumers in electricity profile classes 3 and 4. Suppliers can offer a choice between an advanced meter and a smart meter to non-micro-business customers (ie larger businesses and public sector organisations).
[15] We have consulted on access to half-hourly data for settlement purposes, see https://www.ofgem.gov.uk/publications-and-updates/consultation-access-half-hourly-electricity-data-settlement-purposes

also face greater barriers to engagement due to their individual circumstances or characteristics.

1.4 There is evidence from previous trials[16] where consumers have been offered a smart meter and access to ToU tariffs, or have been surveyed about engaging with these, that suggests that at least some of them do have an appetite to engage, even where they are in a vulnerable situation, including with more complex dynamic ToU tariffs.[17] This evidence only partially helps us understand how consumers may behave in the real world in the future. Trials often offer incentives to participating consumers for the trial period only, meaning it is uncertain whether they would make an enduring change to their behaviour. Also, there may be a 'no-loss' scenario involved, ie no consumers are disadvantaged financially by engaging during the trial period.

1.5 We are using this Call for Evidence to help us better understand the likely reaction to market-wide half-hourly settlement (including potential distributional impacts) by different types and groups of domestic and small non-domestic consumers (in particular their ability to shift their demand) which will assist us in developing our economic business case.[18] It will also help us better understand whether, and what, further activity may be needed from us to help protect and engage these consumers.

1.6 We also want to use this Call for Evidence to help us understand relevant implications for potential network access and charging options, which market-wide settlement reform could help enable.[19] In exposing suppliers to the true cost of supply, network charges may form part of what could be signalled following settlement reform, so suppliers and end consumers would respond to the combined set of signals they may receive, including those reflecting network costs or benefits.

1.7 In future, demand and flexibility at household level could increase significantly due to electric vehicles (EVs), heat pumps and other new technologies. Larger users' demand could change too. Many such technologies could offer new opportunities for flexibility. However, they could also create a significant need for network reinforcement, with associated costs for consumers. Our review of electricity network access and forward-looking charging arrangements seeks to ensure these arrangements support efficient network use and development, so that any increase in demand is met at efficient cost.

1.8 Network users, including consumers, may also be able to choose from a greater range of access options which more closely reflect their requirements. In addressing the themes and questions in this Call for Evidence, we invite respondents to consider how they would apply for this potential combined set of signals and options reflecting both energy costs and network signals.

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[16] See, for example, the Customer-Led Network Revolution study: http://www.networkrevolution.co.uk/
[17] Appendix 2 describes a number of different time-based and other tariff types that suppliers may develop and offer in the future.
[18] The OBC has our most recent work on the costs and benefits of market-wide electricity settlement reform: https://www.ofgem.gov.uk/publications-and-updates/market-wide-settlement-reform-outline-business-case
[19] Appendix 4 outlines the scope of the Electricity Network Access SCR and describes key options for reform of forward-looking charges and access options considered in the review, which may develop in the future.

Key concepts

1.9 Here we define the key terms used in this document:

- **Engagement in the market:** for a consumer to switch supplier or tariff, or to consider switching by comparing suppliers and tariffs on the market with their own. Switching supplier/tariff was traditionally the primary route that consumers had to engage with energy, prior to smart technology and more granular data being available. This is how the term 'engagement' has typically been defined.[20]

- **Engagement with energy usage:** for a consumer to modify, or to consider modifying, their consumption pattern in some way in response to a signal. This may be by signing up for an innovative tariff like a Time of Use (ToU) tariff, or by adjusting their usage in response to the signals in that tariff. It may involve providing direct or indirect flexibility, with or without automation, as described below.

- **Engaged consumer:** a consumer who engages with their usage, as described above.

- **Disengaged consumer:** a consumer who does not engage with their energy usage, as described above.

- **Offer flexibility:** for a consumer to modify their generation and/or consumption pattern in reaction to an external signal (such as a change in price) to provide a service within the energy system.[21]

- **Direct engagement/load shifting/flexibility:** for a consumer to take actions themselves to engage with their energy usage, to reduce or shift their consumption manually or through a timer or other automation device to provide flexibility.

- **Indirect engagement/load shifting/flexibility:** for an appointed agent such as a supplier, Demand Side Response Aggregator or other party to modify the consumption pattern of a consumer on their behalf to provide flexibility. This can involve an automated response or may be actively controlled by the external party.

- **Automated load shifting/flexibility:** for a consumer to have their consumption pattern modified automatically for them in response to a signal via a technological solution, such as a mobile app, to provide flexibility.

- **Aggregation:** The process by which an appointed agent manages the demand of a group of customers on their behalf and aggregates it, offering any flexibility to

[20] This definition comes from (see page 3): https://www.ofgem.gov.uk/system/files/docs/2018/10/consumer_engagement_survey_2018_report_0.pdf
[21] This definition comes from: https://www.ofgem.gov.uk/electricity/retail-market/market-review-and-reform/smarter-markets-programme/electricity-system-flexibility

the system. Aggregation services already exist for large non-domestic consumers and may develop in the future for domestic and small non-domestic consumers.

- **Domestic consumers:** the group of consumers that uses energy for the purposes of household use.

- **Non-domestic consumers:** the group of consumers that uses energy for purposes other than household use.

- **SMEs:** Small and medium-sized enterprises

Our key themes

1.10 We are asking stakeholders for their views as well as any relevant additional evidence or examples they may have gathered by trialling/testing actual smart products and/or services. This will help us better understand consumers' ability and willingness to engage with a future retail energy market where new 'smart' tariffs, products and services reward them for offering their flexibility. In Chapter 2, we ask stakeholders to consider these themes in respect of domestic consumers. Chapter 3 relates to small non-domestic consumers.

1.11 We have separated our questions out into four key distinct themes. Underlying these four themes is the question of how to provide consumers with all the positive benefits of settlement reform whilst also ensuring they are appropriately protected. All consumers will benefit from system-level benefits, but those who engage, directly or indirectly, with their energy usage and in the retail energy market using new smart offerings (including those supported by innovative technology) can also be rewarded for load shifting and responding to price and other signals. In line with our principal duty to protect existing and future energy consumers, our principles-based regulatory framework aims to provide strong consumer protection while giving suppliers greater freedom to determine how they meet the diverse needs of their customers. We would like to test the extent to which the framework is likely to cover potential consumer risks which may arise from introducing market-wide electricity settlement reform and/or potential reforms to the network access and forward-looking charging framework and whether there are risks which may need solutions beyond current rules.

1) **Engagement with energy usage** - consumer engagement with their energy usage based on their understanding of the variability of electricity costs over time

   This theme relates to domestic and small non-domestic consumers using their electricity flexibly following the introduction of market-wide electricity settlement reform. We are seeking evidence about how different forms of communication may increase consumer awareness around the varying cost of the electricity they consume over time. We would also like evidence about how they may use this knowledge when making choices about tariffs and other offerings, potentially including any new access options. We especially welcome evidence from

stakeholders of any recent trials and/or tests[22] they have carried out to capture potential factors which may impact consumer engagement and confidence, such as different ways of presenting energy costs to consumers.

2) **Willingness to load shift** - Consumers' ability and/or willingness to load shift/offer flexibility

This theme relates to consumers shifting their electricity use across the day. We seek evidence about the ways that domestic and small non-domestic consumers could potentially load shift in return for savings on their energy bills based on their circumstances at any particular time. We are also seeking evidence on whether certain types of consumer, and types of consumer demand, may offer more potential for flexibility than others. Also, we ask about what potential barriers exist to some consumers offering flexibility, the impacts they may face and the enablers that may help them overcome these, eg an automation or aggregation managed service. Within this theme, we consider how consumers would respond to a combined set of signals and options for network access and forward-looking charging signals which may be enabled by half-hourly metering and settlement.

We also ask whether any specific protection or support might be needed in the future to assist consumers facing relatively greater barriers to offering flexibility, and what, if any, protection or engagement measures may help ensure small consumers' network access arrangements and the signals from network charging which apply for their usage are appropriate.

3) **Adoption of innovative technology** - Consumers' access to and ability and/or willingness to adopt innovative technology to unlock flexibility

This theme relates to innovation in the retail energy market and new consumer offerings which could further support consumers' ability and/or willingness to load shift. Having access to innovative technology is not, in itself, a necessity in order to load shift. We seek views, alongside relevant supporting evidence, about how consumers may be able to access different kinds of innovative technology to better enable them to load shift and what types of technologies or innovations stakeholders may have considered, or are considering, offering. Where access to, and adoption of, innovative technology that may unlock flexibility may be limited by issues of affordability or practicality, we ask whether any further protection or engagement measures might assist consumers, including those in vulnerable situations and the disengaged, to be supported to overcome these.

4) **Choice of tariff** - Consumer choice of tariffs and other options

This theme relates to consumers' ability to understand and choose products such as new tariffs which may develop in the retail energy market following the introduction of market-wide electricity settlement reform. Some tariff options

[22] The evidence may have been generated through large-scale consumer trials in the field, in laboratory style experiments, or may have been conducted using smaller, in-depth methods of evidence generation with a smaller sample of consumers.

may help more consumers to load shift. We ask whether domestic and small non-domestic consumers will value having these options in the future if they are developed. This theme also considers how suppliers or other parties would respond to the different network charging and access options which may become available in designing tariff options, including different levels or types of network access.[23] We also ask whether there is evidence relating to tariff options, for example ToU tariffs, incorporating network access and / or charging signals, that may provide a greater incentive to consumers to use electricity flexibly in the future, and, if so, how consumers may respond to these choices. We consider whether and how consumers facing barriers to load shifting could or should be helped to take up tariff which is suitable for them and the protection arrangements which may be needed.

Context and related publications

1.12 The **settlement reform project** consists of workstreams delivering:

- ***The Business Case*** – assessing the costs, benefits and drivers for reform and how we deliver reform. We published the Outline Business Case in August 2018. We expect to publish the Full Business Case in the second half of 2019 alongside our final decision on market-wide electricity settlement reform

- ***The Target Operating Model (TOM)*** - work by stakeholders (led by the ELEXON-chaired Design Working Group) to design the TOM (the detailed revised future settlement arrangements).[24]

- ***Policy decisions*** – we expect to make two key policy decisions on settlement reform ahead of our final decision:

    - *Access to data* – adopting appropriate rules for access to consumers' actual metered data for settlement purposes to facilitate the benefits of settlement reform[25]

    - *Agent functions* – whether or not to centralise settlement functions in the revised future settlement arrangements[26]

1.13 The **electricity network access project** recently launched a review of electricity network access and forward-looking charging arrangements. We launched a Significant

[23] The options outlined in our recent publications on network access reform could include capacity-based or ToU volumetric charges, and may vary by location. Alternatively, different options for access could offer another route to providing flexibility, such as off-peak access, or options which enable suppliers or network operators to manage consumers' load to help enable them to provide flexibility. More information on these options is available in Appendix 4.
[24] More information about the TOM design work is on our website here: https://www.ofgem.gov.uk/electricity/retail-market/market-review-and-reform/smarter-markets-programme/electricity-settlement
[25] Our consultation on the rules for access to data for settlement purposes (July 2018) is here: https://www.ofgem.gov.uk/publications-and-updates/consultation-access-half-hourly-electricity-data-settlement-purposes
[26] Our consultation on supplier agent functions (September 2018) is here: https://www.ofgem.gov.uk/publications-and-updates/consultation-supplier-agent-functions-under-market-wide-settlement-reform

Code Review (SCR), which we are leading, and also asked industry to lead a review into several wider elements - access right allocation and balancing services charges. The scope and timescales for this review are outlined in our decision document. We outlined our aim to:

- publish working papers and other discussion materials – summer 2019
- consult on our minded-to decision and draft Impact Assessment - spring 2020
- publish decision and final Impact Assessment - autumn 2020.

Our objective for the review is to ensure that electricity networks are used efficiently and flexibly, reflecting users' needs and allowing consumers to benefit from new technologies and services while avoiding unnecessary costs on energy bills in general. Alongside this, we also set out in our decision document guiding principles, which we intend to inform our assessment, though which may evolve through the review. These are that arrangements support efficient use and development of network capacity, that they reflect the needs of consumers as appropriate for an essential service and that any changes are practical and proportionate. We outline key options we are considering in Appendix 4.

We invited stakeholders to get involved in this work and are establishing a number of groups to facilitate input in taking the review forward, which we outlined alongside our decision document.[27]

Related publications

- Ofgem/BEIS (July 2017), A Smart, Flexible Energy System: Call for Evidence and responses - https://www.gov.uk/government/consultations/call-for-evidence-a-smart-flexible-energy-system
- Ofgem (July 2017), Electricity Settlement Reform Significant Code Review: Launch Statement, revised timetable, and request for applications for membership of the Target Operating Model Design Working Group - https://www.ofgem.gov.uk/publications-and-updates/electricity-settlement-reform-significant-code-review-launch-statement-revised-timetable-and-request-applications-membership-target-operating-model-design-working-group
- Ofgem (July 2017), Ofgem-commissioned CEPA (Cambridge Economic Policy Associates) Report on the Distributional Impacts of Time of Use Tariffs - https://www.ofgem.gov.uk/publications-and-updates/distributional-impacts-time-use-tariffs
- Ofgem (November 2017), Reform of electricity network access and forward-looking charges – a working paper - https://www.ofgem.gov.uk/publications-and-updates/reform-electricity-network-access-and-forward-looking-charges-working-paper

[27] An outline of our intended approach to gathering stakeholder input through the review of network access is set out in Appendix 3 to our decision document – Getting stakeholders' input to our work - available here: https://www.ofgem.gov.uk/system/files/docs/2018/12/appendix_3_-_stakeholders_engagement_1.pdf

- Ofgem (July 2018), Getting more out of our electricity networks by reforming access and forward-looking charging arrangements - https://www.ofgem.gov.uk/publications-and-updates/getting-more-out-our-electricity-networks-through-reforming-access-and-forward-looking-charging-arrangements

- Ofgem (August 2018), Market-wide Settlement Reform: Outline Business Case - https://www.ofgem.gov.uk/publications-and-updates/market-wide-settlement-reform-outline-business-case

- Ofgem/BEIS (October 2018), Smart Systems and Flexibility Plan update - https://www.gov.uk/government/publications/upgrading-our-energy-system-smart-systems-and-flexibility-plan

- Ofgem (December 2018), Electricity Network Access and Forward-Looking Charging Review – Significant Code Review launch statement and decision on the wider review - https://www.ofgem.gov.uk/publications-and-updates/electricity-network-access-and-forward-looking-charging-review-significant-code-review-launch-and-wider-decision

Next steps

1.14 Following the close of this Call for Evidence we will aim to publish responses in Spring 2019. We will consider responses to inform our final decision on introducing market-wide electricity settlement reform, as well as in taking forward our review of network access and forward-looking charges.

How to respond

1.15 We want to hear from anyone interested in providing views and related evidence in response to the questions in this Call for Evidence. Please send your response to the person or team named on this document's front page.

1.16 We have asked for your feedback in each of the questions throughout. Please respond to each one as fully as you can, *providing separate confidential and non-confidential responses if applicable*. We will publish non-confidential responses on our website

Your response, data and confidentiality

1.17 You can ask us to keep your response, or parts of your response, confidential. We'll respect this, subject to obligations to disclose information, for example, under the Freedom of Information Act 2000, the Environmental Information Regulations 2004, statutory directions, court orders, government regulations or where you give us explicit permission to disclose. If you do want us to keep your response confidential, please clearly mark this on your response and explain why.

1.18 If you wish us to keep part of your response confidential, please clearly mark those parts of your response that you *do* wish to be kept confidential and those that you *do not* wish to be kept confidential. Please put the confidential material in a separate appendix to your response. If necessary, we'll get in touch with you

to discuss which parts of the information in your response should be kept confidential, and which can be published. We might ask for reasons why.

1.19 If the information you provide in your response contains personal data under the General Data Protection Regulation 2016/379 (GDPR) and domestic legislation on data protection, the Gas and Electricity Markets Authority will be the data controller for the purposes of GDPR. Ofgem uses the information in responses in performing its statutory functions and in accordance with section 105 of the Utilities Act 2000. Please refer to our Privacy Notice, see Appendix 6.

1.20 If you wish to respond confidentially, we'll keep your response itself confidential, but we will publish the number (but not the names) of confidential responses we receive. We won't link responses to respondents if we publish a summary of responses, and we will evaluate each response on its own merits without undermining your right to confidentiality.

2. Impacts on domestic consumers

Section summary

In this chapter, we are asking stakeholders to consider themes around domestic consumers' interest in, and their willingness and ability to flex energy use in response to price signals. Specifically, we ask about whether these consumers will be more engaged with their energy usage if they better understand how the cost of the electricity they use varies across the day, their ability and willingness to shift use to cheaper off-peak times in response to price signals, and whether they will do so by choosing new types of tariffs (eg ToU tariffs) and/or other options, such as potential network access options, potentially alongside supporting new technology, to help them offer flexibility. We also consider the factors which may affect the type of tariffs which suppliers choose to develop and then offer to consumers to take up in the future. Where there may be barriers to these consumers benefiting from these options and/or offering flexibility, we also ask if specific consumer protection and/or engagement measures may be needed.

Questions

Question 2.1: Individual domestic consumers will differ in their ability and/or willingness to engage with how they use electricity.

a) What are your views on the forms of communication most likely to facilitate/encourage consumers to engage with their energy use to help them make informed choices?

b) What specific information about their energy use could encourage consumers to engage? Please consider how this information is presented and how regularly it is communicated.

Question 2.2: Aside from communication, what other measures or initiatives would encourage consumers to become more confident about engaging with their energy use? This engagement may be direct, or through an intermediary/third party.

Question 2.3: Based on any relevant evidence you have collected,

a) what proportion of consumers would be price responsive?
b) what enablers would be important and what barriers might exist?
c) what volume of load shifting from peak to off-peak periods (%) will a consumer be able to offer?

Question 2.4: A number of different approaches to load shifting exist.

a) Which approaches to load shifting (direct, or indirect, with or without automation) would domestic consumers be more likely to prefer and respond to?
b) What are the risks and benefits of these approaches?
c) How could those risks be mitigated?
d) Would certain types/groups of consumers favour certain approaches?
e) Would certain types/groups of consumers be at greater risk of detriment from certain approaches?

These approaches could include but are not limited to:

- ToU tariffs
- Tariffs reflecting capacity-based charges, which may involve a defined access limit or different types of access option as described in paragraph 2.6 and Appendix 4

Question 2.5: Which parties (eg suppliers, other third parties, network companies, community schemes etc) do you consider could be best placed and/or trusted to facilitate these above approaches?

Question 2.6: Certain consumers may face barriers that prevent them from load shifting.

a) What barriers exist that may prevent consumers from load shifting?
b) Which particular groups of domestic consumers may face greater or more significant barriers than others?
c) For particular consumers are there certain types or levels of consumption that there will be less scope to flex (ie are there any forms of consumption that consumers would consider as "essential" and be unable to shift, such that suppliers, network companies or third parties should not be able to offer to reduce consumers' usage below this limit)?

Question 2.7: Do you have any views about the scale of any distributional impacts? How may these be mitigated?

Question 2.8: How could innovative technologies or solutions enable more consumers to provide flexibility, either individually or collectively (eg through a community approach)?

Question 2.9: We want to understand what specific concerns or risks of detriment may exist with the use of technology and innovation to enable flexibility.

a) What barriers exist for consumers to access these enabling technologies/innovative products?
b) How could these barriers be overcome?
c) Are there any particular concerns which may apply for certain consumer groups, eg vulnerable consumers (affordability and practicality)?
d) What further protection measures should be considered alongside these technologies?

Question 2.10: Do you have any views about whether consumers may prefer particular tariff types over others (for reference, some examples of ToU tariffs are listed in Appendix 2, and potential access options are described in Appendix 4)?

Question 2.11: Which types of flexible tariffs and offers are likely to be available following settlement reform, considering the potential network charging and access options described? Please identify specifically the types of tariff options which

a) suppliers are already offering or are developing
b) you expect may emerge following settlement reform
c) you expect suppliers may develop in response to more granular, locationally differing network charging signals and the availability of different access options for their consumers. Would you expect to see such tariffs, automation deals or offers targeted to consumers by location if underlying network charges varied locationally?

Question 2.12: Considering any tariff options or packages you have developed or may develop, please provide any evidence of consumers' attitudes or response to them.

Question 2.13: How far could principles-based obligations help ensure tariffs/choices are appropriate, including in relation to potential new access options?

In responding to these questions, please provide any available evidence to support your answer, including from any recent offerings or trials you have been involved in, clearly marking as confidential if applicable.

Key themes for domestic consumer impacts

2.1 This chapter explores how domestic consumers could be affected by the introduction of market-wide electricity settlement reform and the new options and tariffs it can enable. We are seeking evidence around key themes we have identified.

2.2 Introducing market-wide electricity settlement reform will affect all electricity consumers. However, the impact will differ for individual, and groups of, domestic consumers depending on their circumstances and characteristics. In broad terms, some factors that will determine this impact include:

- whether they have a smart meter
- the granularity in data recorded by their smart meter to which they allow access for their supplier or other parties, for the purposes of billing and offering them new tariffs or other products and services[28]

[28] Ofgem consulted on whether and how to change certain rules regarding supplier and other parties' access to

- the applicable network access and charging arrangements, and corresponding tariff offers and options for consumers which emerge

- what type of tariff they are currently on (which reflects how they pay for their energy, eg credit or prepayment) and the type of tariff (and payment method) that will suit their circumstances/characteristics

- whether, in order to make an informed tariff choice in the future, consumers will understand if they could, or would want to, offer flexibility that suits them, directly (by changing behaviour) or indirectly (a third party managing this for them), and

- whether they have, or could obtain access to, new technology to support and enable them to load shift where this could benefit them by saving money.

2.3 Some domestic consumers who are more engaged in the retail energy market could choose a suitable tariff or option that lowers their energy bills if they change behaviour and respond to time-based price signals or opt for different access options. This may depend on their circumstances and characteristics now and also in the future. Some of their domestic electricity use may provide opportunities to load shift, recognising that certain uses of electricity will be easier to shift than others (eg wet appliances over lighting).[29]

2.4 Other consumers may choose not to, or be less able to, change their behaviour, again dependent on their circumstances. They could still offer benefits to the system for which they could be rewarded, eg they may already use electricity mainly at off-peak times and be incentivised to continue doing so. Or they may take up options that involve them engaging indirectly. For example, one option, where these consumers have smart products, is for their supplier, or other third party, to offer them an automated load shifting service, using the demand from these appliances, with their agreement and in return for a bill saving. A supplier or third party could offer the consumer's flexibility as an aggregation service. Aggregation services already exist for large non-domestic consumers and may develop in the future for domestic and also for small non-domestic consumers.[30] New access options could also provide routes to offer flexibility in a range of ways.

2.5 For domestic consumers generally, access to new technology may help them load shift and could be used alongside a suitable tariff. They may already use technology, eg a smart plug or retrofit option for an existing appliance/heating system, to provide convenience and control over their use. Others may be considering other innovative technology (e.g. battery storage or smart appliances) to support their ability to respond to price signals. Access to

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smart meter data in July 2018:
https://www.ofgem.gov.uk/system/files/docs/2018/07/access_to_data_for_settlement_consultation_5.pdf

[29] The more flexible use of wet appliances (washing machines and dishwashers) are often cited as examples of how some consumers could load shift to off-peak times by changing behaviour in order to save money. Going forward, new forms of electricity demand such as electric vehicles may offer greater potential for flexibility.

[30] Industry is currently developing a voluntary code of conduct for current aggregation services. More details are at the Association for Decentralised Energy's (ADE's) website: https://www.theade.co.uk/. We will monitor the market in aggregation services for domestic (and small non-domestic) consumers as it develops to ensure consumers receive proper protection.

supporting new technology is not a necessity to offer flexibility, but it may increase opportunities for consumers to (directly or indirectly) offer more flexibility.

2.6 The Electricity Network Access Project will consider options to increase the granularity of charging signals, and to better define and enhance the choice of options for access to the network. These could include capacity-based charges, or charges based on usage which vary across the day and could involve consumers (or suppliers on their behalf) specifying the level and type of access they may require. This could comprise selecting from new available options such as off-peak access or access that could be constrained down when the network is congested (which could, for example, be applied to the charging of intensive loads such as EVs). The charges for these access options could reflect the network savings or costs associated with them. More information on the options being considered in this review is available in Appendix 4.

2.7 Some domestic consumers, despite sharing in the system-wide benefits of settlement reform, may, at an individual level, face barriers to offering flexibility and find that they cannot unlock any flexibility potential they have without support. They may, for example, be in a vulnerable situation or be at risk of falling into a vulnerable situation, even for a short time, depending on their individual circumstances and characteristics. Ofgem's principles-based regulatory framework[31] provides a robust approach to addressing risks of potential consumer detriment now and in the future. Nevertheless, we consider it prudent to explore with stakeholders whether any future consumer protection and engagement measures might be needed due to the introduction of market-wide electricity settlement reform and to support wider changes which this can help enable, such as network access and forward-looking charging reform.

2.8 In the Electricity network access project, there may be limits to how far granular charging signals or different access options should be available for small users[32], including households, which may need to be considered. There could also be a role for principles-based licence obligations on suppliers or intermediaries in ensuring access options and tariffs offered are appropriate for consumers' needs.

2.9 Below we have set out the themes and related questions through which we want stakeholders to provide views, backed by any relevant evidence they have, that will help us better understand the potential impacts on domestic consumers of introducing market-wide electricity settlement reform, and potential related changes to network access and forward-looking charging arrangements, their likely response and any protections which may be needed.

[31] For more information about our principles-based regulation framework, see https://www.ofgem.gov.uk/electricity/retail-market/market-review-and-reform/future-retail-market-regulation

[32] By small users here we are referring to those users we identified in our review of electricity network access who do not have an agreed capacity as the basis for their distribution use of system charges. These users are typically those that do not have Current Transformer meters. We expect this definition to overlap with the scope of consumers considered in this Call for Evidence.

Engagement with energy usage

Domestic consumers' engagement with their energy usage based on their understanding of the variability of electricity costs over time

2.10 Some domestic consumers could be more able/willing to engage to a greater or lesser extent with their electricity use and offer flexibility if they better understood how the cost of the electricity they use varies over time and how, by using it flexibly and responding to price signals or selecting from potential new access options (eg to use more electricity at off-peak times), they could save money. This will depend on their circumstances, now and in the future. Some consumers may already choose to actively engage with their energy usage because they understand the benefits of using electricity flexibly and have taken up a suitable tariff, eg a ToU tariff, to respond to price signals. Other (and possibly many) consumers may be disengaged now and in the future, for example because they don't have access to quality data about how the cost of their electricity use varies over time.[33]

2.11 Some domestic consumers who have previously taken part in trials or studies[34] that seek to understand their attitudes to having a smart device and/or a ToU tariff that may help them respond to price signals and load shift, were found to broadly favour:

- A defined bill saving (in '£s' or '%') or another upfront incentive, eg a gift card
- A simple and/or predictable tariff structure that applies to their electricity use, eg a few clearly defined peak and off-peak times across the day.[35]

2.12 Some consumers who are currently disengaged may choose to remain so. However, they could still benefit from offering flexibility indirectly in the future if their supplier or a third party offers them a managed or automated tariff, potentially including any new access option, which could save them money. This could be favoured by some domestic consumers as a hassle-free way to engage, removing the need for them to understand how the cost of electricity may vary more dynamically. However, it may not suit all consumers depending on their individual circumstances.

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[33] Our work on future retail energy market design is exploring options to ensure consumers on default tariff arrangements are appropriately protected in the long term (response to the future supply market arrangements call for evidence, page 5: https://www.ofgem.gov.uk/system/files/docs/2018/07/future_supply_market_arrangements_-_response_to_our_call_for_evidence_0.pdf)

[34] See, for example, the Citizens Advice's report on The Value of ToU tariffs in Great Britain and the BEIS Consumer Panel Smart Meter Research study: https://www.citizensadvice.org.uk/about-us/policy/policy-research-topics/energy-policy-research-and-consultation-responses/energy-policy-research/the-value-of-time-of-use-tariffs-in-great-britain/ and https://www.gov.uk/government/consultations/call-for-evidence-a-smart-flexible-energy-system

[35] Some consumers are willing to engage with complex dynamic ToU tariffs where providing them with simple, user-friendly messages about when price periods occur and change would encourage that engagement (see the Low Carbon London study: http://innovation.ukpowernetworks.co.uk/innovation/en/Projects/tier-2-projects/Low-Carbon-London-(LCL)/

Question 2.1: Individual domestic consumers will differ in their ability and/or willingness to engage with how they use electricity.

a) **What are your views on the forms of communication most likely to facilitate/encourage consumers to engage with their energy use to help them make informed choices?**

b) **What specific information about their energy use could encourage consumers to engage? Please consider how this information is presented and how regularly it is communicated.**

Question 2.2: Aside from communication, what other measures or initiatives would encourage consumers to become more confident about engaging with their energy use? This engagement may be direct, or through an intermediary/third party.

Willingness to load shift

Domestic consumers' ability and/or willingness to load shift/offer flexibility

2.13 Many domestic consumers are likely, to varying degrees, to be able to offer flexibility to the energy system. Where they generate electricity, they may also wish to export or store it. Whether they choose to load shift may depend on, amongst other things:

- Individual characteristics/circumstances which determine their load profile, (and ability and/or willingness to load shift), including the types of usage which make up their demand, now and in the future.

- Their attitude to changing behaviour in future to save money, which could involve their receptiveness to incentives to do so. Some consumers may prefer to engage with their energy usage indirectly, eg by taking up a suitable managed automation solution, while others may prefer to engage directly.

- The nature of the tariff option offered and how it enables flexibility, including how the network access and charging arrangements are reflected in that tariff (eg tariffs could reflect capacity-based charges or charges which vary across the day, or load shifting may be facilitated by specific access options or technical enablers which form part of the product offered to consumers).

2.14 Some domestic consumers, including those in a vulnerable situation, may be using electricity mainly at off-peak times, with or without behaviour change. Others may need encouragement to help them shift demand to off-peak times and offer flexibility, which may, or may not, involve access to, and use of, smart innovative technology. Half-hourly settlement can enable them to be rewarded for this flexibility. Equally, other consumers who are high peak users and/or less flexible would not receive these rewards (although they would still share in the system-wide savings unlocked by market-wide settlement reform).

2.15 Where individual domestic consumers face greater barriers to load shifting due to a reduced ability to change behaviour, or simply because they view engagement

as a hassle, other indirect options may be open to them that could save them money, for example:

- Contracting with a supplier or other party to manage their demand for them and offer flexibility through a direct demand control/automation or aggregation route, which may be supported by smart innovative technology, in return for a saving on their bill. The supplier or other party could manage their electricity use whilst also promising certain levels of comfort or utility as a service to them. This business model could ensure some level of customer control, though deciding to override this managed response could result in the loss of reward. This would of course rely on the consumer engaging with such a party to provide this service in the first place.

- Where feasible and if they agree, consumers could benefit from a communal solution, possibly controlled and managed by a supplier or other party offering a collective flexibility opportunity and a bill reduction, eg communal battery storage in a block of flats or particular locality. This could benefit consumers who are less engaged.

- Potential new access options could also provide routes to some domestic consumers to offer flexibility. Suppliers or other third parties could provide cheaper tariff options in return for the consumer agreeing to limit their consumption during peak periods (which could be automatic, direct or indirect), or allowing a supplier, network operator or other third party to curtail their usage down to a certain threshold when the network is congested (which could be indirect and automatic). However not all new options may be suitable for all types of demand.

2.16 The above are examples of how consumers may load shift without needing to engage directly with time-based price signals in real time, facilitated by the introduction of smart metering and market-wide electricity settlement reform. There may be others.

2.17 Where domestic consumers may face barriers to offering flexibility due to their circumstances, our principles-based regulatory framework, through appropriate customer communications that allow consumers to make an informed choice, aims to provide strong consumer protection while giving suppliers greater freedom to determine how they meet the diverse needs of their customers. However, we want to better understand whether introducing market-wide electricity settlement reform and potential changes to access and forward-looking charging arrangements could create further risk of consumer detriment which may need solutions beyond current rules.

2.18 In the electricity network access project we have recognised that there may be limits to how far granular charging signals or different access options should be available for small users[36], including households. There may be a need to set further limits to protect consumers from inappropriate tariff/product choices, such as charges which are too granular, in order that their basic electricity demand needs are met. There may be different options for how any such level(s) could be set, but it may be challenging to identify an appropriate level across a range of

[36] As outlined in footnote 32.

consumers with diverse needs, eg below which consumers would not reasonably be able to flex their use, or would face detriment in doing so. There may also be a role for principles-based licence obligations on suppliers or intermediaries in ensuring access options and tariffs offered are appropriate for consumers' needs, discussed further under the theme on consumers' choice of tariffs below. We are seeking views on these potential approaches.

Question 2.3: Based on any relevant evidence you have collected,

a) **what proportion of consumers would be price responsive?**
b) **what enablers would be important and what barriers might exist?**
c) **what volume of load shifting from peak to off-peak periods (%) will a consumer be able to offer?**

Question 2.4: A number of different approaches to load shifting exist.

a) **Which approaches to load shifting (direct, or indirect, with or without automation) would domestic consumers be more likely to prefer and respond to?**
b) **What are the risks and benefits of these approaches?**
c) **How could those risks be mitigated?**
d) **Would certain types/groups of consumers favour certain approaches?**
e) **Would certain types/groups of consumers be at greater risk of detriment from certain approaches?**

These approaches could include but are not limited to:

- **ToU tariffs**
- **Tariffs reflecting capacity-based charges, which may involve a defined access limit or different types of access option as described in paragraph 2.6 and Appendix 4**

Question 2.5: Which parties (eg suppliers, other third parties, network companies, community schemes etc) do you consider could be best placed and/ or trusted to facilitate these above approaches?

Question 2.6: Certain consumers may face barriers that prevent them from load shifting.

a) **What barriers exist that may prevent consumers from load shifting?**
b) **Which particular groups of domestic consumers may face greater or more significant barriers than others?**
c) **For particular consumers are there certain types or levels of consumption that there will be less scope to flex (ie are there any forms of consumption that consumers would consider as "essential" and be unable to shift, such that suppliers, network companies or third parties should not be able to offer to reduce consumers' usage below this limit)? (See further discussion in paragraph 2.18).**

Question 2.7: Do you have any views about the scale of any distributional impacts? How may these be mitigated?

Adoption of innovative technology

Domestic consumers' access to and ability and/or willingness to adopt innovative technology to unlock flexibility

2.19 Some domestic consumers who face barriers to offering flexibility may benefit from access to innovative technology to help them do so. Technology isn't strictly necessary in order to load shift. However, its adoption could be useful in some circumstances. For example, two innovative technologies which could drive increased flexibility in the coming decades, including the take up of new types of tariffs, are battery storage and electric vehicles. The costs of these technologies would be expected to fall over time to make them more affordable to consumers, though there are some practicality issues that may need to be addressed (eg whether the consumer has sufficient space to fit a battery), that could prevent consumers from adopting them without supportive measures in the short term.

2.20 Smart plugs, thermostats and other retrofit options could offer more immediate ways for some individual consumers to offer flexibility in a convenient way. These devices could help consumers monitor and control energy use of existing electrical appliances/heating systems, eg by using smartphone apps or voice-activated technology. To gain consumers' acceptance, we expect the technology would likely have to be simple and convenient to use, eg 'plug and play' with messages prompting action that are simple to follow. If appropriate smart devices become available, adoption could be made easier for some consumers if they were given support to access them, eg as an incentive offered alongside another energy product.

2.21 As discussed above, access to technology could be made easier for larger numbers of domestic consumers in certain situations, eg in social housing, by offering community-based solutions to help them collectively offer, and benefit from, flexibility. One example may be the offer of communal battery storage to local communities, managed by a supplier or other third party, allowing the community to achieve cost savings and dispersing the high cost of a battery across many consumers. The terms of use and changes to circumstances, for example what happens if one or more consumers moves out of the community, would need further consideration.

Question 2.8: How could innovative technologies or solutions enable more consumers to provide flexibility, either individually or collectively (eg through a community approach)?

Question 2.9: We want to understand what specific concerns or risks of detriment may exist with the use of technology and innovation to enable flexibility.

a) **What barriers exist for consumers to access these enabling technologies/innovative products?**
b) **How could these barriers be overcome?**
c) **Are there any particular concerns which may apply for certain consumer groups, eg vulnerable consumers (affordability and practicality)?**
d) **What further protection measures should be considered alongside these technologies?**

Choice of tariff

Domestic consumers' choice of tariffs and other options

2.22 Following the introduction of market-wide electricity settlement reform, suppliers will have incentives, once exposed to the true cost of supplying energy, to innovate to help lower their purchase and transportation costs. By accessing actual half-hourly metered data (in accordance with the regulatory regime), suppliers may increasingly develop and offer different types of tariffs, such as ToU tariffs, or other options to domestic consumers (see Appendix 2). These tariffs may include or reflect network charges and may also include a choice of new access options, reflecting how suppliers have incorporated any new access options and more granular network charging signals (which could vary over time and by location) that we may develop and take forward (see Appendix 4).

2.23 For example, new access options could enable domestic consumers to choose off-peak access for part of their demand or allow a supplier or other third party, such as a DNO, to manage their usage and provide flexibility on their behalf, to save money on their bill. We are seeking to understand how suppliers are likely to respond to these signals in developing options for new tariffs and packages.

2.24 In general, we would expect suppliers and/or third parties (including price comparison websites) to explain these new tariff choices and options to consumers so they can make an informed choice about the most suitable tariff or package for them.[37] These parties will have an important role to play in ensuring access options and charging signals offered within their products are appropriate for a consumer, based on their understanding of their consumers' diverse needs and characteristics, with a potential role for principles-based licence obligations in ensuring access options and tariffs offered are appropriate. This could include having a role in helping select the most appropriate access level or type of access option for a consumer's needs.

2.25 We expect that in a well-functioning market, savings made by suppliers from the reduced cost of purchasing wholesale energy, or savings in network costs, should be passed through to consumers. Consumers offering flexibility could make individual savings by choosing a suitable tariff for them.

2.26 Whether domestic consumers consider a particular type of tariff is right for them will depend on their circumstances and how these affect their use of electricity. Previous studies of domestic consumer attitudes to ToU tariffs[38] suggest that some consumers could respond to these tariffs, though it may depend on their individual circumstances/characteristics:

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[37] Our principles-based rules make 'informed choice' a key aspect of how consumers should be helped to find the right tariff for them - see: https://www.ofgem.gov.uk/electricity/retail-market/market-review-and-reform/future-retail-market-regulation

[38] See Citizens Advice's study commissioned on the Value of ToU tariffs: https://www.citizensadvice.org.uk/about-us/policy/policy-research-topics/energy-policy-research-and-consultation-responses/energy-policy-research/the-value-of-time-of-use-tariffs-in-great-britain/ and BEIS's Smart Energy Research carried out through the BEIS Consumer Panel (November 2016): https://www.gov.uk/government/consultations/call-for-evidence-a-smart-flexible-energy-system

- Static ToU tariffs could offer consumers stable, predictable prices across the day, and could reflect network charges which varied by time or location. Consumers on these tariffs would benefit from predictable pricing signals. This type of ToU tariff has proved popular in surveys and with a number of consumers who have tried it on a trial basis. Capacity-based tariff options could provide similar stability. Consumers could potentially specify an access level to meet their requirements, or might choose a time-profiled access option, which could form the basis for their network charge, reflected in their tariff.

- Dynamic ToU tariffs or options based on certain access choices (such as time-profiled access) could reward consumers for shifting their usage based on signals or time bands which changed, either within each day or across different days, as well as potentially by location, such as if underlying network charges varied. As these options could be less predictable, they may attract those consumers who are potentially more able and willing to respond to price signals by flexing their electricity use. Many consumers may not want (or be able) to engage with these changing signals to the extent needed to benefit from dynamic ToU tariffs – for example they may need greater clarity ahead of time on when flexibility will be required, though indirect or other automated flexibility options could still potentially help. In trials, some consumers were open to taking up a dynamic ToU tariff.

- Load control/automation tariffs or options could involve a supplier, network operator or other third party managing the risk of within-day and across-day price variations for groups of consumers in return for a lower price. Tariffs could reflect both energy and network cost savings. They could involve managing a consumer's load within their chosen access level, or providing flexibility as part of their agreed access option, in return for a lower energy price. This price could reflect the costs and benefits of this flexibility from underlying network charging signals, which may vary by time or location. These approaches may prove more popular with consumers who could offer flexibility but choose not to make active changes to their usage in real time. Individual consumers could be protected and benefit from a managed service.

2.27 Although only tested in a limited way in Great Britain[39], there is international evidence that a Critical Peak Rebate (CPR) ToU tariff that charges all consumers the peak price for specific peak events but also offers rebates to those consumers who respond with flexibility during these events, could prove popular with consumers.[40] This tariff type could encourage less flexible consumers to consider options to become flexible if suited to their circumstances.

2.28 Some domestic consumers will face greater barriers to offering flexibility which may expose them to higher prices compared to consumers with more flexibility to offer. However, we would still expect them to benefit from the broader system-

[39] See the Energywise trial: http://innovation.ukpowernetworks.co.uk/innovation/en/Projects/tier-2-projects/Energywise/

[40] As reported in Citizen's Advice's study commissioned on the Value of ToU tariffs: https://www.citizensadvice.org.uk/about-us/policy/policy-research-topics/energy-policy-research-and-consultation-responses/energy-policy-research/the-value-of-time-of-use-tariffs-in-great-britain/

wide benefits. The choice of whether to take up new retail tariffs and opportunities will remain with the consumer.

2.29 We expect that our principles-based regulation framework can appropriately help avoid the risk of detriment where consumers end up on the wrong tariff for them, ie we expect consumers to be treated fairly and that they should be able to make an informed choice of tariff based on their circumstances. We need to better understand if further protection may be required so that consumers can choose a suitable tariff option that would meet their needs, including suitable network access options and underlying network charges.

2.30 We want to understand if there are ways to help less flexible consumers transition to offering more flexibility, benefitting from a suitable tariff in line with their circumstances. We want to know whether other potential protections may be needed, including whether some consumers should have limits on the choice of access options offered, or whether some basic usage should not be exposed to sharp price signals, discussed further in paragraph 2.18. These might limit the choice of tariffs or options they were offered. We also want to understand the role principles-based licence obligations on suppliers or intermediaries could play in ensuring access options and tariffs offered are appropriate. These options are outlined further in Appendix 4.

Question 2.10: Do you have any views about whether consumers may prefer particular tariff types over others (for reference, some examples of ToU tariffs are listed in Appendix 2, and potential access options are described in Appendix 4)?

Question 2.11: Which types of flexible tariffs and offers are likely to be available following settlement reform, considering the potential network charging and access options described? Please identify specifically the types of tariff options which

a) suppliers are already offering or are developing
b) you expect may emerge following settlement reform
c) you expect suppliers may develop in response to more granular, locationally differing network charging signals and the availability of different access options for their consumers. Would you expect to see such tariffs, automation deals or offers targeted to consumers by location if underlying network charges varied locationally?

Question 2.12: Considering any tariff options or packages you have developed or may develop, please provide any evidence of consumers' attitudes or response to them.

Question 2.13: How far could principles-based obligations help ensure tariffs/choices are appropriate, including in relation to potential new access options?

3. Impacts on small non-domestic consumers

Section summary

In this chapter we are asking stakeholders to consider themes around small non-domestic consumers' interest in, and their willingness and ability to, flex energy use in response to price signals. Specifically, we ask about whether these consumers will engage if they better understand how the cost of electricity varies across the day, their ability and willingness to shift use to off-peak times in response to price signals, and whether they will do so by choosing ToU tariffs and/or other options, including potential network access options, potentially alongside supporting new technology, to help them offer flexibility. We also consider the factors which may affect the type of tariffs which suppliers choose to develop and then offer to consumers to take up in the future. Where there may be barriers to these consumers benefiting from and/or offering flexibility, we also ask if specific protection and/or engagement measures may be needed.

Questions

Question 3.1: Individual small non-domestic consumers will differ in their ability and/or willingness to engage with how they use electricity.

a) What are your views on the forms of communication most likely to facilitate/encourage these consumers to engage with their energy usage to help them make an informed choice?

b) What specific information about their energy use could encourage these consumers to engage? Please consider how this information is presented and how regularly it is communicated.

Question 3.2: Aside from communication, what other measures or initiatives would encourage small non-domestic consumers to become more confident about engaging with their energy use? This engagement may be direct, or through an intermediary/third party.

Question 3.3: Who would be best placed to help small non-domestic consumers to be more engaged with their energy usage? How would this vary with sector and company size?

Question 3.4: Based on any relevant evidence you have collected,

a) what proportion of small non-domestic consumers would be price responsive?
b) what enablers would be important and what barriers might exist?
c) what volume of load shifting from peak to off-peak periods (%) will a small non-domestic consumer be able to offer? How would this vary with sector and company size?

Question 3.5: A number of different approaches to load shifting exist.

a) Which approaches to load shifting (direct, or indirect, with or without automation) would small non-domestic consumers be more likely to prefer and respond to?
b) What are the risks and benefits of these approaches?
c) How could those risks be mitigated?
d) Would certain types/groups of small non-domestic consumers favour certain approaches?
e) Would certain types/groups of small non-domestic consumers be at greater risk of detriment from certain approaches?

These approaches could include but are not limited to:

- ToU tariffs
- Tariffs reflecting capacity-based charges, which may involve a defined access limit or different types of access option, as described above and in Appendix 4.

Question 3.6: Which parties (eg suppliers, other third parties, network companies, community schemes etc) do you consider could be best placed and/or trusted to facilitate these above approaches for small non-domestic consumers?

Question 3.7: What barriers exist that may prevent small non-domestic consumers from load shifting? Can you identify:

a) Which particular groups of small non-domestic consumers may face greater barriers than others?
b) Are there certain types or levels of consumption that there will be less scope to flex for particular small non-domestic consumers (such as the very smallest)? Are there any which these consumers would consider as "essential" and be unable to shift, such that suppliers, network companies or third parties should not be able to offer to reduce consumers' usage below this limit?
c) Are any other protections beyond the current regulatory framework needed to ensure arrangements are appropriate and meet small non-domestic consumers' needs? Please identify any measures you consider would be beneficial and how these may vary with sector and company size.

Question 3.8: Which technologies could be useful for small non-domestic consumers to help them offer flexibility and gain better control of their own energy usage, if they chose to do so? How does this vary with sector and company size?

Question 3.9: Who would small non-domestic consumers trust to provide an automation or load management service (eg direct control over their demand) to them, eg if using an innovative solution like battery storage? What specific protections may these consumers need? Would they be more likely to offer flexibility if it were automated?

Question 3.10: What are the circumstances in which a communal solution could bring more benefit to small non-domestic consumers (sharing risks/benefits of offering flexibility) and are there any specific protections needed?

Question 3.11: Which different sectors where small non-domestic consumers are active could benefit from innovative technologies that unlock flexibility and how could other sectors also benefit?

Question 3.12: Do you have any views about whether small non-domestic consumers may prefer particular tariff types over others (for reference, some examples of ToU tariffs are listed in Appendix 2, and potential access options are described above and in Appendix 4)?

Please consider how this may differ by different types of small non-domestic consumers, eg by sector/company size.

Question 3.13: Which types of flexible tariffs and offers are likely to be available to small non-domestic consumers following settlement reform, considering the potential network charging and access options described? Please identify specifically the types of tariff options which

a) suppliers are already offering or are developing
b) you expect may emerge following settlement reform
c) you expect suppliers may develop in response to more granular, locationally differing network charging signals and the availability of different access options for their consumers.

Would you expect to see such tariffs, automation deals or offers targeted to small non-domestic consumers by location, if underlying network charges varied locationally?

Question 3.14: Considering any tariff options or packages you have developed, please provide any evidence of consumers' attitudes or response to them.

Question 3.15: How could protections ensure tariffs/choices are appropriate, including in relation to potential new access options?

In responding to these questions, please consider how the answer may vary by sector or company size. Please provide any available evidence to support your answer, including from any recent offerings or trials you have been involved in, clearly marking as confidential if applicable.

Key themes for small non-domestic consumer impacts

3.1 This chapter explores how small non-domestic consumers[41] could be affected by the introduction of market-wide electricity settlement reform. It asks for evidence around key themes we have identified that arise from the potential impact on them. *For the purposes of the remainder of this chapter, we are using the term small and medium-sized enterprise (SME) to refer to these consumers.* We expect

[41] See also footnote 11 for reference to the relevant settlement Profile Class for these consumers. We are using this term in this document to cover a wide range of businesses, including microbusinesses (see the Ofgem definition here: https://www.ofgem.gov.uk/key-term-explained/micro-business-consumer) and other, larger organisations with up to 250 employees. The consumer protection and engagement issues we discuss in this document will, generally, affect these non-domestic consumers.

that SMEs are likely to overlap with the scope of 'small users' which we set out in our recent consultation on access and forward-looking charging.[42]

Ofgem is working with BEIS on their non-domestic work relating to the Smart Meter Implementation Programme. BEIS is also exploring non-domestic consumers' engagement with their energy use, although the BEIS focus is specifically around smaller businesses' awareness of smart metering and issues around the way non-domestic data is made available to consumers. BEIS issued a separate consultation on this in early 2019.[43] Given there is a degree of commonality between the information being requested, Ofgem and BEIS will work together on the findings from these respective consultation responses to ensure that the resulting proposals are coordinated as appropriate.

3.2 As there is a broad range of businesses that fall under the SME umbrella, which are active in almost every business sector (industrial and commercial), there is a large range of potential impacts for us to consider and there will not be a 'one size fits all' solution for addressing these impacts.

3.3 The range of SMEs in operation means that electricity usage will vary by size of business and also by sector. While it is difficult to generalise, one trial suggested that many SME businesses appear to consume less electricity per hour during the early evening peak than during the day or at night, while larger SME businesses appear to consume electricity more evenly across a 24-hour period, and smaller SME businesses appear to consume a higher proportion of their total electricity in the early evening peak.[44]

3.4 The largest SME firms do not necessarily have the highest power demand. In terms of business size, organisations with 10 to 49 employees had proportionately the highest demand (more than those with 50 to 249), suggesting that the relationship between number of employees and electricity demand is not linear.[45]

3.5 A study by Lee, Haben and Grindod (2014)[46] noted that the energy usage pattern of SME consumers is very predictable in use over the day.

3.6 We are seeking to better understand SME consumers' potential to load shift, and which factors might make a difference. This includes whether SME consumers could become more engaged with understanding their electricity usage, costs and their potential to load shift, whether technology could assist them to load shift, and whether they may need assistance to access this technology. We also want to understand more about how suppliers may respond to the signals they receive when developing tariff offerings. In addition, we also want to understand whether SME consumers will value new tariffs and options which may become available to

[42] As outlined under footnote 32.
[43] The BEIS consultation (24 January 2019) is here: https://www.gov.uk/government/consultations/smart-metering-implementation-programme-realising-non-domestic-benefits
[44] Customer Led Network Revolution: http://www.networkrevolution.co.uk/
[45] This was a survey run by the Customer-Led Network Revolution. 13,000 domestic and SME consumers' load patterns were monitored: http://www.networkrevolution.co.uk/wp-content/uploads/2015/01/small-customers-L2-report-v0-9.pdf. This conclusion was drawn from an average half-hourly data set of the consumers they trialled of 1,514 consumers (for a range of businesses).
[46] See Lee, Haben and Grindod (2014): http://www.energy.ox.ac.uk/wordpress/wp-content/uploads/2014/07/2014-ECMI-Lee-Haben-Grindrod.pdf

them. Examples could include ToU tariffs, and potentially capacity-based charges or new access options, as described in chapter 2 and Appendix 4. Finally, we want to better understand whether and what alternative measures could help these consumers realise the benefits of market-wide electricity settlement reform, and the access and network charging reform options which may be enabled.

3.7 As smart meter data provides opportunities for non-domestic consumers to better manage their electricity consumption, government has developed initiatives aimed at discovering innovative approaches to energy management. BEIS is currently running a non-domestic smart energy management innovation competition which focuses on three non-domestic sectors - hospitality, schools and retail.[47] Access to, and use of, half-hourly data will greatly assist with realising the benefits of these technologies.

3.8 Below we have set out the themes and related questions through which we are seeking to better understand the potential impact on SME consumers of introducing market-wide electricity settlement reform, and potential reforms to access and forward-looking charging arrangements, based on any evidence provided.

Engagement with energy use

SME consumers' engagement with their energy usage based on their understanding of the variability of electricity costs over time

3.9 SME consumers generally do not engage with the energy market regularly (24% switched supplier in 2018[48]), though this has risen slightly from previous years. This could be for a number of reasons, including a lack of time and understanding due to the complexity of the market. Some SME consumers may be actively engaged with their usage either through technology or energy saving measures if they are aware of the benefits of being able to flex their electricity use. However, for the vast majority of SME consumers, studies show that engagement is low. For example, Ofgem's 2018 survey of micro and small businesses noted that engagement increased with size of business. Businesses with 10-49 full time employees were the most engaged in the market (71%) and sole traders were the least likely to engage (65%).[49]

Ofgem intends to conduct a strategic review of the microbusiness retail market to understand the market challenges and consumer experience at each key stage of the customer journey, with our work focusing on ensuring microbusiness needs and preferences are met by the market, that they have the tools to easily

[47] See https://www.gov.uk/government/publications/non-domestic-smart-energy-management-innovation-competition

[48] See Ofgem's Micro and small business customer engagement in the energy market survey (October 2018): https://www.ofgem.gov.uk/system/files/docs/2018/10/micro_and_small_business_engagement_survey_2018_report.pdf.

[49] See Ofgem's Micro and small business customer engagement in the energy market survey (October 2018): https://www.ofgem.gov.uk/system/files/docs/2018/10/micro_and_small_business_engagement_survey_2018_report.pdf. Engagement for the purposes of this survey is defined as where the customer has either switched supplier, switched tariff, compared tariffs, or attempted to switch but were unable to do so, in the past 12 months.

navigate the market and access competitive offerings, and are adequately protected where necessary.[50]

3.10 SME consumers may be more willing to engage with their electricity usage if they are able to understand, in a simple way, how to do so and the associated benefits of engaging for their organisation and its circumstances. For SME consumers, engagement may increase when information is provided in a way that they are able to easily understand (eg '£s saved' rather than 'kWh reduced') and which is relevant to the way they do business. A financial incentive may help to increase engagement where this is linked to use, as many SME consumers could be influenced by the price they pay and the offer of a saving on their bills, though there is no universal evidence to suggest this works for all.

3.11 A number of smart meter trials[51] have looked at whether SME consumers would be able and willing to engage more by offering flexibility and whether they will take up ToU tariffs to do so. These trials have noted that the energy market is often confusing to SME consumers. Due to this, they concluded that at least some SME consumers (although perhaps not including microbusinesses who may lack the resources to do so) value the following to help increase their understanding:

- One person within the organisation who can monitor energy usage. 38% of organisations that reduced overall usage stated that a person internal to the organisation is assigned to monitor energy use, compared to 19% of those who did not reduce overall usage.[52] This pattern can sometimes extend to a party external to the organisation who is trusted to help switch their supplier, eg a third party intermediary (TPI). As noted in paragraph 3.9, some SME consumers are more likely to engage in the market if they have more employees. This may be because someone actively spends time looking at these issues

- Easy-to-understand bills that are sent more frequently to ensure customers are able to keep an effective track of their usage without further intervention, and

- A device that tracks usage and feeds back on it in real time so they can easily see their consumption.

3.12 Lack of engagement is often due to a lack of time. SME consumers may therefore prefer someone else to handle their energy contracts. In the future, this may lead to TPIs playing a larger role that may include managing technology offerings for their SME consumers. TPIs already have significant influence within the small non-domestic market. In 2017, 67% of microbusinesses and SMEs with more

[50] See Ofgem's draft Forward Work Programme 2019-21: https://www.ofgem.gov.uk/system/files/docs/2018/11/ofg1100_fwp_2019_21_programme_web.pdf
[51] These trials were the Element Energy Trial: http://www.element-energy.co.uk/wordpress/wp-content/uploads/2012/07/Demand-Side-Response-in-the-non-domestic-sector.pdf and Customer Led Network Revolution http://www.networkrevolution.co.uk/conclusions/domestic-customers/
[52] These results came from the Irish regulator's (Commission for Energy Regulation (CER)) smart meter trial: https://www.cru.ie/wp-content/uploads/2011/07/cer11080ai.pdf

than 10 employees who switched tariff or supplier used a broker and 42% of those who switched tariff or supplier said the broker was their main influence.[53]

Question 3.1: Individual small non-domestic consumers will differ in their ability and/or willingness to engage with how they use electricity.

a) What are your views on the forms of communication most likely to facilitate/encourage these consumers to engage with their energy usage to help them make informed choice?

b) What specific information about their energy use could encourage these consumers to engage? Please consider how this information is presented and how regularly it is communicated.

Question 3.2: Aside from communication, what other measures or initiatives would encourage small non-domestic consumers to become more confident about engaging with their energy use? This engagement may be direct, or through an intermediary/third party.

Question 3.3: Who would be best placed to help small non-domestic consumers to be more engaged with their energy usage? How would this vary with sector and company size?

Willingness to load shift

Consumers' ability and/or willingness to load shift/offer flexibility

3.13 Some SME consumers will, to varying degrees, be able to offer flexibility. However, many will find it challenging, particularly due to the constraints around business opening hours. In trials[54], the reasons often noted for why a number of small non-domestic consumers were not able to offer flexibility and use their energy at different times were:

- In some cases, where they did understand how to be flexible, they were wary of doing so. Energy is essential for operating their business and so they were concerned that adjusting usage times could adversely impact on their business activity

- They were disengaged due to a lack of knowledge about how to offer flexibility and concerns over the potential impact on their business

[53] See Ofgem's State of the Energy Market Report 2018: https://www.ofgem.gov.uk/system/files/docs/2018/10/state_of_the_energy_market_report_2018_1.pdf
[54] See Appendix 3 for a full list of the trials referred to in this paper.

- There was a perceived lack of ability to offer flexibility rather than an actual lack of ability

- Energy is often not at the forefront of these consumers' minds as a core business priority, especially in the commercial sector.

Question 3.4: Based on any relevant evidence you have collected,

a) **what proportion of small non-domestic consumers would be price responsive?**
b) **what enablers would be important and what barriers might exist?**
c) **what volume of load shifting from peak to off-peak periods (%) will an small non-domestic consumer be able to offer? How would this vary with sector and company size?**

Question 3.5: A number of different approaches to load shifting exist.

a) **Which approaches to load shifting (direct, or indirect, with or without automation) would small non-domestic consumers be more likely to prefer and respond to?**
b) **What are the risks and benefits of these approaches?**
c) **How could those risks be mitigated?**
d) **Would certain types/groups of small non-domestic consumers favour certain approaches?**
e) **Would certain types/groups of small non-domestic consumers be at greater risk of detriment from certain approaches?**

These approaches could include but are not limited to:
- **ToU tariffs**
- **Tariffs reflecting capacity-based charges, which may involve a defined access limit or different types of access option as described above and in Appendix 4.**

Question 3.6: Which parties (eg suppliers, other third parties, network companies, community schemes etc) do you consider could be best placed and/ or trusted to facilitate these above approaches for small non-domestic consumers?

Question 3.7: What barriers exist that may prevent small non-domestic consumers from load shifting? Can you identify:

a) **Which particular groups of small non-domestic consumers may face greater barriers than others?**
b) **Are there certain types or levels of consumption that there will be less scope to flex, for particular small non-domestic consumers? Are there any which these consumers would consider as "essential" and be unable to shift, such that suppliers, network companies or third parties should not be able to offer to reduce consumers' usage below this limit?**
c) **Are any other protections beyond the current regulatory framework needed to ensure arrangements are appropriate and meet small non-domestic consumers' needs? Please identify any measures you**

consider would be beneficial and how these may vary with sector and company size.

Adoption of innovative technology

Consumers' access to and ability and/or willingness to adopt innovative technology to unlock flexibility

3.14 Where it is not obvious for SME consumers how they should realise their ability to offer flexibility, smart innovative technology could help them. There is the potential to use a number of different technologies, for example:

- Battery storage in individual premises could help some SME consumers unlock the benefits of electricity settlement reform with minimal impact on their businesses. This could take the form of a managed, automated service provided by a supplier or other party with the customer's agreement. EV fleets could also be a source of flexibility.

- Communal battery storage which could be used by multiple SME consumers located in one place, eg business parks. This could also be a managed, automated service provided by a supplier or other party with customers' agreement

- Where purchased (as opposed to rented) battery storage may involve a high up front business cost. Other forms of smart technology may (subject to reasonable affordability options) provide more effective opportunities to offer flexibility in the short term, eg investing in smart thermostats, plugs, fridges (for use in small commercial premises) and smart heating solutions.

3.15 Some SME consumers may not be able to access the technologies referred to above if the premises are rented and the landlord is responsible for any changes to the premises. Low-cost, high-impact and portable solutions such as the cheaper smart devices could offer some SME consumers a better option to offer flexibility in the short term based on their individual circumstances. Where commercial premises are on long-term lease, it could be worthwhile for the landlord and tenant to discuss and install higher-cost technologies, eg smart refrigeration could become useful to consumers in the catering sector, where this is feasible and affordable.

3.16 As noted in paragraph 3.5, electricity usage patterns amongst SME consumers appear to be very predictable. This may mean that, depending on their circumstances, offering flexibility without the support of some form of technology may not be suitable for them. We want to better understand whether some SME consumers could benefit from access to affordable technologies that could help support them to unlock opportunities to offer flexibility. This may not be suitable or necessary for all SME consumers and much will depend on their existing load profile. Electricity use may be essential to their business but managing its cost may be less of a direct priority.

3.17 The coupling of technology and automation may offer a solution to some SME consumers depending on their circumstances, through either direct or indirect flexibility. Some potential new network access options could embed flexibility, allowing consumers to choose off-peak access or agreeing to limit their consumption during peak periods, or enabling a supplier or DNO to curtail down to a certain threshold when the network is congested. Other options could include tariffs which reflected more capacity based or ToU network charges, and may also be facilitated through automation. These options are described further in Appendix 4.

3.18 We want to better understand whether some specific sectors will have particular issues with accessing innovation due to the nature of their business.

Question 3.8: Which technologies could be useful for small non-domestic consumers to help them offer flexibility and gain better control of their own energy usage, if they chose to do so? How does this vary with sector and company size?

Question 3.9: Who would small non-domestic consumers trust to provide an automation or load management service (eg direct control over their demand) to them, eg if using an innovative solution like battery storage? What specific protections may these consumers need? Would they be more likely to offer flexibility if it were automated?

Question 3.10: What are the circumstances in which a communal solution could bring more benefit to small non-domestic consumers (sharing risks/benefits of offering flexibility) and are there any specific protections needed?

Question 3.11: Which different sectors where small non-domestic consumers are active could benefit from innovative technologies that unlock flexibility and how could other sectors also benefit?

Choice of tariff

SME consumer attitudes to, and value placed on, ToU tariffs and other options

3.19 The introduction of new tariffs like ToU tariffs is one of the features we expect could help deliver a smart and flexible energy system. SME consumers who could, based on their individual circumstances, actively load shift and use more electricity at off-peak times could make individual savings additional to any overall system savings. They would have to choose the right tariff for them, which would depend on their existing load profile and how flexible they potentially want to be. ToU tariffs will reward responsiveness to price signals which, in turn, may involve changes to consumers' behaviour.

3.20 However, some SME consumers could, based on their circumstances, engage with and take up new tariffs and options if it suits their business and a tangible cost saving is achievable. This may be because they can change usage behaviour in response to price signals without an adverse business impact (with or without automation), or because they contract another party to manage this load on their behalf.

3.21 As described above, and outlined in Appendix 4, potential new access options being considered in our review of network access and forward-looking charging, could also provide routes for consumers to offer flexibility. Some SME consumers could potentially choose from options such as off-peak access for part of their demand, or access with different levels of curtailment, which could enable a supplier or other party to manage their demand, providing flexibility on their behalf. Suppliers might also choose to reflect more granular, capacity based network charging signals, which may vary with time (eg within day or seasonally), as well as by location, through new tariff options.

3.22 Some SME consumers may have limited or no ability to load shift due to the nature of their businesses, inability or unwillingness to change behaviour, or lack of access to smart technology to help them be flexible due to affordability issues or constraints, eg rented premises. They would still benefit from the overall system benefits.

Question 3.12: Do you have any views about whether small non-domestic consumers may prefer particular tariff types over others (for reference some examples of ToU tariffs are listed in Appendix 2, and potential access options are described above and in Appendix 4)?

Please consider how this may differ by different types of small non-domestic consumers, eg by sector/company size.

Question 3.13: Which types of flexible tariffs and offers are likely to be available to small non-domestic consumers following settlement reform, considering the potential network charging and access options described? Please identify specifically the types of tariff options which

a) suppliers are already offering or are developing
b) you expect may emerge following settlement reform
c) you expect suppliers may develop in response to more granular, locationally differing network charging signals and the availability of different access options for their consumers.

Would you expect to see such tariffs, automation deals or offers targeted to small non-domestic consumers by location, if underlying network charges varied locationally?

Question 3.14: Considering any tariff options or packages you have developed, please provide any evidence of consumers' attitudes or response to them.

Question 3.15: How could protections ensure tariffs/choices are appropriate, including in relation to potential new access options?

4. Appendices

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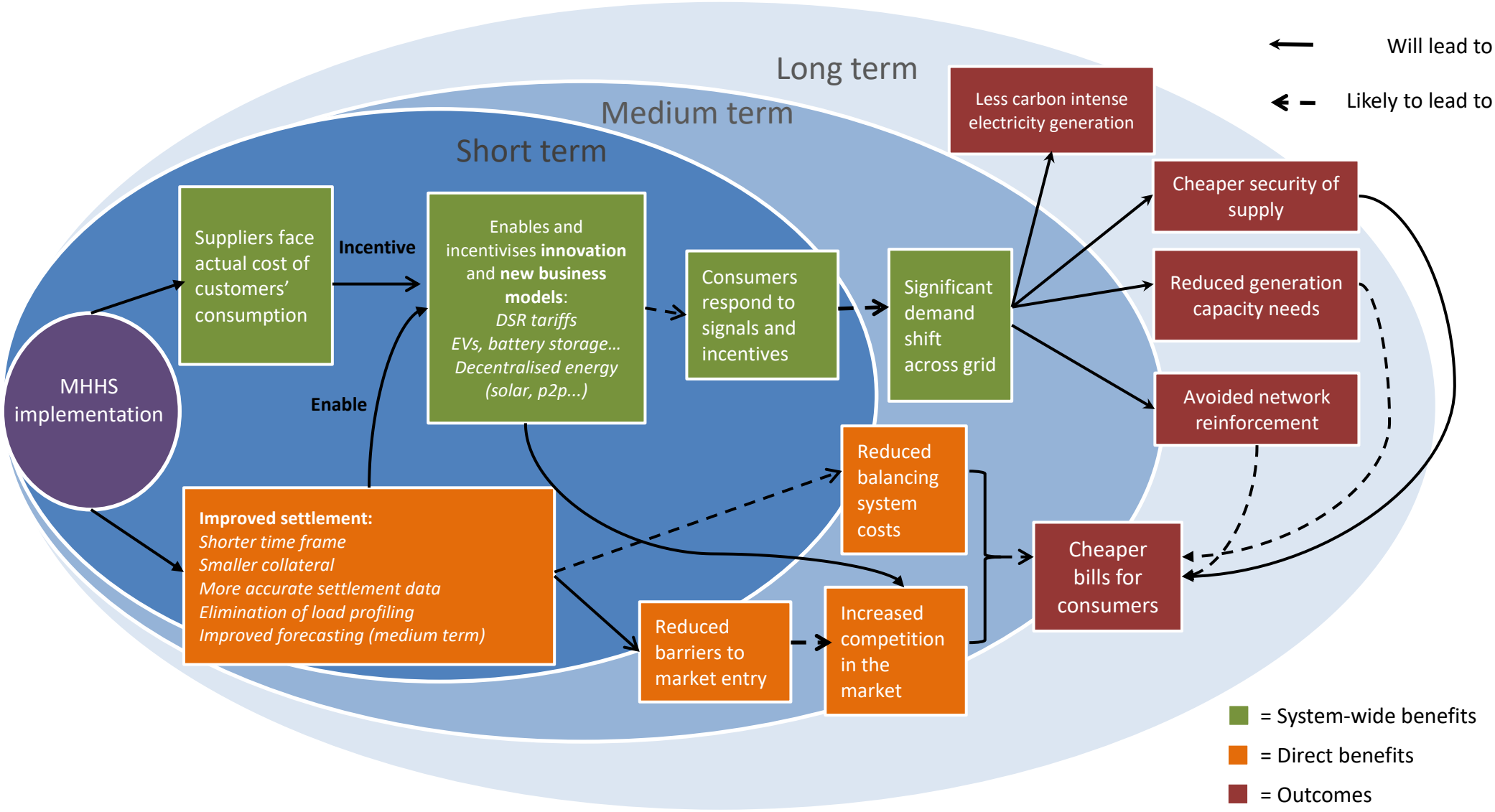
Appendix 1 – Benefits of settlement reform



Appendix 2 - Examples of potential supplier tariff offerings (Time-of-Use (ToU) and other)

The following table provides general descriptions of potential types of tariffs[55] suppliers may develop and offer to consumers facilitated by them obtaining actual half-hourly metered data.

Potential tariff offerings (ToU tariff offerings may be bundled with a smart tech offering, eg EV, battery storage)	Main features
Flat rate non-ToU tariff	Customers pay a fixed (flat) price across the day. The cost is the same regardless of how much or when electricity is used.
Static ToU tariff	2 or 3-rate tariff, eg peak and off-peak, or peak, shoulder and off-peak (or free period(s)). Predictable daily price schedule with no seasonal changes. Simple to understand and how it applies to the customer, eg Economy 7, free Saturdays or Sundays tariffs. Some ToU tariffs could signal times when there tends to be excess generation.
Basic dynamic ToU tariff	Different tariff rates at different times within and across days. Prices will be variable but may involve some longer periods of more predictable pricing. Customer gets notice of when price changes to encourage a response
Dynamic HH ToU tariff	As with basic, multi-rate tariff rates across different time periods. Price may vary every 30 or 60 minutes, reflecting not only changes in energy price but also the time-specific allocation of generation, transmission, and distribution capacity costs
Dynamic 'spot price' tariff	Prices vary according to the wholesale 'spot' price. Tariff is set at close to, or mirrors, real-time pricing
Critical Peak Pricing (CPP) dynamic ToU tariff	Consumer charged a broadly flat price but with extreme high peak prices for specific limited peak events (a few each year which may relate to system stress periods). Up to the consumer whether to respond and avoid high peak prices
Critical Peak Rebate (CPR) dynamic ToU tariff	The CPR tariff mirrors the CPP tariff but the consumer gets a rebate for load reductions related to an estimated baseline consumption level during the peak period events. Those who can't reduce demand won't pay any more than the peak price for the peak period events. Those who can will receive a rebate
Direct Load Control tariff	The consumer pays a flat reduced rate tariff but agrees to some direct load control by the supplier at specific time periods when load is turned down. Smart device(s) remotely operated by the supplier with customer consent or with agreed customer manual intervention. The customer is rewarded for offering flexibility
Device specific, eg EV-only, smart tariff	A tariff for particular types of smart technology, eg electric vehicle, separated out from the rest of the customer's demand. Encouraging off-peak use and flexibility which will incentivise the customer to receive lower prices at off-peak times. Relies on take-up of specific smart technologies

[55] As discussed in Citizens Advice's report, The Value of ToU Tariffs in Great Britain: https://www.citizensadvice.org.uk/about-us/policy/policy-research-topics/energy-policy-research-and-consultation-responses/energy-policy-research/the-value-of-time-of-use-tariffs-in-great-britain/

Appendix 3 - Research findings (studies and trials) into distributional impacts of Time of Use (ToU) tariffs

The following studies and trials into the impact that smart meters have on consumer behaviour and the value placed by consumers on ToU tariffs, where offered, were reviewed:

- Cambridge Economic Policy Associates (CEPA): report for Ofgem on Distributional impact of ToU tariffs (May 2017)[56]
- Competition and Markets Authority (CMA) energy market investigation (Appendix 8.5 of the final report): evidence from the international experience of smart meters (Dec 2016)[57]
- Customer-led Network Revolution study: Low Carbon Fund, et al (March 2015)[58]
- Low Carbon London (LCL) study: UKPN, EdF Energy, Imperial College London, et al (ended Dec 2014)[59]
- Energywise study: UKPN, British Gas, National Energy Action, et al (2015-2017)[60]
- The Value of ToU tariffs in GB: Citizen's Advice (commissioned from Brattle Group (July 2017))[61]
- TOU rates and vulnerable households: Electricity consumption behaviour in a Canadian case study (Ontario Study) (University of Waterloo) (2007)[62]
- Advanced Metering (AM) (smart meter) customer impact survey: Victoria (Australia) (Deloittes) (2011-12)[63]
- Irish electricity market smart meter trials: Commission for Energy Regulation (CER) (May 2011)[64]
- BEIS Consumer Panel (Smart Energy Research) (Nov 2016)[65]

The following studies and trials into the impact that smart meters have on non-domestic consumer behaviour and the value placed by consumers on ToU tariffs, where offered, were reviewed:

- Carbon Trust: Advanced metering for SMEs[66] (2007)
- CER Smart Meter Trial - Electricity Smart Metering Customer Behaviour Trials Findings Report (2011)[67]
- Element Energy Demand side response in the non-domestic sector (for Ofgem) (2012) [68]
- Customer Led Network Revolution (2015) [69]
- Helping Businesses to improve the way they use energy – Call for evidence (2018) [70]

[56] CEPA's report is available on Ofgem's website: https://www.ofgem.gov.uk/publications-and-updates/distributional-impacts-time-use-tariffs
[57] CMA final report is here: https://assets.publishing.service.gov.uk/media/576bcb9be5274a0da900007c/appendix-8-5-evidence-of-international-experience-of-smart-meters-fr.pdf
[58] The Customer Network-led Revolution study is here: http://www.networkrevolution.co.uk/
[59] The LCL study is here: http://innovation.ukpowernetworks.co.uk/innovation/en/Projects/tier-2-projects/Low-Carbon-London-(LCL)/
[60] The Energywise study is here: http://innovation.ukpowernetworks.co.uk/innovation/en/Projects/tier-2-projects/Energywise/
[61] The Value of ToU Tariffs study is here: https://www.citizensadvice.org.uk/about-us/policy/policy-research-topics/energy-policy-research-and-consultation-responses/energy-policy-research/the-value-of-time-of-use-tariffs-in-great-britain/
[62] See https://uwaterloo.ca/sustainable-energy-policy/sites/ca.sustainable-energy-policy/files/uploads/files/Simmons.pdf
[63] The Deloittes study is here: http://www.smartmeters.vic.gov.au/about-smart-meters/reports-and-consultations
[64] The CER smart meter trials report is here: https://www.cru.ie/wp-content/uploads/2011/07/cer11080ai.pdf
[65] Available here: https://www.gov.uk/government/consultations/call-for-evidence-a-smart-flexible-energy-system
[66] The Carbon Trust Study is here: https://www.carbontrust.com/media/77244/ctc713_advanced_metering_for_smes.pdf
[67] See https://www.cru.ie/wp-content/uploads/2011/07/cer11080ai.pdf
[68] The report is here: http://www.element-energy.co.uk/wordpress/wp-content/uploads/2012/07/Demand-Side-Response-in-the-non-domestic-sector.pdf
[69] See http://www.networkrevolution.co.uk/
[70] The call for evidence is here: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/726711/Call_for_Evidence_-_helping_businesses_to_improve_the_way_they_use_energy_.pdf

Appendix 4 – Electricity Network Access and Forward-Looking Charging Review - Overview

In December 2018, we launched a Significant Code Review (SCR) of aspects of the electricity network access and forward-looking charging arrangements.[71] By 'access arrangements' in this review we mean the nature of users' access to the electricity networks (for example, when users can import/export electricity and how much) and how these rights are allocated. 'Forward-looking charges' are those electricity network charges which signal to users how their actions can either increase or decrease network costs in the future. Under the SCR, we are leading the review of the definition and choice of access rights, a wide-ranging review of Distribution Use of System (DUoS) network charges, a focused review of Transmission Network Use of System (TNUoS) charges and a review of the distribution connection boundary. We also asked industry to lead on the review of several wider elements of arrangements, outside the scope of the SCR - access right allocation and balancing services charges.

Network charging signals are currently sent to suppliers (rather than consumers directly). We are seeking to understand how these could manifest themselves in tariffs, and how consumers who can be flexible may be able to access savings, as well as the likely scale of consumers' response and any protections which may be needed. We are seeking evidence through this Call for Evidence to inform our review.

Access definition and choice

In the SCR we will be reviewing how access rights are defined and the choice of options for access which transmission and distribution users have. This includes looking at these arrangements for small users, which includes households and small businesses.[72] The access options could form part of a package or tariff which a consumer selects from in future, and the corresponding charges could reflect the costs or benefits which different types of access implied for the system. Currently, the electricity supplier faces network charges associated with the consumers they supply. The supplier decides how to respond to these signals, including how to reflect them in the tariffs and packages they offer their customers (eg they may offer ToU tariffs or technology to support flexibility).

In launching this review, we identified small users as those who do not have an agreed capacity as the basis for their distribution use of system charges. The options we are considering could include measures for consumers, or suppliers on their behalf, to specify the level of capacity they require more precisely – ie an agreed limit which could form the basis for the network charge. They could also potentially enable consumers to choose from wider access options, such as those outlined below. This could potentially be above a minimum firm access threshold, to ensure they secured adequate access to meet their needs. Principles-based licence obligations on suppliers could be an alternative or complementary protection measure.

We identified a number of specific options in our decision, and we will consider which of these options could be made available as part of the review. These are:

[71] The Significant Code Review (SCR) process provides a tool for Ofgem to initiate wide ranging and holistic change and to implement reform to a code based issue. Our decision is available here: Electricity Network Access and Forward-Looking Charging Review - Significant Code Review launch and wider decision (December 2018) https://www.ofgem.gov.uk/publications-and-updates/electricity-network-access-and-forward-looking-charging-review-significant-code-review-launch-and-wider-decision

[72] As outlined in footnote 32 above, by small users, here, we are referring to those users who do not have a specified capacity. These users are typically those that do not have Current Transformer meters. We expect these to overlap with the consumers considered in this Call for Evidence.

- how ***'firm'*** an access right is - ie the extent to which a user's access can be 'curtailed' or restricted, and what happens if it is, eg whether they receive a payment. Consumers could allow a supplier, network operator or other third party to curtail their usage down to a certain level when the network is congested as part of their tariff.

- how access **varies with time** - ie consumers could choose to have some access which was off-peak only, or different levels in summer and winter. Suppliers or other intermediaries could provide cheaper tariff options in return for the consumer agreeing to limit their consumption during peak periods, for example.

We also said we may consider some other options if we identify evidence to support further action or if we found them to be beneficial and viable.[73] These are:

- **shared access** - This could allow users across multiple sites in the same broad area to obtain access to the whole network (rather than just part of the network), up to a jointly agreed level. This could allow the participating network users to decide how to apportion access rights amongst themselves – for example within a community energy scheme
- **short term access** - This could provide a choice for limited duration access (eg one year), where long term access is not immediately available or where the user does not want to make a long term commitment
- **other conditions on access** - This could involve establishing conditions on access, for example 'use-it-or-lose-it' or use-it-or-sell-it' requirements.

Not all of these options may be suitable for all small users, considering domestic consumers and the vulnerable in particular.

As an illustrative example of how these potential options could apply, an electric vehicle (EV) owner may need to nominate a higher capacity level in order to be able to charge their vehicle at a fast rate. They could choose from different choices around their access. For example, if they were willing to only charge off-peak, opt to charge more slowly or possibly have their charging managed by their Distribution Network Operator (DNO), this could reduce their charges relative to fast, uninterruptible charging at peak times. These options would reflect the different impacts the types of EV charging would have on system costs.

Charging arrangements

We have decided to proceed with a wide-ranging review of DUoS charges focusing on:

- The balance between usage-based and capacity-based charges. This is to evaluate whether changes to how charges are based on usage as well as capacity could send more cost-reflective and effective signals to network users. As part of this assessment, we intend to consider 'time-of-use' variants for both usage-based and capacity-based charges. For example, charges could change according to the time of day or season (such as higher charges during peak usage times in the evenings and winter).
- Improvements to signal how network costs vary by location.
- We also intend to explore threshold limits for sharper charging signals (eg above a basic usage threshold) for small users, or sub-sets of small users.

The review will also consider the distribution connection charging boundary, (the depth of a connection boundary refers to the costs incurred by a connectee in cases where wider

[73] These areas are listed in Table 1 of our decision document (see footnote 9 above). We said we would additionally explore the feasibility and value of shared access rights across different sites and/or between different users, noting it may become a priority area. 'Short term' and 'other conditions' on access are areas that we do not consider as priorities for change, but we have said we would review the materiality of these issues and are prepared to take further action during the SCR if further evidence emerges to support this.

reinforcement of the network is required) and a focused review of transmission network charges.

Protections
We will consider options to mitigate the potential impacts of our proposed reforms on small users, in particular those in vulnerable situations. This could involve setting a minimum basic access level or a basic charging threshold (as noted above) with usage or capacity requirements below this tier protected from sharper charging signals.

We recognise that a key challenge relates to variability in the nature of household demand and how "essential" usage might be understood, together with consumers' evolving needs. We understand that this approach may not prove feasible to take forward, and we will also consider alternative approaches to ensure that customers in vulnerable situations are protected.

Appendix 5 - Glossary

B

BEIS
The Department for Business, Energy and Industrial Strategy is the government department responsible, amongst other things, for energy and clean growth.

D

Demand-side response (Flexibility)
Action taken by consumers to modify their generation and/or consumption pattern in reaction to an external signal (such as a change in price) to provide a service within the energy system.[74]

Distribution network
In England and Wales this is the wires, cables and other network infrastructure that operate at 132kV and below, while in Scotland it is the infrastructure that operate below 132kV. Distribution networks carry electricity from the high voltage transmission grid to industrial, commercial and domestic users.

Distribution Network Operator (DNO)
Distribution Network Operator companies own, operate and maintain the distribution networks. They do not sell electricity to consumers. This is done by electricity suppliers. There are 14 licensed distribution network operators (DNOs) in Great Britain, each responsible for a regional distribution services area.

E

Electricity Network
The electricity network includes both the distribution network and the transmission network.

F

Forward looking charges
The elements of network charges that signal to users how their actions can either increase or decrease future network costs. They typically provide signals about the costs or benefits of locating at different points on the network (sometimes called "locational charges") and/or of using the network at different times.

N

Network access rights
Network access rights define the nature of users' access to the networks – how much they can import or export, when and for how long, where to/from, and how likely their access is to be interrupted and what happens if it is.

Network access arrangements
Network access arrangements refers to how the network access rights are allocated to users.

Network capacity
The amount of electricity flows that the network is able to accommodate.

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[74] This definition comes from: https://www.ofgem.gov.uk/electricity/retail-market/market-review-and-reform/smarter-markets-programme/electricity-system-flexibility

O

Ofgem
The Office of Gas and Electricity Markets (Ofgem) is responsible for protecting gas and electricity consumers in Great Britain. It is governed by the Gas and Electricity Markets Authority (GEMA).

P

Profile Class
Consumers that are not settled using actual meter readings for each settlement period (the period over which contracted and metered volumes are reconciled, defined as a period of 30 minutes) 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.

S

Settlement process
Settlement places incentives on generators and suppliers to contract efficiently to cover what they produce or their customers consume respectively. For suppliers, it operates by charging for any difference between the volume of electricity that they buy and the volume that their customers consume.

Significant Code Review
A Significant Code Review provides a tool for Ofgem to initiate wide ranging and holistic change and to implement reform to a code based issue, as introduced under the Code Governance Review - https://www.ofgem.gov.uk/licences-industry-codes-and-standards/industry-code-governance/code-governance-review

Smart meter
A meter which, in addition to traditional metering functionality (measuring and registering the amount of energy that passes through it), is capable of providing additional functionality (for example, recording consumption in each half hour of the day and of being remotely read) is known as a smart meter.

T

Time of Use (ToU) tariffs
These are tariffs where customers are charged a lower price at specified off-peak times that may be consistent or vary day to day or week to week depending on tariff type, reflecting the fact that electricity is generally cheaper to generate and transport at off-peak times. (Some time of use tariffs could have different weekday and weekend rates).

Transmission network
The transmission network comprises of circuits operating at high-voltage, defined as 400kV, 275kV, and 132kV (in Scotland only). The system is responsible for the transmission of energy from generators to lower voltage distribution networks, which subsequently distribute the supply to users.

Appendix 6 – Privacy notice

Personal data
The following explains your rights and gives you the information you are entitled to under the General Data Protection Regulation (GDPR).

Note that this section only refers to your personal data (your name address and anything that could be used to identify you personally) not the content of your response to the call for evidence.

1. The identity of the controller and contact details of our Data Protection Officer
The Gas and Electricity Markets Authority is the controller, (for ease of reference, "Ofgem"). The Data Protection Officer can be contacted at dpo@ofgem.gov.uk

2. Why we are collecting your personal data
Your personal data is being collected as an essential part of the call for evidence process, so that we can contact you regarding your response and for statistical purposes. We may also use it to contact you about related matters.

3. Our legal basis for processing your personal data
As a public authority, the GDPR makes provision for Ofgem to process personal data as necessary for the effective performance of a task carried out in the public interest. i.e. our Significant Code Reviews.

4. With whom we will be sharing your personal data
We are not intending to share your personal data with other organisations. We are intending to publish non-confidential call for evidencere responses, including any personal data that may be contained within them.

5. For how long we will keep your personal data, or criteria used to determine the retention period.
Your personal data will be held until the implementation of Ofgem's work on market-wide settlement reform and work on Electricity network access and forward looking charging.

6. Your rights
The data we are collecting is your personal data, and you have considerable say over what happens to it. You have the right to:

- know how we use your personal data
- access your personal data
- have personal data corrected if it is inaccurate or incomplete
- ask us to delete personal data when we no longer need it
- ask us to restrict how we process your data
- get your data from us and re-use it across other services
- object to certain ways we use your data
- be safeguarded against risks where decisions based on your data are taken entirely automatically
- tell us if we can share your information with 3rd parties
- tell us your preferred frequency, content and format of our communications with you
- to lodge a complaint with the independent Information Commissioner (ICO) if you think we are not handling your data fairly or in accordance with the law. You can contact the ICO at https://ico.org.uk/, or telephone 0303 123 1113.

7. Your personal data will not be sent overseas.

8. Your personal data will not be used for any automated decision making.

9. Your personal data will be stored in a secure government IT system.

10. More information For more information on how Ofgem processes your data, click on the link to our "Ofgem privacy promise".