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Decision

Market-wide Half-Hourly Settlement: Full Business Case

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The Market-wide Settlement Reform Outline Business Case (**OBC**), published in August 2018, set out our expectation that we would need to introduce half hourly settlement (**HHS**) on a market-wide basis in order to realise the full benefits of settlement reform. The analysis in the OBC suggested that - due to the magnitude of the potential net benefits - our decision should centre on determining when and how, rather than whether, market-wide settlement reform should be introduced.

The consultation on our Draft Impact Assessment (**Draft IA**) confirmed this position and has enabled us to decide how best to implement market-wide half-hourly settlement (**MHHS**). Our conclusion is that the case for MHHS remains robust and that implementing it over a period of 4 years and 6 months will maximise the expected net benefits for consumers. We therefore confirm our intention to proceed with MHHS on this basis.

This document sets out our updated assessment of the case for implementing MHHS, including a Final IA. It also provides updates on how MHHS will be implemented.

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Foreword

The energy sector is undergoing a major transformation as we decarbonise our economy and embrace the opportunities of digitalised energy data. Ofgem is working closely with the government, industry and wider stakeholders to help the UK make the transition to net zero greenhouse gas emissions at the lowest cost to consumers.

Last November the government published the Ten Point Plan for a Green Industrial Revolution. Building on this plan in its Energy White Paper, the government has set out an ambitious programme to build a fairer, greener energy system. As part of that commitment, Ofgem and BEIS will shortly publish the Smart Systems and Flexibility Plan 2.0 setting out our joint approach to driving a more flexible energy system.

One of the key activities in our new Forward Work Programme for 2021/22 is to implement market-wide half-hourly settlement (**MHHS**). Building on previous reforms, MHHS will be a vital enabler of the flexibility that will support this country's transition to net zero. MHHS will send accurate signals to suppliers about the cost of serving their customers throughout each day.

Suppliers will have powerful incentives to offer new tariffs and products that encourage more flexible use of energy and help consumers to lower their bills. Making the most efficient use of existing infrastructure should reduce the need for extra spending on future generation and network assets. This will help decarbonise the sector cost-effectively, which will benefit all consumers and wider society. MHHS is therefore a vital step in ensuring that our future energy system is affordable for consumers.

We are placing responsibility on industry for implementing MHHS over a period of 4 years and 6 months. This timeframe strikes a balance between securing the benefits of MHHS as soon as possible while recognising the complexity of the changes involved. There will be strong legal and regulatory incentives on the industry to implement MHHS efficiently and effectively. Delivering MHHS is an essential step on our path to the net zero future, so we expect industry to accept the challenge.

Executive summary

In August 2018 we published our Outline Business Case (**OBC**) setting out the results of a draft economic assessment of the impact of market-wide half-hourly settlement (**MHHS**). The draft assessment indicated substantial potential benefits, suggesting that our decision should focus on when and how, rather than whether, to introduce MHHS. The OBC also explored the strategic interactions of settlement reform with other projects and presented our thinking on how to ensure that the industry can manage and deliver MHHS successfully.

In this Full Business Case, we provide an update on the key developments since we published the OBC. These include

- consulting on and finalising an Impact Assessment (**IA**), which we have published alongside this document
- establishing roles and functions to coordinate and assure the timely and effective implementation of this large, technical, multi-stakeholder change programme.

In this document, we do not restate at length the rationale, options analysis and cost-benefit assessment for the proposed systems, processes and implementation mechanisms. We summarise the positions set out in the OBC and provide further information only where things have developed materially or changed.

Strategic Case

The Strategic Case sets out our rationale for introducing MHHS. We make clear that introducing MHHS is a key component of our work to facilitate decarbonisation and a smarter, more flexible energy sector. We state that the project intends to capitalise on smart metering infrastructure and previous work on half-hourly settlement (**HHS**) to encourage innovative products and services that would enable consumers to benefit from the energy system transition.

We have examined the interactions between settlement reform and other policies and projects, such as the smart metering roll out, the Switching Programme, future retail regulation, the Targeted Charging Review and the Access and Forward-looking Charging project. We have considered the benefits and risks of introducing MHHS, focusing on the potential for product and service innovation in response to the incentives it will provide.

Since we published the Outline Business Case, Ofgem has made significant progress on these projects and has published a Decarbonisation Action Plan setting out a detailed programme of action to facilitate the energy sector transition. We have provided updates on those projects in this document and links to further information about our activities (including to the plans we have set out in our latest annual Forward Work Programme).

Economic Case

The Economic Case summarises the Draft Impact Assessment on which we consulted in 2020, the changes we have made to our proposal in the light of responses (in particular to the length of the transition period and to the intended implementation arrangements), and the impact of those changes. The Economic Case sets out the costs and benefits of introducing our chosen option for MHHS as compared with the counterfactual of retaining the elective half-hourly settlement arrangements, and the preferred option in our Draft IA.

Based on the evidence we have received, it is clear that relying solely on the elective HHS arrangements will deliver insufficient load shifting to produce the scale of system-level benefits we seek. Introducing MHHS is essential to secure the necessary transformation. After considering a range of possible options, we have concluded that implementing MHHS for import- and export-related MPANs over a period of 4 years and 6 months will maximise the expected net benefits to GB energy consumers.

We estimate that this option will deliver net benefits to GB energy consumers in the range of £1,559m-£4,509m. It will also deliver benefits that we expect to see but cannot quantify, notably increased competition amongst retailers and innovation in new products and services. For full details about the expected impacts, see the Final IA that we have published alongside this document.

Commercial Case

The Commercial Case notes that we are placing responsibility for management and delivery of the implementation of MHHS with industry. This will require industry to take greater ownership of the reforms, drawing on their deeper knowledge of, and expertise with, industry systems and processes.

Recognising its existing role as the manager of the Balancing and Settlement Code (**BSC**), Elexon will act as Senior Responsible Owner (**SRO**) for the project. The Commercial Case outlines the SRO's role and the functions it will need to undertake to implement MHHS

efficiently, and recognises the importance of having strong governance that reflects the interests of all parties and ensures effective management of any conflicts of interest. Given the importance of settlement reform and the pace at which it will need to be delivered, we have set out in the Commercial Case the lessons that we have learned from previous reform programmes.

In January 2021 we consulted stakeholders on how best to mitigate any risks arising from placing industry in a position of leadership. We will shortly be publishing a further consultation to develop the details of the implementation and governance arrangements. We intend to ensure that all parties have an appropriate voice, that there is a clear separation of responsibilities and a strong independent assurance function. All this will be designed to ensure progress in line with programme requirements and plans. We will also seek views on our proposals for the scope of Ofgem's role as Programme Sponsor and the circumstances in which we would intervene to ensure that implementation remains firmly on track.

Financial Case

The MHHS Programme will impose costs on a wide range of parties. It will be vital to ensure that implementation is carried out efficiently so as to minimise those costs. The majority of the costs will fall on industry participants as they make changes to their own systems and processes. We expect all parties to meet their own costs, other than in relation to central programme management costs. Where costs are incurred by bodies funded by industry, these costs will be managed via those bodies' usual budgetary and governance processes.

In our consultation on the Draft IA, we proposed that the delivery functions would be paid for by BSC parties under the current funding structure. Most respondents to the consultation supported that proposal. We have confirmed in our Decision Document that central programme management costs will be recovered via a new specified BSC charge. Ofgem has approved the P413 alternative code modification proposal. This modification provides that MHHS programme management costs will be recovered from suppliers only, on a per meter point basis. For further information see the MHHS Decision Document and Ofgem's P413 Decision Letter, which we have also published today.[1]

[1] See the Ofgem website for access to all the MHHS documents published on 20 April 2021, including the decision on BSC modification P413. The MHHS Decision Document contains a list of acronyms and a glossary of terms used in our MHHS documents which readers may find useful.

Management Case

This section sets out our position on the governance arrangements for ensuring timely and effective implementation of robust MHHS arrangements. We discuss industry-led implementation, with Elexon as SRO, and describe its implications for the key parties involved in implementing the MHHS programme.

As noted above, we will further develop the details of the governance and implementation arrangements through a consultation document that we will publish shortly. This consultation will cover the governance structures and processes, obligations to be placed on Elexon and programme parties to ensure efficient and timely implementation of MHHS, arrangements for independent assurance and the role of Ofgem as Programme Sponsor, including the thresholds for Ofgem involvement.

1. Strategic Case

Section summary

This section summarises the objectives and strategic context for settlement reform, and the associated benefits and risks. The objectives have remained essentially unchanged throughout the duration of the project, save for inserting a reference to moving to a net zero carbon electricity system. The section also provides an update on the key Ofgem projects that fit strategically with Market-wide Half-hourly Settlement (**MHHS**).

Objectives and strategic context

1.1. The MHHS programme's strategic energy transformation objective is to promote an electricity system that delivers the Government's and Ofgem's objectives in a cost-effective manner, minimising the overall cost to current and future consumers of moving to a net zero carbon electricity system. This must be done while maintaining security of supply and system efficiency by minimising the need for new infrastructure investment and facilitating more efficient use of existing generation and network assets.

1.2. The programme's specific settlement-related objective is to develop settlement arrangements that incentivise all retailers and suppliers (current and future) to encourage customer behaviour that contributes to a more cost-effective electricity system. Linking future retailers' costs to their customers' actual consumption within the course of a day will have this effect, encouraging new and disruptive business models through settlement arrangements that facilitate competition in new areas.

1.3. Ofgem has a role to play in ensuring that the conditions are in place for innovative products and services to emerge and that consumers are suitably protected when using them. Our Decarbonisation Action Plan made clear we would take appropriate action to ensure that consumers who cannot provide flexibility are not unduly disadvantaged. As set out in our Forward Work Programme 2021/22, Ofgem aims to enable a future retail market that can deliver the technological and behavioural changes needed to support decarbonisation at lowest cost, while ensuring that the interests of consumers remain protected. MHHS is a key enabler of this.

1.4. These objectives, and the rationale for adopting them, are largely unchanged since we first set them out in September 2017[2] and, later, in the Outline Business Case.

Benefits, risks, constraints and dependencies

Potential benefits

1.5. MHHS will expose suppliers to the true cost of supplying their customers in every half hour period. As set out in the Outline Business Case and the Final IA, we expect that suppliers will respond by offering an incentive to their customers (for example through a smart tariff, an incentive to use electric vehicle-to-grid functionality or other innovations including battery storage) to reward them for shifting their consumption away from peak periods.

1.6. A significant aggregate demand shift across the grid can deliver substantial benefits by reducing the need for generation capacity to supply peak periods and by avoiding expensive network reinforcements, as well as lowering network operating costs. Using innovation enabled by HHS to reward consumers for matching their consumption with periods of high generation from renewables such as wind and solar photovoltaics (**PV**) can help to integrate this generation into the system and so lower the carbon intensity of the British generation mix. MHHS is a key enabler for this transition to a smarter, more flexible energy system and market.[3]

Potential risks, constraints and dependencies

1.7. In the Outline Business Case and the Final IA, we identified a number of interactions that either present risks to the implementation of the project, are critical dependencies or could constrain the realisation of the project's benefits. These are:

- smart metering: the implementation of MHHS, and the scale of benefits that can be achieved, depends on the roll out of smart meters. The benefits set out in the Final IA are based partly on an assumption that suppliers will comply with their

[2] See the project objectives and assessment options for the MHHS Business Case.
[3] See pages 19-20 of the MHHS Outline Business Case for more detail.

legal obligations in respect of the smart meter roll out.[4] However, even if suppliers undershoot their targets in the short term, this would merely delay some of the benefits. It would have no significant impact on the scale of benefits we expect from MHHS over the long term as suppliers respond to the ongoing economic incentives on them to innovate and offer new products and services;

- the market and consumer response: realising the potential benefits of a flexible energy system enabled by MHHS will depend on the consumer response to the new incentives. This in turn will depend on factors such as the state of competition in the market and the value of flexibility arising from wholesale price variations and network charges. The scale of benefits will also depend on the levels of half-hourly consumption data made available for settlement, the extent to which suppliers and other retailers offer new products and services making use of customers' half-hourly data, the take-up rate of these offerings by consumers, and the extent of their resultant load shifting behaviour. Our Final IA estimates the range of load shifting outcomes that could result from the more flexible electricity system enabled by MHHS. The analysis shows MHHS can be expected to bring significant benefits even under low load shifting scenarios;

- Ofgem, industry and other stakeholders' resource constraints: the success of the project depends partly on stakeholders' engagement and ability to resource it, not least during the design, building and testing phases. Our decisions on the length of the transition period, and the programme implementation arrangements represent our best informed expectations on what can realistically be delivered by the industry. We set out the reasons for these decisions in our Decision Document. The Final IA includes a consideration of their impact. The implementation and governance arrangements themselves are described in broad terms in the Management Case, with further details to be developed via a consultation that we will publish shortly.

[4] Suppliers are currently required take 'all reasonable steps' to install smart meters in all consumers' premises by end of June 2021, with a new framework based on binding annual targets to apply from July 2021 to June 2025. BEIS has consulted on proposed targets and reporting thresholds for the first two years of the new framework.

Interactions with other projects

1.8. In section 2 of the consultation document on our Draft IA[5] we provided an update on the strategic context for settlement reform. This emphasised the need to increase the flexibility of the electricity system so that we can decarbonise the energy sector in the most cost-effective way. It also outlined key items in the programme of work we are undertaking to meet the UK's net zero commitment, including the Targeted Charging Review and the Access and forward-looking charging reform project. We provide an update on these below.

Ofgem's Decarbonisation Action List

1.9. Ofgem's Decarbonisation Action Plan contained an Action List setting out what we are doing to facilitate the energy transition. Alongside settlement reform, this includes:

- building **adaptability into the RIIO-2 price controls** to ensure that the network businesses invest efficiently, respond flexibly to technology changes, and deliver the infrastructure that will support a decarbonised future;
- setting up a **regulatory fund to unlock investment** in innovative solutions to tackle climate change;
- creating a **more flexible electricity system** to ensure that consumers will benefit from the lowest cost transition to a reliable net zero system;
- developing a **regulatory strategy for electric vehicles** to support roll out and maximise consumer benefits;
- supporting **innovation and experimentation, especially in the retail market**, to create low carbon products and services that will directly benefit consumers; and
- becoming **more adaptive in the way we work** and in our regulatory approaches.

1.10. The Forward Work Programme 2021/22 provides an update on the wide range of work we expect to undertake in support of the energy transition. Here, we focus on two separate but closely related projects.

[5] See pages 23-29 of Ofgem's MHHS Draft IA that we published in June 2020.

Targeted Charging Review and Access and forward-looking charging reform

1.11. The Final IA discusses the linkages, and the attribution of benefits, between settlement reform and separate but related projects (notably the Targeted Charging Review, and the Access and forward-looking charging reform project). Here, we provide an update on these projects.

1.12. In November 2019, we published our Decision (and associated Direction) on the Targeted Charging Review (**TCR**) Significant Code Review.[6] When the Decision is fully implemented, the costs of operating, maintaining and upgrading the electricity grid will be spread more fairly and, by reducing harmful distortions, will save consumers about £300m per year, with anticipated £4bn-£5bn consumer savings in total over the period to 2040.

1.13. The TCR included a review of how residual network charges are set and recovered. The aim was to ensure these charges are recovered from network users in a way that meets the TCR Principles of reducing harmful distortions, fairness, and proportionality and practical considerations. We decided that residual charges should apply to final demand consumers only and that they will be fixed charges, with implementation of these changes in April 2022. The Authority has since approved a series of code modification proposals intended to implement various aspects of our Decision.[7] Other code modification proposals are under consideration. Customers will be placed into bands that will be reviewed every Transmission Price Control, depending on their Maximum Import capacity or, where that is not available, by their consumption.[8]

[6] See Ofgem's TCR Full Decision Document.
[7] See the following decision letters: Distribution Connection and Use of System Agreement (DCUSA) DCP361: Ofgem Targeted Charging Review (TCR) Implementation – Calculation of Charges', Ofgem, 30 September 2020; Distribution Connection and Use of System Agreement (DCUSA) Ofgem Targeted Charging Review (TCR) Implementation - DCP358: Determination of Banding Boundaries and DCP360: Allocation to Bands and Interventions', Ofgem, 30 September 2020; Distribution Connection and Use of System Agreement (DCUSA) DCP359: Ofgem Targeted Charging Review (TCR) Implementation – Customers: Who Should Pay?', Ofgem, 30 September 2020; Connection and Use of System Code (CUSC) CMP334: Transmission Demand Residual - consequential definition changes (TCR)', Ofgem, November 2020; and Connection and Use of System Code (CUSC) CMP333: BSUoS – charging Supplier Users on gross demand (TCR)', Ofgem, 3 December 2020.
[8] For information on how the bands and the allocation of customers to the bands are worked out see section 3 of the TCR final decision document or documentation on the approved code modifications.

1.14. In December 2018, we launched the Future Charging and Access significant code review (Access SCR), which aims to ensure that the electricity networks are used efficiently and flexibly, reflecting users' needs, and allowing consumers to benefit from new technologies and services while avoiding unnecessary costs. To achieve this, the Access SCR is considering the following potential changes:

- connection boundary - reducing the extent that new or increased connections to the distribution networks are required to pay upfront for any reinforcement needed to connect them
- access rights – improving the choice of access rights for those connecting to distribution networks, by introducing options for time-profiled or non-firm access
- ongoing distribution charges – increasing the number of charging zones, enabling charges to reflect how costs, generation and demand loads and timing of local peaks vary
- transmission charges – introducing seasonal "triad" or having fixed periods for time of use charges and removing the cap at zero on charges for distributed generation.

1.15. Although we had intended to publish our minded-to consultation in early 2021, we decided to delay this to ensure our access reforms are aligned with the approach that will emerge from our work programme on full-chain flexibility. As noted in the Forward Work Programme 2021/22, we now plan to consult on an early 'minded to' position in the spring. We will feed our initial findings into our work with BEIS on the new joint Smart Systems and Flexibility Plan (to be published later this spring).

1.16. Collectively, these projects seek to enable more granular, more cost-reflective and more equitable signals to network users, including suppliers and ultimately consumers, for using the energy system. The projects do this by seeking to make better use of existing system assets, and ensuring the right signals are sent to electricity system users. The projects seek to facilitate a smarter, more flexible energy system which will incentivise behaviour that delivers a better outcome for the system and for consumers.

2. Economic Case

Section summary

This section, when read in conjunction with the Final Impact Assessment (**Final IA**) that we have published alongside this document, provides a detailed economic assessment of the option for market-wide half-hourly settlement (**MHHS)** we have chosen to implement. Our chosen option is based on the Design Working Group's Target Operating Model (**TOM**). Under this option, MHHS will apply to import- and export-related Meter Point Administration Numbers (**MPANs**) and the transition period will be 4 years and 6 months.

The Final IA sets out the impacts of introducing our chosen option for MHHS as compared with the counterfactual of retaining the elective half-hourly settlement (**HHS**) arrangements. We expect that our chosen option for MHHS will deliver net benefits for GB energy consumers in the range of £1,559m-£4,509m.

Here, we summarise the development of the Economic Case, including the Request for Information and the Draft IA on which we consulted, and we set out the changes that we made to our preferred option for MHHS as a result of stakeholder feedback.

Approach to the Economic Case

Development of the Economic Case

2.1. In our earlier Business Case documents we identified a range of potential policy options for achieving the objectives of the settlement reform programme. We appraised them using a mix of qualitative and quantitative assessment.[9] In the Outline Business Case (**OBC**), we presented a high-level draft economic assessment of the impact of MHHS compared to elective HHS (the counterfactual). The assessment outlined a strong benefits case for MHHS compared to the expected scale of costs, and indicated that Ofgem should focus on when and how to implement MHHS.

2.2. Consequently, in August 2019, we issued an extensive request for information (**RFI**) from a wide range of stakeholders. We did so in order to improve our understanding of the potential impact of introducing MHHS for import- and export-related MPANs over a period of 3, 4 or 5 years. We also used a GB power market model (the

[9] See project objectives and assessment options, Strategic Outline Case and Outline Business Case.

Dynamic Dispatch Model) to assess the long term potential benefits of implementing MHHS under a variety of different assumptions about fossil fuel prices and levels of load shifting. We also took account of benefits that are difficult to quantify, such as increased competition and innovation and improved quality of service that we expect would result from MHHS.

2.3. We used all these sources of data to inform our cost-benefit analysis. This enabled us to identify a 'preferred option', on which we consulted in our Draft IA. Having considered the responses to that consultation, and engaged further with relevant stakeholders, we made appropriate changes to our proposal. The economic assessment in our Final IA shows that our chosen option for MHHS optimises value for money and benefits for consumers.

Export-related MPANs

2.4. In the Outline Business Case we expressed the view that HHS of export on a market-wide basis would help to realise the full benefits of settlement reform.[10]

2.5. We also sought views on the costs, benefits, risks and opportunities of MHHS for export. We published the non-confidential responses, and a summary of them, on our website.[11] As noted above, our August 2019 RFI sought further evidence about the impact of MHHS for export- as well as import-related MPANs. Stakeholder feedback to the OBC and the RFI provided support for the view that MHHS should be introduced for export-related MPANs and on the same timescale as for import-related MPANs. Accordingly, this was a key element in the preferred MHHS option on which we consulted in 2020.[12]

2.6. In the Draft IA we reiterated our view that MHHS for export from installations smaller than 30kW would bring benefits including more accurate demand

[10] For details see pages 30-32 of the Outline Business Case.
[11] See Ofgem's response to feedback on the OBC, August 2019.
[12] See Ofgem's MHHS Draft IA.

forecasting, more accurate settlement and better network management. This would lower system costs and lead to lower costs for consumers.[13]

2.7. We noted that most RFI responses had not suggested that settling export MPANs half-hourly would impose significant costs (but acknowledged that this might not be the case for some independent suppliers). Taking all this into account, we made clear that our preferred option would require all export from small-scale installations[14] (including generation, energy storage and vehicle to grid (**VTG**)) to be settled, and settled on a HH basis, with the same transition period as for import-related MPANs.

2.8. Responses to the consultation indicated widespread support given the potential benefits that could be expected.[15] Many also expressed the view that transitioning import and export MPANs at the same time would be time- and cost-efficient. Some respondents raised concerns around the interaction with the FITs and Smart Export Guarantee schemes, and about the capacity of the SMETS1 to support MHHS for export.

2.9. Our Decision Document discusses our response to these concerns. Our view remains that the potential benefits of introducing MHHS for export significantly outweigh the costs. We have therefore decided that export-related MPANS should be within the scope of the reform. Our Decision Document sets out our reasoning in full.[16]

[13] Most small-scale exported volumes are spilled onto the distribution network without being metered. These volumes must still be accounted for in the settlement process. At present, they are allocated via the Grid Supply Point Group Correction process, potentially causing cross-subsidies that lead to inaccurate demand forecasting and, in turn, a requirement for network and generation investment that could be avoided were settlement allocations more accurate. If all export volumes were metered and settled half-hourly, electricity allocations would be more accurate and cost-reflective. Ultimately, this should reduce the need for additional upstream spending and enable a fuller realisation of the benefits of MHHS.
[14] Installations smaller than 30kW.
[15] See the responses to the consultation on the MHHS Draft IA, Ofgem, December 2020.
[16] See the Decision Document (this link is to all the MHHS documents published on 20 April 2021).

Summary of the Draft Impact Assessment[17]

Options

2.10. Ofgem has considered a wide range of potential options for reform as part of developing the Business Case.[18] Consistent with the Green Book guidance, we then analysed three representative policy options in depth in the Draft IA. Option 1 was to rely solely on the existing elective HHS arrangements. Option 2 was to introduce MHHS based on the Design Working Group's (**DWG's**) Target Operating Model (**TOM**) for all Meter Point Administration Numbers (**MPANs**) with a transition period of about 4 years up to the end of 2024. This was Ofgem's preferred option. Option 3 was to introduce MHHS based on the DWG's recommended TOM but only for import-related MPANs and with a longer transition period of about 5 years up to the end of 2025.

Costs

2.11. Costs in the Draft IA were derived from estimates provided by market participants for implementing and operating MHHS. Reflecting the uncertainty associated with trying to assess the impact of the changes, we presented a range of costs and said the central cost was our best estimate. For the period 2021-2045, the costs under option 2 ranged from £399.7m to £591.9m (in PV terms). The central estimate of total net costs was £492.5m (PV). For option 3, total net costs ranged from £380.6m to £560.6m with a central estimate of £467.7m (PV).[19]

Benefits

2.12. The Draft IA estimated the monetised direct benefits of MHHS using a GB power market model - the Dynamic Dispatch Model. Given the high levels of uncertainty about the technological, market and behavioural factors that will influence the

[17] Cost and benefit figures in the Draft IA were in 2019 prices unless stated otherwise. The net benefit figures in the Draft IA and summarised here are presented in Net Present Value (NPV) terms relative to the counterfactual. NPV was calculated using 2018 as the base year.
[18] For example, see the Project objectives and assessment options for the market-wide half-hourly settlement business case (September 2017) and the options framework diagram from it that we reproduced at page 91 of the Outline Business Case (August 2018). For the details of our decisions in relation to our chosen option for MHHS, see our Decision Document.
[19] For more detail see tables 21 and 22 on pages 85-86 of the Draft IA.

extent of future load shifting, we took a scenario-based approach. The monetised benefits included the benefits from load shifting by domestic and small non-domestic consumers under certain fossil fuel price and load shifting scenarios and sensitivities. We also tested various sensitivities, including narrower load shifting windows, a high carbon value scenario, and the benefits of load shifting on the distribution network (using the Distribution Network Model). The total monetised benefits of option 2 for consumers ranged from £1,200m to £5,050m (in PV terms).

2.13. The model enabled us to capture benefits such as

- generation and transmission network investment savings through better use of existing assets
- operational savings due to a reduced need to operate generation assets at peak time, and
- carbon emission savings, since the lower demand can be met with 'cleaner' generation.

2.14. The Draft IA quantified other benefits such as lower imbalance costs due to more accurate forecasting of supply and demand.

2.15. The Draft IA also noted that we expected MHHS to deliver other consumer benefits that we could not monetise, such as those arising from a more accurate and efficient settlement process. Moreover, the Draft IA set out our expectation that MHHS would encourage and enable greater competition and innovation. It noted that MHHS should enable non-traditional players with disruptive business models to enter the market and compete with existing suppliers. New entry and new price signals should stimulate an innovative response from those already in the market.

2.16. In addition, the Draft IA noted that MHHS should accelerate the growth of new energy 'tariff-only' propositions, third party managed energy services involving smart controls, and bundled 'asset and tariff' offering managed by the consumer or on their behalf. It should also offer consumers new ways to offer flexibility to the energy system such as peer-to-peer trading and grid balancing services. Making non-aggregated data available to industry in a manner compliant with data protection rules should stimulate innovation in value-added services and allow, amongst other things, better tariff comparisons. We were clear, though, that we could not yet monetise these benefits.

Net monetised consumer benefits

2.17. The Draft IA set out the net position for consumers of options 2 and 3 after taking account of monetised costs and benefits. MHHS under either option 2 or option 3 was expected to have a significant net benefit for consumers relative to the counterfactual.

2.18. Under option 2, these net benefits ranged from £1,607.5m (low load shifting) to £4,557.5m (high load shifting) under the central cost estimate (in NPV terms). Even the lowest benefit sensitivity scenario (low load shifting and a two-hour shifting window) showed substantial positive net welfare benefits relative to the costs, albeit by a significantly lower margin than our central estimate (central fossil fuel prices and an eight-hour shifting window). The net monetised benefits of option 3 were estimated to be £24.8m higher than under option 2.[20] The difference between the two options is largely explained by how we accounted for the different implementation periods under each option.

Updating the Impact Assessment

Key changes for the Final IA

2.19. Ofgem has decided to introduce MHHS based on the DWG's TOM for import- and export-related MPANs.[21] The substance of our proposal is, therefore, largely unchanged. The two main changes to the preferred option that we set out in the Draft IA relate to the length of the transition period and improved estimates for the costs of programme implementation. We also updated other cost estimates where new information became available, and accounted for potential optimism bias.

2.20. Our chosen option for MHHS includes a slightly longer transition period than we had previously thought necessary. MHHS will be implemented over a period of 4 years

[20] For more detail see table 23 on page 86 of the Draft IA.
[21] We considered two alternative TOMs that were put to us as part of the consultation on the Draft IA. We have assessed these proposals against a range of factors, including efficiency and cost effectiveness, the potential for flexibility, data quality benefits for settlement, and competition benefits. On that basis of that assessment, we have decided that it would be proportionate and beneficial overall to implement MHHS based on the DWG's TOM. For full details of our decision, and the assessment and reasoning for it, see our Decision Document.

and 6 months from April 2021 to October 2025. In making this change, we have taken account of stakeholder views about the inherent complexities of the transition, the need to avoid overstretching scarce industry resources (especially given the additional uncertainty caused by Covid-19), and the need to ensure that sufficient contingency is in place to deal effectively with any unanticipated difficulties that may arise during the transition.

2.21. We are adopting an industry-led approach to programme implementation. We have thought hard about incorporating the lessons from earlier industry change programmes and about how to avoid the problems that arose with their implementation.

2.22. The Decision Document sets out in full the reasons for these changes. The Commercial, Financial and Management Case sections of the FBC provide further details on our proposed approach and we shall be shortly issuing a consultation on these implementation and governance arrangements. Immediately below we summarise the other changes that we have made for the Final IA.

Monetised costs and benefits

2.23. In the light of consultation responses and further stakeholder discussions, we have made some changes to the estimated costs and benefits of introducing MHHS. This includes adjustments to correct for potential optimism bias, and an increase to the estimated costs of managing programme delivery.

2.24. These adjustments produce a net increase of just under £50m in the central estimate of costs (in PV terms). This increase, however, should be considered against the net benefits for our chosen option, which range from £1,559m-£4,509m (NPV). The change to the transition period means that those benefits cannot begin to be realised until late 2025. We have, however, taken a conservative approach in the Final IA by calculating the benefits from the start of 2026.[22]

[22] Following the publication of the Full Business Case, we will look further whether there are barriers to the use of elective HHS, what they are, and what could be done to remove them so as to bring forward some of the benefits of HHS before MHHS comes into force.

2.25. We have included commentary on the analytical approach followed in the Final IA for MHHS in relation to net zero scenarios. However, given the strategic role that MHHS will play in supporting the transition to a net zero carbon electricity system, we think that the right analytical approach is to test the value of the reform against a counterfactual that reflects current policies only, rather than using a counterfactual that assumes net zero targets will be achieved.[23]

2.26. We have also carried out an additional sensitivity analysis to estimate the benefits of MHHS assuming no load shifting from small non-domestic customers. To be clear, we do not regard this scenario as credible. Most of the dynamics that would trigger domestic demand-side response hold true for small-non domestic consumers. That said, we acknowledge that not all small non-domestic consumers will be able or willing to offer DSR and the assumptions we have made in the Final IA reflect this.

Net consumer impacts

2.27. The changes referred to above do not alter our conclusion that MHHS can be expected to produce substantial net benefits for GB consumers. This holds true even under our sensitivity testing scenarios.

2.28. The Final IA sets out the impacts of introducing our chosen option for MHHS as compared with the counterfactual of retaining the elective HHS arrangements. As noted above, we expect that our chosen option for MHHS will deliver net benefits for GB energy consumers in the range of £1,559m-£4,509m (NPV).

2.29. We have also set out, in section 6 of the Final IA, the best information we have about the potential distributional impacts of MHHS. This includes the results from analysis considering the distributional impacts on household energy bills of both taking up specific ToU tariffs and the system-wide benefits of introducing MHHS.

[23] The UK has made significant progress in decarbonising the economy. However, significant challenges remain if we are to continue on the path to meet our 2050 net zero goals. Ofgem is working closely with the Government industry and wider stakeholders to help the UK make the transition to net zero at the lowest cost to consumers. Ofgem's Forward Work Programme 2021/22 sets out key strategic programmes to help deliver this transition.

Nevertheless, we recognise that MHHS will present different opportunities and risks for different sets of consumers.

2.30. We have set out in our Forward Work Programme 2021/22 that we will deliver a future retail market with innovative new retail products that, for example, enable consumers to benefit from the flexibility they can provide, while ensuring protections are in place for all. We are currently developing our future of retail Strategic Change Programme with a high level objective (amongst other things) of an energy transition that works for all energy consumers, harnessing innovation and flexibility, with effective protection for consumers.

Risks, assumptions and monitoring

2.31. Section 7 of the Final IA sets out the risks that we have considered and the assumptions that we have made in assessing the impact of introducing MHHS. It also summarises our intentions for monitoring MHHS and post-implementation review. In response to stakeholder feedback on that section of the Draft IA, we have added material on the relationship between smart meter penetration and the potential benefits of MHHS. Stakeholders should be aware that we took a consciously conservative approach in relation to our lower bound load shifting scenario to account for uncertainties.

3. Commercial Case

Section summary

The commercial case sets out how we will ensure the industry is able to deliver Market-wide Half-hourly Settlement (**MHHS**) to the implementation timeframes specified.

As the industry will be leading MHHS implementation, this section provides more information about its capacity and capability to do so. It also sets out what further work industry, and particularly Elexon, ought to undertake to mobilise the resources to implement MHHS. We also say more about how to address lessons learned from previous major change programmes such as Project Nexus.

Availability of capability and capacity for implementation

3.1. In our June 2020 consultation on the Draft IA, we outlined a number of roles and capabilities[24] that will be required during the transition period for MHHS. These were the Programme Management Office (**PMO**), System Integrator (**SI**), Programme Party Co-ordinator (**PPC**), and Independent Assurance functions. Most respondents to that consultation agreed that we had identified the correct implementation roles to deliver the MHHS programme successfully.[25]

3.2. In our January 2021 consultation on programme implementation principles, we set out our plan to place clear responsibility on industry for management and delivery of the programme. We are developing implementation arrangements accordingly.

3.3. This approach will give industry more control over implementation, drawing on its deeper knowledge of, and expertise with, industry systems and processes, as well as allowing industry to take greater ownership of the reforms. Recognising its existing role in relation to settlement as the Balancing and Settlement Code (**BSC**) code manager, Elexon will act as Senior Responsible Owner (**SRO**) for the programme.

3.4. Elexon, in its capacity as SRO under the industry-led implementation model, will be responsible for the PMO, PPC and SI roles. Ofgem will run the procurement for the

[24] See paragraphs 9.10-9.13 of the consultation on the MHHS Draft IA for details.
[25] See the summary of responses in appendix 1 of our January 2021 Consultation.

Independent Assurance function, although once the successful bidder has been appointed, the contract management will be delegated to Elexon.

3.5. All competitive procurement will be carried out with particular regard for the total cost to industry. Further discussion of procurement will be provided in our consultation on implementation and governance arrangements.

Commercial Management

3.6. Elexon will manage the contracts with all service providers it has procured, in line with its normal commercial practices and subject to standard BSC financial and commercial governance. Elexon will be expected to ensure that all of its service providers are able to operate in accordance with the governance structures for MHHS implementation, and to ensure successful and effective implementation in accordance with the timetable – see the Management Case for more information on governance.

3.7. The Independent Assurance provider will use assurance reviews to identify when any of the central programme functions, including Elexon and its service providers, or any of the programme parties, are failing to support the implementation of MHHS effectively by meeting their obligations, and to report to programme governance on their findings. This reporting mechanism would include making recommendations on any remedial action the Independent Assurance provider considers is needed by the relevant parties.

Lessons learned from previous change programmes

3.8. In our Outline Business Case in 2018, we set out that we intend to use the lessons learned from other industry change programmes, including settlement reform for Profile Classes 5-8 (P272) and Gas Settlement Reform (Project Nexus) to investigate issues that may arise during the transition to market wide half hourly settlement.[26] We have since conducted further work to determine which issues that occurred

[26] The Outline Business Case can be found on the Ofgem website.

during P272 and Nexus would potentially also occur as part of the transition to MHHS, and how these can potentially be mitigated.

Settlement reform for Profile Classes 5-8 (P272)

3.9. The issues identified by stakeholders as occurring during the implementation of P272, which could also potentially occur during the implementation of MHHS, fell into two main categories: issues identified as part of the migration processes, and overarching programme governance issues.

3.10. Of the issues stakeholders identified as part of the migration, we consider the change of measurement class process, potential large increases in charges when a customer becomes HH settled, and issues with advanced meters that had communication failures as being issues that could potentially arise as part of MHHS. We intend to address these potential issues in the following ways:

- **Change of Measurement Class** – The Code Change Development Group's (**CCDG's**) detailed design recommendations include removing both Measurement Classes and Profile Classes and replacing them with Consumption Component Classes (**CCCs**) aligned with the TOM Market Segments. While the new CCCs will need to be populated as part of the transition, they will not change when the supplier migrates the MPAN. We believe this mitigates the risk of seeing change of measurement class issues arise for customers in Profile Classes 1-4 as part of the MHHS transition
- **Charge increases for some formerly NHH customers** – To mitigate the risk of this issue occurring in network and transmission charging as part of the transition to MHHS, we have worked with industry so that plans will be created for allocating customers to the Targeted Charging Review (**TCR**) charging bands during the transition
- **Advanced meters with communication issues** – the Target Operating Model (**TOM**) for MHHS can accommodate meters without working communications systems through estimation and load shaping processes. Ultimately this means that advanced meters where communication can never be established or repaired will be treated like traditional meters in the smart and non-smart segment. While we would like as many as possible of these meters to provide HH data, the CCDG will make a recommendation to Ofgem in summer 2021 on whether the transition for the advanced segment includes a step to try and

ensure communication is established for as many advanced capable meters as possible.

3.11. Of the issues identified as part of programme governance, we consider that issues could potentially arise around the implementation timetable not being met and sanctions on parties for non-compliance not being effective as part of MHHS implementation. We intend to address these potential issues through regulatory obligations and incentives on relevant parties – see the Management Case below. We will also use the commercial management actions described above to ensure that an effective programme governance structure is maintained in order to manage issues that arise.

3.12. We expect Elexon, as SRO, to use its experience with P272 to ensure the risk of the identified issues occurring are mitigated. As part of the governance structure we are suggesting the creation of a cross-code body collaboration forum which should help address some of the inter-code communication and cooperation issues

Project Nexus

3.13. The issues identified as occurring during the implementation of Project Nexus, that could potentially occur during the implementation of MHHS were poor communication between industry and XoServe and issues around a lack of internal testing by parties before integration testing began.

3.14. The potential for communication issues between Elexon and wider industry will be mitigated through the governance arrangements we intend to set up, including an Independent programme Assurance function and incentives on Elexon to collaborate and engage effectively with industry – see the Management Case. The governance arrangements also include the SI and PPC roles, which are responsible for ensuring that parties develop clear test plans against which their progress will be monitored.

Switching Programme

3.15. Whilst it is too early to identify all the lessons to be learned from the Switching Programme, we have identified a number of issues that may help with MHHS implementation:

- **The importance of establishing a credible plan which includes an appropriate level of contingency**. Whilst no-one could have foreseen the impact of the Covid-19 crisis, the Switching Programme re-plan last year has helped to build confidence in the programme. For MHHS, we have scheduled in a plan review in October 2021, once all the central programme service providers are in place, to ensure that the plan remains robust,
- **The value of independent assurance**. A strong Independent Assurance function in the Switching Programme has been very valuable both in making constructive recommendations to address areas of risk and uncertainty in implementation and in providing confidence to programme parties that progress is being accurately reported and the programme is on track. We are proposing a strong Independent Assurance function for MHHS to ensure that accurate information and advice is being provided into governance, and so that all parties, including Ofgem, can have confidence in progress reporting,
- **Managing the burden of governance**. Whilst the Switching Programme governance process provides a high level of transparency for all parties and ensures that all voices can be heard within the programme, it is resource heavy to run and places relatively heavy burdens on programme parties. We have tried to propose a governance structure for MHHS that has the advantages of the Switching Programme governance but with less of the burden.

Elective Half-Hourly Settlement

3.16. In the OBC, we said supplier incentives under the elective arrangements were unlikely to be strong enough to facilitate a transformational shift in consumption patterns. Developments in the market since then, together with the evidence submitted to us by stakeholders, have only confirmed that view and strengthen the case for MHHS. Having said that, some stakeholders did identify specific issues with the elective arrangements that could be improved so as to increase their attractiveness. These are outlined in the Final IA.

3.17. Consequently, following the publication of the Full Business Case, Ofgem will be looking at whether there are barriers to the use of elective HHS, what they are, and what could be done to remove them so as to bring forward some of the benefits of HHS before MHHS comes into force. In the meantime, we have already learned from our stakeholder engagement during the implementation of elective HHS, and made use of some similar communication tools such as our monthly newsletter and working group issues tracker.

4. Financial Case

Section summary

This section sets out our approach to cost control and recovery across the programme. The majority of implementation costs will fall on industry participants as they make changes to their own systems and processes. We expect all parties to meet their own costs, other than in relation to the central programme costs. Where costs are incurred by bodies funded by industry, these costs will be managed via those bodies' usual budgetary and governance processes.

Ofgem has approved the P413 alternative code modification proposal. This modification provides that MHHS programme management costs will be recovered from suppliers only by market share through a new Specified BSC Charge.

Financial costs of implementing MHHS

4.1. The MHHS Programme will impose costs on a wide range of parties. In our Outline Business Case **(OBC)** we provided an update on the resource implications of supporting phase 1 of the TOM design work, from an Ofgem, Elexon and DWG member perspective. Below we outline the costs we expect parties to incur for delivering MHHS.

Central programme management costs

4.2. In our June 2020 consultation, we proposed that central implementation management costs would be met by BSC parties under the current funding structure. As set out in our Decision Document, there was strong agreement from respondents that this funding approach would be appropriate.

4.3. In August 2020, a new BSC code modification (P413) was raised by Scottish Power. The purpose of this code modification was to require Elexon, as the BSC Company (**BSCCo**), to provide Programme Manager services for implementing MHHS, with overall accountability to Ofgem for its performance. The purpose of the modification was subsequently amended on initial assessment by a workgroup to enable Elexon to do so. The modification also addresses the cost recovery mechanism for the programme management costs of MHHS implementation in the event that Elexon fulfils this role.

4.4. The original modification proposal proposed to use the Main Funding Share[27] mechanism for spreading the programme costs across BSC Trading Parties. However, following completion of the P413 assessment, the P413 Workgroup, by a majority, recommended approval of an alternative P413 modification. The alternative modification differs from the proposed modification only in so far as it will recover Elexon's ongoing costs in providing MHHS Implementation Management services solely from suppliers by market share calculated by number of meter points (through a new Specified BSC Charge).[28] A majority of the BSC Panel recommended approval of the P413 original proposal and a minority recommended the alternative.

4.5. Ofgem has approved the P413 alternative code modification proposal. For further information see Ofgem's P413 Decision Letter, which we have also published today.[29]

4.6. Elexon has provided programme management cost estimates for the implementation phase of MHHS. For the central cost estimate in our Final IA, we have adjusted these costs by 10% to take account of potential optimism bias. We therefore expect them to be in the order of £90m (in 2020 prices). These estimated costs correspond to the resourcing and procurement of the four previously identified implementation roles (PMO, System Integrator, Programme Party Coordinator and Independent Assurance Function) and they take into account the ramp up and ramp down periods in the early and latter stages of the transition.

Costs impacted by programme decisions but not within programme control

4.7. All other parties participating in the programme are responsible for how best to manage their own costs. Existing system providers have their own governance mechanisms for ensuring cost control. We expect those mechanisms to be used in order to ensure that costs incurred in delivering MHHS outcomes are proportionate

[27] A BSC Party's Main Funding Share is its energy volume as a percentage share of total energy volumes across all Parties paying the Main Funding Share. The Main Funding Share is paid by various BSC Parties. Around 60% of costs recovered using the Main Funding Share comes from suppliers and around 40% from generators. There is more information in the P413 Final Modification Report.
[28] The proposed new BSC Specified Charge would be levied on a monthly basis per Supplier Volume Allocation (SVA) metering system registered to each supplier. Elexon calculated the implementation costs for the new BSC Specified Charge to be £50-60k, to be recovered using the Main Funding Share mechanism.
[29] Our decision on BSC modification P413 is on the Ofgem website.

and efficient. Licensed parties will be responsible for managing their own costs efficiently to meet their obligations.

4.8. We recognise that decisions taken within the MHHS programme, for example in relation to design or timing, may have cost implications for licensed parties. It will be for the parties potentially affected by those decisions to identify and quantify the impacts of them. In making such decisions, we expect the Programme Manager to take appropriate account of the costs as well as the benefits. We will be consulting shortly on the implementation and governance arrangements for the remaining, implementation, stage of the project. Our proposals for the key principles for the governance framework are given in the Management Case below, including a requirement that the overall costs of the programme should not escalate unless the impact assessment for the proposed change shows a net benefit from proceeding with it and that any material increase in costs would require Ofgem approval.

4.9. We recognise that electricity suppliers are currently subject to a default tariff price cap. The price cap is set at a level explicitly intended to cover regulatory costs such those relating to the implementation of MHHS. However, if a supplier subsequently considers that the cap level is proving insufficient to take into account the costs of MHHS, it may make representations to the price cap team. In so doing, the supplier should explain why MHHS has led or is leading to a material increase in its operating costs, and why this increase would not be covered by the existing cap allowances, bearing in mind our stated position in relation to potentially offsetting cost trends.

Costs subject to price control

4.10. The Data Communications Company (**DCC**) maintains the national infrastructure that connects smart meters to industry users such as suppliers and network operators, under licence. One of the DCC's key responsibilities is to effectively manage its external contracts and ensure value for money and good quality service. It is important that we hold DCC to account for its costs, which are ultimately passed on to consumers. DCC is subject to an annual ex post price control to ensure its Internal and External Costs were incurred economically and efficiently.

4.11. The ex post framework requires DCC to submit price control information to Ofgem by 31 July after the end of each Regulatory Year. This information includes reporting on incurred costs during the Regulatory Year and updated forecasts for DCC's costs over the licence period. We expect DCC to demonstrate through its reporting that it

has incurred all costs as efficiently and economically as possible, and that updated forecasts only contain economic and efficient costs. The Licence defines "Unacceptable Costs" as any External or Internal costs that we consider were not economically and efficiently incurred in the Regulatory Year. If we identify such Unacceptable Costs in our price control assessment, we will consider whether to direct that they should be excluded from any future calculation of DCC's allowed revenue. These decisions are reconciled with the revenue DCC receives through adjustments in its charging statement to users in subsequent years.

4.12. As with all significant new programmes, DCC will be required to develop a business case in advance which is then reported against at programme level. Aspects of these reports should be made available to the relevant programme governance groups during the design, build and testing phase. This reporting should include progress against time, cost and quality for DCC's identified deliverables and activities. This is with the aim of making costs incurred, and cost changes relative to the baseline, more visible. For price control purposes, we will review DCC's MHHS implementation costs to ensure they have been incurred economically and efficiently after the end of the regulatory year and make decisions on its allowed revenue. For the implementation phase of MHHS this will be done against a zero baseline basis, meaning that all costs should be justified.

Code administrator costs

4.13. Electricity settlement processes are set out in the relevant industry codes, most notably the Balancing and Settlement Code (**BSC**) but also the Retail Energy Code (**REC**), the Smart Energy Code (**SEC**), the Distribution Connection Use of System Agreement (**DCUSA**), and the Connection and Use of System Code (**CUSC**). These codes place specific requirements on all relevant parties as to what information must be provided by whom, where, how and when it must be transmitted and how that information is to be processed.

4.14. Implementing MHHS will require significant changes to those data flows and processes. The changes will be achieved through the introduction of substantive changes to the BSC and supporting changes to the REC, SEC, DCUSA and CUSC. Those changes are currently being developed, consulted on and drafted in an industry process led by Elexon, with input from the other affected code bodies.

4.15. The industry-funded bodies that administer changes to those codes (respectively Elexon, Gemserv, ElectraLink and National Grid Electricity Transmission) will incur costs related to the administration of these MHHS-related changes. Some may also incur costs related to system changes that may be required. We expect that these costs will be managed through the code bodies' normal budgetary processes and subject to their normal governance arrangements.

Costs within Ofgem control

4.16. Costs incurred directly by Ofgem as part of our ongoing Programme Sponsorship are wholly within our control. We will set clear budgets in relation to those costs and manage to those budgets. Internal Ofgem costs will be managed and reported on internally.

4.17. Ofgem will incur transitional costs of continuing to sponsor the programme through to its conclusion. We have estimated the costs over the transition period, including an extra year of ramp down period, to be £1.6m (in 2020 prices).

5. Management Case

Section summary

This section sets out our position on the governance arrangements for ensuring timely and effective implementation of robust Market-wide Half-Hourly Settlement (**MHHS**) arrangements. We discuss the industry-led implementation approach, with Elexon as Senior Responsible Owner (**SRO**), and describe its implications for the key parties involved in MHHS programme implementation. Further details about programme governance will be developed through our forthcoming consultation.

We also say more about the legal powers we have at our disposal to change relevant licences and industry codes that can facilitate successful implementation of MHHS.

Management Strategy

5.1. In our Outline Business Case (**OBC**), we highlighted that implementing MHHS would involve changes to both systems (central and market participant systems) and market rules (licences and codes).

5.2. Detailed work on the revised settlement arrangements (the Target Operating Model (**TOM**)) has been under way since the Design Working Group (**DWG**) submitted its final report to Ofgem in August 2019. This work has been undertaken by industry expert groups chaired by Elexon. The Architecture Working Group (**AWG**) has focused on system changes needed for MHHS implementation. A Code Change Development Group (**CCDG**) has developed the more detailed design of the TOM and outlined the potential code changes required. Both the AWG and CCDG are continuing their developmental work.

5.3. The programme is moving from the policy design stage to the implementation phase. We intend that Ofgem will now step back from day-to-day leadership of the programme but will retain the Programme Sponsor role. Accountability for implementation of MHHS will move to industry. Elexon, as Balancing and Settlement Code (**BSC**) manager, will be the SRO, responsible for the central management and governance of the programme.

5.4. We will be consulting shortly on the governance and implementation of MHHS. This will include further detailed arrangements for the governance of MHHS implementation, including the governance structures and processes, the obligations

to be placed on parties to ensure effective and timely implementation of MHHS, the requirements for independent assurance and Ofgem's role as Programme Sponsor and the thresholds for our intervention. This document describes each of these areas at a high level for information.

Transition Timeline

5.5. Elexon will be taking forward the transition timeline as set out in our Decision Document. This forms a baseline for the timetable that Elexon will take forward and industry will deliver against. Under this timeline, the transition begins on publication of our Full Business Case in April 2021 and ends in October 2025. The transition timeline, detailing the main milestones (including Level 1 programme milestones), activities and the critical path, is set out in the Decision Document.[30]

5.6. The timeline shows a scheduled review of the plan in October 2021, when the Elexon-led delivery functions and independent assurance provider are in place. Any changes recommended as part of that review (or subsequent changes proposed) would have to be approved through the programme governance outlined below, and to be set out in more detail in our upcoming consultation. If a recommended change meets the threshold for Ofgem intervention – proposed to be a 3 month delay to any Level 1 programme milestone - it would be subject to Ofgem approval.

5.7. The transition timeline has taken into account the consultation responses to our Draft Impact Assessment (**IA**) consultation. It has been reviewed by independent consultants, and has been discussed and validated with a broad sample of representative stakeholders. The timeline represents our best informed expectations on what can realistically be delivered by the industry. For more information see section 5 of the Decision Document.

Governance arrangements for the implementation phase

5.8. In our Draft IA consultation, we set out our expected approach to the management of the implementation phase of the programme. We articulated a number of objectives to be met by implementation management, and set out a number of

[30] See Figure 1 at the end of section 5 of the Decision Document.

programme roles that we thought should be established to support the effective implementation of the programme. We also said that Ofgem would remain both Programme Sponsor and the programme SRO.

5.9. In January 2021, we published a consultation document that stated that we had reflected further on the requirements for implementation and had considered responses to the implementation management questions in the Draft IA consultation. As a result, we said that we plan to place clear responsibility for management and delivery of the programme with industry, and that we would be developing implementation arrangements accordingly. This industry-led approach will give industry more control over implementation, drawing on its deeper knowledge of, and expertise with, industry systems and processes, as well as allowing industry to take greater ownership of the reforms.

5.10. As noted above, in recognition of its existing role in relation to settlement as the BSC code manager, Elexon will act as SRO for the programme. Elexon will therefore be responsible for establishing, operating, and managing appropriate programme structures and governance in a manner that ensures timely and effective implementation of MHHS. This is discussed at paragraphs 8.2-8.6 of the Decision Document.

Governance

5.11. We have also been further developing our thinking on governance and assurance, and we will set out the detail of our proposals in our upcoming consultation. Here we set out the principles that we will apply to the governance of MHHS.

5.12. We also consulted on the range of challenges and risks associated with industry taking leadership of the implementation.[31] We intend to say more about the governance and other requirements on parties that should address those challenges, and mitigate those risks, in the further consultation that we will publish shortly.

[31] See our January consultation for details.

Roles and responsibilities

5.13. Ofgem will remain as the Programme Sponsor for MHHS implementation. This will ensure that we remain properly accountable for successful delivery of the key MHHS programme objectives. There may be situations in the future where our further involvement is needed in MHHS implementation even as industry retains ownership of the programme. In our forthcoming consultation on the governance arrangements, we will set out our proposals as to when and how Ofgem may intervene in the implementation programme in order to ensure full and timely delivery of the programme objectives. Examples of some of the key principles that we will propose in our consultation are:

- Design Baseline (the TOM): If there is a material or fundamental change proposed to the design baseline set out in our Decision Document, for example a change that materially alters what the TOM services are responsible for, or who can carry them out; a change to any of the policy decisions made on access to data or agent functions; or a change to the settlement timetable.
- Costs and benefits: The overall costs of the programme should not escalate unless the impact assessment for the proposed change shows a net benefit from proceeding with it. We will propose that a significant proposed or forecast shift in either costs (materially higher) or benefits (materially lower) than our Final Impact Assessment suggests should require Ofgem approval.
- Transition Timetable: Where significant delays to planned implementation are experienced or forecast. Specifically, we will propose that any proposal to move one or more of the Level 1 programme milestones identified in the Transition Plan[32] by 3 months or more should require Ofgem approval.
- Impact on competition or market stability and conflict of interest: We will propose that the Independent Assurance Provider (**IAP**) will be responsible for identifying and reporting on these issues (which may be brought to their attention by parties). Where the IAP considers the issues are material, they should be able to bring them to Ofgem for consideration.
- Consumer Impact: We will propose that the IAP will be responsible for identifying and reporting on these issues where it appears that the design process is not

[32] The Level 1 Programme Milestones are identified in red in Figure 1 of the Decision Document. The Programme Milestone descriptions and written identification of the Level 1 Programme Milestones can be found in appendix 1 of the Decision Document.

taking proper account of the interests of end consumers, or a change would have a material impact on consumers. (These issues may be brought to their attention by stakeholders). Where the IAP considers the issues are material, they should be able to bring them to Ofgem for consideration.

Assurance Function

5.14. Ofgem has always stipulated that the assurance function must be wholly independent, irrespective of which implementation model is adopted. We believe that robust independent expert assurance is essential to build participants' confidence in the programme, and to ensure trust in the operation of the governance process and the decisions made by governance. The objectives for the assurance provider will include verifying that the governance processes are adequate to support the requirement for well-informed and fair decision making and that they are operated appropriately.

5.15. We will set out the assurance principles in our forthcoming consultation and these will be the basis upon which procurement for the IAP will be founded. In the light of feedback to the January consultation, we propose that Ofgem will carry out the procurement of the assurance function.

Independent Assurance Assessment of Elexon implementation capability

5.16. Responses to our June 2020 consultation highlighted that some stakeholders had concerns with Elexon's capabilities, capacity, ability to manage conflicts of interest and incentives on Elexon for programme implementation success. To that end we set out in our January 2021 consultation that in order to provide additional confidence to all parties, including programme participants, an independent assurance assessment would be commissioned to look at Elexon's plans for leading the programme implementation.

5.17. This assessment was to look specifically at Elexon's capacity and capability in relation to their plans as the MHHS Programme SRO for which they will be responsible, and to make recommendations for change or strengthening capacity or capability, if appropriate. It also considered how Elexon will avoid any conflict of interest within the Programme Manager roles and between being the Programme Manager and delivering central system changes. The assessment also looked at how Elexon is incentivised to ensure that the programme is successfully delivered.

Future modification of licences and industry codes

5.18. As described above, giving industry the leading role in implementing MHHS has implications for the Significant Code Review (**SCR**) process that we used to launch market-wide settlement reform in July 2017. In our upcoming consultation, we will say more about these potential implications and also about the use of the Smart Meters Act (2018) powers we were given for MHHS.[33]

5.19. As this consultation will also provide more detail about the arrangements for governance and management of MHHS implementation, we intend to set out our further views about what code changes may be needed to obligate relevant parties (Elexon, BSC parties and their agents, and the DCC) to operate in accordance with the governance and management of MHHS implementation. We expect to consult on the text of those obligations, including what is expected of parties to cooperate with programme assurance.

5.20. We will also discuss our approach to using licence obligations in the future, and our approach to the implementation of substantive code changes, such as those being developed by the CCDG. The CCDG is currently working towards a package of redlined changes. Specifically, it is developing further detailed areas of the TOM design and assessing the impact on industry codes. It issued an initial consultation in December 2020.[34] Our aim is to make appropriate and timely changes to licences and industry codes to ensure implementation milestones are met. For our proposed next steps on this, see section 10 of our Decision Document.

[33] Our launch statement (July 2017) set out our plans for using an SCR Option 3 (Ofgem-led end-to-end) process. The Smart Meters Act 2018 provides Ofgem with powers to amend industry codes and licences to enable MHHS using customers' half-hourly actual consumption data.
[34] For more detail see the CCDG consultation on MHHS.