

## Regulatory treatment of Customer Load Active System Services as a balancing service in the RIIO-ED2 price control

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In March 2022, we published a consultation (2022 Consultation) and impact assessment (IA) on the regulatory treatment of Customer Load Active System Services (CLASS) as a balancing service in the RIIO-ED2 network price control.

This document summarises the responses to our 2022 Consultation. It also sets out the rationale for our decision to implement CLASS in RIIO-ED2 by allowing Distribution Network Operators (DNOs) to offer CLASS to National Grid Electricity System Operator (ESO) in a competitive market and for it to be included under Directly Remunerated Services (DRS). This represents a continuation of the current regulatory treatment in RIIO-ED1.

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## Executive summary

Our<sup>1</sup> vision is for a secure, affordable, net zero system where all connected resources can flexibly respond to available energy and network capacity. The Department for Business, Energy and Industrial Strategy (BEIS) and Ofgem’s Smart Systems and Flexibility Plan 2021 outlined that the UK could need around 30GW of low carbon flexibility by 2030, and 60GW by 2050, to deliver a fully flexible system and bring more low carbon generation online while simultaneously keeping costs down for all consumers.<sup>2</sup>

In response, Ofgem is committed to enabling Full Chain Flexibility<sup>3</sup> by reforming markets and institutions to remove barriers to flexibility and ensure it is appropriately rewarded. In the near future, we intend to engage with industry on the future vision for flexibility by setting out forward options for feedback, including the Flexibility Exchange concept for distributed energy resource (DER) and energy services that will encourage deep, consecutive, concurrent markets for different products.

Ofgem’s principal objective is to protect the interests of Great Britain's (GB) existing and future energy consumers. Recent events have reinforced the need to keep costs down, while ensuring the ESO has access to a broad range of tools to keep the electricity system operating securely. System balancing costs have risen 98% year-on-year between 2021/2022 and 2022/2023<sup>4</sup> and electricity system security has become an increased area of focus. This context heightens the importance of us considering the full range of innovations that can deliver cost-effective flexibility.

Distribution network voltage control services are one among a suite of technologies that the ESO can use to balance the system. These services are commonly referred to as CLASS. CLASS can only be provided by DNOs as it requires the use of existing distribution network assets, although the companies do have to invest in separate technology, software and expertise to deliver the service. Since 2016, DNOs have been allowed to offer CLASS to the

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<sup>1</sup> References to the “Authority”, “Ofgem”, “we” and “our” are used interchangeably in this document. The Authority refers to GEMA, the Gas and Electricity Markets Authority. The Office of Gas and Electricity Markets (Ofgem) supports GEMA in its day to day work. This decision is made by or on behalf of GEMA.

<sup>2</sup> [BEIS & Ofgem \(2021\), Transitioning to a net zero energy system: Smart Systems and Flexibility Plan 2021](#)

<sup>3</sup> [Ofgem \(2022\), 2022/23 Ofgem Forward Work Programme](#)

<sup>4</sup> [National Grid ESO, Monthly Balancing Services Summary \(MBSS\), April 2022 and August 2022](#)

ESO<sup>5</sup> and, for the past four years, one DNO has used CLASS to participate across three balancing service products.<sup>6</sup>

In deciding the regulatory treatment for CLASS in RIIO-ED2, we initially consulted in February 2020 (2020 Consultation) and then again in March 2022<sup>7</sup> with a supporting IA<sup>8</sup> that included a detailed assessment of the costs, benefits and wider impacts of CLASS.<sup>9</sup> On both occasions, we put forward four options for consideration and set out our minded-to position to continue to allow DNOs to deploy CLASS in the competitive market for balancing services, with the relevant costs and revenues reported through Directly Remunerated Services Category 8 (DRS8).

After careful consideration of all the responses to both of our consultations, we have decided to implement our minded-to position to continue to allow DNOs to provide CLASS to the ESO as a balancing service. In RIIO-ED2, these services will once more be remunerated through DRS8.<sup>10</sup>

We consider that CLASS is one of the many low cost, low carbon and reliable technologies that will be needed to meet the ESO's future balancing service requirements. Across GB, we believe there is potential to invest in around 3GW of flexible demand reduction through the use of CLASS, which could unlock consumer benefits of up to £1.8bn in net present value (NPV) terms.<sup>11</sup>

Through DRS8, DNOs will be incentivised to deploy CLASS only when there is a strong investment case, and increased competition in the balancing services market should help to

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<sup>5</sup> [Ofgem \(2016\), CLASS DRS8 Direction to DNOs](#)

<sup>6</sup> Electricity North West Limited (ENWL) has deployed CLASS in balancing services including Fast Reserve, Optional Fast Reserve and Secondary Static Firm Frequency Response.

<sup>7</sup> [Ofgem \(2022\), Regulatory treatment of CLASS as a balancing service in RIIO-ED2 network price control](#)

<sup>8</sup> [Ofgem \(2022\), IA - Regulatory treatment of CLASS as a balancing service in RIIO-ED2](#)

<sup>9</sup> [Ofgem \(2020\), Regulatory treatment of CLASS as a balancing service in RIIO-ED2 network price control](#) and [Ofgem \(2022\), Regulatory treatment of CLASS as a balancing service in RIIO-ED2 network price control](#)

<sup>10</sup> As set out in more detail at paragraphs 3.48 and 4.2 – 4.3 of this decision, Ofgem is minded to remunerate CLASS through a new purpose-made Directly Remunerated Services ("DRS") category (DRS 16) from the start of the RIIO-ED2 period on the basis that DRS16 would operate in an identical way to DRS8 with regard to remuneration, but would provide additional transparency due to how the CLASS costs must be shown i.e. the revenue from CLASS would be reported separately from other DRS8 activities. For the purposes of this decision, DRS8 and DRS16 should be used interchangeably, and both correspond to Option 1A. We do not repeat this footnote for every instance in which DRS8 is mentioned and would instead ask that our minded to-position as regards DRS16 in RIIO-ED2 is borne in mind throughout this decision document. Please note that our final decision on this matter is of course subject to our decision on the licence modifications to be made to the electricity distribution licence following the statutory licence consultation for RIIO-ED2.

<sup>11</sup> [Ofgem \(2022\), IA - Regulatory treatment of CLASS as a balancing service in RIIO-ED2, p. 8](#)

bring down market prices.<sup>12</sup> We also believe that there should be transparency around how and when CLASS is deployed, which is why we think it should compete in a market rather than be mandated through a code modification to the Grid Code or by some other means.

Our 2022 Consultation received a total of 20 responses with 10 of those in favour of our minded-to position of allowing CLASS under DRS8, 1 recommending we mandate the use of CLASS through the price control and 9 proposing that we should prohibit the use of CLASS as a balancing service entirely. We published non-confidential responses on our website.<sup>13</sup> We also conducted additional stakeholder engagement to further understand the views held by DNOs, the ESO, consumer groups, industry associations and other market participants.

Stakeholders supporting our minded-to position recognised that CLASS is a low cost, low carbon innovation that will reduce consumer bills and strengthen electricity system security. Those against the minded-to position expressed concerns about the longer-term impact on investment in other sources of flexibility and the continued prospect of DNOs operating in competitive markets. We believe these concerns are overstated, and we were not provided with any evidence to demonstrate that the direct and indirect costs of CLASS would outweigh the considerable consumer benefit we found in our IA.

Consistent with our ongoing review of the next network price control<sup>14</sup>, we expect to consult at the mid-point of RIIO-ED2 on the sector specific methodology for the subsequent electricity distribution network price control. We believe this to be an appropriate time to review the deployment of CLASS and assess whether any changes are required to its future regulatory treatment as a balancing service.

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<sup>12</sup>[Ofgem \(2022\), IA - Regulatory treatment of CLASS as a balancing service in RIIO-ED2, paragraph 6.72](#)

<sup>13</sup>[Ofgem \(2022\), CLASS 2022 Stakeholder Consultation Responses](#)

<sup>14</sup>[Ofgem \(2022\), Open Letter on the next network price control review process](#)

## 1. Introduction

### Context and related publications

- 1.1. Our vision is for a secure, affordable, net zero system where all connected resources can flexibly respond to available energy and network capacity. We want to be able to take advantage of a fully flexible system to bring more renewable generation online, while simultaneously keeping costs down for all consumers.
- 1.2. Ofgem’s principal objective is to protect the interests of existing and future energy consumers in GB. We do this by:
  - Working with government, industry and consumer groups to deliver a net zero economy, at the lowest cost to consumers
  - Ensuring fair treatment for all consumers, especially the vulnerable
  - Enabling competition and innovation, which drives down prices and results in new products and services for consumers.
- 1.3. Recent events have reinforced the need to keep costs down, while ensuring the ESO has access to a broad range of tools to keep the electricity system operating securely. System balancing costs have risen 98% year-on-year between 2021/2022 and 2022/2023 and electricity system security has become an increased area of focus. This context heightens the importance of us considering the full range of innovations that can deliver cost-effective flexibility.
- 1.4. DNOs can provide network voltage control and network management services via the remote management of deployed network assets. These services are commonly referred to as CLASS. In RIIO-ED1, DNOs have been permitted to sell CLASS to the ESO in the competitive market for balancing services. More information about balancing services, procurement processes and market information can be found on the ESO’s website.<sup>15</sup>

### Associated documents

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<sup>15</sup> See <https://www.nationalgrideso.com/balancing-services>

- [The Electricity Safety, Quality and Continuity Regulations 2002](#)
- [Electricity North West \(2015\), Customer Load Active System Services Second Tier LCN Fund: Project Closedown Report](#)
- [Ofgem \(2016\), ED1 Specials template](#)
- [Ofgem \(2014\), ED1 Specials template: Supplementary annex 1](#)
- [Ofgem \(2016\), CLASS DRS8 Direction to DNOs](#)
- [Ofgem \(2020\), Consultation: Regulatory treatment of CLASS as a balancing service in RIIO-ED2](#)
- [Ofgem \(2021\), RIIO-ED2 Business Plan Guidance](#)
- [Ofgem \(2022\), Consultation: Regulatory treatment of CLASS as a balancing service in RIIO-ED2](#)
- [Ofgem \(2022\), Impact Assessment: Regulatory treatment of CLASS as a balancing service in RIIO-ED2](#)
- [Ofgem \(2022\), RIIO-ED2 Draft Determinations](#)
- [Ofgem \(2022\), RIIO-ED2 Final Determinations](#)

## Our decision making process

### Consultation responses

- 1.5. Our 2016 Direction on the current regulatory treatment of CLASS lasts until only the end of RIIO-ED1 (ie 31 March 2023). In March 2022, we consulted on the regulatory treatment of CLASS as a balancing service for the next electricity distribution price control, RIIO-ED2, which begins on 1 April 2023.
- 1.6. We consulted on several options for the regulatory treatment of CLASS in RIIO-ED2:
  - **Option 1A:** a continuation of the current regulatory treatment of RIIO-ED1, allowing DNOs to sell CLASS to the ESO and remunerating this through DRS8
  - **Option 1B:** continuing to allow DNOs to sell CLASS to the ESO, but instead remunerating this through DRS9
  - **Option 2:** requiring DNOs to provide CLASS to the ESO outside of market mechanisms and thereby funding the costs through the RIIO-ED2 price control
  - **Option 3:** prohibiting the use of CLASS as a balancing service entirely.



- 1.7. We first consulted on these options in 2020 and received extensive and varied responses, as well as requests from stakeholders for further analysis of the options under consideration. For this reason, we decided to consult again in 2022 on the same options and elected to publish an accompanying IA where we set out detailed analysis and evidence to support our minded-to decision making.
- 1.8. We have carefully considered stakeholder views from both the 2020 Consultation and 2022 Consultation, alongside bilateral engagement and working groups with stakeholders, in order to reach our decision. This decision document sets out our detailed consideration of stakeholder responses to the 2022 Consultation. This builds on the 2020 Consultation, where Ofgem already considered and provided a response (via the 2022 Consultation) to stakeholder responses that were raised.<sup>16</sup> In considering the stakeholder responses, we have taken into account the perspective from which each stakeholder provides its views.
- 1.9. We received 20 responses to our 2022 Consultation and published the non-confidential responses on the Ofgem website. While there was nuance to each individual response, we broadly identified that 10 stakeholders supported Option 1A: DRS8 (our minded-to position), 9 argued that we should go for Option 3: Prohibit CLASS and 1 stakeholder preferred Option 2: Price control. Those in favour of Option 1A included DNOs, the ESO, market participants and a consumer group. Stakeholders who backed Option 3 consisted of market participants and industry associations.
- 1.10. Out of 20 responses, 16 directly answered the nine questions we sought views on as part of our 2022 Consultation. However, the majority of responses included discussion that went beyond the scope of the questions, often choosing to raise broader arguments on the merits of CLASS. For this reason, we have structured this decision document to set out consultation responses and our decision rationale with respect to three broader questions:
- Whether it is in the interest of consumers to allow CLASS to be deployed as a balancing service (see Chapter 2)

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<sup>16</sup> For the sake of brevity (and unless otherwise stated), we do not repeat our points from the 2020 or 2022 Consultations in this decision document. However, for the avoidance of doubt, we still rely on and maintain the points we made in the 2020 and 2022 Consultation documents.

- Whether there is a need to review the current arrangement in RIIO-ED2, and introduce any new requirements, especially if more DNOs were to deploy CLASS (see Chapter 3)
- Whether DNOs providing CLASS fall within the regulatory regime (see Chapter 3).

1.11. Before turning to address those three broader questions, below we have provided a brief summary of the views that stakeholders gave on each of the specific questions we asked in the 2022 Consultation:

*Question 1: Do you agree that the approach taken in our IA is proportionate and balances the trade-offs between the scale of expected impacts and the cost of doing further analysis relative to the benefits such analysis may yield?*

1.12. 6 stakeholders fully agreed with our approach and believed that Ofgem had completed a proportionate level of analysis. 2 stakeholders mostly agreed with the question, but noted additional modelling could have been undertaken to inform the future decision. 8 stakeholders disagreed, with some questioning the approach taken in the IA and others highlighting that additional modelling or analysis could have been pursued in areas such as the impact to investor confidence.

*Question 2: Do you agree that our sensitivity analysis captures a reasonable range of uncertainty over the likely costs and benefits of deploying CLASS as a balancing service?*

1.13. 6 stakeholders agreed, and 1 partially agreed, that the sensitivity analysis captured a reasonable range of uncertainties. 5 stakeholders suggested a range of sensitivities that were not captured, and 2 stakeholders suggested just one sensitivity that they believed should have been included. 1 stakeholder understood the approach taken, but suggested the perspective of other providers could have been further incorporated across the full analysis.

1.14. Of those stakeholders that fully agreed, some believed the downside scenario was unlikely to manifest and that the upside scenario had not accounted for a number of additional hard to monetise benefits. 9 stakeholders disagreed that the full range of uncertainties had been explored. The majority of these stakeholders pointed to the indirect impact of CLASS on investor confidence and other energy markets. Several stakeholders also questioned why alternative use cases for voltage management had not been factored into the cost benefit analysis (CBA).

*Question 3: Do you agree that it would not be proportionate for Elexon to work with industry to develop a solution to adjusting supplier imbalance positions via the modification process in response to CLASS activations at this stage?*

1.15. 13 stakeholders agreed it would not be proportionate to develop a solution to adjusting supplier imbalance positions and/or that it should be something that is reviewed in the future. These stakeholders justified their view based on the minimal distortions that CLASS causes and the immaterial financial impact. However, 5 stakeholders believed a solution should be developed prior to further deployment of CLASS, arguing that it would be better to pre-emptively address any potential issues before they materialise.

*Question 4: Do you agree with our assessment that there is no evidence that competition is currently being distorted or impeded by the participation of CLASS?*

1.16. The majority of stakeholders agreed with our assessment and did not raise any concerns that competition had been distorted or impeded by the historical participation of CLASS. However, 5 stakeholders disagreed, often arguing that the limited participation of ENWL means any distortions would not be immediately apparent and that there would be greater distortions to competition should there be further CLASS deployment by DNOs. 7 stakeholders stated explicitly that there had been no adverse impact on competition, with some going further to point to the beneficial impacts CLASS has had on the competitive process.

*Question 5: Do you think existing safeguards (including licence obligations and competition law) against DNOs taking advantage of their DNO role in the context of participating in the balancing markets with CLASS are sufficient?*

1.17. 7 stakeholders agreed that the existing safeguards are sufficient and did not believe additional safeguards would be needed in the future. Stakeholders cited, amongst other considerations, the ESO's own monitoring practices and the penalties DNOs could face if they were found to discriminate against competitors. 6 stakeholders disagreed, believing that a DNO could take advantage of its privileged role in the distribution system. 3 stakeholders had more mixed views, acknowledging the present safeguards but also considering that further monitoring would be beneficial.

*Question 6: What additional measures do you think would be effective and proportionate to address actual or perceived conflicts of interest with respect to CLASS?*

1.18. 5 stakeholders believed that no additional measures were required, commonly referencing existing arrangements in the price control and specific governance measures DNOs have proposed to introduce in RIIO-ED2. 10 stakeholders believed additional checks were needed, often referencing the need to mitigate potential DNO and DSO conflicts with respect to CLASS. These stakeholders also put forward what they saw as potential mitigations, such as caps on the volumes the ESO could procure from providers of CLASS, to alleviate the perceived risks.

*Question 7: Do you agree that our minded-to position provides the most efficient incentive for CLASS's participation in balancing services?*

1.19. 7 stakeholders agreed with our minded-to position, arguing that price discovery and the efficient allocation of CLASS capacity would be best achieved through market signals. 3 stakeholders had a more mixed response to this question, referencing that they would prefer CLASS to be prohibited but, if it were not prohibited, then Option 1A: DRS8 represented the best option for avoiding market distortions. 6 stakeholders disagreed, stating their general opposition to CLASS being allowed to participate in the balancing services market. Some stakeholders also discussed the possibility of efficiently deploying CLASS by remunerating the service through Option 2: Price control, arguing that this could also be done in such a way to ensure that consumers see larger benefits from CLASS.

*Question 8: Do you agree that requiring CLASS in the price control would not promote efficient investment signals in CLASS and could distort competitive outcomes?*

1.20. 7 stakeholders agreed that the price control would not provide the most optimal investment signals for CLASS and could distort competitive outcomes. Of those opposing our minded-to position, and in favour of prohibiting CLASS, there was general agreement that Option 2: Price control would be worse in terms of distortions than Option 1A: DRS8. 6 stakeholders disagreed, noting the higher potential customer benefits case outlined in the IA for Option 2, and suggested funding models such as a use-it-or-lose-it allowance as a means to realise lower levels of market distortion than under Option 1A. 3 stakeholders presented mixed arguments regarding the pros and cons of mandating CLASS through the price control, but overall signalling that they saw this as a viable route in the future.

*Question 9: What additional reporting or monitoring in RIIO-ED2 could be valuable to assess the ongoing impact of CLASS? Please explain how Ofgem, the DNOs or any other party would be required to support the proposed measure.*

1.21. The majority of stakeholders responded that additional reporting and monitoring measures would be valuable to assess any ongoing impacts from CLASS. 4 stakeholders suggested that the current reporting was adequate, pointing to the ESO's data portal and market monitoring as containing all relevant information that was required. For the 11 stakeholders requesting that there should be additional measures, a range of proposals were put forward including market reviews, reporting of DNO CLASS activity and wider monitoring of CLASS impacts on customers. Varying suggestions were made on the frequency of such reporting including continuous, annual, at the mid-point of RIIO-ED2 or once a particular level of CLASS deployment had been reached.

### **Our decision**

1.22. We have decided to implement our minded-to position for the regulatory treatment of CLASS as a balancing service in RIIO-ED2, ie to continue to allow CLASS to be sold to the ESO through a market framework where attributable costs and revenues are included in the scope of DRS8.

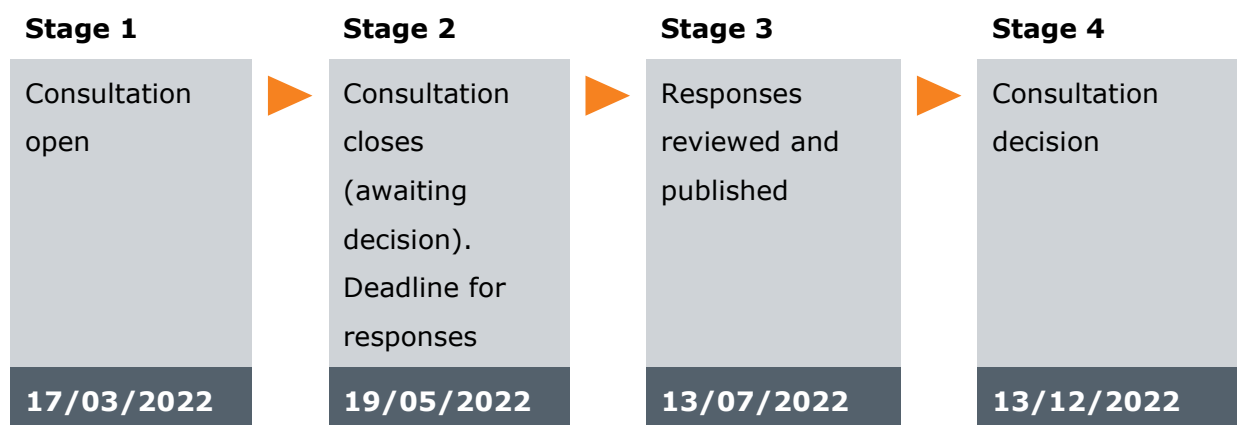
1.23. We have carefully considered stakeholders' views, as well as the available evidence, in reaching our decision. This indicates that CLASS is a cost effective, reliable technology that has the potential to reduce energy bills for consumers. We consider that, by using market-based mechanisms, this option sets efficient incentives for DNOs to invest in CLASS, while creating opportunity for greater competition in the balancing services market. Meanwhile consumers will benefit from sharing in any profits to reflect that CLASS requires, in part, the use of network assets that have been paid for through allowed revenue in the price control.

1.24. We also recognise the arguments stakeholders have put forward in support of other options that would permit the use of CLASS as a balancing service, including Option 2: Price control. However, on balance, we consider that Option 1A presents a better approach at this time and is preferable, at least at this stage, to the alternative of opting to mandate the use of CLASS across all DNOs and determine the level of capacity. One factor we have taken into account in reaching this view is that CLASS is still a relatively new technology and that it would be beneficial to gather more evidence on its application.

1.25. We expect to consult at the mid-point of RIIO-ED2 on the sector specific methodology for the subsequent electricity distribution network price control. We believe this to be an appropriate time to review the deployment of CLASS and

assess whether any changes are required to its future regulatory treatment as a balancing service. We will quantitatively review the level of CLASS deployment, and net revenue earned by DNOs, to understand the appropriateness of the regulatory treatment of CLASS as a balancing service in RIIO-ED2. This work will also contribute to our enduring regulatory framework for the wider suite of emerging distribution network voltage technologies.

**Figure 1: Decision making stages**



## Your feedback

1.26. We believe that consultation is at the heart of good policy development. We are keen to receive your comments about this report. We would also like to get your answers to these questions:

1. Do you have any comments about the overall quality of this document?
2. Do you have any comments about its tone and content?
3. Was it easy to read and understand? Or could it have been better written?
4. Are its conclusions balanced?
5. Did it make reasoned recommendations?
6. Any further comments?

1.27. Please send any general feedback comments to [flexibility@ofgem.gov.uk](mailto:flexibility@ofgem.gov.uk).

## 2. Benefits of allowing CLASS

### Section summary

In this Chapter, we set out the rationale for our decision and address concerns raised by stakeholders in response to the 2022 Consultation and associated IA. This includes consideration of the costs and benefits of CLASS, its impact on competition and investment as well as alternative use cases.

- 2.1. Stakeholders that supported our minded-to position did so because they recognised the significant consumer benefits that CLASS would deliver. These stakeholders also highlighted that a national portfolio of CLASS could contribute towards net zero goals, and that the technology represented a good use of assets that have already been largely paid for by consumers.
- 2.2. Stakeholders that disagreed with our minded-to position often cited concerns about the impacts on investor confidence in flexibility and argued that CLASS providers would gain significant market share, potentially leading to distortions. These stakeholders warned of consequences to future innovation in flexibility, such as emerging Demand Side Response (DSR), as they claimed these providers would rely upon revenues from the same products that CLASS can compete in. It was suggested that, when accounting for these wider impacts, there would be no benefit to CLASS in the long-term.
- 2.3. There was a diverse range of topics raised in the responses alongside the overview we provided above. In this Chapter, we set out the rationale for our decision and address specific concerns raised by stakeholders on the costs and benefits of CLASS in response to the 2022 Consultation and associated IA.

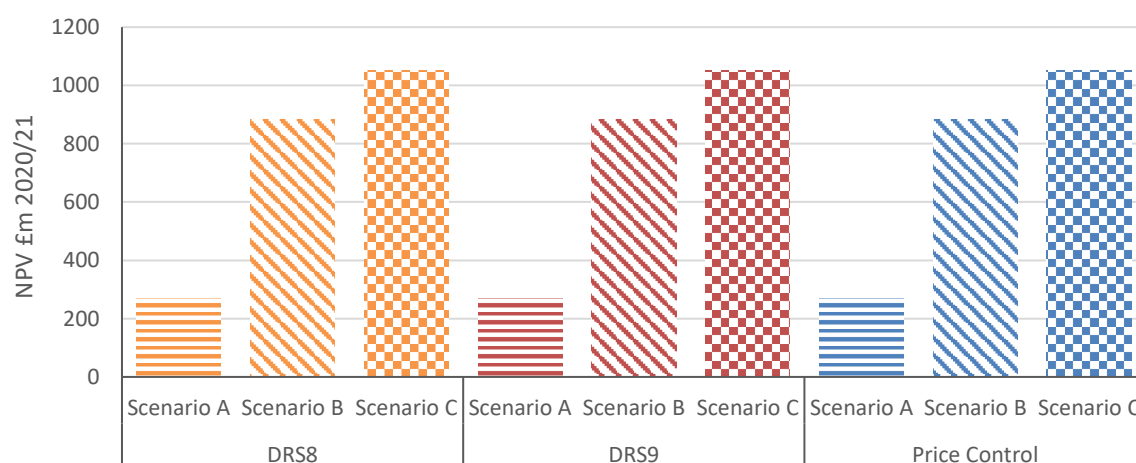
## Cost Benefit Analysis

### Summary of our consultation position

- 2.4. As part of our 2022 IA, we commissioned NERA Economic Consulting (NERA) to undertake a monetised CBA of the regulatory options under consideration. The counterfactual for the assessment was where CLASS is prohibited from operating as a balancing service (ie Option 3).

2.5. The results of the analysis indicated that the economic net benefit of CLASS is expected to be strongly positive across all regulatory options and deployment scenarios.<sup>17</sup> There was very little variation in the NPV under each regulatory option as CLASS is a competitively priced technology (and therefore procured) irrespective of the assumed bidding strategy. This is shown in the figure below.

**Figure 2: NPV of net benefit across regulatory options and deployment scenarios, £m 2020/21 prices**



**Source:** [NERA \(2022\). IA for CLASS – Supporting Annex](#), Figure 1.1.

2.6. NERA demonstrated that, for Option 1A: DRS8, the NPV change in cash flows for Distribution Use of System charges (DUoS) and Balancing Services Use of System charges (BSUoS) customers could range from ~ £242m under Scenario A (conservative deployment) to ~ £1bn in Scenario C (large-scale deployment) over a 30-year period under the base case scenario.<sup>18</sup>

2.7. Recognising CLASS is a new technology, and subject to uncertainty over its costs and benefits, we asked NERA to prepare alternative assumptions as part of a downside and upside scenario for the options under consideration. The parameters of this sensitivity analysis were set so as to capture a reasonable range of hard to monetise costs, reflecting concerns previously raised by stakeholders in the 2020

<sup>17</sup> See Table 1 Deployment scenarios for CLASS: [Ofgem \(2022\), IA - Regulatory treatment of CLASS as a balancing service in RIIO-ED2, pg. 25](#)

<sup>18</sup> [Ofgem \(2022\), IA - Regulatory treatment of CLASS as a balancing service in RIIO-ED2, pg. 31](#)



Consultation. The table below shows the combined sensitivities under three scenarios.<sup>19</sup>

**Table 1: Summary of assumptions in combined sensitivities**

Category	Central case	Downside	Upside
Direct costs	No adjustment	+ 50%	No adjustment
Asset health costs	Not included	+ 10%	Not included
Balancing services costs	No adjustment	-2% per annum	+2% per annum
Pay-as-bid adjustment	Costs are 75% of bid price	Costs are 50% of bid price	Costs are 100% of bid price
Carbon cost	BEIS central projection	BEIS low projection	BEIS high projection

**Source:** [NERA \(2022\). IA for CLASS – Supporting Annex.](#)

2.8. Accounting for this broad range of sensitivities, NERA demonstrated that CLASS is expected to deliver a net benefit under all the regulatory options and deployment scenarios. Under Option 1A: DRS8 and Scenario B (medium deployment), this represented an NPV of ~ £487m in the downside scenario and ~ £1.4bn in the upside scenario.<sup>20</sup>

2.9. We believe the analysis produced by NERA demonstrates a very strong economic case for allowing CLASS to operate in the balancing services market in RIIO-ED2. We provided further analysis of hard to monetise costs raised by stakeholders as part of our IA and found no evidence to suggest that the benefits of CLASS would be outweighed by these factors. However, in making our final decision, we drew upon wider considerations as to the development stage of CLASS, efficient deployment, competition impacts and proportionality.

### **Stakeholder responses and decision rationale**

2.10. A broad range of stakeholders including DNOs, the ESO, a consumer group and market participants recognised in their responses the significant consumer benefits that could be generated by allowing DNOs to operate CLASS in the balancing

<sup>19</sup> Further detail on these sensitivities can be found in Chapter 5 of [NERA's supporting annex](#) to the IA.

<sup>20</sup> [NERA \(2022\). IA for CLASS – Supporting Annex, pg. 13](#)

services market. Many of these stakeholders agreed that the sensitivity analysis captured a reasonable range of hard to monetise costs and uncertainties, with some stakeholders arguing that the downside scenario would be highly unlikely to arise in practice or to the extent that was modelled.

- 2.11. However, a number of stakeholders also cited concerns with some of the CBA assumptions, sensitivities and perceived omissions from the modelling. These stakeholders held the view that these additional sensitivities would reduce the benefits and/or increase the costs of CLASS, although they did not set out any evidence for how this might change the overall results of the CBA. We respond to each of these critiques in turn.

#### *CLASS deployment levels*

- 2.12. Many stakeholders did not comment directly on what they saw as optimal levels of CLASS deployment, but it was generally accepted that the range of deployment scenarios presented accurately reflected CLASS's technical capabilities.
- 2.13. However, some stakeholders thought it was likely that all 6 DNOs would pursue CLASS to the fullest extent within RIIO-ED2. Their reasoning was that CLASS is profitable for DNOs and therefore DNOs will maximise this opportunity. Some stakeholders therefore thought we should have focused our analysis on a high deployment scenario which, in their view, may have greater costs.
- 2.14. We requested that DNOs set out any intentions they had to deploy and operate CLASS in the next price control period as part of their RIIO-ED2 business plan submissions. Stakeholders will be aware from the IA that ENWL has approximately 260 CLASS enabled primary substations installed to date and, in its business plan submission, the DNO reiterated its intention to continue operating these services.<sup>21</sup> Northern Powergrid (NPG) indicated it would look to trial CLASS at up to 256 primary substations, but in different balancing service products to ENWL. NPG also stated that it will look to prioritise its Boston Spa Energy Efficiency Trial (BEET) project over CLASS activity.<sup>22</sup> Three of the DNOs did not set out any firm plans for CLASS, often highlighting the regulatory uncertainty, and one DNO did not indicate any ambition to deploy CLASS.

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<sup>21</sup> [ENWL \(2022\), Our plan to lead the North West to Net Zero: 2023-2028](#)

<sup>22</sup> [NPG \(2021\), Annex 4.2: DSO Strategy, pg. 87](#)

- 2.15. From this, and accounting for the lead time to deploy CLASS, we conclude that deployment in RIIO-ED2 may be more modest than some stakeholders envisage. However, while there are diminishing marginal returns with greater deployment of CLASS, we note that the highest economic benefit is under Scenario C (high deployment) and we have seen no evidence that costs would exceed benefits in the event of more investment in CLASS capacity.

#### *Changes in prices for balancing services*

- 2.16. A small number of stakeholders that did not agree with the approach of the CBA noted that, under the counterfactual, we should expect that other market participants' costs could decrease over time due to innovation and improved efficiency. This could lead their bid prices to decrease and, therefore, ESO procurement costs to fall. The implication was that this could undermine the benefits case for CLASS.
- 2.17. We would refer stakeholders to NERA's supporting annex that was published alongside our IA, where NERA provides more detail on the sensitivities created.<sup>23</sup> The analysis includes a 2% reduction per annum to the bid prices of non-CLASS balancing services to capture the uncertainty in costs over longer time horizons. Under this downside scenario, the economic benefit of CLASS is still strongly positive.

#### *Impact on asset health*

- 2.18. We received a number of responses to the previous 2020 Consultation in which concerns were expressed about the potential impact of CLASS on asset health and quality of supply. While no evidence or analysis was provided for this claim, we addressed this concern in detail as part of our IA in paragraphs 4.3 to 4.79. Our analysis of academic studies, trial reports, voltage regulation and maintenance records from ENWL did not suggest any material level of degradation to assets or customer supply.
- 2.19. The majority of responses we received for the 2022 Consultation did not raise concerns about the impact to asset health in light of the evidence we had presented as part of our IA. However, a small number of stakeholders were not satisfied by our conclusion and suggested that even the smallest amount of asset wear and tear

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<sup>23</sup> [NERA \(2022\), IA for CLASS – Supporting Annex, appendix A 3.1](#)

may, in aggregate, outweigh the benefits of CLASS. No evidence was provided for this claim, nor was it acknowledged that the CBA sensitivity analysis included a downside scenario assumption of a 10% cost increase due to asset degradation. Without prejudice to our view that CLASS does not cause a material level of degradation to assets, we believe the 10% downside assumption captures a reasonable degree of hard to monetise impacts.

- 2.20. Sharing a different perspective, two stakeholders challenged our assumption of a 10% cost increase due to asset health impacts. One of these stakeholders argued that there may be upside benefits to asset health as new CLASS capable assets provide greater visibility and condition monitoring of network infrastructure. We also noted the benefits of new tap changer technologies as part of our IA when considering potential new replacement tap changer assets with much longer life expectancies, such as vacuum based interrupter tap changers.<sup>24</sup> As assets degrade and DNOs upgrade them over time, we would expect these further benefits to materialise beyond what is explored in our IA.
- 2.21. A small number of stakeholders raised concerns that, in the case that non-CLASS network assets were impacted by CLASS activities, cross-subsidisation would cause significant distortions to the true cost of providing the service. The analysis from our IA on the risks of cross-subsidisation concluded that the incentive and magnitude associated with cross-subsidisation is likely to be very low. Stakeholders did not provide evidence to support their views that these risks would be significantly higher or that their impact would result in significant distortions. For DRS8, we do not consider there to be a within period risk of cross-subsidisation as the single-till approach means the costs of CLASS and totex allowances are treated equally.
- 2.22. We would also highlight to stakeholders measures in the wider RIIO-ED2 framework, such as the Network Asset Risk Metric (NARM)<sup>25</sup>, as means of holding DNOs accountable for investment decisions on asset replacement. This would help to identify if a DNO were an outlier.

#### *Balancing services that CLASS could compete in*

- 2.23. As part of our IA, we discussed the technical capabilities of CLASS extensively with the ESO and ENWL in order to understand the relevant markets for the technology.

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<sup>24</sup> [Ofgem \(2022\), IA - Regulatory treatment of CLASS as a balancing service in RIIO-ED2, pg. 48](#)

<sup>25</sup> See Chapter 6 in [Ofgem \(2022\) RIIO-ED2 Final Determinations Core Methodology](#)

We identified that CLASS had attractive qualities for the ESO across a range of their needs and that, ultimately, each product is a construct with requirements that are subject to change. With respect to the CBA, NERA modelled secondary Firm Frequency Response (FFR), Dynamic Containment (DC) and Optional Fast Reserve (OFR) as products with historical price data where CLASS is able to deliver against the requirements.

- 2.24. We note multiple stakeholders believed that the CBA relied too heavily upon historical pricing from the DC market for its analysis. These respondents suggested that if CLASS is unable to fulfil DC or respond less efficiently than if participating in another product, the benefits may be overstated and there may be inefficiently high levels of CLASS deployment.
- 2.25. We do not agree with these arguments. While NERA's modelling indicated that CLASS capacity yields greater value in FFR and DC, the return is also positive in OFR and the results of the CBA are not particularly sensitive to CLASS deployment across different products. We also note if, for example, CLASS is unable to meet the requirements of particular products then one would reasonably expect less investment in capacity. In our analysis, the deployment scenarios were based on assumptions that were made outside of the model that NERA developed for the purposes of the CBA and was therefore not driven by the costs/benefits of CLASS. However, in reality, deployment under Option 1A: DRS8 will be based on DNOs' investment decisions and analysis of the market size and expected returns.
- 2.26. One respondent suggested that more work should have been done to identify the exact products DNOs will choose to participate in with CLASS. However, other stakeholders accepted that CLASS is still relatively early in its market development and that the ongoing reforms to products make it difficult to assess the best market fit for CLASS with a high degree of certainty.
- 2.27. We would also refer stakeholders to our discussion of service requirements in Chapter 6 of the IA, where we considered in detail the relevant market for CLASS. Under Option 1A: DRS8, DNOs will choose which products they wish to participate in. As CLASS has only historically operated in three specific balancing services products, and been deployed by only one DNO, we expect that different DNOs may choose to offer CLASS into different product categories and that this could also change over time as market conditions can be highly volatile. This is already evident in NPG's proposed plans for CLASS in RIIO-ED2, where they would look to allocate CLASS capacity to high frequency response and reactive power services.

2.28. While we may expect DNOs to focus their participation in the highest priced balancing services, we believe that strategies may vary based on DNO priorities and will likely react to market conditions, particularly in the context of the ESO's ongoing reforms to the balancing services market. Regardless of what product CLASS is offered into, we believe that it will yield an economic net benefit. The ability of DNOs to react to market conditions and discover the most efficient allocation of CLASS is a key benefit we see of the DRS8 mechanism.

#### *CBA timeframe*

2.29. A small number of stakeholders were concerned that the CBA modelled benefits over a 30-year period, when the proposed decision is just for the period of RIIO-ED2. The implication was that the benefits of CLASS would be lower or outweighed by the costs if only accounting for a 5-year period.

2.30. We believe it was correct to commission the NERA CBA for a 30-year timeframe, as this allowed us to model the impact of CLASS over the full lifetime of the assets. Various stakeholders stressed in their response to the 2020 Consultation that Ofgem had not given enough consideration to the long-term impact of CLASS, and we conducted an IA in order to address those points. We note that the conclusions of the CBA are not particularly sensitive to the timeframe under consideration. Indeed, if we isolate the costs and benefits NERA identified over the 5-year period of RIIO-ED2 only, we still find a positive NPV for CLASS under all regulatory options, deployment scenarios and sensitivities.

2.31. While our decision applies to the RIIO-ED2 period, we note the possibility that the technology could continue to operate in the market beyond that. We intend to review the deployment of CLASS at the midpoint of RIIO-ED2 and assess whether any changes are required to its future regulatory treatment as a balancing service.

#### *Impact on investment*

2.32. A number of stakeholders argued that investment in low carbon flexibility depends on revenue streams from the balancing services market. These stakeholders argued, if DNOs were to secure a greater share of the market for balancing services, there would be a negative impact on investment in flexibility that would ultimately manifest in an increase in future balancing costs.

- 2.33. We engaged with stakeholders in bilateral meetings to understand these arguments in more detail. They stated, for example, that battery storage investments rely on modelled forecasts of the aggregate revenues from across the wholesale markets, capacity markets and frequency response markets, with a significant percentage of these revenues typically attributed to DC. If CLASS providers can compete in DC services, they argued that this will remove revenues for battery storage operators and thereby lower expected returns and reduce the case for future investment.
- 2.34. These stakeholders did not provide evidence on how material the impact of our minded-to position would be on the modelling of aggregate revenues for battery storage, nor did they provide any examples of actual investment decisions that have been forestalled by CLASS to date.
- 2.35. To understand the impact of our minded-to position, we first considered the future size of the market that flexible technologies, such as batteries, compete in. We've taken batteries as an example as it was cited by stakeholders and is expected to be an area of major future investment in flexibility. BEIS and Ofgem's joint Smart Systems and Flexibility Plan 2021 outlined that the UK would need around 30GW of flexible assets by 2030 and around 60GW by 2050, if we are to cost-effectively integrate high levels of renewables.
- 2.36. One potential source of system flexibility is battery storage, which the ESO expects could grow to as much as 20GW by 2030 and 35GW by 2040.<sup>26</sup> Stakeholders often cited battery storage as an area of future investment that could be impinged by CLASS, and for these reasons our discussion in this section considers whether the deployment of CLASS could impact on these projections. We note that the arguments are largely analogous to other technologies that could contribute to future system flexibility.
- 2.37. With respect to our CLASS decision and the ESO's balancing services market specifically, we engaged with the ESO to understand its future requirements. In the period of RIIO-ED2, the ESO expects to see a growing requirement which is set to expand further still into the future as more large-scale, single-site generators come online, such as Hinkley Point C, and new interconnectors are established like the Viking Link.<sup>27</sup> CLASS would only theoretically be able to meet a small proportion of

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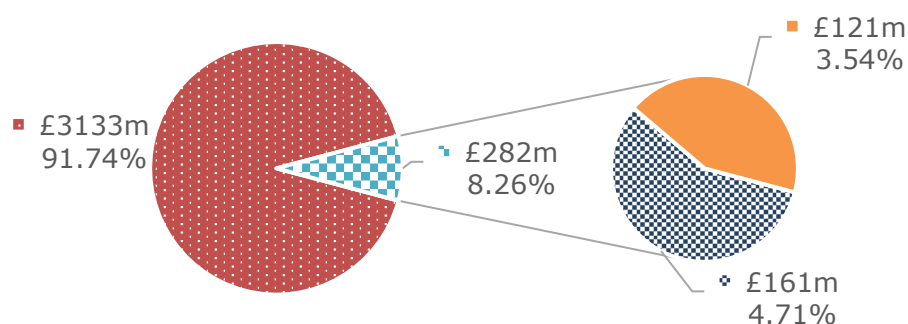
<sup>26</sup> [National Grid ESO \(2022\), Future Energy Scenarios 2022, pg. 215](#)

<sup>27</sup> [National Grid ESO \(2021\), Operability Strategy Report, pg. 27](#)

the ESO’s needs, reaching a total of approximately 3GW under Scenario C (large-scale deployment) as analysed in our IA.

2.38. We previously estimated that a large-scale deployment of CLASS across a small subset of relevant services would see DNOs account for only approximately 8% of the ESO’s annual balancing costs.<sup>28</sup> If DNOs were to have deployed CLASS in line with our CBA’s large-scale deployment scenario in 2021, they would have the combined capacity to deliver only up to 43% of this subset of balancing services.<sup>29</sup> This share of supply is not a given as DNOs would be competing in the market with other balancing service providers. Figure 3 illustrates this theoretical potential market for CLASS in the context of the ESO’s full balancing costs.

**Figure 3: Total ESO Costs (£m) by product category from 2021**



- ESO Total Annual Costs (excl. NMB - Frequency Response, NBM - STOR, NBM - Fast Reserve, DC)
- ✕ NBM - Frequency Response, NBM - STOR, NBM Fast Reserve, DC
- CLASS capacity under Scenario C (large-scale deployment)

**Note:** Annual totals used are based on April – March reporting. While the ESO’s total costs have varied year to year, the percentage split between the categories shown is similar across the past several years.<sup>30</sup>

**Source:** Ofgem analysis of National Grid ESO MBSS tender data.

<sup>28</sup> [Ofgem \(2022\), IA - Regulatory treatment of CLASS as a balancing service in RIIO-ED2, pg. 96](#)

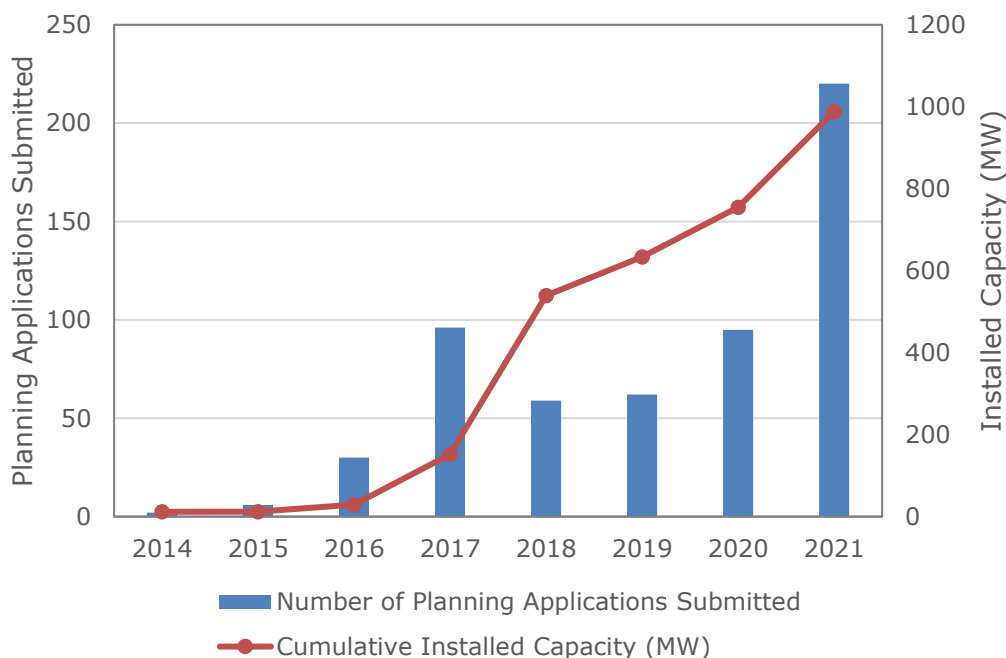
<sup>29</sup> [Ofgem \(2022\), IA - Regulatory treatment of CLASS as a balancing service in RIIO-ED2, pg. 112](#)

<sup>30</sup> NBM – Frequency Response: includes the following costs from the ESO’s MBSS data: NBM FFR (Tendered), NBM Demand Side Response (Commercial), NBM Enhanced Frequency Response (Commercial). NBM – Short-term operating reserve (STOR): includes the following costs from the ESO’s MBSS data: AS – NBM STOR availability (Tendered), AS – NBM STOR utilisation (Tendered), and AS – NB< Season/Term Reconciliation (Tendered). NBM – Fast Reserve: includes the following costs from the ESO’s MBSS data: NBM Optional Fast Reserve Availability (Commercial), NBM Optional Fast Reserve Utilisation (Commercial), NBM Firm Fast Reserve Avail + Nom (Tendered), and NBM Firm Fast Reserve Utilisation (Tendered). Dynamic Containment / FFR / Bridging / FFR auction: the



- 2.39. As the ESO’s procurement volumes increase in the future, we would expect the market share that DNOs could theoretically achieve to diminish further. To our mind, this demonstrates that CLASS is a relatively modest portion of the total market that other providers have access to and compete in. This is before considering the wider markets flexible assets have access to, which CLASS providers cannot participate in, such as the Balancing Mechanism (BM) and the wholesale market.
- 2.40. As CLASS has been allowed to compete in the balancing services market since 2016, and has been actively operating in the market for several years, we can also observe whether its deployment has been associated with any historical change in investment in flexibility, such as battery storage projects. This is notable as at any point since 2016, under the current regulatory treatment of CLASS, project developers would have had to form a view on whether DNOs would start to deploy the technology when presenting their case to potential investors. Figure 4 below shows clearly that battery storage capacity has increased significantly in the years following our decision to allow CLASS.

**Figure 4 Number of battery storage planning applications submitted and cumulative installed capacity (MW)**



ESO started reporting this category in 2020, with the vast majority of costs attributed to Dynamic Containment.

**Source:** [BEIS \(2022\), Renewable Energy Planning Database \(REPD\)](#)

- 2.41. We are mindful that, in 2020, when we first consulted on the regulatory treatment for CLASS in RIIO-ED2, we provided our minded-to position to continue with the existing arrangement along with our rationale. We then reiterated our minded-to position again in our most recent 2022 Consultation. While it of course remained a possibility that we would not follow our minded-to decision in our final decision, it nonetheless does not appear that sharing our minded-to positions over the past two years has dampened the pipeline of energy storage projects which are operational, under construction, consented or being planned. Indeed, RenewableUK’s EnergyPulse Energy Storage report showed that in 2022 the total pipeline of battery projects has doubled from 16.1GW a year ago to 32.1GW today.<sup>31</sup>
- 2.42. It is difficult for us to assess how the future deployment of CLASS could impact on investment decisions, particularly as no stakeholder set out sufficient evidence in this regard. While we would recognise that, everything else being equal, our decision to continue to allow DNOs to provide CLASS could reduce revenue available to other market participants, it is unclear how material this reduction would be. Revenue projections from wholesale markets and capacity markets, as well as a host of other risk factors, will impact on future investment decisions. We are of the view that these other factors may be more important to investment decisions than CLASS.
- 2.43. We note that analysis from LCP, an energy consultancy, suggests that battery operators are becoming less reliant on long term contracts for balancing services and are increasingly looking to optimise revenues from the wholesale market and BM.<sup>32</sup> The shift should be expected as the primary balancing services product for batteries, DC, has historically been undersubscribed and as more battery storage competitors enter the market, returns will become more consistent with those from the energy markets.<sup>33</sup> This same trend was highlighted by Baringa, an energy consultancy, in their 2021 CBA of CLASS, commissioned by ENWL, where they note that the shift of focus away from DC revenues in the battery sector would occur whether or not CLASS was present.<sup>34</sup>

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<sup>31</sup> [RenewableUK \(2022\), Pipeline of UK energy storage projects doubles within 12 months](#)

<sup>32</sup> [LCP \(2021\), Is battery storage a good investment opportunity?](#)

<sup>33</sup> [Ibid, p. 7](#)

<sup>34</sup> See page 23 of CLASS Impact Assessment Final Report in the ENWL folder of CLASS 2022 Consultation Stakeholder Responses: <https://www.ofgem.gov.uk/sites/default/files/2022-07/Published%20CLASS%202022%20Consultation%20Responses.zip>

- 2.44. Our view that other factors may be more important to investment decisions than the impact of CLASS seemed to be confirmed by our stakeholder engagement. The impacts of higher inflation, GBP exchange rate depreciation and commodity prices, such as lithium, were often cited as significant factors influencing investment decisions in battery storage. We also solicited investor feedback in various forums, and this did not provide any strong indication that CLASS was seen as an especially significant risk factor.
- 2.45. The greater challenges that face battery storage investment, and the shifting trends in revenue stacking, suggest that the further participation of CLASS in a subset of balancing market products is a marginal factor in the broader investment environment for batteries. This is further highlighted by the small portion of ESO costs attributed to the subset of potential products that CLASS providers could participate in when compared with the growing broader market opportunities for flexibility assets.
- 2.46. Ofgem is committed to promoting investment in flexibility, as demonstrated through our Full Chain Flexibility<sup>35</sup> strategic programme. Recently, Ofgem granted approval to the ESO's Demand Flexibility Service, opening up flexibility market participation to consumers by incentivising voluntarily flexing of the time when they use their electricity. In the near future, we intend to engage with industry on the future vision for flexibility, setting out forward options for feedback, including the Flexibility Exchange concept for DER and energy services that will encourage deep, consecutive, concurrent markets for different products. The UK Government has also set out a number of initiatives to promote flexibility through the Flexibility Innovation Programme.<sup>36</sup> Last month, BEIS announced that over £32 million in government funding would be put towards five new energy storage projects across the UK.<sup>37</sup>

#### *Impact on other energy markets*

- 2.47. A number of the same stakeholders also raised concerns that the modelling by NERA had not accounted for potential knock-on effects associated with the further deployment of CLASS. Specifically, these stakeholders contended that balancing services market participants displaced by CLASS would need to increase their prices

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<sup>35</sup> [Ofgem \(2022\), 2022/23 Ofgem Forward Work Programme](#)

<sup>36</sup> [BEIS \(2021\), Flexibility Innovation Programme](#)

<sup>37</sup> [BEIS \(2022\), Energy storage backed with over £32 million government funding](#)

in other markets, such as the wholesale and capacity markets. It was argued that this would then offset the benefits of CLASS in the balancing services market. These stakeholders often suggested that Ofgem could commission further modelling to assess these potential impacts.

2.48. We have carefully considered the possibility that greater deployment of CLASS could lead to higher prices in other energy markets, but we did not consider that it would be a proportionate use of our resources to undertake further modelling to assess this risk, not least because any such risk needs to be considered in the context of the large customer benefits we have identified. The competitive pressure exerted by DNOs offering CLASS in the market for balancing services should benefit consumers by creating downward pressure on prices. We consider that prices in the wholesale and capacity market are determined by the interaction of a range of demand side and supply side factors, and this dynamic means there is unlikely to be a linear relationship between CLASS deployment and outcomes in other energy markets.

2.49. We therefore do not believe it would be proportionate to conduct additional modelling of these impacts in this case. There would be considerable complexity and uncertainty involved in such whole electricity system modelling, and this would come at a not inconsiderable cost to consumers. We also note that no stakeholder responded to our 2022 Consultation with evidence to suggest that the large benefit our IA identified with respect to CLASS would be offset by costs elsewhere.

#### *Mandating CLASS*

2.50. In our approach to reaching a decision on CLASS, we were first required to establish whether allowing CLASS to participate in the balancing market could lead to positive outcomes for consumers. We did this by quantitatively assessing the costs and benefits of three potential regulatory options for CLASS against a counterfactual scenario where CLASS is prohibited. The outcome of the CBA, conducted by NERA, suggested that under all regulatory options allowing CLASS resulted in superior outcomes for consumers.

2.51. Each regulatory option yielded a similarly positive NPV figure, although we did identify more variation in the distributional impact across consumers, DNOs and market participants. For these reasons, we view each option as a viable means for deploying CLASS. However, we found across several stakeholder responses in favour of CLASS that there was also support for regulating CLASS through Option 2: Price control.

- 2.52. Stakeholders expressing support for Option 2 pointed to the larger share of benefits that consumers could enjoy, as demonstrated by the NERA CBA. Under Option 1A, consumer benefits could range from ~ £242m to ~ £1bn in the base case scenario depending on the level of deployment. Whereas under Option 2, consumer benefits could range from ~£455m to ~ £1.8bn.<sup>38</sup> Additionally, a stakeholder commented that their potential concerns about market distortions would be ameliorated if CLASS was not competitively procured by the ESO, but rather a free option to call upon.
- 2.53. We agree with stakeholders that regulating CLASS through the price control and mandating DNOs to provide the service could deliver considerable benefit for consumers under the right circumstances, and this is potentially a viable long-term option for the regulation of CLASS. A similar effect could also be achieved by an industry actor raising a code modification to the Grid Code to require that activities such as CLASS are deployed by DNOs. However, we believe that DRS8 is the best means of implementing CLASS in the RIIO-ED2 period.
- 2.54. Mandating CLASS would require Ofgem to assess what level of CLASS deployment consumers should fund, and potentially also what balancing services products CLASS should be used for. The historical evidence base for assessing this would be only one DNO that has used CLASS to participate in just three balancing services products.<sup>39</sup> However, there are several other products that have not yet been explored, and the ESO is currently reforming many of these, meaning any judgement may need to be revisited frequently depending on new market arrangements within the RIIO-ED2 period.
- 2.55. An assessment at this time may not demonstrate the best market fit and deployment level of CLASS based on the historical evidence from RIIO-ED1. We are concerned that an inefficient allocation of CLASS may be detrimental to the technology's development and curtail some of the consumer benefit. In addition, implementing CLASS under allowed totex in the price control would require a re-opener. We have concerns that this would delay the benefits realisation as time and resource is spent administering the re-opener, undertaking an assessment of efficient costs and ultimately adjusting totex allowances before any further deployment is possible.

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<sup>38</sup> [Ofgem \(2022\), IA - Regulatory treatment of CLASS as a balancing service in RIIO-ED2, pg. 31](#)

<sup>39</sup> Static Secondary Firm Frequency Response (FFR), Firm Fast Reserve (Firm FR) and Optional Fast Reserve (Optional FR).

- 2.56. In contrast, we believe DRS8 will provide the necessary investment signals for DNOs to deploy CLASS through competition in the balancing services market. This will allow DNOs to react to changing market conditions, as well as reforms from the ESO, while also exploring different balancing services products that have not yet been tested by ENWL.
- 2.57. In exploring the price control option we also considered that, were this option to be chosen, the ESO would in most instances be likely to always call upon CLASS resources before accepting any bids from the competitive process of the balancing services market. In practice, this would have the consequence of removing a portion of the ESO's requirements from the competitive process and thereby deny third parties the possibility of competing against a CLASS provider for the provision of balancing services to the ESO. Should an existing third party provider or a new provider be able to offer a more efficient and lower cost response than CLASS, it would not have opportunity to compete for capacity that had already been allocated to a CLASS provider.
- 2.58. Lastly, we also considered that DNOs are exploring other forms of voltage control technologies and, in the specific case of NPg's BEET project, we note that CLASS cannot be operated simultaneously for all relevant balancing products with this initiative. We discuss the BEET project and other voltage control technologies in more detail in the final section of this Chapter. In RIIO-ED1, we saw voltage projects such as CLASS, Smart Street and BEET trialled by ENWL and NPg, and we may see further innovation and development in this space from these DNOs and others within the RIIO-ED2 period. Mandating CLASS may act as a barrier to the development of these new technologies and remove the possibility for DNOs to put forward the case for additional innovation projects. Conversely, under DRS8, DNOs will be able to assess the investment case for CLASS alongside other potential initiatives.
- 2.59. With these concerns in mind, we believe that existing and future consumers will see the best outcome from regulating CLASS through DRS8 in the RIIO-ED2 period. However, we note that the concerns we have raised with Option 2 are not enduring features of the regulatory option, but rather the result of the relatively early-stage development of CLASS. It would be expected that as CLASS is deployed more widely, and a more robust historical evidence base is established, the regulation of CLASS as a mandated activity could possibly become an option for consumers to benefit from further energy bill reductions. We plan to reflect on how CLASS develops as part of our mid-point review of CLASS deployment in RIIO-ED2 to inform our sector specific methodology for the subsequent price control period.

## Competition impacts

### Summary of our consultation position

- 2.60. From analysing ENWL’s historical participation in the balancing services market, across paragraphs 6.40. to 6.73 of our IA, the evidence suggests that ENWL has not gained significant market power through its operation of CLASS even when adopting extremely narrow product market definitions. Rather, its participation has contributed to positive outcomes for consumers with bid prices and availability fees that were on average lower across products such as Secondary FFR and Firm FR once ENWL began participating in the market.
- 2.61. We see this analysis as providing evidence that ENWL’s entry into the balancing services market resulted in a positive outcome for consumers. During this period of heightened balancing costs and resource pressures, we believe further deployment of CLASS will help increase competition and have a positive impact on costs for consumers. While further CLASS deployment is unlikely to be available for this winter period, we expect that in the next winter period additional CLASS capacity could also aid the ESO in maintaining electricity system security at the lowest cost to consumers.
- 2.62. We do expect that further deployment of CLASS could displace some existing providers but, such providers are likely to be less efficient and more carbon intensive than other market participants. Looking to the future, we expect the ESO’s balancing services market requirements to continue to grow and that there will be a plethora of new opportunity for market participants. The ESO is actively encouraging new market entrants to meet this rising demand through its ongoing market reforms to open up wider access and pathfinders to identify innovative solutions to system challenges.<sup>40</sup>

### Stakeholder responses and decision rationale

- 2.63. The majority of respondents did not raise concerns that ENWL’s use of CLASS to participate in the balancing services market had led to distortions or impeded competition to date. Indeed, some stakeholders also highlighted the beneficial

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<sup>40</sup> [National Grid ESO \(2022\), Markets Roadmap](#)

downward pressure CLASS has had on prices in the balancing services market from increased competition.

- 2.64. However, multiple stakeholders who both agreed and disagreed with the minded-to position of the 2022 Consultation, noted several concerns about the potential impact further deployment could have on competition in the market. These responses covered a number of themes.

#### *Innovation in the market*

- 2.65. Stakeholders in favour of the minded-to position recognised that CLASS is an innovative low-cost and low-carbon balancing solution. Some of these stakeholders highlighted the importance of low-carbon solutions, particularly in light of the challenge to reach net zero by 2050 and the reliance on fossil fuels amplifying the energy crisis. Furthermore, stakeholders also noted the importance of low-cost solutions like CLASS to help lower bills for consumers during a cost-of-living crisis. We believe that these factors combined have greatly increased the value of innovations like CLASS in recent years.
- 2.66. However, several stakeholders raised concerns that CLASS would extract revenues from the most lucrative products that new innovations rely upon for their investment cases. They argue that CLASS will curtail innovation and that this will eventually lead to higher prices in the balancing services market.
- 2.67. Ofgem is of the view that CLASS represents innovation in the balancing services market. Our view is that a successful market is one where different forms of innovation are able to compete freely such that the consumer benefit can be maximised through the efficient allocation of resources. It would seem contradictory to prohibit CLASS on the grounds that it would help foster other types of innovation, if these alternative technologies provided a similar service but at a higher cost and environmental impact. Indeed, one of the ways in which we seek to achieve our principal objective is to enable innovation to drive down prices resulting in new products and services for consumers.
- 2.68. Additionally, we note that the ESO is incentivised to ensure security of supply and through its market reforms, continues to encourage new providers to enter and compete in the market in order to widen its suite of tools to balance the system. Ofgem is also committed to encouraging innovation in the market for flexibility to ensure, for example, that the opportunity and value associated with decentralised



assets is realised. We intend to engage with industry on the future vision for flexibility, setting out forward options for feedback, including the Flexibility Exchange concept for DER and energy services that will encourage deep, consecutive, concurrent markets for different products.

#### *Demand Side Response providers*

- 2.69. Several stakeholders raised concerns that other providers, in particular DSR providers, will see their ability to provide balancing services degraded by CLASS activations. Some of these stakeholders argued that this could lead DSR providers to under deliver and face penalties. These stakeholders did not provide analysis or evidence to support this claim.
- 2.70. ENWL has been operating CLASS on its distribution network for the past several years and we note that we have not seen evidence to suggest that DSR providers on ENWL's network regularly under deliver or receive penalties due to CLASS activations.
- 2.71. It is important to recall that CLASS operates within statutory limits for voltage and that there are no requirements for DNOs to keep voltage within a narrower threshold for specific customers. As stated within the National Terms of Connection (NTC), that is accepted by all customers connecting to the distribution network including DSR providers, customers should expect transients in voltage within statutory limits, both higher and lower than 230V or 400V.<sup>41</sup> We would expect that a DSR provider would operate with an understanding that their response will be subject to variations within these limits, whether this is caused by CLASS activations or other factors. Without analysis or evidence to suggest differently, DSR providers have been able to operate on ENWL's network for several years under these established conditions without needing to challenge or report issues with the NTC.
- 2.72. As part of our IA, we also looked at how often CLASS is typically activated, its duration and percentage of voltage reduction. Historically, a CLASS-enabled transformer has been activated 4 times per day and for a duration of between 6 – 18 minutes, where voltage is reduced by 5%.<sup>42</sup> It is important to note that this 5% reduction is within statutory limits and, depending on the transformer's voltage set point at the time of activation, it may mean that voltage remains above the nominal

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<sup>41</sup> [ENA \(2022\), National Terms of Connection](#)

<sup>42</sup> [Ofgem \(2022\), IA - Regulatory treatment of CLASS as a balancing service in RIIO-ED2, pg. 54 - 55](#)

level. The ratio of change in voltage to load on the transformer may be approximately 1:1.3 for domestic loads, representing a decrease of 6.5% in load on a primary substation transformer.<sup>43</sup> This reduction would also include reducing losses (heat) from network components. This change is in aggregate across, typically, several thousands of customers and all network components between the primary substations and customers' connections.

- 2.73. On a related note, due to the low materiality of this voltage variation within statutory limits across thousands of customers, it was Elexon's judgement that it would not be proportionate at this time to create a bespoke settlement arrangement for CLASS. We further discuss settlement arrangements in the next Chapter of this document.

#### *Competitive constraints on CLASS*

- 2.74. A small number of stakeholders stated that they believe CLASS did not face any competitive constraints due to its low marginal costs. They argued that no other provider could compete under these conditions.
- 2.75. First, we would point out to these stakeholders that DNOs would be competing against each other following further deployment of CLASS, and that it is also not uncommon for providers with different operating costs to compete in the same market. For example, a battery storage provider may have a lower marginal cost than a gas generator, but both compete against each other in the balancing services market.
- 2.76. Second, CLASS would be limited in its capacity and technical capabilities, such that there would still be a need in the market for a range of diverse balancing service providers. As an inframarginal technology, providers of CLASS may be less likely to determine the market clearing price under a pay-as-clear auction for different balancing services products. Instead, the price would likely reflect the short-run marginal cost of other technologies and therefore still support their deployment in the market for balancing services.
- 2.77. Finally, we would also note that it is not always the case that the lowest cost provider is chosen. For example, in fast reserve dispatch, the size and length of time the unit can run for is also considered by the ESO before selecting providers.

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<sup>43</sup> [ENWL \(2016\), CLASS LCNF Project Seminar](#)

Providers may also be rejected if their bids significantly deviate from the average accepted tender price.<sup>44</sup> Assessment principles such as these are subject to change, particularly as certain products are phased out and replaced.

#### *Balancing service technical requirements*

- 2.78. As part of our IA, we provided a detailed account of how CLASS operates, its technical characteristics and historical data of its operation. One stakeholder requested we share more information on the technical capabilities of CLASS and how this will affect which products it will participate in.
- 2.79. Beyond providing private or commercially sensitive information, we are unsure what further technical information is being requested in this response and did not gain further clarity during a bilateral with the stakeholder who raised this concern. We also expect that some technical queries stakeholders might have about CLASS technology would be best placed with the original equipment manufacturer of the devices that DNOs use for CLASS, rather than the DNOs themselves.
- 2.80. With regard to how we might expect CLASS to be allocated into different balancing service products, we believe that this is a judgement to be made by the service provider and the service operator. The ESO should therefore communicate with CLASS providers to determine where they meet the technical requirements of services, and then it is for CLASS providers to enter those markets as they see best. It is possible the ESO could modify existing or proposed markets that opens or closes participation for certain technologies where they determine that this is possible and in the interest of consumers. The ESO had previously mentioned in their 2020 Consultation response that a review of their C16 licence obligations<sup>45</sup> may help to guide their future decisions on longer-term procurement priorities. This was not raised again in their 2022 response, but we have engaged throughout the consultation process with the ESO to further understand whether any additional guidelines may be required for CLASS. We concluded that no additional guidelines or review would be proportionate or necessary at this time. We have provided considerations for how CLASS's technical characteristics may be attractive to the ESO for its residual balancing purposes in our IA under paragraphs 6.12 to 6.14.

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<sup>44</sup> [National Grid ESO \(2019\), Fast Reserve assessment principles](#)

<sup>45</sup> [National Grid ESO, C16 statements and consultations](#)

2.81. We have observed that ENWL has provided CLASS in a selection of products to date, moving capacity between balancing service products. We also see a number of products suggested by NPg in its proposal for CLASS that ENWL has historically not participated in, such as high frequency response and reactive power services.<sup>46</sup> Depending on market reforms by the ESO, and the strategies of CLASS providers, the range of products CLASS participates in may increase or decrease in the future. If there is less value to CLASS across balancing services products, we would expect lower deployment levels. Our decision to implement CLASS via DRS8 will provide DNOs with a market based signal for investment and participation that will further demonstrate the value of CLASS and help to inform Ofgem’s future regulatory outlook for the technology.

#### *Historical analysis of CLASS*

2.82. A number of stakeholders raised concerns that our analysis of ENWL’s past participation in the balancing services market relied too heavily on data from a brief time period, low levels of CLASS activity and/or during a period of high levels of volatility. They argued that because ENWL’s participation was limited, and there were ongoing changes to balancing products at the time, our analysis was not necessarily indicative of future market competition if there were further CLASS deployment.

2.83. Our analysis in the IA under Chapter 6 on CLASS historical participation provides considerable detail on ENWL’s activity in the balancing services market starting from February 2018 – November 2021. We analysed price impacts, changes to the number of competitors and changes in the number of accepted/rejected bids across three different balancing services products. These different products were also diverse in their characteristics, with different types of procurement methods and levels of competition, providing insight into more than just one set of market dynamics. For example, Optional FR has relatively low levels of competition with only a handful of providers. In contrast, a product such as secondary static FFR, had dozens of providers competing during the period we assessed. How successful ENWL was also changed between services, taking up larger shares of supply in products like Firm FR when compared to more modest growth in products such as secondary static FFR.

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<sup>46</sup> [NPg \(2021\), Annex 4.2: DSO Strategy, p. 87](#)

2.84. While we consider that this analysis provides insight into the characteristics of how CLASS providers may interact and compete in the balancing services market, we do not draw all of our conclusions on CLASS competition impacts from this analysis alone. After presenting this analysis, we go on to look at the ESO's expected market reforms and future procurement requirements in Chapter 6 of the IA. In this section, we also discuss how multiple DNOs competing against each other may unfold in the changing context of RIIO-ED2. The next section of Chapter 6 covered a detailed examination of theories of harm, such as market foreclosure and coordinated effects. We believe that across the full analysis presented in Chapter 6 we explored a reasonable range of possibilities for how a CLASS provider may compete in the balancing services market and that it would not be proportionate to conduct further analysis at this time.

#### *Future balancing requirements*

2.85. The majority of respondents did not question that the ESO will have a growing requirement for balancing resources in the future. This was evident in our analysis of the ESO's requirements in 2021, compared to the rising requirements expected in RIIO-ED2 and beyond.<sup>47</sup> However, one stakeholder suggested that, as the ESO's new products are expected to be more efficient, the procured volumes by the ESO will decrease and that this will compound any impacts from CLASS.

2.86. We engaged frequently with the ESO in our process of consulting on CLASS to understand the requirements they will have in the future. The rate of growth may accelerate or decelerate as new efficiencies are developed, but we would disagree with the characterisation that the ESO's market for balancing services is decreasing. Indeed, in the period of RIIO-ED2 we expect to see growth in requirements and looking further into the future as more large-scale, single-site generators come online such as Hinkley Point C, and new interconnectors are established such as the Viking Link, this market is expected to expand much further.<sup>48</sup> For stakeholders looking to understand more about the future requirements the ESO will have, we suggest they review the previous Operability Strategy Report 2022 published by the ESO and their updated 2023 report expected later this year.<sup>49</sup>

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<sup>47</sup> [Ofgem \(2022\), IA - Regulatory treatment of CLASS as a balancing service in RIIO-ED2, pp. 111 - 112](#)

<sup>48</sup> [National Grid ESO \(2021\), Operability Strategy Report, p. 27](#)

<sup>49</sup> [National Grid ESO \(2021\), Operability Strategy Report](#)

### *Role of a DNO*

- 2.87. Several respondents who expressed a preference for prohibiting CLASS highlighted in their response that they believed, on a principles basis, DNOs should not be operating CLASS-type activities nor be participating in the balancing services market.<sup>50</sup>
- 2.88. Commonly, stakeholders referenced Ofgem’s decision on the Prohibition of Generation Guidance (POGG) for DNOs.<sup>51</sup> This decision is intended to prevent DNOs from owning and operating battery storage services, a technology that is regulated as generation. The rationale for this decision is specifically made in the context of a form of generation that can be operated by other third parties. As such, our decision to prohibit DNOs from operating in this space was to enable a competitive market for other providers to develop storage technologies and new flexibility business models.
- 2.89. However, the case of CLASS is fundamentally different to our decision on the POGG and we do not agree that we should simply apply the same rationale for a different technology. Unlike batteries, CLASS is a technology that can only be operated by DNOs and does not constitute generation. These factors mean that in relation to CLASS we do not have the same concerns we had about market distortions and impacts to competition as we had in relation to batteries in our decision on the POGG. Given no other providers could come forward to offer CLASS technology, prohibiting DNOs from operating it would mean stopping a specific technology from developing in its entirety. We consider that this would run contrary to our responsibility to enable competition and innovation, which drives down prices and results in new products and services for consumers.<sup>52</sup>
- 2.90. We also note that DNOs are already engaged in voltage control services to the ESO as part of the Grid Code Operating Code (OC) 6 requirement.<sup>53</sup> This DNO function is a balancing activity used by the ESO when the balancing services market has been exhausted. While it may be possible for third parties to provide balancing services for these situations, we do not see calls from stakeholders to stop DNOs from performing these balancing activities or claims that DNOs are not entitled to deliver demand reduction in this case. In fact, we saw suggestions from stakeholders in our

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<sup>50</sup> Please see paragraphs 3.69-3.73 of the 2022 Consultation for further comment on this.

<sup>51</sup> [Ofgem \(2021\), Prohibition on Generating Guidance \(POGG\)](#)

<sup>52</sup> [Ofgem, Our role and responsibilities](#)

<sup>53</sup> [Grid Code \(2022\), Operational Code 6](#)

2020 Consultation and from one stakeholder in our 2022 Consultation, that CLASS should be used as a method to enhance DNOs existing abilities to respond to their OC6 requirement. We do not see a clear rationale for why consumers would benefit from CLASS being used as part of the OC6 requirement, but be worse off when CLASS is deployed to provide balancing needs outside of these circumstances.

- 2.91. The market for balancing services exists to create an efficient solution that cannot be addressed more efficiently by network infrastructure and its operation methods. It should be expected that new innovation in network infrastructure and operation methods, offering more efficient solutions, would be allowed to develop. We believe CLASS represents an innovation in network operation that helps to address the challenges of balancing the system. Allowing CLASS and subjecting it to competitive market forces helps to ensure its efficient deployment, while also passing benefits of its development on to consumers. Our decision relates to the RIIO-ED2 period, during which time we will reflect on how CLASS develops as part of our process for the next price control period to inform our longer-term outlook on distribution network voltage control services.

## **Alternative use cases**

### **Summary of our consultation position**

- 2.92. In putting forward a consultation on the regulatory treatment for CLASS in RIIO-ED2, we looked to assess whether CLASS should be allowed as a balancing service and, if so, what would be the best regulatory option for consumers. We did not approach the 2022 Consultation as an opportunity to ask whether CLASS would be better or worse than a different technology, nor whether there was a better or worse use case for CLASS.
- 2.93. In our IA, we noted the emergence of other voltage control technologies and provided an overview of how CLASS could be used to enhance the current OC6 requirement for DNOs to disconnect or use voltage reduction in response to an ESO instruction. However, we stated that we saw these matters as outside the scope of our 2022 Consultation on whether CLASS should be allowed to be used in the balancing services market.

### **Stakeholder responses and decision rationale**

- 2.94. Nevertheless, we received multiple responses from stakeholders who were concerned that there may be greater benefits to be found from alternative use cases of CLASS as a voltage optimisation initiative. Additionally, there were concerns that overly incentivising the deployment of CLASS would prevent DNOs from exploring other voltage management activities.
- 2.95. As mentioned in the previous section, one stakeholder suggested that the use of CLASS should be reserved to supporting the ESO with system operation, eg in line with DNOs' obligations to manage system frequency during losses of generation under OC6. However, we note that Baringa's analysis indicates that the costs associated with the wider deployment of CLASS dominate the benefit gained by a reduction in automated disconnection due to CLASS.<sup>54</sup>
- 2.96. Stakeholders commonly cited NPG's BEET project. It was suggested that the benefits would be much larger for optimisation focused voltage initiatives, such as the BEET project, and that they did not have strong opposing views about DNOs pursuing these types of activities instead. In raising these concerns, we noted a number of inaccuracies and misunderstandings in stakeholders' responses and in this section, we intend to further clarify the relationship between voltage control services such as CLASS and other voltage optimisation projects.
- 2.97. We are aware that voltage management technology is an innovation area that DNOs have been exploring through a variety of initiatives and innovation projects during RIIO-ED1. Ofgem is supportive of the objectives of these projects, ie seeking to optimise voltage on the LV network in order to reduce customer demand and energy consumption. DNOs are able to develop these technologies with the rise of new remote technologies for adjusting tap changers and DNOs gaining more accurate data from their networks. Using these technologies, they have been able to explore methods for making precise and frequent adjustments to voltage levels to generate economic and efficiency benefits for customers and the network.
- 2.98. However, Ofgem disagrees with some stakeholders' characterisations of voltage management solutions being an "either/or" problem, where a choice must be made between CLASS-type activities and voltage optimisation solutions.

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<sup>54</sup> See CLASS Impact Assessment Final Report in the ENWL folder of CLASS 2022 Consultation Stakeholder Responses: <https://www.ofgem.gov.uk/sites/default/files/2022-07/Published%20CLASS%202022%20Consultation%20Responses.zip>



- 2.99. We note that NPg has put forward plans to operate both CLASS and voltage optimisation through its BEET project. It recognises that CLASS may conflict with BEET operations if it were being used for a service requiring demand reduction, but NPg believes there are complimentary applications for CLASS if used for other balancing services. We would also highlight a similar initiative to NPg's BEET project, not referenced by stakeholders, which is ENWL's Smart Street. Both projects aim to utilise the principle of Conservation Voltage Reduction to make frequent and small adjustments to voltage in order to reduce customer demand. While NPg's BEET project is active at primary substations where CLASS operates, Smart Street does not operate at the primary substation level and instead allows for both technologies to be active simultaneously, regardless of the balancing service product that CLASS is being used for (eg a balancing service requiring demand reduction). We do not have a view on which implementation is superior nor do we believe that these projects represent the only possible voltage optimisation methods being explored. However, it is not clear to Ofgem that voltage optimisation initiatives are precluded by a DNO decision to deploy CLASS.
- 2.100. In the specific case of NPg's BEET project, we note that NPg intends to prioritise its voltage optimisation project over its CLASS activities. This initially demonstrates to us that DNOs are continuing to pursue voltage optimisation initiatives, despite CLASS being an activity that has been open to every DNO since 2016.
- 2.101. We would also highlight to stakeholders that we do not believe the modelled consumer benefits of early-stage innovation projects such as NPg's BEET project are as reliable as the measurable consumer benefits of CLASS, a technology that has been active for several years. Stakeholders raising the concern of alternative use cases commonly cited annual consumer benefits from NPg's BEET project to be up to £20 per annum<sup>55</sup>, comparing this with NERA's CBA of CLASS presenting a consumer benefit of £2 per annum.
- 2.102. We note that these stakeholders in their response compared the net benefit of CLASS (discounted at a rate of 3.5 per cent) with a gross benefit figure for BEET (undiscounted). In the below table, we set out a more like-for-like comparison of the estimated benefits for BEET and CLASS. This suggests a far more comparable £/customer benefit of £19.71 and £15.81 for BEET and CLASS respectively. We also note that the CLASS estimates are more robust as they are based on observed market data. Moreover, a DNO may choose to deploy both BEET and CLASS like

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<sup>55</sup> See [NPg \(2021\), Detail on our CVPs](#)

services across their distribution network, such that the benefits are cumulative rather than mutually exclusive.

**Table 2: Comparison of estimated benefits under NPg BEET and ENWL CLASS**

	Unit	NPg BEET	ENWL CLASS
Typical domestic consumption value	kWh	2,900	
Assumed demand reduction	%	4	
Assumed demand reduction	kWh	116	
Assumed unit rate of electricity	p/kWh	17	
Total bill impact	£m		26.87
Total customers	No.		1,700,000
<b>Benefit per customer</b>	<b>£/year</b>	<b>19.72</b>	<b>15.81</b>

**Source:** NPg (2021), [Detail on our CVPs](#) and Ofgem (2022), [IA - Regulatory treatment of CLASS as a balancing service in RIIO-ED2](#).

**Note:** Total bill impact for CLASS is based on Option 1A: DRS8 (scenario A, base case) in 2023/24. All benefits expressed in 2020/21 prices.

2.103. Another alternative use case suggested by a respondent to the 2022 Consultation was to permanently lower voltage at primary substations by the amount CLASS does for temporary and short periods, between 3 – 5%. They suggested this would achieve a permanent reduction in energy consumption on the network.

2.104. Ofgem believes that this proposal does not show a sound understanding of the voltage operation of a network and would potentially compromise the duty of DNOs to deliver voltage to customers within statutory limits. While CLASS is able to temporarily reduce voltage by 3 – 5% for short periods of time, if this response were extended permanently it would likely lead to demand rebound<sup>56</sup>, negating much of the temporary demand reductions.

2.105. To conclude, we would like to highlight our Final Determination decision for RIIO-ED2 on projects like Smart Street and the BEET project, where we have decided that the costs are included in the technically assessed category and not subject to cost

<sup>56</sup> Resistive loads such as charging an electric vehicle battery will still consume the same amount of electricity to reach a full charge, even if CLASS is temporarily lowering voltage. When CLASS is activated the consumption from some demands is shifted and spread across a longer time period which would begin to overlap with new peaks in consumption profiles across potentially thousands of customers connected to the same primary substation.

benchmarking.<sup>57</sup> We are funding these activities and gathering reporting from each DNO with the intention to gain further understanding of the value they deliver for consumers and overall network efficiencies. At the mid-point of RIIO-ED2, we will likely begin work on the sector-specific methodology for the future price control period.<sup>58</sup> At that time, we intend to further review the comprehensive suite of distribution voltage technologies that are emerging to establish a longer-term regulatory framework.

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<sup>57</sup> See ENWL and NPg Company Annex: [Ofgem \(2022\), RIIO-ED2 Final Determinations](#)

<sup>58</sup> [Ofgem \(2022\), Open Letter on the next network price control review process](#)

### 3. Arrangements for CLASS deployment

#### Section summary

This Chapter outlines our decisions on how CLASS should be implemented under DRS8 and our considerations for a range of implementation measures that stakeholders suggested. This includes topics such as potential limits on CLASS, adjusting sharing factors, settlement arrangements as well as reporting and monitoring measures.

- 3.1. In our 2022 Consultation, we asked stakeholders to provide their thoughts on any additional measures they thought it necessary to introduce in the event of a wider deployment of CLASS in RIIO-ED2. While some DNOs and the ESO believed current procedures and policies were sufficient and proportionate, other stakeholders provided a broad range of suggestions. These included subjecting CLASS to new reporting and monitoring requirements, introducing restrictions on the level of deployment and reducing the incentive on DNOs to deploy CLASS.
- 3.2. This Chapter summarises the stakeholder responses on each of these proposals and sets out our decision rationale on whether to introduce new arrangements for RIIO-ED2.

#### Adjustment of totex efficiency incentive rate for CLASS

- 3.3. Under DRS8, the net revenue a DNO receives from CLASS activities is shared with consumers through the totex incentive mechanism (TIM) and reflected in DUoS charges. The ratio of the revenue that is retained (or paid for if net revenue is negative) by the consumer is determined by the totex efficiency incentive rate. If a DNO has, for example, a totex efficiency incentive rate of 55%, then consumers would retain 45% of the profit or pay for 45% of the loss.<sup>59</sup> The totex efficiency incentive rate can vary from DNO to DNO.

#### Stakeholder responses

- 3.4. Some stakeholders raised concerns that the totex efficiency incentive rate, with respect to CLASS, would be set at too high level and that it should be reduced. One stakeholder argued that DNOs would still have a strong incentive to deploy CLASS,

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<sup>59</sup> The mechanism is described in CRC 5C in [Ofgem \(2016\), ED1 Specials template](#)

even if they retained a lower share of the profit, and a lower rate would see a greater share of benefit passed on to consumers as deployment levels of CLASS would still be comparable. Other stakeholders also suggested a lower totex efficiency incentive rate, stating that it should be closer in line with the profit margin of a typical commercial aggregator. This margin was cited as being 10% in favour of the company and 90% in favour of the customer, although we were unable to substantiate how representative such a ratio may be in the industry.

### **Our decision rationale**

- 3.5. In response to these arguments from stakeholders, we carefully considered whether it would be advisable to introduce a bespoke totex efficiency incentive rate for CLASS. Ultimately, we have decided to retain the approach in DRS8 which sees net revenues shared with consumers via the TIM. There are a number of reasons why we have decided to maintain this position for RIIO-ED2.
- 3.6. With only one DNO currently operating CLASS, there is limited visibility on what might be the steady state costs and revenues associated with CLASS deployment. The absence of historical data means it would be challenging to calibrate an “optimal” incentive rate that drives DNOs to deploy CLASS while ensuring consumers earn the maximum possible benefit. Our concern here is that setting the rate too low would mean that CLASS is not deployed by DNOs and the aggregate benefit accruing to consumers would therefore in fact reduce.
- 3.7. We also consider that CLASS investment decisions must contend with a number of risks. For example, DNOs must bear the risk associated with capex investment across a number of primary substations and the uncertainty over what balancing services products CLASS may be able to successfully compete in given that it is still a novel technology. In addition, we note that the regulatory uncertainty over the enduring framework for CLASS is another factor that may influence investment decisions.
- 3.8. We also note that, in contrast to other balancing services providers, DRS8 also exposes consumers to potential losses. Reducing the rate would also have the effect of increasing the share of losses that consumers would have to bear in the event that CLASS net revenues were negative. While this may be a more remote possibility, we still had concerns on exposing consumers to greater risk in this regard.

3.9. Furthermore, as set out in Final Determinations for RIIO-ED2, we have decided to reduce the totex efficiency incentive rates for the majority of DNOs.<sup>60</sup> Our view is that, at the present time, these rates strike an appropriate balance between incentivising DNOs to deploy CLASS and rewarding consumers.

3.10. The table below shows the totex efficiency incentive rates for each DNO in RIIO-ED1 and RIIO-ED2, alongside the percentage change. We can see that on average the incentive rate for CLASS under DRS8 will decrease by 10% in RIIO-ED2. This shows that, on average, a higher proportion of profits from CLASS will be shared with consumers from CLASS in RIIO-ED2 than seen in RIIO-ED1.

**Table 3: DNO totex efficiency incentive rates at Final Determinations**

DNO group	RIIO-ED1	RIIO-ED2	% change
ENWL	58%	49.4%	-15%
NPg	56%	49.9%	-11%
SPEN	54%	49.9%	-8%
SSEN	47%	49.3%	5%
NGED	70%	50%	-29%
UKPN	53%	50%	-6%

**Source:** [RIIO-ED1 Price Control Financial Model for the Annual Iteration Process November 2021](#) and [RIIO-ED2 Final Determinations Overview, Chapter 9](#)

3.11. As part of our review of the next network price control, we expect to consult at the mid-point of RIIO-ED2 on the sector specific methodology for the subsequent electricity distribution network price control. We believe this to be an appropriate time to formally review the deployment of CLASS and consider whether any changes are needed to the incentive rate.

## Managing CLASS participation levels in the balancing services market

### Stakeholder responses

<sup>60</sup> [Ofgem \(2022\), RIIO-ED2 Final Determinations Overview, Chapter 9](#)

- 3.12. Some stakeholders proposed that Ofgem should limit the deployment of CLASS. They indicated this could be achieved by prohibiting CLASS from being deployed in select balancing service products and/or introducing a cap on overall CLASS market share of, say, 50%. Stakeholders seemed to be motivated by concerns they raised on a large-scale deployment scenario of CLASS having an adverse impact on competition and investor confidence, and saw limiting DNO market entry as a potential mitigation.

### **Our decision rationale**

- 3.13. We disagree with measures that stakeholders put forward to limit the deployment of CLASS. It would be perverse for Ofgem to limit the deployment of CLASS when our analysis indicates that it yields a strong consumer benefit, and one that increases with the level of deployment.
- 3.14. We believe that the market is best placed to dictate the level of CLASS deployment, and that imposing arbitrary thresholds on the market share of one technology would increase the regulatory burden and run the risk of sub-optimal allocations. We are unsure why stakeholders seem to treat DNOs as one homogenous entity, as opposed to recognising the competitive pressure that different providers of CLASS can exert. As discussed in Chapter 2, we also have reasons to believe that concerns stakeholders raise around the impact of CLASS on other investment in the market are overstated.
- 3.15. As stakeholders have recognised, the ESO is reforming the balancing services market and CLASS has not yet been tested across the full range of balancing services products that it could meet the technical requirements for. Rather than imposing limits on the rollout of CLASS, we believe competitive dynamics will help to reveal the value of the technology. Observing how CLASS participation evolves alongside the reforms to the balancing services market will allow us to better understand the technology, its impacts and the role it could play in a net zero energy system.

### **Monitoring the impact on customers**

- 3.16. In Chapter 4 of our IA, we provided analysis of potential impacts on customer asset health and quality of supply and concluded that any impacts would be minimal to none.

## Stakeholder responses

- 3.17. A small number of stakeholders raised concerns in their 2022 Consultation responses that CLASS would still have a material impact on domestic and Industrial and Commercial (I&C) customers. These stakeholders did not provide evidence to substantiate their view, but nonetheless suggested two main types of mitigations for any potential impacts. These included:
- Customers should be notified when CLASS is activated and then be able to report any issues they observe
  - Customers should be able to opt-out of being connected to a CLASS-enabled primary substation.
- 3.18. A small number of stakeholders raised these concerns with specific reference to I&C customers who may have more sensitive equipment than domestic customers.

## Our decision rationale

- 3.19. We would first refer stakeholders to the survey conducted by ENWL during their trial phase of CLASS which was summarised in our IA under Chapter 4. The survey results showed no statistically significant change in the proportion of customers noticing a difference in the quality of their electricity supply due to CLASS.<sup>61</sup> We note that it is unlikely that a customer would be able to distinguish the difference between small variations in voltage and associate those variations with specific electrical issues. In any case, we note that the voltage variation associated with CLASS takes place within statutory limits, and it does not seem appropriate to introduce such a process for CLASS but not for any other factor that may lead to a temporary change in voltage.
- 3.20. With regard to allowing customers to opt out, we do not believe that this is a proportionate measure. As CLASS is installed and activated at primary substations, it is not possible for a single customer to be exempted from CLASS activations without potentially excluding thousands of others who are keen to realise the benefits of CLASS. Again, because the service remains within the statutory limits, we also do not see any reason why customers should be given this option.

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<sup>61</sup> [ENWL \(2015\) Customer Survey Initial Summary Report](#)



- 3.21. As set out in the NTC, customers are required to accept specific characteristics for the supply they receive if they have a connection to the distribution network. The NTC states that customers accept that electricity will normally be delivered within voltage limits of +10% and -6% for 230V and 400V supply. Customers also agree that if they wish to have a supply free from transient variation in voltage and frequency, they must take their own protective measures.<sup>62</sup>
- 3.22. With respect to I&C customers, a large amount of information was gathered during ENWL's first deployment stages of CLASS. This included surveys and engagement with I&C customers.<sup>63</sup> We have not seen evidence to suggest that I&C customers have had any systematic problems with CLASS operating for several years over much of ENWL's network.
- 3.23. We would expect other DNOs planning to deploy CLASS to learn from ENWL's experience and that DNOs would follow procedures already in place for monitoring and addressing specific customer issues. ENWL has already been proactive in disseminating its learnings from deploying CLASS and should customer-specific issues arise, we would expect them to be addressed by current BAU practices.

## Addressing supplier imbalances

- 3.24. In our 2022 Consultation, we asked stakeholders if they agreed with our view that it would not be proportionate to require Elexon to work with industry to develop a solution to adjusting supplier imbalance positions via the modification process in response to CLASS activations at this stage. The analysis in Chapter 4 of our IA found that the aggregate impact of CLASS on settlement cashflows was immaterial.

## Stakeholder responses

- 3.25. 7 stakeholders agreed with our position, although 2 explicitly disagreed. 5 gave a more ambiguous response that changes could be needed, but indicated that they were unsure of what the threshold for doing so should be.
- 3.26. Where stakeholders disagreed, they often referenced Modification Proposal P415, which seeks to amend the Balancing and Settlement Code (BSC) to allow Virtual

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<sup>62</sup> [ENA \(2022\), National Terms of Connection](#)

<sup>63</sup> [ENWL \(2015\), CLASS customer engagement](#)

Lead Parties to participate in the GB wholesale market.<sup>64</sup> Stakeholders thought there was some similarity between this proposal, which relates to action taken on a final demand asset that impacts on the supplier's position, and suggested this would be a precedent for modification with respect to CLASS. Some of these stakeholders also argued that distortions may increase as Market Wide Half Hourly Settlement expands and if high imbalance prices continue. One stakeholder estimated the cost of a modification to be around £1.5m (excluding supplier costs).

- 3.27. However, the majority of stakeholders believed that adjusting supplier imbalance positions via the modification process in response to CLASS was not necessary at this stage. They pointed to existing mechanisms within the settlements process as being sufficient to manage any impacts attributable to CLASS participation. These stakeholders agreed that the impact in monetary terms was not currently large enough to warrant any changes, although the settlement process may need to be reviewed if CLASS activations increase considerably.

### **Our decision rationale**

- 3.28. We agree with the view expressed by some stakeholders that the current impact on supplier imbalances is immaterial and does not therefore warrant a modification at this stage. The analysis in our IA, which was supported by Elexon, found that CLASS activations, on a pro rata basis, would account for < 0.01% of the total energy imbalance cashflow.
- 3.29. We also note BSC and non-BSC parties can submit modification proposals, should circumstances change, and we would encourage industry to explore this option if there are reasons to believe the impact of CLASS has materially increased.

### **Perceived conflicts of interest**

- 3.30. As part of our IA, we reviewed whether the provision of CLASS as a balancing service by DNOs could adversely affect competition in the RIIO-ED2 period. While neither Ofgem nor stakeholders had identified any historical examples of anti-competitive behaviour, we nevertheless considered the possibility that coordinated

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<sup>64</sup> [Elexon \(2022\), P415 'Facilitating access to wholesale markets for flexibility dispatched by Virtual Lead Parties'](#)

effects and/or foreclosure effects could arise. This analysis can be found on pages 119 – 133 of our IA.

- 3.31. In short, we concluded that it is unlikely that coordinated or foreclosure effects could arise in the market for balancing services in the event of a wider deployment of CLASS. We determined it would be unlikely that a DNO could secure a dominant position in the market for balancing services and that DNOs face limited incentive and opportunity to discriminate against potential rivals. We also considered ongoing developments in the DSO transition and the baseline expectations on conflicts of interest set out for DNOs as part our business planning guidance for RIIO-ED2. For the avoidance of doubt, Ofgem’s view is that CLASS is strictly a DNO activity.
- 3.32. Under any circumstances, we stated that Ofgem currently has the necessary tools and enforcement powers should a licensee breach any relevant licence conditions or be found to have entered into anti-competitive agreements or committed abuses of a dominant position.

### **Stakeholder responses**

- 3.33. Several stakeholders maintained their concerns that DNOs operating CLASS would represent conflicts of interest that could lead to market distortions. Some were concerned on explicit conflicts of interest that may manifest with respect to CLASS, eg if a DNO may discriminate against a potential rival in the market for balancing services that is looking to connect to its distribution network. Other stakeholders argued on a more principles basis that it was inappropriate for a DNO to participate in the balancing services market.
- 3.34. Both groups had concerns that the proposed measures in RIIO-ED2 should go further still and mandate, for example, full legal separation of DNO and DSO functionalities. These stakeholders also suggested that Ofgem outline guidelines for what would represent DNOs taking advantage of their role and what conflicts of interest may arise.
- 3.35. One stakeholder raised a concern that if National Grid Electricity Distribution (formerly Western Power Distribution) were to operate CLASS it could see one subsidiary of National Grid Group selling services to another. We believe this concern is outside of the scope of our 2022 Consultation and decision-making

process. However, we would draw attention to the ESO's special licence conditions<sup>65</sup> which seek to ensure the ESO's independence from National Grid's other business activities.<sup>66</sup> Should the ESO fail to adhere to these licence conditions, Ofgem can use its enforcement powers to ensure that any such breach is remedied. We would also refer this stakeholder to the Competition and Markets Authority (CMA) investigation into the relevant acquisition for further information and competition analysis on the acquisition.<sup>67</sup>

- 3.36. However, other stakeholders agreed with our analysis and believed that current arrangements, as well as those proposed in RIIO-ED2, would be sufficient to mitigate conflict of interest concerns or anti-competitive behaviour. The ESO pointed to its own market monitoring which would identify any instances where the actions of a provider of CLASS (or other technology) warranted investigation. One DNO outlined in detail the steps it is proposing as part of its business plan for RIIO-ED2 to address conflicts of interest in the creation of its separate DSO function.
- 3.37. One stakeholder raised a concern about the Reactive Power Market Design Project's potential move to a nodal approach to needs-assessment and pricing. They suggested that this would likely lead DNOs to having greater ability to discriminate with regards to connections. We note that as part of this suggestion, a methodology has been developed to create a consistent, transparent and repeatable way to produce market signals.<sup>68</sup> Additionally, one stakeholder referenced the developing primacy rules concerning Active Network Management (ANM) and how DNOs will have the ability to foreclose balancing services providers in favour of their CLASS activities.

### **Our decision rationale**

- 3.38. We are comfortable that our proposals as part of RIIO-ED2 are sufficient to mitigate any potential conflicts around a DNO deploying CLASS and fulfilling its licence obligations, including with respect to its new DSO roles. We would again refer stakeholders to our detailed review of conflicts of interest under paragraphs 6.120 –

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<sup>65</sup> [Special Conditions - ESO \(ofgem.gov.uk\)](https://www.ofgem.gov.uk/special-conditions-eso)

<sup>66</sup> In particular, please see Special Conditions 2.3, 2.6 and 2.7. Alongside these Special Conditions, we would also highlight the recent [decision](#) to modify the ESO's licence in relation to Business Separation.

<sup>67</sup> [CMA \(2021\), National Grid / PPL WPD Investments Merger Inquiry](#)

<sup>68</sup> [National Grid ESO \(2021\), Reactive Power Market Design: Innovation project](#)

- 6.133 of our IA, which concluded that DNOs face weak incentives to discriminate against potential rivals in their role as regulated distribution networks.<sup>69</sup>
- 3.39. We also consider that the measures that we are proposing to introduce in RIIO-ED2 on DNO/DSO separation are the right ones at the current time. Baseline expectation 3.2.5 requires DNOs to introduce proportionate measures, developed with robust stakeholder engagement, to identify and address actual and perceived conflicts between its DSO and network ownership roles or other business interests.<sup>70</sup> This extends to whether CLASS, a DNO activity, has any conflict with DSO functions and services. We are also committed to exploring the value of alternative governance arrangements at a sub-national level to support delivery of net zero at least cost.<sup>71</sup>
- 3.40. Furthermore, we have decided to introduce a new financial DSO incentive in RIIO-ED2.<sup>72</sup> This will see DNOs penalised (or rewarded) if they fail to meet (or exceed) the baseline expectations for DSOs. We have decided that the incentive will draw on three forms of evidence – a stakeholder survey, a performance panel assessment and outturn performance metrics. This should ensure that if a DNO were, for example, to promote its own business interests (such as CLASS) at the expense of its role in ensuring neutral flexibility market facilitation it would run the risk of incurring penalties.
- 3.41. We have also been clear on why we think DNOs should be allowed to deploy CLASS in the market, even if we have previously decided they should not operate storage or other forms of aggregation. Only DNOs can provide CLASS, the service could not be offered by a third party, and our assessment suggests that the net economic benefit is likely to be significant. Prohibiting CLASS would narrow the set of choices available to the ESO and, for the reasons we have set out above, we consider that it would ultimately mean consumers faced higher electricity bills than they might otherwise do.
- 3.42. With regard to DNOs involvement in connecting providers to offer reactive power services or foreclosing other providers through ANM, we would point stakeholders to our previous discussion in Chapter 6 of our IA where we assess theories of harm such as foreclosure effects. We concluded that in theory DNOs could foreclose rivals, but in practice they have very little incentive or ability to do so. DNOs must provide

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<sup>69</sup> [Ofgem \(2022\), IA - Regulatory treatment of CLASS as a balancing service in RIIO-ED2](#)

<sup>70</sup> [Ofgem \(2021\), RIIO-ED2 Business Plan Guidance](#)

<sup>71</sup> [Ofgem \(2022\), Call for Input: Future of local energy institutions and governance](#)

<sup>72</sup> [Ofgem \(2022\), RIIO-ED2 Final Determinations Core Methodology](#)

connection offers whenever requested by a potential customer (other than in exceptional circumstances) and have limited ability to alter their offers to be more or less favourable to a customer due to regulatory and technical reasons.

## Reporting and monitoring on CLASS deployment

3.43. As part of our 2022 Consultation, we asked stakeholders what additional reporting or monitoring in RIIO-ED2 could be valuable to assess the ongoing impact of CLASS. We requested that stakeholders describe how they envisaged DNOs, Ofgem or any other party should support their proposed measures.

### Stakeholder responses

3.44. A number of stakeholders commented that they believed there was no need for additional monitoring or reporting to be put in place. They often pointed to existing reporting, such as the ESO's real-time publishing of balancing actions and weekly/monthly balancing reports, as being sufficient. These stakeholders also argued that CLASS should not be subject to additional reporting requirements when compared with any other balancing service technology.

3.45. However, other stakeholders were more enthusiastic about the idea of additional reporting and monitoring requirements. They believed this would improve transparency and enable market participants to better understand the development of CLASS. These stakeholders' proposals included:

- A specific publication, by the DNOs or Ofgem, that summarises CLASS activity in the period and includes analysis of DNOs' revenue, bid pricing, activations and product participation
- A review of the deployment of CLASS and its associated impacts, eg on competition and ESO balancing costs, which could be either annual or triggered when a specific threshold has been reached (eg CLASS market share).

### Our decision rationale

3.46. We do not believe there would be value in introducing bespoke reporting on CLASS at this stage. We consider that, in many instances, the suggestions from stakeholders often relate to information that is already monitored and in the public domain. For example, CLASS activity can already be observed through the ESO's data portal, where stakeholders can review full data sets for each balancing service.

For some services, this also includes real-time updates on provider utilisation, including CLASS. While there may be some value in providing this information on CLASS in a more accessible and consolidated format, we do not believe this would merit the additional costs to consumers.

- 3.47. However, we do recognise the need for a subsequent review of the deployment of CLASS in RIIO-ED2. At the mid-point of the price control, we intend to review CLASS market activity and assess whether any changes are required to its future regulatory treatment as a balancing service. For this reason, we do not believe that a further annual review, or one that is triggered at a particular threshold, is necessary.
- 3.48. In addition, we are minded to implement CLASS through a new DRS Category, DRS16: Distribution Network Voltage Control Services, in RIIO-ED2. DRS16 would operate in an identical way to DRS8 with regard to remuneration, but provide additional transparency as CLASS net revenues would be reported separately from other DRS8 activities. However, our final decision on this matter is of course subject to our decision on the licence modifications to be made to the electricity distribution licence following the statutory licence consultation for RIIO-ED2. We provide further detail on this in the following section.
- 3.49. One stakeholder suggested that DNOs should include CLASS enabled substations in their Embedded Capacity Registers (ECR), in the same way that other DER may be. The ECR could then show if the substation is being used to provide services to the ESO. However, we do not believe that it is necessary to require DNOs to publish which primary substations have installed CLASS equipment, whether on their ECR or in another format. We do not see issues in the deployment of CLASS, to the extent that it operates within statutory voltage limits, that would require other providers to have this increased visibility.
- 3.50. A few stakeholders also suggested that monitoring and reporting processes should be put in place to test any CLASS impact on network or customer asset health, including engagement with customers.
- 3.51. With respect to network asset health, we would refer these stakeholders to our analysis of asset health impacts in Chapter 4 of our IA that identified no material concerns. Nonetheless, we would highlight measures in the wider RIIO-ED2 framework, such as the NARM<sup>73</sup>, as holding DNOs accountable for investment

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<sup>73</sup> See Chapter 6 in [Ofgem \(2022\), RIIO-ED2 Final Determinations Core Methodology](#)

decisions on asset replacement. This would help to identify if a DNO is an outlier in terms of asset replacement.

- 3.52. With respect to monitoring of asset impacts by engaging with customers, we note that ENWL has already engaged with customers throughout their deployment of CLASS, including surveys of customers and engaging with I&C customers. We also would refer stakeholders to our analysis in our IA where we concluded that CLASS operates within statutory voltage limits which ensures safe operation of the distribution network. In short, we do not believe it would be proportionate to require such measures in addition to DNOs' existing practices of engaging with customers, alongside enquiry and complaints processes.

## Regulatory regime

- 3.53. Some stakeholders expressed concerns that it would not be lawful for the Authority to direct that CLASS be included as a DRS. Similar concerns were also raised during the 2020 Consultation and were responded to in the 2022 Consultation in Chapter 3, paragraphs 3.62 – 3.80. With careful consideration of these concerns regarding the applicable legal framework, Ofgem remains of the view that it would not be unlawful to proceed with our minded-to position to continue to allow CLASS to participate in the balancing services market, remunerated through the DRS category 8 (Option 1a).
- 3.54. This section summarises Ofgem's considerations and response to the main concerns expressed by these stakeholders in their responses to the 2022 Consultation (Ofgem having already considered and provided a response to the stakeholder concerns raised in the 2020 Consultation via the 2022 Consultation), in particular:
- Whether the Authority has the power to direct that CLASS should be treated as a Directly Remunerated Service and, specifically, as a DRS8 service.
  - Whether any decision to that effect would comply with applicable legislation in relation to electricity balancing and electricity transmission system operation.

### Charge Restriction Condition 5C.10

#### *Stakeholder responses*

- 3.55. One stakeholder argues that Ofgem has no power under Charge Restriction Condition ("CRC") 5C.10 to direct that CLASS be funded as a DRS because CLASS



does not fall within the General Principle set out in CRC 5C.4, since it is neither a “normal activity” of a DNO’s “distribution business” nor “ancillary” to that business. This stakeholder argues that our previous response regarding the “normal activities of [the DNOs’] distribution business”, in CRC 5C.4 of Schedule 2A, did not consider definitions set out in the applicable SLCs and the wider legislative context. However, for the reasons outlined below we consider this stakeholder’s interpretation to be too narrow and incorrect.

#### *Our decision rationale*

3.56. The stakeholder’s argument is made on the basis that since CLASS is not the service of “distribution” in the narrowest sense of the term (i.e., the “...conveying [of] electricity to any premises or to any other distribution system”<sup>74</sup>), it cannot be “part of the normal activities of [a DNO’s] distribution business” as provided in CRC 5C.4. Therefore, the stakeholder appears to be contending that the only services that Ofgem can classify as DRS are those that entail the distribution of electricity through the DNO’s distribution system. The stakeholder makes no distinction between the concepts of “distribution”, “Distribution Business”<sup>75</sup> and “normal activities of a DNO’s distribution business”.<sup>76</sup> Ofgem is of the view that all these terms must be considered to understand the purpose of the DRS licence condition.

3.57. “Distribution” is defined in Article 2(28) of the EU Directive 2019/944 (the “2019 Directive”) and the EU Regulation 2019/943 as amended (the “2019 Regulation”)<sup>77</sup> as “the transport of electricity on high-voltage, medium-voltage and low-voltage distribution systems with a view to its delivery to customers, but does not include supply”. While “Distribution Business” is not defined in the legislation, Standard Condition 1 of the electricity distribution licence defines “Distribution Business” as including a wider range of services than the mere transport of electricity with view to delivery, such as metering services and equipment and data services, and, in

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<sup>74</sup> See section 4(4) of the Electricity Act 1989 for a definition of “distribute” in relation to electricity.

<sup>75</sup> Standard licence condition 1 of the electricity distribution licence defines “Distribution Business” as “a business of the licensee (or, in relation to either of sub-paragraphs (a) and (c), a business of any Affiliate or Related Undertaking of the licensee) which, except to the extent otherwise specified by the Authority in a direction to the licensee, comprises any of the following activities: (a) the distribution of electricity through the licensee’s Distribution System (including any business in providing connections to that system); (b) the provision of Metering Services and Metering Equipment (including the service of providing Legacy Metering Equipment within the meaning of standard condition 34); and (c) the provision of Data Services, and in each case includes any business that is ancillary to the business in question.”

<sup>76</sup> CRC 5C.4 (The General Principle).

<sup>77</sup> Amended by the Electricity and Gas (Internal Markets and Network Codes) (Amendment etc.) (EU Exit) Regulations 2020/1006.

each case, any business that is ancillary to the business in question. This definition clearly supports the argument that “*normal activities*” extend beyond solely “*distribution*” in its narrowest sense.

- 3.58. Further, whether something forms part of the “*normal activities*” of the DNO’s Distribution Business is properly read as covering a wider range of activities than just the activity of “*distribution*” itself (or even of the “*Distribution Business*” itself). In our view, “*normal activities*” connotes a range of activities that the business carries out to facilitate and enable its core service provision, including enabling it to operate efficiently. Had the intention been to confine DRS to the act of “*distribution*” alone, the general principle in CRC 5C.4 would have provided for that and would not have stated that DRS may include “*services provided by a licensee as part of the normal activities of its Distribution Business*” (emphasis added).
- 3.59. Notably, the stakeholder accepts that voltage management is a required aspect of distribution but nonetheless states that providing voltage management to the ESO as a service for the purposes of balancing supply and demand on the electricity system as a whole is a very different matter. They do not, however, explain why this is the case. On the contrary, as set out above, we consider that CLASS can be considered a “*normal activity*” of a DNO’s “*distribution business*” or “*ancillary*” to that business. We therefore remain of the view that the Authority has the power to make the direction proposed in our minded-to position.

## **Consideration of regulatory framework**

### *Stakeholder responses*

- 3.60. The second argument that is made by the stakeholder is that DNOs providing CLASS would fall outside the scope of the key legislation regulating the provision of balancing services. We disagree and respond below to the stakeholder’s particular arguments under this head.

### *Our decision rationale*

- 3.61. Firstly, the stakeholder contends that balancing services are conceptually different from distribution under the legislative schemes and subject to a different regulatory regime (including not being subject to the licensing regime in ss. 4-10 of the Electricity Act 1989 (EA89)), so they necessarily cannot form part of the DNO’s “*normal business activities*”. However, we do not agree with the premise that scope

of those “*normal business activities*” is to be determined solely by reference to the scope of that licensing regime. Further, the logic of the stakeholder’s argument here would mean that any activity not licensed under ss. 4-10 EA89 would be outside the remit of Ofgem’s regulation of DNOs, which is plainly incorrect. The services covered by ss. 4-10 EA89 include numerous activities that are subject to regulation because they constitute part of the activities of the licensed entity, as determined by Ofgem in accordance with its broad licensing powers and by reference to its principal objective.<sup>78</sup>

3.62. Secondly, the stakeholder argues that DNOs are not “*market participants*” as defined in Article 2(25) of the 2019 Regulation and therefore fall outside the regulatory scheme for regulating balancing service providers. The stakeholder claims that Ofgem failed to consider this. That is incorrect. Ofgem has carefully considered the regulatory regime and is satisfied that there is nothing in that regime that would prevent Ofgem allowing DNOs to recover for the provision of CLASS through DRS8. Our view is that DNOs are “*market participants*” that provide “*aggregation*” through CLASS.

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<sup>78</sup> Our principal objective under section 3A(1) of the Electricity Act 1989 is to protect the interests of existing and future consumers in relation to electricity conveyed by distribution systems or transmission systems.

## 4. Next steps

- 4.1. Our decision has no implications for the regulatory treatment of CLASS as a balancing service in RIIO-ED1. DNOs may continue to offer CLASS to the ESO, with remuneration under DRS8, in line with our 2016 Direction until 31 March 2023.
- 4.2. With respect to RIIO-ED2, we propose to include a new DRS category in Special Condition 9.7 of the electricity distribution licence (DRS16: Distribution Network Voltage Control Services) which provides specifically for the remuneration of CLASS. We consulted on this new DRS category in our RIIO-ED2 Informal Licence Drafting Consultation.<sup>79</sup> The purpose of this new category would be to provide greater visibility of CLASS net revenues reported by DNOs, which will assist us in our review process during RIIO-ED2. We also consider that this will assure stakeholders that our decision on CLASS does not extend to other forms of flexibility services that a DNO could in theory offer to the ESO.
- 4.3. As currently drafted, the effect would be that CLASS is automatically treated as a DRS in RIIO-ED2 due to DRS16 being listed in Part C of Special Condition 9.7.<sup>80</sup> We would therefore not need to issue a direction to allow CLASS. However, our final decision on this matter is of course subject to our decision on the licence modifications to be made to the electricity distribution licence following the statutory licence consultation for RIIO-ED2.
- 4.4. As previously stated, we are committed to reviewing the development of CLASS as part of our sector specific methodology consultation for the next price control period. We will also use this opportunity to inform our longer-term outlook on the regulatory framework for distribution network voltage control services.

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<sup>79</sup> [Ofgem \(2022\), RIIO-ED2 Informal Licence Drafting Consultation](#)

<sup>80</sup> See Special Condition 9.7.5(b) in [Ofgem \(2022\), RIIO-ED2 Informal Licence Drafting Consultation](#)

## Appendix 1 – Glossary

### A

The Authority/Ofgem/GEMA

Ofgem is the Office of Gas and Electricity Markets, which supports the Gas and Electricity Markets Authority (GEMA or 'the Authority'), the body established by section 1 of the Utilities Act 2000 to regulate the gas and electricity markets in Great Britain.

### B

Balancing Mechanism (BM)

The ESO's primary tool for managing the balance of supply and demand on the electricity transmission system within each half hour trading period of every day.

Balancing Services Use of System (BSUoS) charges

The means by which the ESO recovers costs associated with balancing the electricity transmission system from generators and suppliers.

### C

The Competition and Markets Authority (CMA)

A non-ministerial government department in the UK that considers regulatory references and appeals, conducts in depth inquiries into mergers, markets and aspects of regulation of the major regulated industries.

Conservation Voltage Reduction (CVR)

Is the intentional operation of the distribution system to reduce customer voltages, within statutory limits, to achieve energy and demand reductions.

Customer Load Active System Services (CLASS)

A common term for remote voltage management technologies located at 33/11 (6.6)kV primary substations operated by DNOs. CLASS was an Electricity North West Limited (ENWL) innovation project that demonstrated this capability. The CLASS project, funded through Ofgem's Low Carbon Network Fund (LCNF) that operated under the previous electricity distribution price control to March 2015, showed that by remotely managing transformers and circuit breakers at primary substations to change voltage, DNOs can reduce or increase effective electricity demand and absorb reactive power.

## **D**

### Directly Remunerated Services (DRS)

Has the meaning given to it in CRC 1B (Interpretation of Part 4) of the electricity distribution licence.

#### DRS8: Value Added Service

Has the meaning given to it in Appendix 1 of CRC 5C (Directly Remunerated Services) of the electricity distribution licence.

#### DRS9: Miscellaneous

Has the meaning given to it in Appendix 1 of CRC 5C (Directly Remunerated Services) of the electricity distribution licence.

### Distributed Energy Resource (DER)

Any resource on the distribution system that produces or stores electricity. This can include distributed generation, storage, heat pumps and electric vehicles as well as other technologies.

### Distribution Network Operator (DNO)

A DNO is a company which operates the electricity distribution network which includes all parts of the network from 132kV down to 230V in England and Wales. In Scotland 132kV is considered to be a part of transmission rather than distribution so their operation is not included in the DNOs' activities.

There are 14 licenced DNOs that are subject to RIIO price controls. These are owned by six different groups.

#### Distribution System Operator (DSO)

The development of distribution system operation roles is a live and evolving policy area with various workstreams currently in progress. In general, DSO roles refer to innovative techniques and use of market-based solutions as alternatives to network reinforcement, as well as greater coordination with other network and system operators to achieve efficient outcomes in a whole system context.

#### Distribution Use of System (DUoS) charges

DUoS is a cost paid by suppliers to DNOs for the building and maintenance of the local distribution network. Suppliers then pass this DUoS charge on to energy consumers.

### **E**

#### Electricity System Operator (ESO)

The entity responsible for operating the electricity transmission system and for entering into contracts with those who want to connect to and/or use the electricity transmission system. National Grid Electricity System Operator Limited is the electricity system operator in Great Britain.

### **F**

#### Flexibility

The ability to modify generation and/or consumption patterns in reaction to an external signal (such as a change in price, or a message).

#### Frequency Response services

System frequency is a continuously changing variable that is determined and controlled by the second-by-second balance between system demand and total generation. The ESO is required to maintain a frequency of +/-1% of 50Hz at all times. To do this they procure

frequency services to respond to fluctuations in electricity demand or generation from forecast volumes or to withstand faults to the network or connected generation. These services include Firm Frequency Response, Dynamic Containment, Dynamic Regulation and Dynamic Moderation.

## **L**

### Licence conditions

These are the conditions under which a licensee holds its licence to operate as a gas transporter or electricity transporter and address various detailed matters including requirements to meet certain standards of performance, how the company's allowed revenue is to be calculated and procedures for modifying various documents.

## **N**

### Net Present Value (NPV)

NPV is the discounted sum of future cash flows, whether positive or negative, minus any initial investment.

## **P**

### Price control

The control developed by the regulator to set targets and allowed revenues for network companies. The characteristics and mechanisms are developed by the regulator in the price control review period depending on network company performance over the last control period and predicted expenditure (companies' business plans) in the next.

## **R**

### Reserve services

Reserve services provide additional electricity to the grid (or reduce electricity consumption) to manage unforeseen changes in demand or shortfalls in of generation. They can be distinguished from frequency response services by their slower response speeds and longer delivery durations, and by the fact that they are dispatched by instructions from the



ESO rather than in response to local measurements of grid frequency. Reserve services include Fast Reserve, Optional Fast Reserve and Short Term Operating Reserve.

RIIO (Revenue = Incentives + Innovation + Outputs)

Ofgem's regulatory framework, stemming from the conclusions of the RPI-X@20 project, to be implemented in forthcoming price controls. It builds on the success of the previous RPI-X regime, but better meets the investment and innovation challenge by placing much more emphasis on incentives to drive the innovation needed to deliver a sustainable energy network at value for money to existing and future consumers.

## **S**

Supplier

Any person authorised to supply gas and/or electricity by virtue of a Gas Supply Licence and/or Electricity Supply Licence.

## **T**

Tap changer

A mechanism for changing the connection to an electrical transformer from one tap position to another that allows for control of output voltage under a varying load.

Third party

Within the innovation context, third party refers to any person other than network companies. It may include, for example, private companies, academics, small and medium-sized enterprises, and trade bodies. It is often used interchangeably with non-network company.

Total expenditure (totex)

Totex includes both capital expenditure (capex) and operating expenditure (opex). Totex is made up of fast money and slow money.

Transmission system

The system of high voltage electric lines and high-pressure pipelines providing for the bulk transfer of electricity and gas across GB.