

# Annex 15B: CLASS Consumer Value Proposition (CVP)

Introduction to our CLASS CVP proposal for RIIO-ED2.

December 2021

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# 1 Executive Summary

This Annex describes the introduction of the CVP concept for RIIO-ED2 and our considerations behind the CLASS CVP proposal in our Final Business Plan (FBP).

Ofgem define CVPs as:

*Consumer Value Proposition is Stage 2 of the Business Plan Incentive, where a DNO could bid for reward by demonstrating the additional value its business plan will generate for existing and future consumers and consumers in vulnerable situations<sup>1</sup>.*

We have reviewed our Draft Business Plan (DBP) in this context, considering both the CVP criteria and also where our proposals go beyond Ofgem's baseline expectations.

We have reviewed potential candidates for CVPs in our Draft submission and identified Customer Load Active System Services (CLASS) as a Whole System CVP that is now included in our FBP.

CLASS works by reducing the voltage at primary substations to reduce electricity demand placed on the network from ENWL customers. This is achieved by lowering the tap changers on the transformers at each substation to achieve an aggregated response across our network. This response can then be provided to National Grid Electricity System Operator (NGESO) to help it to balance the national demand and supply of electricity and maintain security of those supplies.

CLASS is controlled through ENWL's Network Management System (NMS) which monitors the status of each CLASS substation and informs the tap changers to move up or down when an instruction is received from NGESO. Whilst our systems enable CLASS to operate, the actual operation happens directly by NGESO actions to instruct CLASS, with no intervention by ENWL.

CLASS provides the following benefits to our customers:

1. CLASS revenue is shared with customers on a 50% sharing basis providing an overall reduction in the customer's electricity bill;
2. The technology used reduces carbon and potentially displaces other providers with higher emissions e.g. diesel generators, from the market.

We consider that CLASS clearly qualifies as a CVP and invite Ofgem to assess CLASS under stage 2 of the Business Plan Incentive (BPI). Because CLASS competes in a market with other service providers we do not propose that the costs of CLASS should be directly funded via a CVP reward. The costs should be met via Ofgem setting efficient Totex allowances in ED2, on the basis that the treatment of the ED2 CLASS revenues would continue to be Totex shared as they are in ED1.

We suggest that Ofgem expedites the ongoing assessment of the regulatory approach to CLASS in ED2 and incentivises the further rollout of CLASS by other DNO's within ED2. This will bring even more benefits to all GB consumers.

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<sup>1</sup> P.93, [https://www.ofgem.gov.uk/sites/default/files/docs/2020/12/ed2\\_ssmd\\_overview.pdf](https://www.ofgem.gov.uk/sites/default/files/docs/2020/12/ed2_ssmd_overview.pdf)

## 2 CVP definition

### 2.1 CVP background

Ofgem introduced the Consumer Value Proposition as part of the Business Plan Incentive (BPI) for the RIIO-2 price controls. It forms Stage 2 of a four stage BPI process and looks to incentivise companies to propose initiatives that generate additional value for consumers.

A wide range of CVPs were proposed as part of the RIIO-GD and T2 price reviews and the overwhelming majority of them were rejected by Ofgem. As a consequence, Ofgem has issued much greater detail in the Business Plan Guidance on its CVP expectations for RIIO-ED2, including the areas of focus which would make a CVP eligible. Ofgem has stated that its CVP areas of focus are:

- i) Proposals that demonstrate approaches to providing services to vulnerable consumers that clearly go beyond the baseline expectations
- ii) Proposals that demonstrate approaches to providing services to major connection customers that clearly go beyond the baseline expectations
- iii) Proposals that exceed the baseline expectations that Ofgem has set out for Environmental Action Plans
- iv) Proposals that demonstrate approaches to Distribution System Operation (DSO) activities that clearly go beyond the baseline expectations set out in the roles and principles for DSO
- v) Proposals that exceed the minimum requirements that Ofgem has set out for whole system approaches in the whole systems section of the RIIO-ED2 Business Plan Guidance

For each of these, Ofgem has set out a range of 'baseline expectations' that are effectively minimum requirements that the Business Plans have to satisfy. Satisfying these expectations forms Stage 1 of the BPI, essentially the first hurdle that the Business Plan has to clear. Proposals above these baselines can be considered as eligible for a reward under the CVP process.

### 2.2 Addressing Ofgem CVP Considerations

Ofgem gave further specific guidance on how to identify CVPs in preparation for our FBP submission. We have therefore taken a selective approach to the identification of CVPs at final submission stage, though our plan overall contains many aspects that provide consumer value within eligible scopes for CVP.

The following section provides the information and benefits assessment behind the selection of CLASS as a CVP.

In assessing a CVP proposal, Ofgem expects to consider matters including:

Ofgem Criteria	ENWL Response
The monetised value should be at least £3m per proposal and the total number of proposals should not exceed ten per Business Plan.	Our CVP is of value to consumers of at least £3m.
Whether the proposal goes over and above the minimum requirements under Stage 1 of the BPI.	We confirm undertaking CLASS is not a minimum requirement for ED2.

Ofgem Criteria	ENWL Response
<p>The extent to which the proposal represents additional value to consumers, taking into account the functions typically undertaken by an energy network company as business as usual. For example, we would not expect to reward activities currently undertaken by DNOs in RIIO-ED1.</p>	<p>The activity is not undertaken by other DNOs in ED1. We are uniquely undertaking CLASS in ED1 and therefore it is not a business as usual (BAU) DNO activity. The existing direction<sup>2</sup> from Ofgem regarding the ED1 treatment of CLASS revenues is further evidence that CLASS is not a BAU activity as CLASS is provided using a specific regulatory instrument under a direction to be able to undertake the activity.</p>
<p>The extent to which the proposal includes evidence that shows how it incorporates consumer expectations/priorities and value (which may include willingness to pay). Extensive consumer and stakeholder interaction has taken place through developing the CLASS service.</p>	<p>Our CVP provides the assessment of value to consumers and in this case the ESO is a proven user of the service who makes, on behalf of all consumers, an actual payment for the CLASS service. The track record of actual payments is even stronger evidence than demonstrating a willingness to pay.</p>
<p>The extent to which the proposal has been reviewed by and received the support of the Ofgem RIIO-2 Challenge Group, the DNO's CEG or, otherwise, the extent to which reasons for the lack of such support are clearly and satisfactorily explained.</p>	<p>We have engaged with our Customer Engagement Group (CEG) at a specific session on this CLASS CVP and also engaged the CEG and Challenge Group on our process and candidates as CVPs. This CLASS CVP was developed post our draft business plan submission and post the engagement with Ofgem's RIIO-2 Challenge Group. As a result of engagement, this CVP was introduced into our Final Business Plan in response to the Challenge Groups feedback that they would like to see more Whole System benefits.</p>

<sup>2</sup> [Class DRS8 Direction to DNOs \(ofgem.gov.uk\)](https://www.ofgem.gov.uk/class-drs8-direction-to-dnos)

Ofgem Criteria	ENWL Response
<p>Whether the proposal includes a monetised consumer benefit and an associated monetisation methodology and the extent to which such a methodology is reasonable. The more confidence we have that the methodology is robust and generates an accurate value of consumer benefit, the more confidence we will have that any associated reward is appropriately sized and will provide a net benefit for the consumer. We consider that the use of a common methodology will enable consistency and comparability between how DNOs estimate consumer benefit and, in doing so, is likely to provide a level of confidence of whether consumer benefit has been reasonably calculated. For the avoidance of doubt, it is the responsibility of the DNO to propose a monetised consumer benefit and an associated monetisation methodology.</p>	<p>We confirm that the CVP has been monetised using a common approach developed across DNOs and reviewed and assured by SIA Partners, who have looked across the CVPs of all DNOs to ensure the monetised benefit is reasonable and consistent with an agreed national framework.</p>
<p>The extent to which the monetised benefits associated with the proposal accrue to existing and future consumers including consumers in vulnerable situations.</p>	<p>The benefits accrue to current ENWL customers in the form of bill reductions for the sharing of the CLASS revenue stream. The avoided carbon emissions accrue to customers now and in future due to the benefit of addressing net zero that the reduced carbon emissions bring. The benefits accrue to all customers including those in vulnerable situations.</p>
<p>Where a company makes a proposal that includes a commitment to deliver something within RIIO-ED2 (for example, a commitment to complete a project), whether arrangements to address the possibility of non-delivery are set out and the extent to which such arrangements for non-delivery are appropriate and implementable.</p>	<p>We consider the risk of non-delivery to be negligible into ED2 subject to Ofgem extending the current regulatory arrangements that enable us to undertake CLASS into RIIO-ED2. Should Ofgem not allow us to undertake CLASS in ED2 then we would not seek to recover our CLASS costs in ED2.</p>

The CLASS CVP falls into the section of Ofgem’s Business Plan Guidance relating to Whole Systems approach, v) Proposals that exceed the minimum requirements that Ofgem set out for whole system approaches in the whole systems section of the RIIO-ED2 Business Plan Guidance. This allocation is for the following reasons: -

- ENWL as a distribution licensee provides services to National Grid ESO who holds a different licence class. The activities of National Grid ESO relate to the electricity transmission system operation. CLASS is therefore a clear example of whole electricity system thinking in practise;
- Currently Ofgem has provided a determination for CLASS during ED1 to be treated as a DRS and our CVP is dependent on this treatment continuing in ED2.



## 2.3 Programme description

CLASS (Customer Load Active System Services) aims to increase the capacity and operability of the electricity network. It provides a low-cost solution which uses voltage control to manage electricity consumption at peak times and provide the Electricity System Operator (ESO) with an alternative source for a number of ancillary services predominately Fast Reserve, while still providing customers with the same standard of service.

The ability to manage peak demand and offer alternative sources for ancillary services provides a useful tool to help meet the increasing demand for electricity and brings a number of other advantages: -

- Reduces costs for electricity customers and could be rolled out on a national level
- Reduces carbon emissions when used
- Contributes to the ESO toolkit for ensuring security of electricity supply

The forerunner CLASS Low Carbon Network Fund (LCNF) project<sup>3</sup> showed that we could elicit a demand response without connected customers discerning its use. Following its introduction in 2019, CLASS has been successfully delivering significant value to ESO and to ENWL customers. Operating at 257 primary substations, it routinely provides between 36MW and 75MW of demand response to the National Grid ESO, several times a day. Small responses at each of the 257 substations are being grouped together to form a useful service for national grid ESO. Our widescale roll-out of CLASS and its continued use since 2019 provides further evidence in support of this finding.

CLASS works by reducing the voltage at primary substations to reduce electricity demand placed on the network from ENWL customers. This is achieved by lowering the tap changers on the transformers at each substation to achieve an aggregated response across our network. This response can then be provided to NGENSO helping it to balance the overall network.

CLASS is delivered in real-time by the integration of our NMS with enhanced voltage control relays (AVCs) housed in primary substations and connected via SCADA. We use a CLASS dashboard in the NMS to configure the AVCs at each primary substation, including calibrating CLASS demand response levels and optimising CLASS functions. AVCs are set to regulate the output voltage of transformers to a nominal value (e.g. 11kV), and the AVCs will automatically adjust transformer tap changers in response to changes in demand throughout the day. When activated by National Grid ESO, CLASS temporarily offsets the AVC target voltage, causing the transformer tap changers to activate (tap down). The change in voltage achieved remains within the statutory voltage limits. Once the NGENSO tells us to cease the service provision, the CLASS offset is removed and the AVC returns the tap changers position to that of regulating voltages around nominal.

In real time, CLASS is controlled through NMS which monitors the status of each CLASS substation and informs the tap changers to move up or down when an instruction is received from NGENSO. In ED1 this is happening many times a day, all year round, and is uniquely proposed by us to continue into ED2.

CLASS will provide the following benefits to our customers:

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<sup>3</sup> A full range of documents from the innovation project that developed CLASS can be found here [CLASS project \(enwl.co.uk\)](https://enwl.co.uk)

- CLASS revenue is shared with customers on a 50% sharing basis providing an overall reduction in the customer’s electricity bill;
- The technology used reduces carbon emissions and potentially displaces other providers with higher emissions e.g. diesel generators, from the market.

## 2.4 Societal Benefits Evaluation

Economics consultancy, Economic Insight, has assisted us with its assessment of the social value generated by a range of projects that have been included in the ED2 Business Plan, including CVPs. Benefits values were forecast following detailed discussions with relevant stakeholders to gain an understanding of each projects aims and the changes they made. The benefits measurement approach adopted is aligned to the national framework, government best practice and academic guidance.

A variety of robust data sources were used to derive the societal benefits of CLASS, including an objective, independent analysis of the potential impact of CLASS on the costs of operating a low carbon electricity system. The assessment, undertaken by Baringa, considered of both first and second order effects. Alongside the first order cost benefit analysis (CBA), quantitative and qualitative analysis of potential second order effects was undertaken to ensure the full impacts of a wider deployment of CLASS were considered. The primary first order benefits which have been modelled include:

- Financial savings for ENWL customers; and
- Carbon reduction societal benefits.

Caution has been exercised in our benefits modelling by constraining the use of CLASS to the north west of England i.e. the area covered by ENWL, however, it could easily be replicated and deployed on a national scale. This has been made possible through the leadership shown by Electricity North West and the sharing of our experience with all DNOs.

## 2.5 Financial savings for customers

Financial savings are generated through the provision of capacity to frequency response and fast reserve markets. This revenue is shared with customers through the Directly Remunerated Service (DRS) mechanism as approved by Ofgem for ED1, which we assume will continue to be the treatment in ED2<sup>4</sup>. The provision of CLASS into the Balancing Services markets results in other technologies being displaced leading to reductions in carbon emissions. Typically, the demand reduction provided by CLASS would have been provided by increasing generation on technologies such as diesel engines.

CLASS is applied at primary substations to manage network demand. It improves energy demand management and reduces carbon emissions for customers. This means that it is appropriate to allocate the benefit across the entire ENWL customer base of 2.4m customers, this is the total number of ENWL customer Meter Point Administration Numbers (MPANS): -

Customer type	Volume (MPAN Count)	%
Domestic MPANs (CDCM)	2,268,385	92.5%
Commercial MPANs (CDCM)	184,664	7.5%
Commercial MPANs (EDCM)	120	0.0%

<sup>4</sup> Ofgem is considering how it proposes to regulate CLASS, including for the ED2 period.



Customer type	Volume (MPAN Count)	%
<b>Total</b>	<b>2,453,169</b>	<b>100%</b>

The CLASS revenue forecast is based on August 2020 to August 2021 actual MWh delivered and multiplied by a factor of five (years) to create the ED2 forecast:

	Delivered MWh	Revenue
Aug-20		
Sep-20		
Oct-20		
Nov-20		
Dec-20		
Jan-21		
Feb-21		
Mar-21		
Apr-21		
May-21		
Jun-21		
Jul-21		
Aug-21		
<b>Total</b>		
Five-year forecast		

As this research is based on 2021 data, inflationary adjustments have been made to revenue forecasts.

Where CLASS is deployed for Balancing Services, there is a positive customer bill impact almost immediately, given the scale of benefits relative to the deployment costs. NGESO use CLASS multiple times a day for balancing services and the revenue earned is anticipated to be shared with consumers on a 50%<sup>5</sup> basis. The table below shows the potential reward to ENWL customers based on CLASS performance. The present value (PV) of the customer financial benefits from CLASS as quantified by Economic Insight is shown below.

	2024	2025	2026	2027	2028
<b>PV of customer financial benefits</b>					

In its RIIO-ED2 Sector Methodology Decision: Annex 2 Keeping bills low for consumers, Ofgem set out its decision on the sector methodology that it will apply to the RIIO-ED2 price control. In this methodology Ofgem states, 'We intend to assign high-confidence baseline costs with a 50% incentive rate and other costs with a 15% incentive rate.' Given the precedent set with GDNs and the high-confidence baseline CLASS costs, a 50% sharing rate is a reasonable working assumption.

<sup>5</sup> We have taken the upper limit of the range for the TOTEX sharing factor from Ofgem's ED2 proposals.

## 2.6 Carbon reduction societal benefits

The provision of CLASS into the Balancing Services markets results in other technologies being displaced leading to reductions in carbon emissions. To carry out the assessment accurately a drop off has been used as the energy system decarbonises. The drop off is estimated to be the reduction in carbon emissions per year.

Data from the Baringa Impact assessment has been utilised to estimate the yearly carbon saving of CLASS. In line with the Ofgem CBA template<sup>6</sup>, Economic Insight used yearly estimates published by BEIS of the average traded price of carbon as a proxy for the monetary value of this carbon saving. This saving reduces on a yearly basis as the carbon intensity of the grid decreases. To do this, the formula below was used:

$$\text{Drop off rate} = \frac{\text{Carbon saving from CLASS}_t}{\text{Carbon saving from CLASS}_{t-1}} - 1$$

To generate the 7.83% drop off used in its modelling, Economic Insight averaged the yearly drop off rate calculated in Table 1 below over the ED2 period.

Table 1: CLASS drop off rate calculation based on carbon saving

	2024	2025	2026	2027	2028
Carbon saving from CLASS	88,000	83,000	75,000	75,000	63,000
Drop off rate		-6%	-10%	0%	-16%

Economic Insight has set the success percentage for the societal benefits of carbon saving at 12.96%. This represents the proportion of total energy distributed in the north west compared to the whole of England, sourced from government statistics<sup>7</sup>. This adjusts the carbon benefit so that it is only applied to- ENWL's region as opposed to the whole country.

## 2.7 Total benefits quantified

To work out the total net economic benefit per £ spent, commonly referred to as the Social Return on Investment (SROI), CLASS operating costs were identified. The costs of staff, maintenance and telemetry expenditure were sourced in 2020/21 prices. The SROI was calculated using an ENWL model developed by Economic Insight. This model is available for review as part of the FBP process if requested.

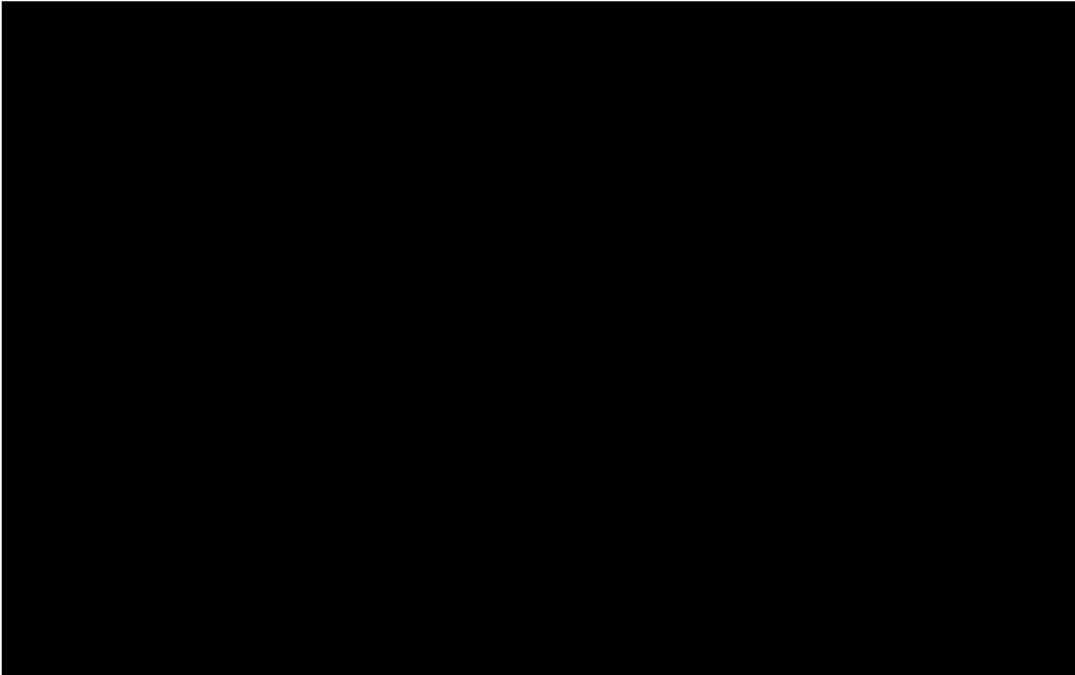
The SROI assessment over a five-year period is as follows:

5-year reporting figures		
Economic	Total cost	
	Total gross present value	
	NPV	£19,621,815.18
	SROI	

<sup>6</sup> 'RIIO-ED2 Cost Benefit Analysis (CBA) Guidance'. Ofgem (2021), page 19

<sup>7</sup> 'Regional and local authority electricity consumption statistics'. Department for Business, Energy & Industrial Strategy (2020)

The total net economic benefit per £ spent is [REDACTED] making CLASS one of the strongest performing investment proposals for social return on investment in our ED2 plan. The breakdown of costs and benefits are illustrated in the infographic below:



## 2.8 Other qualitative benefits

In addition to the calculated benefits highlighted above, CLASS can reduce the amount of automatic load disconnection which reduces the likelihood of an August 2019 style event<sup>8</sup> from taking place in the future, where 669 MWh was lost. In total 1,152,878 UK customers were affected by power supply interruptions, 56,613 of whom lived within the north west.

The incident had wider social costs, such as a significant impact on the rail network. 23 trains were evacuated, and thousands of passengers had their journeys delayed with 371 trains cancelled, 220 partially cancelled, and 873 trains delayed. London St Pancras and King's Cross stations had to close for several hours due to overcrowding and London Euston switched to exit only for a period of time.

Through CLASS being able to reduce the amount of automatic load disconnection, value materialises through a decrease in the cost of lost load associated with these low probability, but high impact events (potentially once every ten years or longer). Although not the primary focus of benefit measurement, this deployment scenario is noteworthy despite not being quantified.

CLASS could be used as a buffer to avoid the use of automatic load disconnection by using CLASS to reduce demand, before disconnecting customers to reduce demand.

## 2.9 Assurance

SIA Partners has assessed the CVPs of Electricity North West and audited the approach taken to measure the additional benefit to society.

For CLASS, to ensure consistency with the other DNOs, SIA recommend using the most recent figures from Ofgem's CBA spreadsheet (v6.0) for both the carbon price and greenhouse gas (GHG) conversion

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<sup>8</sup> Source: [https://www.ofgem.gov.uk/system/files/docs/2020/01/9\\_august\\_2019\\_power\\_outage\\_report.pdf](https://www.ofgem.gov.uk/system/files/docs/2020/01/9_august_2019_power_outage_report.pdf)

factor for each year. It stated, *'it is important to recognise that ENWL has followed the initially suggested values. However, Ofgem's figures provide more granularity, accuracy, and consistency with the rest of the business plan'*. This recommendation was taken-up, with Ofgem's latest figures used in an updated forecast.

SIA observed that Electricity North West had provided sufficient evidence to justify that the reach, scale of impact and qualitative evidence used in CLASS benefit measurement was appropriate. SIA concluded, *'Based on the effective execution of these adjustments and provision of additional justification where required, we are pleased to provide assurance that ENWL has delivered a conservative picture of the value they will provide, in line with the Social Value Framework.'*

The ENWL CEG reviewed the CLASS CVP principles at a dedicated session in November 2021.

### 3 Conclusions

CVPs are a new introduction for RIIO-ED2. We have reviewed potential candidates for CVPs in our Final Business plan and identified CLASS as a proposed CVP for our final business plan. This CVP has a financially quantified net present value (NPV) of £19.6m, plus additional qualitative benefits set out in this paper and wider CLASS documentation<sup>9</sup>.

CLASS provides a fast response service to NGENSO and is used multiple times a day along with or instead of other providers. Where CLASS is used instead of other providers this is because it was judged a more economic and efficient option by NGENSO to use CLASS over alternatives.

CLASS is a low carbon whole system approach to enabling net zero operation which is not business as usual for DNO's and is not mandated to be undertaken in ED2.

The CLASS project also offers a significant value proposition for customers with the 50% share of any potential revenue earned plus carbon savings along with other qualitative benefits being delivered.

We look forward to Ofgem reviewing and evaluating the CVP.

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<sup>9</sup> A full range of documents from the innovation project that developed CLASS can be found here [CLASS project \(enwl.co.uk\)](https://enwl.co.uk)