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Consumer Value Proposition

for the RIIO-ED2 price control period

CVP-1: Ensure WPD is a net zero business by 2028, and adopt a stretching Science Based Target of 1.5 ºC

Version Control

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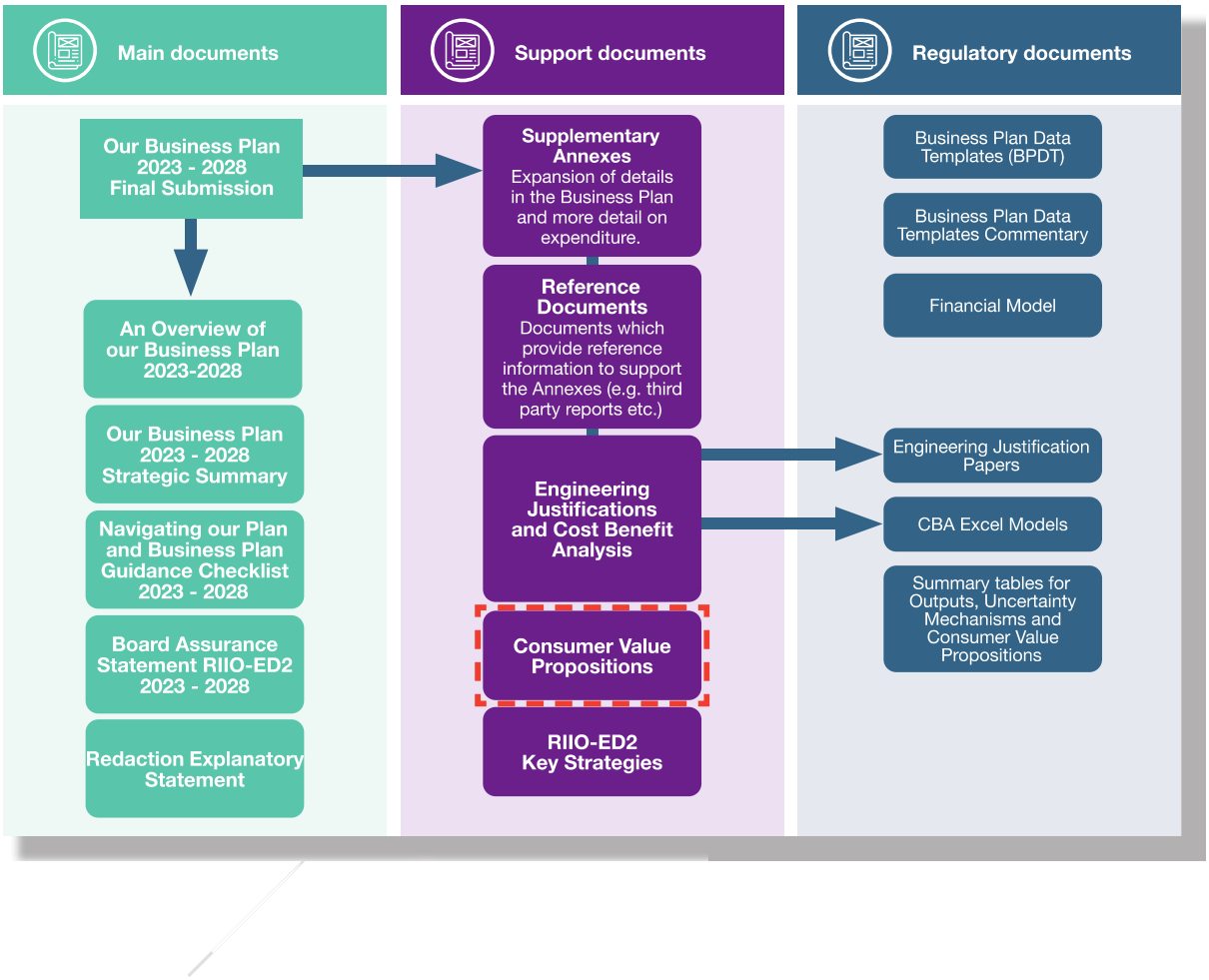
Navigating our plan

This document is a Consumer Value Proposition which is part of our final submission RIIO-ED2 Business Plan in December 2021 to Ofgem.

The full structure of our submission to Ofgem is shown below:



1. Summary

£14.4 million of value
delivered over the RIIO-ED2 price control period

134 sites
fitted with EV charging facilities

CVP-1
Ensure WPD is a net zero business by 2028, and adopt a stretching Science Based Target of 1.5 °C

89% Electric Vehicles
in our commercial van fleet, lowering our annual transport emissions by 6,542 tCO_2e in RIIO-ED2

Renewable Energy for buildings
at all suitable offices and depots saving about 3000 MWh per year.

2. Introduction

2.1. In this document we highlight one of the areas where our transformative Business Plan goes above and beyond in order to deliver outstanding services for our customers and/or the environment. The proposal outlined here forms part of our Consumer Value Propositions (CVPs). Our core Business Plan is highly ambitious, comprehensive and stretching and via our CVP proposals we demonstrate where WPD is raising the bar even further for the benefit of our customers.

2.2. Our CVP proposals span a wide spectrum of projects covering many areas of our business: from committing to becoming a net zero company by 2028 to helping our customers reduce their carbon emissions and ensuring that no customers are left behind in accessing the opportunities of the energy system transition.

2.3. While each of our CVP proposals detail stand-alone commitments, they are intrinsically linked and inter-dependent - part of our business wide objectives to deliver excellent customer service, harness the benefits of a smart future, drive industry leading sustainability plans, and prioritise digitalisation and innovation. Our commitments encompass:

2.4. We have followed a robust and transparent approach in identifying and testing our CVP proposals with our stakeholders. This is set out in more detail in Supplementary Annex SA-02: Our commitments. We have co-created everything in our Business Plan with our stakeholders, responding to the most pressing issues and demands of all our customers. We have engaged with more stakeholders than ever during the course of drafting three versions of our plan, and have harnessed stakeholder insight to build and refine our proposals.

2.5. We have sought to cover a range of the categories that Ofgem has indicated as focus areas and have put forward the proposals within these categories that offer the best value to our customers. Our proposals will provide tangible benefits, that we have quantified using a robust methodology. Taken together, our proposals will deliver a combined benefit to customers worth in excess of £75 million, with every proposal delivering a benefit worth at least £3 million.

2.6. The CVP forms part of Ofgem's Business Plan Incentive (BPI). The CVPs set out in our Business Plan represent important commitments to our customers that we will deliver within RIIO-ED2, subject to the approval of efficient cost allowances by Ofgem (except where shareholder funding is part of the commitment). Delivery of these proposals is not contingent on receiving a reward under Ofgem's Business Plan Incentive, the objective of which is not to fund specific DNO activities but instead to encourage DNOs to develop high quality and stretching Business Plans and to make rewards available where the relevant criteria are met. We believe that we have risen to this challenge, proposing a package of schemes across a range of areas of activity that demonstrate where we will go 'above and beyond' on behalf of our customers.

2.7. Below, we set out the detail of one of our CVP proposals: ***CVP-1: Ensure WPD is a net zero business by 2028, and adopt a stretching science-based target of 1.5 ºC.***

What this Consumer Value Proposition includes

2.8. WPD is committed to becoming a net zero carbon organisation in 2028, far in advance of the UK government's 2050 target. We are leading the way towards a more sustainable future, setting an example for the rest of the industry and delivering enduring change.

2.9. Reflecting the feedback we received on the first submission Business Plan that we published in July, we have updated our proposal in the following ways:

- We have set out clearly why we believe WPD is best placed to deliver the initiative.
- We have clarified the ways in which the proposal delivers beyond Business as Usual and Ofgem's baseline expectations.
- We have updated the way we have calculated the benefits that will arise from delivery of the proposal and how we will track the delivery of benefits during RIIO-ED2 (these updates are described in more detail in Section 4). Principally, and following extensive stakeholder engagement, we have now estimated the benefit of this CVP in a way that incorporates our customers' willingness to pay. This reflects the high level of support we received for this CVP and how important it is to our customers that we deliver this target.
- We have reflected the latest stakeholder views on our proposal.
- We have clarified how the proposal fits into the wider Business Plan and made readability improvements.

2.10. The rest of the document is structured in the following sections:

- **Section 2.8.** Error! Not a valid bookmark self-reference.**:** describing what this CVP is about, explaining how it complies with Ofgem's criteria and setting out why WPD is best placed to deliver it.
- **Section 4. Benefits generated by our proposal**

Why we have used two approaches to measure benefits

4.1. We have used two different approaches to quantify the benefits of this CVP:

- **Approach 1 (main quantification):** Following extensive stakeholder engagement we have estimated the benefit of this CVP as per the stated Willingness to Pay from our customers. This reflects the high level of support we received for this CVP and how important it is to our customers that we deliver this target.

- **Approach 2 (supplementary quantification):** We have also cost savings for WPD and the societal benefits in the form of reduced carbon emissions to obtain total benefits.

4.2. The results of both approaches are important in quantifying the benefits of this CVP. The first approach highlights the hard savings that this initiative will bring to WPD and the value of the reduction of emissions that will result from it. The second approach focuses on the value that our customers place on us achieving this target, which is quite significant.

4.3. We believe using both approaches to quantify the benefits of this CVP gives a more holistic view of the value that can be delivered. It emphasises that even though the net present value of Approach 2 does not currently outweigh the cost, this is an initiative that is very important to a large proportion of our customers who are willing to pay a substantial amount to see this delivered.

4.4. As an example of the customer support we have received, during our acceptability testing 75% of customers supported this initiative, with 59% agreeing that it's the right level of ambition for WPD. It was also ranked amongst the top three initiatives in our latest Willingness to Pay research.

4.5. Details for how we have calculated the benefits under each approach are provided below.

Results of quantification – Approach 1 (main quantification)

5 and 10-year results

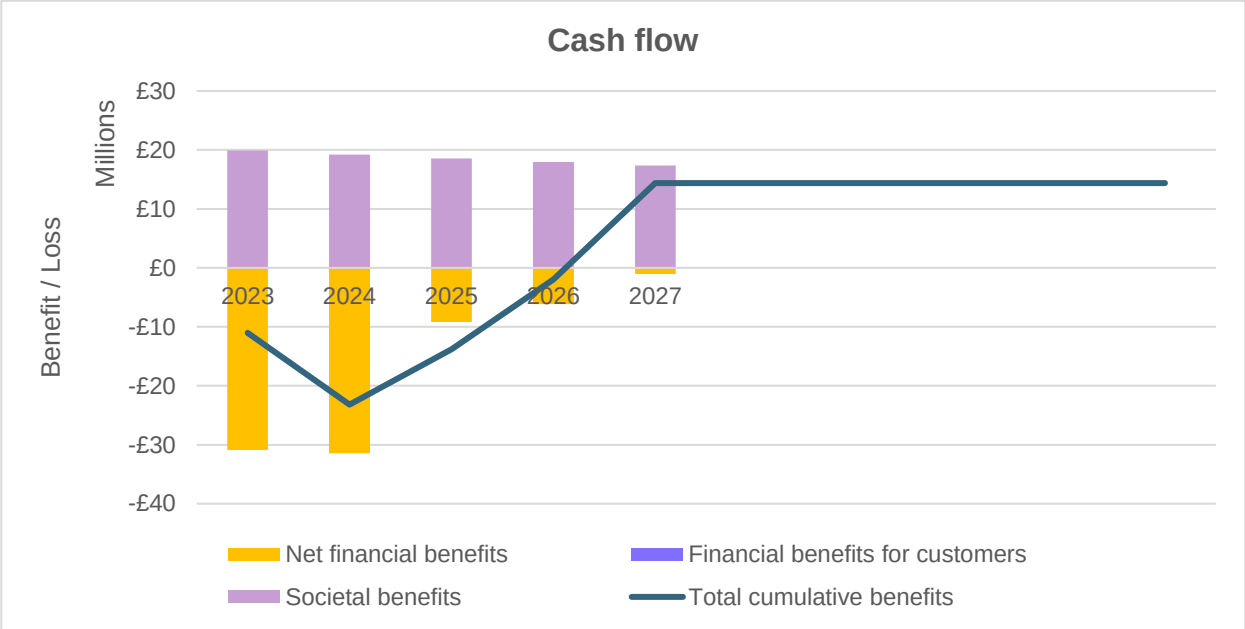
4.6. In line with the joint social value framework, agreed with the five other DNOs and shared with Ofgem in 2020, we have modelled the benefits of this CVP over both a 5 and 10-year appraisal period. More detail on the joint social value framework can be found in Section 8.

4.7. The table below provides the following results from our analysis:

- **Total cost:** The total cost of the proposal, in 2020/21 prices (in line with Ofgem's CBA templates).
- **Total gross present value:** The total value generated by the proposal across financial, environmental, and societal benefits – discounted to present values.
- **NPV – Net present value:** The total value generated by the proposal, net of all costs – again discounted to present values.
- **SROI – Social return on investment:** The £s of benefit achieved for every £ spent

	5-years	10-years
Total cost	£78,655,443.64	£78,655,443.64
Total gross present value	£93,031,660.89	£93,031,660.89
NPV	**£14,376,217.25**	**£14,376,217.25**
SROI	£0.18	£0.18

Benefits Profile



Breakdown of Benefits

4.8. **Societal Benefits**: Based on Willingness to Pay research around the value that customers place on WPD reaching net zero by 2028.

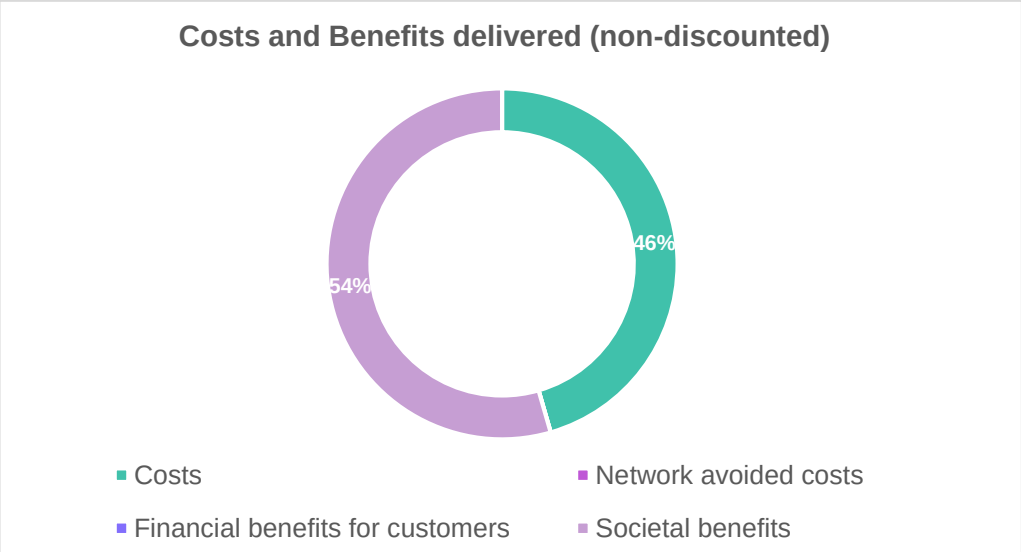
- The WTP survey was designed specifically for the purpose of this CVP, testing the exact wording of our proposal with 1,089 participants. This identifies the value of "Achieving net zero carbon emissions for our own business carbon footprint by 2028 (including the use of greenhouse gas removal schemes)", rather than the baseline.

Distributional impact

4.9. In line with the breakdown above, this CVP delivers benefits for:

- WPD's customers, due to reduced carbon emissions through the different initiatives which are part of our net zero strategy.

4.10. The chart below visualises this distribution, demonstrating the proportions of costs and benefits that fall in each category.



Approach to quantifying

Costs

4.11. We plan to spend the following for each net zero initiative:

Replacing 89% of our existing operational fleet with EVs

- £63.7m over RIIO-ED2. This includes the replacement costs for vehicles, assuming that during RIIO-ED2 we convert 221 small vehicles and 1,591 large/4x4 vehicles into EV. It represents the additional cost over the baseline in the same period of replacing 190 small vehicles, 676 large vehicles and 671 4x4 vehicles for ICE vehicles. Vehicle costs used:
    - Small EV (including fittings): £26,634
    - Large EV (including fittings): £66,288 (guide price, as costs of 4x4 EVs not currently available)
    - Small ICE vehicle (including fittings): £16,726
    - Large ICE vehicle (including fittings): £29,473
    - 4x4 ICE vehicle (including fittings): £37,175

Installing electric vehicle charging infrastructure

- £14.5m over RIIO-ED2. This includes the cost of installing 134 new chargers – 69 in Year 1 and 65 in Year 2. This consists of the cost of a 3rd party installing a 50kW charging point (£59,387 per charger), as well as the substation cost for the new chargers (£37,500 per charger). It also includes the charger maintenance cost. This is £2,484 per year per charger and adds up to £1.5m over RIIO-ED2.

Renewable generation at offices and depots

- £4m over RIIO-ED2. The cost of installing the solar panels will be £793,702 per year, with further maintenance costs after 8 years of installation. Since we are measuring benefits in this approach for a 5-year period, we have not included these costs.

Reducing energy use in our buildings

- £6m over RIIO-ED2. Building energy performance works will be carried out at the locations identified as “easy wins” – where significant energy performance gains can be made through minimal spend. The cost is based on a detailed assessment of the efficiency measures that can be applied in each site.

Non-carbon cars in company car-scheme

- £0m – this will not cost WPD more than what is currently being paid into this scheme. Electricity costs are covered as expenses, however this will be a saving when compared to the baseline of covering for petrol and diesel costs for business miles driven.

Offsetting of emissions

- £1m over RIIO-ED2. To achieve net zero by 2028 we will need to offset some of our emissions. To achieve this, WPD will have to invest from 2022 onwards to support current and new tree planting in local schemes. Each year a donation of £200,000 would result in carbon savings of 3,333 tonnes CO2e per year (we only included costs for the RIIO-ED2 period).

4.12. Other initiatives that do not directly lead to a reduction in emissions (e.g. BREEAM certification) or that will contribute to net zero but will be delivered in RIIO-ED1 were not included in the modelling of benefits.

Number of stakeholders

4.13. Given that a Willingness to Pay (WTP) value was used, the total amount of stakeholders to model is 7.9M.

Approach to Quantifying Societal Benefits

Calculations and Assumptions

- A median WTP value of £2.52 at average annual electricity bill was obtained as part of the October 2021 research for the following attribute: “Achieve net zero carbon emissions for our own business carbon footprint by 2028 (including the use of greenhouse gas removal schemes)”. By using the median, we are making sure to use an estimate that is supported by at least 50% of our customers.
- This resulted in £106.6m (non-discounted) in estimated benefits over RIIO-ED2.

Calculation Factors

- Success: 100%, as we expect the target to be achieved.
- Drop off: 0%, since stakeholder number was only used for year 1.
- Attribution: 0%, since the initiative will be funded and delivered by WPD.
- Deadweight: 0%, since the benefits wouldn’t be achieved without WPD’s activity.
- Optimism Bias: 0%, since research was specific to this initiative.

Sources

- WTP value: Accent and PJM Economics, Western Power Distribution RIIO-ED2 WTP, October 2021

Results of quantification – Approach 2 (supplementary quantification)

5 and 10-year results

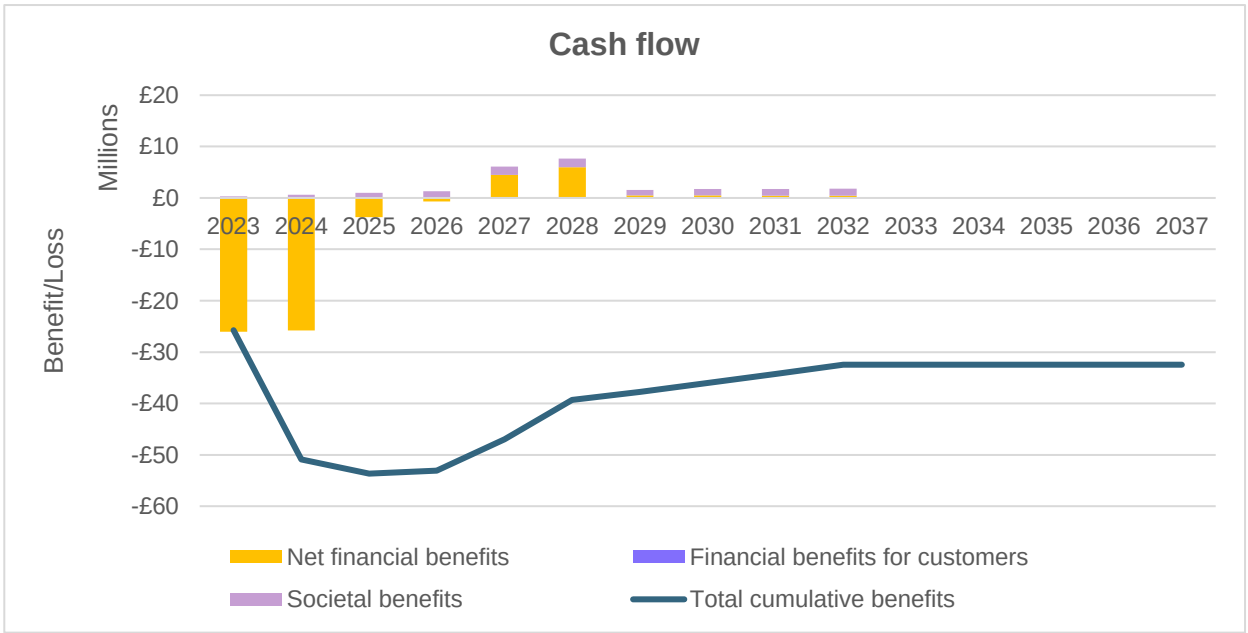
4.14. In line with the joint social value framework, agreed with the five other DNOs and shared with Ofgem in 2020, we have modelled the benefits of this CVP over both a 5 and 10-year appraisal period. More detail on the joint social value framework can be found in Section 8.

4.15. The table below provides the following results from our analysis:

- **Total cost:** The total cost of the proposal, in 2020/21 prices (in line with Ofgem's CBA templates).
- **Total gross present value:** The total value generated by the proposal across financial, environmental, and societal benefits – discounted to present values.
- **NPV – Net present value:** The total value generated by the proposal, net of all costs – again discounted to present values.
- **SROI – Social return on investment:** The £s of benefit achieved for every £ spent

	5-years	10-years
Total cost	£78,655,443.64	£78,675,911.74
Total gross present value	£31,687,280.81	£46,204,766.54
NPV	**-£46,968,162.83**	**-£32,471,145.20**
SROI	-£0.60	-£0.41

Benefits Profile



Breakdown of benefits

4.16. **Network benefits:** WPD will see a significant reduction in bills from reduced use of grid electricity in offices and depots, reduced charging cost from installing EV chargers in depots as well as reduced maintenance and fuel cost from conversion of fleet to EV in addition to other factors,

4.17. **Societal benefits**: Based on carbon emissions reduction from the different planned activities, as well as the offsetting of emissions. The benefits considered represent the incremental benefit of bringing the net zero target forward, compared to achieving net zero by 2043. The following schemes were modelled for estimating benefits:

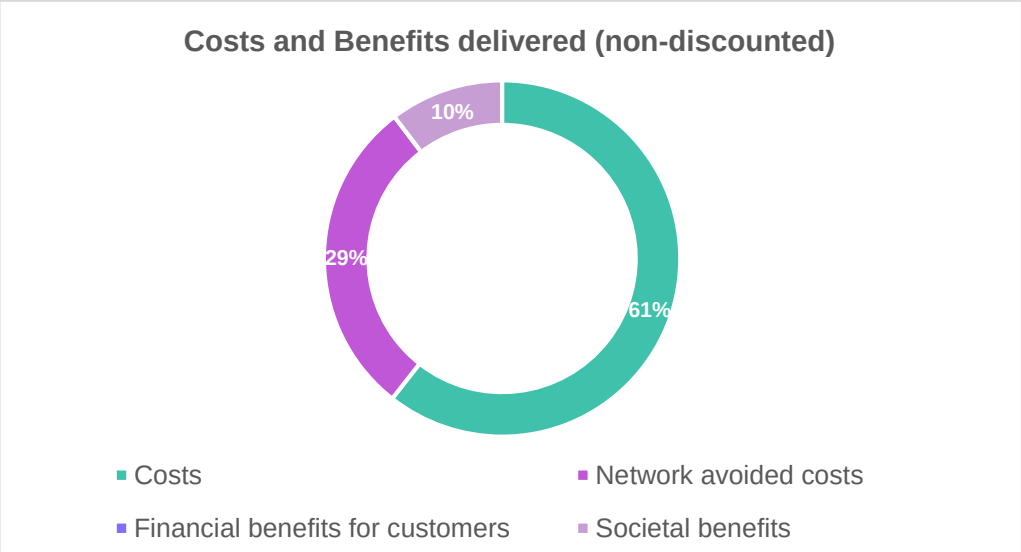
- We will replace a minimum of 89% of our existing operational fleet with electric vehicles by 2028 – given that this activity would not have taken place in RIIO-ED2 without the new 2028 target, all reductions in emissions as a result were considered as benefit. We only considered benefits up until 2028/2029, since this initiative would have taken place in 2030 if the target had not been brought forward.
- EV charging at key operational sites – this initiative would not have been delivered in RIIO-ED2 if it weren't for the new net zero target, all reductions in emissions as a result were considered as benefit. We only considered benefits up until 2028/2029, since this initiative would have taken place in 2029/2030 if the target had not been brought forward.
- Include only non-carbon technology cars in our company car scheme by 2025 – this activity would not have taken place in RIIO-ED2 without the new 2028 target and therefore all reductions in emissions as a result were considered as benefit. We only considered benefits up until 2028/2029, since this initiative would have taken place in 2029/2030 if the target had not been brought forward.
- Install renewable local generation at all suitable offices and depots with a capability to save 2,703 MWh per year –this activity would not have taken place in RIIO-ED2 without the new 2028 target and therefore all reductions in emissions as a result were considered as benefit. We modelled benefits for 10 years, as we assumed this activity would not have taken place before 2033 under the original target.
- Reduce energy use in our buildings – This reduction will be achieved by improving energy performance in certain buildings. This activity would not have taken place in RIIO-ED2 without the new target and therefore all reductions in emissions as a result were considered as benefit. We modelled benefits for 10 years, as we assumed this activity would not have taken place before 2033 under the original target.
- Emissions offsetting at the end of RIIO-ED2 for those emissions that could not be reduced.

Distributional impact

4.18. In line with the breakdown above, this CVP delivers benefits for:

- WPD, in the form of avoided network costs from solar electricity generation, improved energy performance in buildings, avoided fuel, reduced maintenance cost for electric vehicles and avoided public charging costs.
- WPD's customers, due to reduced carbon emissions through the different initiatives which are part of our net zero strategy and improved air quality due to the conversion of fleet vehicles to EVs.

4.19. The chart below visualises this distribution, demonstrating the proportions of costs and benefits that fall in each category.



Approach to quantifying

Costs

4.20. We plan to spend the following for each net zero initiative:

Replacing 89% of our existing operational fleet with EVs

- £63.7m over RIIO-ED2. This includes the replacement costs for vehicles, assuming that during RIIO-ED2 we convert 221 small vehicles and 1,591 large/4x4 vehicles into EV. It represents the additional cost over the baseline in the same period of replacing 190 small vehicles, 676 large vehicles and 671 4x4 vehicles for ICE vehicles. Vehicle costs used:
    - Small EV (including fittings): £26,634
    - Large EV (including fittings): £66,288 (guide price, as costs of 4x4 EVs not currently available)
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    - Large ICE vehicle (including fittings): £29,473
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Installing electric vehicle charging infrastructure

- £14.5m over RIIO-ED2. This includes the cost of installing 134 new chargers – 69 in Year 1 and 65 in Year 2. This consists of the cost of a 3rd party installing a 50kW charging point (£59,387 per charger), as well as the substation cost for the new chargers (£37,500 per charger). It also includes the charger maintenance cost, this is £2,484 per year per charger and adds up to £1.5m over RIIO-ED2.

Renewable generation at offices and depots

- £4m over RIIO-ED2. The cost of installing the solar panels will be £793,702 per year, with further maintenance costs after 8 years of installation. Since we are measuring benefits in this approach for a 10-year period, we have included these costs for years 9 and 10, which equal to £16,000 per year (£2,000 per site).

Reducing energy use in our buildings

- £6m over RIIO-ED2. Building energy performance works will be carried out at the locations identified as “easy wins” – where significant energy performance gains can be made through minimal spend. The cost is based on a detailed assessment by a trusted partner of the efficiency measures that can be applied in each site.

Non-carbon cars in company car-scheme

- £0m – this will not cost WPD more than what is currently being paid into this scheme. Electricity costs are covered as expenses, however this will be a saving when compared to the baseline of covering for petrol and diesel costs for business miles driven.

Offsetting of emissions

- £1m over RIIO-ED2. To achieve net zero by 2028 we will need to offset some of our emissions. To achieve this, WPD will have to invest from 2022 onwards to support current and new tree planting in local schemes. Each year a donation of £200,000 would result in carbon savings of 3,333 tonnes CO_2e per year (we only included costs for the RIIO-ED2 period).

4.21. Other initiatives that do not directly lead to a reduction in emissions (e.g. BREEAM certification) or that will contribute to net zero but will be delivered in RIIO-ED1 were not included in the modelling of benefits.

Number of stakeholders

4.22. Given the nature of this CVP, the number of stakeholders was replaced by the amount of emissions saved in tonnes of CO_2e, which vary from scheme to scheme and are detailed in sections below.

Approach to Quantifying Societal Benefits

Calculations and assumptions

EV Replacement of Operational Fleet – CO_2 emissions

- We have estimated the number of vehicles by type of vehicle that can be replaced with an EV alternative.
- Based on the number of vehicles to be converted each year (545, 591, 300, 240, 136), and an average mileage of 12,000 miles per year, we obtained the following amount of carbon emissions avoided per year:
  - 2023/2024: 1,968 tonnes CO_2e.
  - 2024/2025: 4,101 tonnes CO_2e.
  - 2025/2026: 5,184 tonnes CO_2e.
  - 2026/2027: 6,051 tonnes CO_2e.
  - 2027/2028 & 2028/2029: 6,542 tonnes CO_2e.
- The above assumes that further reductions would require additional investment or would have been achieved without this initiative (diesel vehicles would not be purchased from 2029/2030 onwards under baseline scenario).
- This includes saved emissions from vehicles replaced in RIIO-ED2 only.
- The traded carbon cost as per Ofgem's CBA template was used to obtain benefits per tonne of CO_2e saved.
- It was assumed benefits last for 6 years and that there is no benefit lag.
- This resulted in £1.76m of benefits over the 6-year period (non-discounted).

EV Replacement of Operational Fleet – Air quality

- There are air quality damage costs associated with both diesel car transportation and electricity. Using Green Book tables, we obtained the damage costs for each year in p/L and p/kWh, respectively.

- Based on the number of vehicles to be replaced per year (545, 591, 300, 240 and 136), an estimate of £2,100 fuel cost per year for ICE vehicles, and an estimate of £1.34 per litre of fuel, cumulative fuel savings per year were estimated. All current ICE vehicles to be converted use diesel as fuel. These do not include fuel by any cars converted in RIIO-ED1.
- In terms of electricity expected to be used, given the vehicles that will be purchased, we used an estimate of 3.5 miles/kWh. Given our working assumption that all vehicles travel 12,000 miles a year, the cumulative electricity needs per year were calculated. These do not include electricity used by cars converted in RIIO-ED1.
- Using the damage costs per litre and per kWh, we calculated the difference between diesel transportation and electricity damage costs per year.
- This resulted in £1.41m of benefits over the 6-year period (non-discounted).

Renewable generation at offices and depots:

- Natural Generation have assessed 39 of our sites to determine the amount of generation they can produce, as well as the expected emissions to be saved per year.
- The rollout of sites throughout RIIO-ED2 will be: (8, 8, 8, 8 and 7), with a benefit-lag of 1 year.
- Based on the above rollout, the expected generation per year in MWh will be: (0, 541, 1081, 1622, 2162 and 2703 onwards).
- Using a conversion factor, this translates to the following saved emissions for a 10-year period: (0, 119.03, 228.98, 329.83, 421.6, 504.27, 481.54, 458.82, 436.09 and 413.37). This was then costed using the traded cost of carbon to obtain total benefits.
- This resulted in £275k over the 10-year period (non-discounted).

Company Car Scheme – CO_2 emissions:

- We have set a target to have all company cars be non-carbon by December 2025, with a total of 1,055 cars. The car scheme is circa 10% EV at present, and 47% of the order bank is EV. Therefore circa 950 cars will have to change to a non-carbon option between now and 2025.

- We have considered that this target would have not been in place under the original 2043 target and therefore all emissions from RIIO-ED2 efforts relating to this initiative were included.
- Assuming that each car drives on average 9,169 business miles per year (based on 2019/2020 data), and also that 75% of cars left to convert are petrol and 25% are diesel (based on current split), we can calculate the emissions saved per year using the respective emissions factor for diesel and petrol cars, versus a battery-powered car.
- This results in 8,201 tonnes of CO_2e saved over 6 years, which valued at the traded carbon cost adds up to £482k (non-discounted).

Company Car Scheme – Air quality:

- There are air quality damage costs associated with diesel/petrol car transportation and electricity.
- Using Green Book tables, we obtained the damage costs for each year in p/L and p/kWh.
- Based on the number of vehicles to be replaced per year (see previous section), an average of 9,169 business miles per year for company vehicles, and the respective miles per gallon (49.2 for petrol and 55.4 for diesel), cumulative fuel savings per year were estimated. This assumes the same split of petrol/diesel cars as for the emissions calculations above (75%/25%). These do not include fuel by any cars converted in RIIO-ED1.
- In terms of electricity consumption, we used the number of vehicles converted per year and an estimate of 3.5 miles/kWh to calculate total consumption. Using our working assumption

that vehicles travel 9,169 business miles per year, the cumulative electricity needs per year were calculated. These do not include electricity used by cars converted in RIIO-ED1.

- Using the damage costs per litre and per kWh we calculated the difference between diesel and petrol transportation and electricity damage costs per year.
- This resulted in £78k in benefits over 6 years (non discounted).

Reduced Energy Use in Buildings:

- We have analysed our property portfolio to assess each building's energy usage and performance. Our 23 worst-performing properties from this analysis have been subject to further assessment, which showed that relatively inexpensive M&E upgrades, such as installing LED lighting, upgrading air conditioning systems and/or building control systems can be extremely cost-effective energy performance improvements. Based on this assessment, we estimate that across the 23 sites we can save up to 320 tonnes of CO_2e per year, with the following profile across RIIO-ED2: (0,160,320,320,320 tonnes).
- Using the traded cost of carbon this results in £212k saved over 10 years (non-discounted).

Emissions Offsetting:

- By the end of RIIO-ED2, we estimate that approximately 19,500 tonnes CO_2e would need to be offset to achieve net zero. This accounts for other reductions which have or will take place during RIIO-ED1 as well as the use of a REGO tariff for electricity.
- Given the level of offsetting required, we are working with a partner to understand how this can be achieved in the timeline we have. Based on these discussions, we have decided to start investing in tree planting schemes from 2022, achieving an extra 3,333 tonnes of CO_2e avoided each year, allowing us to reach our 19,500 target by the end of RIIO-ED2. We have only included costs and emissions saved from 2023 onwards.
- We have assumed the benefits last for 10 years, since this offsetting activity would have not happened before 2033 if it weren't for the new 2028 target.
- We have used a traded-carbon price to estimate the benefits of this, which equate to £10.5m over the 10-year period.

Calculation Factors

EV Replacement of Operational Fleet:

- Success: 100%, as we expect the target to be achieved.
- Drop off: 100%, since emissions savings reported per year.
- Attribution: 0%, since the initiative will be funded and delivered by WPD.
- Deadweight: 0%, since the benefits wouldn't be achieved without WPD's activity.
- Optimism Bias: 0% since estimates used are based on current fleet, and standard conversion factors and costs.

Renewable Generation at Offices and Depots

- Success: 100%, as it is expected that WPD will generate that amount of electricity per year.
- Drop off: 100%, since emissions savings reported per year.
- Attribution: 0%, since the initiative will be funded and delivered by WPD.
- Deadweight: 0%, since the benefits wouldn't be achieved without WPD's activity.
- Optimism Bias: 0%, since estimates are particular to our sites.

Company Car Scheme

- Success: 100%, as it is expected we will reach the target by 2025.
- Drop off: 100%, since emissions savings reported per year.
- Attribution: 0%, since the initiative will be funded and delivered by WPD. Even though there is an option in the company car scheme to choose a car that requires a personal contribution, the benchmark price is reviewed by HR and Transport on a quarterly basis to ensure that it covers the cost of a benchmark vehicle (for EVs this would be a Nissan Leaf) without the need of personal contributions. Therefore, the allowance provided is enough to allow for all the benefits to be materialised, and any extra costs covered by employees are optional and won't result in a different level of benefit than if there had been no personal contributions.
- Deadweight: 0%, since the benefits wouldn't be achieved without WPD's activity.
- Optimism Bias: 0%, since estimates used are based on current fleet, and standard conversion factors and costs.

Reduced Energy Use in Buildings

- Success: 100%, as it is expected we will achieve the reductions.
- Drop off: 100%, since emissions savings reported per year.
- Attribution: 0%, since the initiative will be funded and delivered by WPD.
- Deadweight: 0%, since the benefits wouldn't be achieved without WPD's activity.
- Optimism Bias: 0%, since estimates are particular to our sites.

Emissions Offsetting

- Success: 100%, as it is expected that WPD will offset any remaining emissions.
- Drop off: 100%, since emissions savings reported per year.
- Attribution: 0%, since the initiative will be funded and delivered by WPD.
- Deadweight: 0%, since the benefits wouldn't be achieved without WPD's activity.
- Optimism Bias: 0%, since estimates were provided by an expert partner.

Sources

EV Replacement of Operational Fleet

- Conversion Factor: 3.5 mile/kWh – WPD internal market research plus standardisation across EV OEMs
- Traded Carbon Cost: Ofgem CBA Template RIIO2 v6.0.
- Fuel cost per year for ICE vehicles: WPD estimates.
- Fuel cost per litre: AA, Fuel price report September 2021.
- Miles per kWh for EVs: Average based on battery and range of small and large vehicles.
- Damage costs: Treasury Green Book Supplementary Appraisal Guidance on Valuing Energy Use and Greenhouse Gas (GHG) Emissions, Tables 14 & 15.

Renewable Generation at Offices and Depots

- Traded Carbon Cost: Ofgem CBA Template RIIO2 v6.0.

- Avoided emissions per year: Natural Generation estimates (detailed assessment per site available in Annex A & B of EJP011).
- Conversion factor: 0.23314 $kgCO_2e$

Company Car Scheme

- UK Electricity Conversion Factor and Traded Carbon Cost: Ofgem CBA Template RIIO2 v6.0.
- Vehicle Conversion Factors: BEIS, 2020 UK Government GHG Conversion Factors for Company Reporting.
- Damage costs: Treasury Green Book Supplementary Appraisal Guidance on Valuing Energy Use and Greenhouse Gas (GHG) Emissions, Tables 14 & 15.
- Miles per gallon: Table ENV0103 (TSGB0303), Average new car and light goods vehicle (LGV) fuel consumption: Great Britain, 1997-2019, Department for Transport statistics.
- Miles per kWh: Average based on battery and range of small and large vehicles.

Reduced Energy Use in Buildings

- Traded Carbon Cost: Ofgem CBA Template RIIO2 v6.0.
- Avoided emissions per year: EJP009 General Building Refurbishment Programme, Annex B.
- Conversion factor: 0.23314 $kgCO_2e$

Emissions Offsetting

- Traded Carbon Cost: Ofgem CBA Template RIIO2 v6.0.
- Emissions saved: Based on estimates given by Heart of England Forest Scheme.

Approach to Quantifying Network Savings

Calculations and Assumptions

EV Replacement of Operational Fleet:

- We have calculated annual savings due to the replacement of 89% of our fleet to EV, which include: vehicle replacement savings, reduced servicing cost, avoided fuel cost, avoided excise duty, residual value at end of life and Clean Air Zone savings. These have all been calculated as incremental over the baseline of replacing vehicles for ICE ones. All calculated up to year 6 (2028/2029), assuming that EV replacement would have started in 2029/2030 under the baseline.
  - Vehicle replacement savings: These are the difference between the cost of replacing vehicles for ICE versions, versus replacing for EV. Based on costs of vehicles and number of vehicles to be replaced (as laid out in cost section), these amount to £4,230,151 over 6 years.
  - Residual value of vehicles: £585,137 over 6 years, represents the residual value of vehicles when sold at end of asset life, valued at 10% of vehicle purchase price (not including fittings costs).
  - Fuel Savings: £12,648,516 over 6 years. This is based on an average mileage per year of 12,000 miles, a cost of fuel for ICE vehicles of £2,100 per year and an electricity cost for EVs of £0.04 per mile.
  - Vehicle servicing: £1,880,274 over 6 years. Based on the cost of servicing each vehicle per year. This is £390.89 per ICE vehicles and £167.50 per EVs.
  - Vehicle Excise Duty: £2,314,675 over 6 years. This is a saving based on the excise duty paid for each ICE vehicle, which is £275 per vehicle per year.

- Clean Air Zone savings: £159,192 over 6 years. This cost arises when vehicles enter a Clean Air Zone with an ICE vehicle. It includes both Bath and Birmingham Clean Air zones, at a yearly cost of £4,752 and £24,192 respectively. This was estimated using the number of vehicles that entered each zone in July 2021 (44 and 252 respectively) and multiplying this cost by 12 to obtain a cost per year.

- Total savings over 6 years: £21.8m (non-discounted).

Renewable Generation at Offices and Depots:

- Natural Generation have assessed 39 of our sites to determine the amount of generation they can produce, which is up to 2,703 MWh per year. This valued at 17.5p/kWh results in £472,950 per year.
- Assuming a 1-year benefit lag, and considering that the rollout will be of 20% capacity each year across the 5 years, we obtain the following savings in a 10-year period (£0, £94500, £189180, £283770, £378360, £472950, £472950, £472950, £472950, £472950)
- This results in £3.3m benefit over 10 years (non-discounted).

Reduced Energy Use in Buildings:

- Avoided costs will be achieved through a reduction in energy spend from the building energy works.
- Our 23 worst-performing properties have been subject to a detailed assessment. This showed that relatively inexpensive M&E upgrades, such as installing LED lighting, upgrading air conditioning systems and/or building control systems can be extremely cost-effective energy performance improvements. We estimate that across the 23 sites we can save up to £239,836 per year (using an energy cost of £17.5p/kWh).
- A 1-year benefit lag was applied, and it is expected that half of benefits will be achieved by Year 2, with the full benefits from Year 3 onwards.
- These add up to £2.04m over 10 years (non-discounted).

Installing EV Charging Infrastructure:

- Savings will be incurred in the form of saved public charging costs and avoided lost time while charging.
  - Saved public charging costs: £1,894,860 over RIIO-ED2. This is costed at £0.09 per mile travelled by the vehicle. The average mileage for all vehicles is 12,000 miles per year and we estimate the percentage of EV miles using public charging stations will drop from 80% to just 10% after chargers are installed.
  - Avoided lost time while charging: £13,744,051 over RIIO-ED2. This is a benefit associated with the additional charger installation, which will reduce the time our technicians spend travelling to find charging points. This assumed the same % of EV miles using public charging points as above, a £32.64 rate per hour per technician, 2 technicians per van and 2.5h travelling time to a public charger.
- These add up to £15.6m over 5 years (non-discounted).

Sources

EV Replacement of Operational Fleet:

- Vehicle costs (ICE):
  - Small van costs based on Ford Connect diesel at £12,798, fit out costs for each vehicle valued at £3,928.94.

  - Large van costs based on Iveco Daily Diesel at £23,733, fit out costs for each vehicle at £5,740.17.
  - 4x4 vehicle costs based on Isuzu Dmax at £20,416, fit out costs for each vehicle at £16,759 (fitting includes a percentage of truck mounted personnel lifts).
- Vehicle costs (EV):
  - Small van costs based on Nissan eNV200 at £21,713.43, fit out costs for each vehicle at £4,921.
  - Large van costs based on Nissan Fiat eDucato at £58,166, fit out costs for each vehicle at £8,122.21.
- 4x4 costs based on Large van costs (no 4x4 EV costs available at time of writing).Cost of fuel for ICE vehicle: WPD estimates based on past data.
- Cost of electricity for EVs: HMRC, Advisory fuel rates (https://www.gov.uk/guidance/advisory-fuel-rates).
- Servicing costs: Based on WPD data from in-house servicing activity.

Renewable Generation at Offices and Depots and Reduced Energy Use in Buildings:

- Average electricity cost: Pending

Installing EV Charging Infrastructure:

- Electricity cost public charging: Average calculated based on assessment of the mean energy consumption (miles per kW/h) from the 16 most popular battery electric vehicles purchased. To calculate real world figures this energy consumption has been analysed by 1) Driving conditions a) City; b) Highway; c) Combined and 2) Weather Conditions – i) Cold weather; ii) Mild weather, which all have an effect on range, across different options of public chargers available.
- Time to travel to public charging point: Assumption based on battery life of vehicles. We would have to re-charge vehicles 2-3 times per week given their range and battery capacity. If the technicians are not near a main depot then they would have to travel 30mins each way to charge the vehicle.
- % of EV miles using public charging: WPD estimates based on rollout of EV charging points.

Changes from July's draft calculations

4.23. The results shown in this document represent the best estimate of the benefits that will be achieved through this CVP with the information available at this time. To achieve this, we have made a few changes from our previous submission which are detailed below:

4.24. We have included two different approaches for measuring the benefits of this CVP. The first approach focuses on the value that our customers place on us achieving this target, which is quite significant. The second approach highlights the hard savings that this initiative will bring to WPD and the value of the reduction of emissions that will result from it.

4.25. We believe using both approaches to quantify the benefits of this CVP gives a more holistic view of the value that can be delivered. It emphasises that even though the net present value of Approach 2 does not currently outweigh the cost, this is an initiative that is very important to a large proportion of our customers who are willing to pay a substantial amount to see this delivered.

4.26. We have reviewed our previous modelling and made changes where appropriate, such as:

- Revised the costs and avoided costs of the CVP to use our latest estimates.

- Removed two initiatives from the modelling of benefits: ‘Replace diesel used in generators with alternative fuel’ and ‘Reduce business travel by encouraging more remote working and virtual meetings’. The first one still needs to be piloted and therefore we don’t want to commit to benefits of something we may not be able to deliver. The second one was removed from the modelling since business travel has reduced significantly post-Covid, and decided to focus on the reduction of emissions from business travel through the conversion of company cars to EVs.
- We have clarified why we are attributing 100% of the benefits from our conversion to EV of company cars.
- We have shortened the benefit period for our EV initiatives, both our internal fleet conversion as well as company cars. This is to ensure we are only considering incremental benefits from the baseline and including benefits up to 2029, given that no diesel vehicles would be purchased after this date on our baseline scenario.

4.27. Also, following the audit on the DNO Social Value Framework, we have added an air quality benefit associated to the conversion of our EV fleet and company cars, as well as updated the carbon values used to align with Ofgem’s latest CBA template. We also clarified the sources of our calculations of costs and benefits.

- : setting out how we have calculated the additional value that our proposal will deliver to customers.
- **Section** Error! Reference source not found.**.** Error! Reference source not found.**:** explaining how this initiative addresses priorities raised by our customers.
- **Section** Error! Reference source not found.**.** Error! Reference source not found.: defining what the key outputs are and what WPD proposes if outputs are not delivered.
- **Section** Error! Reference source not found.**.** Error! Reference source not found.**:** confirming how this CVP addresses Ofgem’s CVP eligibility criteria.
- **Section 8. Appendix: Joint Social Value Framework:** setting out how we, together with the other DNOs, have agreed a framework to quantify the benefits delivered by CVP proposals.

3. Our proposal

5.1. In this section, we explain the following aspects of the proposal:

- Background for this initiative.
- What we are proposing.
- Why WPD is best placed to deliver this proposal
- How our proposal delivers beyond expectations.
- Our delivery plan.

Background

5.2. The government has committed to reduce all greenhouse gas emissions to net zero by the year 2050. This will require transformational change across the energy, transport, heating sectors – and beyond. WPD will be at the forefront of this transformation in all of these areas, leading the industry towards enduring and systemic change. We are committed to become a net zero company by a much more ambitious date of 2028 – a full twenty-two years ahead of the wider UK target.

5.3. Not only will we deliver against this goal to reduce our own impact on the environment, we intend to be a leader in this area, setting an example to consumers and other businesses within the energy sector, proving that net zero is achievable if we take on ambitious goals. Being a leader on this front will also help us understand the challenges faced by our customers, and other parts of the energy system, in their own transitions. This will enable us to support them in the changes that they need to make.

5.4. Furthermore, we have committed to a Science-Based Target of 1.5ºC verified by the UN Science Based Target Initiative (SBTi).

What we are proposing

5.5. For this reason, we will deliver the following actions by the end of RIIO-ED2 to reduce our Business Carbon Footprint (BCF) to net zero by 2028 (excluding network losses and Scope 3 emissions).

5.6. We have identified and planned out the schemes and initiatives we need to deliver in order to achieve this, which we describe in

5.7. Table *1* below. These schemes cover a wide range of activity, demonstrating the broad scope and scale of what we need to do in order to hit our 2028 goal.

Table 1: Net zero schemes

	Scheme	Description and Benefit
1	Convert 89% of our operational fleet to electric vehicles (EVs)	Our operational fleet currently accounts for 44% of our business carbon footprint. Our operational fleet currently comprises less than 10% EVs. We will replace a minimum of 89% of our existing operational fleet with EVs by 2028, lowering our annual transport emissions by 6,542 tCO_2e in RIIO-ED2.
2	EV charging at key operational sites	Critical to the successful delivery of our fleet replacement programme is the operational accessibility of vehicle charging points. With a large delivery area across the Midlands, the South West and Wales, we propose to install a network of charging points at key sites to ensure our fleet can operate efficiently and that there will be no detrimental impact to service as a result of the fleet replacement. We will install electric vehicle charging infrastructure at 134 key operational and substation sites
3	Non-carbon technology company cars	We will include only non-carbon technology cars in our company car scheme by 2025. This transition has commenced, with the remaining 1050 vehicle fleet to be replaced by December 2025.
4	Photovoltaics(PV) generation at suitable sites	We will install of Low Carbon Technologies (LCT) generation at all suitable depots and offices to produce electricity to meet operational demand. An assessment of our current property portfolio has shown that there is a significant opportunity to install PV at a considerable number of sites, which could contribute up to an estimated 2,678 MWh of energy per annum. Under optimal conditions this will account for approximately 18% of the current annual energy consumption of our buildings.
5	Renewable energy for buildings	We will purchase all building energy from a renewable source and account for this in our reported business carbon footprint, including renewable local generation at all suitable offices and depots with a capability to save 3000 MWh per year.
6	Reduce energy use in our buildings	We will significantly reduce energy use in our buildings. We will achieve this by taking actions including installing LED lighting, upgrading air conditioning systems and building control systems and by fitting devices with controls to minimise consumption at times when areas of our buildings are unoccupied.

		We will also review of all of our fossil-fuelled heating systems to identify candidates which are inefficient and therefore justifying of replacement with a more sustainable alternative.
7	'Excellent' Building Research Establishment Environmental Assessment Method (BREEAM) rating for all buildings[1]	We will ensure that all new WPD buildings achieve an 'Excellent' BREEAM rating. Subsequently, all refurbished buildings will achieve a 'good' BREEAM rating.
8	Minimise carbon emissions through reduction in business travel	We will reduce business travel by encouraging more remote working and virtual meetings and educating our people. The Covid-19 pandemic has highlighted that the business can operate effectively using virtual and remote practices in a controlled framework. As such, we intend to adapt our working practices to minimise unnecessary travel. During the pandemic we were able to demonstrate our flexibility when it comes to adopting remote working, so we will be building on a strong track record in this arena.
9	Small-scale battery powered generation	Currently, we use mobile generation during fault recovery. We will to increase our use of small-scale battery powered generation and where appropriate, reducing reliance on diesel generation. This will help reduce our carbon footprint when restoring customer supply.

5.8. Stakeholder feedback indicates an imperative for us to target as early a date as possible to achieve net zero and to actively consider the use of UK-based greenhouse gas removal schemes in the short to medium term as a means to this end. Together with our stakeholders, we will determine the schemes which would be the most appropriate and add most value to our customers in order to meet our net zero target of 2028.

5.9. According to the criteria set out by Ofgem in relation to the submission of Consumer Value Proposition (CVP) initiatives, this initiative would sit under "*Proposals that exceed the baseline expectations set out for Environmental Action Plans*." We set out in the section below how our proposals exceed the baseline expectations around adopting a Science Based Target to reduce our carbon footprint in line with the achievement of the net zero target.

Why WPD is best placed to deliver this proposal

5.10. This proposal relates to our own carbon footprint and the actions that only we can take in order to reduce the environmental impact of our activities. In undertaking these activities, we intend to set a leading example to others as we deliver on ambitious sustainability targets.

[1] BREEAM is a leading sustainability assessment method for buildings, which recognises and reflects the value in higher performing assets across the built environment lifecycle, from new construction to in-use and refurbishment. Further information may be found at www.breeam.com.

5.11. Additionally, as we set out in Section 5 below, of the stakeholders that attended a recent WPD event, nearly 90% 'agreed' or 'strongly agreed' that WPD was best placed to deliver this proposal

How our proposal delivers beyond expectations

How WPD is doing something different to BAU activities

5.12. Our ambitious goal to ensure that WPD is a net zero business by 2028 and the significant ramp-up in activity that this entails represents a transformational change in our work to decarbonise our business. The setting of a net zero target date and the development of the schemes necessary to achieve this have not happened to date in the RIIO-ED1 period. As such, the activity to be carried out under CVP-1 is far beyond BAU activity.

How WPD will go beyond RIIO-ED2 baseline expectations

5.13. Our net zero schemes represent a step change from existing practice. With this proposal, WPD is going above and beyond the baseline expectations for EAPs set out by Ofgem in its Business Plan Guidance.

5.14. The baseline expectations require that we adopt a Science Based Target to reduce our BCF, together with a long-term date to achieve this target. Our proposal significantly exceeds this requirement by meeting our ambitious targets by 31 March 2028.

5.15. The level of change that is required in our operations, practices and assets to achieve this over the five years of RIIO-ED2 is significant. For example, currently 10% of our small vehicle operation fleet are electric vehicles (EVs) and we plan to increase this to 89% by the end of RIIO-ED2. The magnitude and speed of this change requires a complete change in our approach to fleet and the infrastructure needed to support it.

5.16. Separately, WPD is leading by example, enabling net zero through our employees by replacing all 1,050 company cars with pure electric vehicles by December 2025 and taking action to minimise unnecessary business travel.

5.17. Furthermore, adopting a Science Based Target of 1.5°C will place us among the most ambitious companies, consistent with the Science Based Target Initiative's 'Business Ambition for 1.5°C'.[2]

Our delivery plan

5.18. Table 2 sets out our delivery plans and due dates for the net zero schemes and initiatives that we will deliver.

Table 2: Delivery plan for net zero schemes

Scheme		Delivery Plan	Due date
1	Convert 89% of our operational fleet to electric vehicles (EVs)	Though the transition to an EV fleet will be phased over the five-year period to 2028, we aim to introduce the majority of EVs within the first two years of RIIO-ED2	April 2028

[2] Business Ambition for 1.5°C - Science Based Targets (accessed November 2021)

		We also anticipate 100% replacement of WPD's van fleet by the end of 2030, with the exception of larger specialist vehicles like certain 4x4 and HGVs, where we will continue to monitor the availability of suitable battery-powered vehicles.	
2	EV charging at key operational sites	Delivery of the charger installation programme will be front loaded in RIIO-ED2 to ensure charger capacity is ready for the roll out of our new EV fleet. We anticipate that EV charging will be available at all sites within the first three years of RIIO-ED2, with approximately 45 sites receiving an EV charger per year across this period. The 134 sites that will receive an EV charger have been selected to ensure the best coverage for our fleet, based on geographical spread, rural accessibility Strategically aided by heat map data from business end journeys and the location of our offices and work bases.	April 2026
3	Non-carbon technology company cars	We will replace all 1050 company cars with pure electric vehicles by December 2025. Additionally, employees will have a reduced contract period for internal combustion engine (ICE) company cars. For example, rather than acquiring a five-year contract, employees will only be allowed two-year contracts for new ICE company cars, In June 2023, employees can order 2 year ECOS leases providing the vehicle is delivered before December 2023. ECOS will be turned off after this date. Eventually, this will phase-out all ICE vehicles.	December 2025
4	Photovoltaic(PV) generation at suitable sites	Delivery of PV generation at suitable office and depot sites will take place throughout RIIO-ED2, with an approximately flat expenditure and delivery profile across the period. To maximise the gains from the programme, we intend to target the sites which offer the greatest capacity early in RIIO-ED2 and therefore it is likely that our properties at the Pegasus, Lamby Way and Avonbank sites will be first in the programme. These three sites have been identified as significant energy users.	April 2028
5	Renewable energy for buildings	Renewable Energy Guarantees of Origin (REGO) certificates certify that the energy supply has been produced from 100% renewable sources (wind, solar, geothermal, tidal etc. and does not include nuclear). We will continue to procure electricity from a REGO certified energy supply / tariff across all of our depot locations and unmetered supply. The continued procurement of electricity via REGO will significantly aid our carbon reduction targets. During RIIO-ED2 we will continue to work with Ofgem to ensure that our purchase of our electricity through a	April 2028

		REGO scheme is acknowledged on our Ofgem annual BCF.	
6	Reduce energy use in our buildings	We have analysed our property portfolio to assess each building's energy usage and performance. The analysis has informed a ranking of our properties by size, relative energy usage and property condition category. Our 23 lowest ranked properties from this analysis have been subject to further assessment to identify cost-effective energy performance improvements. Energy performance improvements will be targeted as early as possible in RIIO-ED2 to be most effective. This investment will be made from 2023/24 – 2025/26. Further opportunities to reduce energy use in our buildings will be identified via individual building surveys which will be undertaken throughout RIIO-ED2.	April 2026
7	'Excellent' BREEAM rating for all buildings	By achieving a BREEAM rating of 'Excellent' we are demonstrating a determined and enduring approach to sustainable improvements in the operational performance of our buildings. To achieve a rating of 'Excellent' our buildings, when independently assessed, must demonstrate best practice in the following key areas; Management / Health & Well Being / Energy / Transport / Water / Materials / Waste / Ecology / Pollution / Innovation. According to BREEAM just 10% of UK new non-domestic buildings are rated as 'Excellent' and demonstrate best practice. This means that we will be amongst the most sustainable companies in the country, in terms of construction and buildings.	April 2028
8	Minimise carbon emissions through reduction in business travel	Business travel will be reduced via the adoption of remote working where practical in accordance with our policy for working from home. The combination of a progressive framework for remote working and increased use of video technology for holding virtual meetings will reduce business travel mileage, reduce emissions, as well as time spent travelling.	April 2028
9	Small-scale battery powered generation	Trials of the use of small-scale battery powered generation when restoring customer supply will be undertaken in each of our licence areas during RIIO-ED2. If successful, we will increase our use of these technologies, replacing traditional diesel generation where appropriate (for example, residential fault restoration). The benefits of using small scale battery generation include: • Zero carbon emissions	April 2028

		• No noise or fumes • Zero environmental damage through leaks or spills. • Ability to be charged by renewables at depot.	

5.19. We will carefully monitor our progress towards delivery of this CVP as we move through RIIO-ED2. Our EAP sets out in more detail how we intend to monitor and report on progress towards the achievement of this commitment.

4. Benefits generated by our proposal

Why we have used two approaches to measure benefits

9.1. We have used two different approaches to quantify the benefits of this CVP:

- **Approach 1 (main quantification):** Following extensive stakeholder engagement we have estimated the benefit of this CVP as per the stated Willingness to Pay from our customers. This reflects the high level of support we received for this CVP and how important it is to our customers that we deliver this target.
- **Approach 2 (supplementary quantification):** We have also cost savings for WPD and the societal benefits in the form of reduced carbon emissions to obtain total benefits.

9.2. The results of both approaches are important in quantifying the benefits of this CVP. The first approach highlights the hard savings that this initiative will bring to WPD and the value of the reduction of emissions that will result from it. The second approach focuses on the value that our customers place on us achieving this target, which is quite significant.

9.3. We believe using both approaches to quantify the benefits of this CVP gives a more holistic view of the value that can be delivered. It emphasises that even though the net present value of Approach 2 does not currently outweigh the cost, this is an initiative that is very important to a large proportion of our customers who are willing to pay a substantial amount to see this delivered.

9.4. As an example of the customer support we have received, during our acceptability testing 75% of customers supported this initiative, with 59% agreeing that it's the right level of ambition for WPD. It was also ranked amongst the top three initiatives in our latest Willingness to Pay research.

9.5. Details for how we have calculated the benefits under each approach are provided below.

Results of quantification – Approach 1 (main quantification)

5 and 10-year results

9.6. In line with the joint social value framework, agreed with the five other DNOs and shared with Ofgem in 2020, we have modelled the benefits of this CVP over both a 5 and 10-year appraisal period. More detail on the joint social value framework can be found in Section 8.

9.7. The table below provides the following results from our analysis:

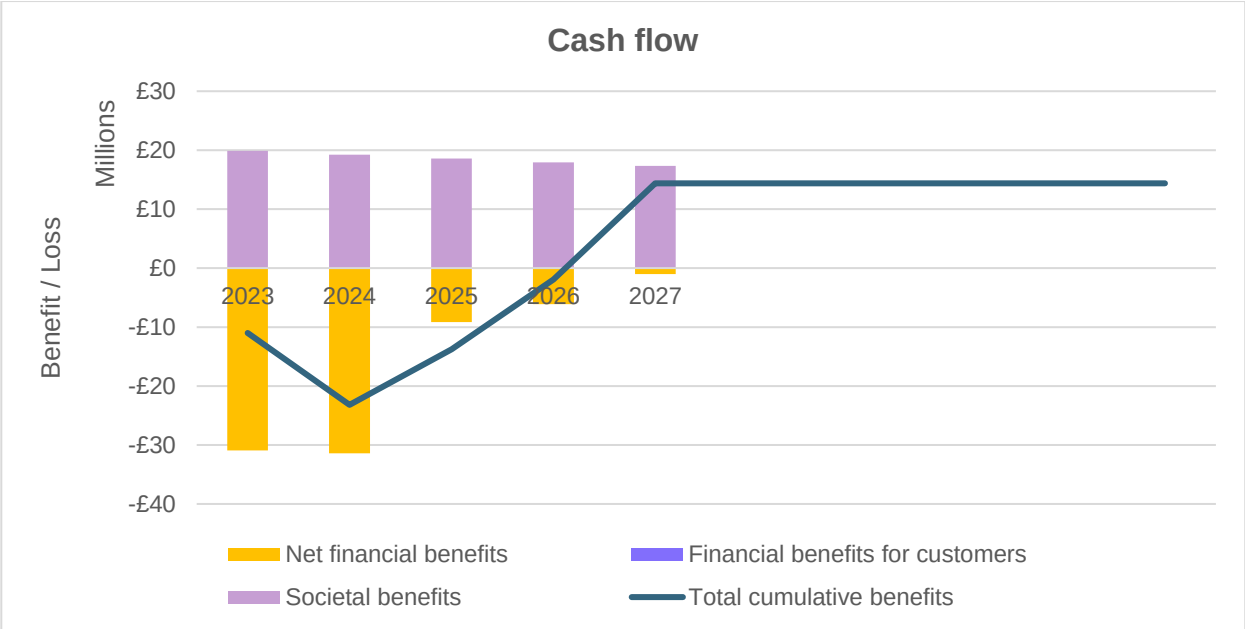
- **Total cost:** The total cost of the proposal, in 2020/21 prices (in line with Ofgem's CBA templates).[3]

[3] As per the discounting applied to all costs and benefits, this figure shows the present value of costs in 2020/21 prices. The values described in the costs section below are expressed in nominal values, i.e. the actual £ prices. For this CVP, the total undiscounted cost is £89.1 million.

- **Total gross present value:** The total value generated by the proposal across financial, environmental, and societal benefits – discounted to present values.
- **NPV – Net present value:** The total value generated by the proposal, net of all costs – again discounted to present values.
- **SROI – Social return on investment:** The £s of benefit achieved for every £ spent

	5-years	10-years
Total cost	£78,655,443.64	£78,655,443.64
Total gross present value	£93,031,660.89	£93,031,660.89
NPV	**£14,376,217.25**	**£14,376,217.25**
SROI	£0.18	£0.18

Benefits Profile



Breakdown of Benefits

9.8. **Societal Benefits**: Based on Willingness to Pay research around the value that customers place on WPD reaching net zero by 2028.

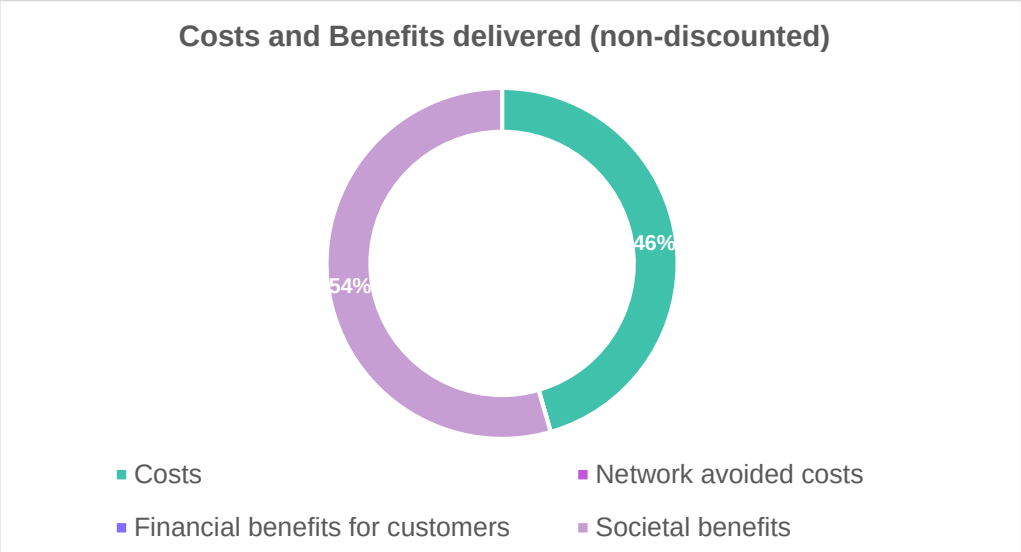
- The WTP survey was designed specifically for the purpose of this CVP, testing the exact wording of our proposal with 1,089 participants. This identifies the value of "Achieving net zero carbon emissions for our own business carbon footprint by 2028 (including the use of greenhouse gas removal schemes)", rather than the baseline.

Distributional impact

9.9. In line with the breakdown above, this CVP delivers benefits for:

- WPD's customers, due to reduced carbon emissions through the different initiatives which are part of our net zero strategy.

9.10. The chart below visualises this distribution, demonstrating the proportions of costs and benefits that fall in each category.



Approach to quantifying

Costs

9.11. We plan to spend the following for each net zero initiative:

Replacing 89% of our existing operational fleet with EVs

- £63.7m over RIIO-ED2. This includes the replacement costs for vehicles, assuming that during RIIO-ED2 we convert 221 small vehicles and 1,591 large/4x4 vehicles into EV. It represents the additional cost over the baseline in the same period of replacing 190 small vehicles, 676 large vehicles and 671 4x4 vehicles for ICE vehicles. Vehicle costs used:
  - Small EV (including fittings): £26,634
  - Large EV (including fittings): £66,288 (guide price, as costs of 4x4 EVs not currently available)
  - Small ICE vehicle (including fittings): £16,726
  - Large ICE vehicle (including fittings): £29,473
  - 4x4 ICE vehicle (including fittings): £37,175

Installing electric vehicle charging infrastructure

- £14.5m over RIIO-ED2. This includes the cost of installing 134 new chargers – 69 in Year 1 and 65 in Year 2. This consists of the cost of a 3rd party installing a 50kW charging point (£59,387 per charger), as well as the substation cost for the new chargers (£37,500 per charger). It also includes the charger maintenance cost. This is £2,484 per year per charger and adds up to £1.5m over RIIO-ED2.

Renewable generation at offices and depots

- £4m over RIIO-ED2. The cost of installing the solar panels will be £793,702 per year, with further maintenance costs after 8 years of installation. Since we are measuring benefits in this approach for a 5-year period, we have not included these costs.

Reducing energy use in our buildings

- £6m over RIIO-ED2. Building energy performance works will be carried out at the locations identified as “easy wins” – where significant energy performance gains can be made through minimal spend. The cost is based on a detailed assessment of the efficiency measures that can be applied in each site.

Non-carbon cars in company car-scheme

- £0m – this will not cost WPD more than what is currently being paid into this scheme. Electricity costs are covered as expenses, however this will be a saving when compared to the baseline of covering for petrol and diesel costs for business miles driven.

Offsetting of emissions

- £1m over RIIO-ED2. To achieve net zero by 2028 we will need to offset some of our emissions. To achieve this, WPD will have to invest from 2022 onwards to support current and new tree planting in local schemes. Each year a donation of £200,000 would result in carbon savings of 3,333 tonnes CO2e per year (we only included costs for the RIIO-ED2 period).

9.12. Other initiatives that do not directly lead to a reduction in emissions (e.g. BREEAM certification) or that will contribute to net zero but will be delivered in RIIO-ED1 were not included in the modelling of benefits.

Number of stakeholders

9.13. Given that a Willingness to Pay (WTP) value was used, the total amount of stakeholders to model is 7.9M.

Approach to Quantifying Societal Benefits

Calculations and Assumptions

- A median WTP value of £2.52 at average annual electricity bill was obtained as part of the October 2021 research for the following attribute: “Achieve net zero carbon emissions for our own business carbon footprint by 2028 (including the use of greenhouse gas removal schemes)”. By using the median, we are making sure to use an estimate that is supported by at least 50% of our customers.
- This resulted in £106.6m (non-discounted) in estimated benefits over RIIO-ED2.

Calculation Factors

- Success: 100%, as we expect the target to be achieved.
- Drop off: 0%, since stakeholder number was only used for year 1.
- Attribution: 0%, since the initiative will be funded and delivered by WPD.
- Deadweight: 0%, since the benefits wouldn’t be achieved without WPD’s activity.
- Optimism Bias: 0%, since research was specific to this initiative.

Sources

- WTP value: Accent and PJM Economics, Western Power Distribution RIIO-ED2 WTP, October 2021

Results of quantification – Approach 2 (supplementary quantification)

5 and 10-year results

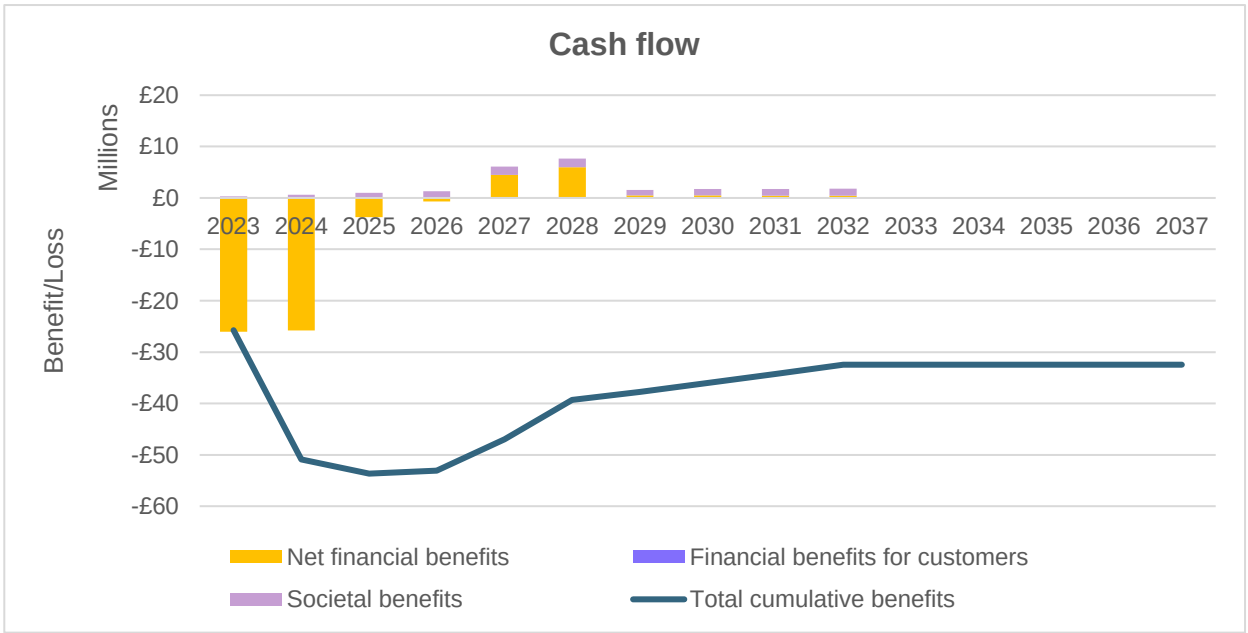
9.14. In line with the joint social value framework, agreed with the five other DNOs and shared with Ofgem in 2020, we have modelled the benefits of this CVP over both a 5 and 10-year appraisal period. More detail on the joint social value framework can be found in Section 8.

9.15. The table below provides the following results from our analysis:

- **Total cost:** The total cost of the proposal, in 2020/21 prices (in line with Ofgem's CBA templates).[4]
- **Total gross present value:** The total value generated by the proposal across financial, environmental, and societal benefits – discounted to present values.
- **NPV – Net present value:** The total value generated by the proposal, net of all costs – again discounted to present values.
- **SROI – Social return on investment:** The £s of benefit achieved for every £ spent

	5-years	10-years
Total cost	£78,655,443.64	£78,675,911.74
Total gross present value	£31,687,280.81	£46,204,766.54
NPV	**-£46,968,162.83**	**-£32,471,145.20**
SROI	-£0.60	-£0.41

Benefits Profile



[4] As per the discounting applied to all costs and benefits, this figure shows the present value of costs in 2020/21 prices. The values described in the costs section below are expressed in nominal values, i.e. the actual £ prices. For this CVP, the total undiscounted cost is £89.2 million.

Breakdown of benefits

9.16. **Network benefits:** WPD will see a significant reduction in bills from reduced use of grid electricity in offices and depots, reduced charging cost from installing EV chargers in depots as well as reduced maintenance and fuel cost from conversion of fleet to EV in addition to other factors,

9.17. **Societal benefits**: Based on carbon emissions reduction from the different planned activities, as well as the offsetting of emissions. The benefits considered represent the incremental benefit of bringing the net zero target forward, compared to achieving net zero by 2043. The following schemes were modelled for estimating benefits:

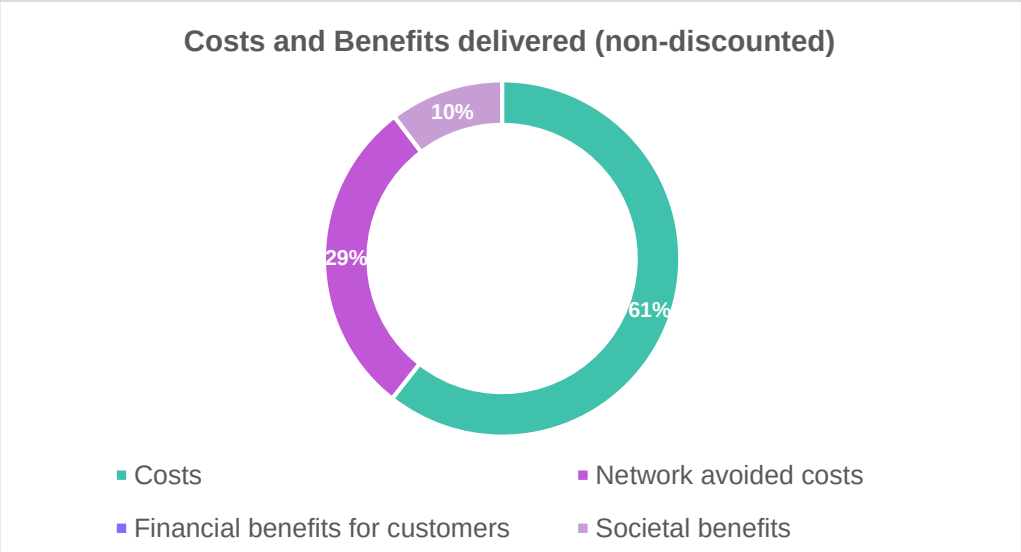
- We will replace a minimum of 89% of our existing operational fleet with electric vehicles by 2028 – given that this activity would not have taken place in RIIO-ED2 without the new 2028 target, all reductions in emissions as a result were considered as benefit. We only considered benefits up until 2028/2029, since this initiative would have taken place in 2030 if the target had not been brought forward.
- EV charging at key operational sites – this initiative would not have been delivered in RIIO-ED2 if it weren't for the new net zero target, all reductions in emissions as a result were considered as benefit. We only considered benefits up until 2028/2029, since this initiative would have taken place in 2029/2030 if the target had not been brought forward.
- Include only non-carbon technology cars in our company car scheme by 2025 – this activity would not have taken place in RIIO-ED2 without the new 2028 target and therefore all reductions in emissions as a result were considered as benefit. We only considered benefits up until 2028/2029, since this initiative would have taken place in 2029/2030 if the target had not been brought forward.
- Install renewable local generation at all suitable offices and depots with a capability to save 2,703 MWh per year –this activity would not have taken place in RIIO-ED2 without the new 2028 target and therefore all reductions in emissions as a result were considered as benefit. We modelled benefits for 10 years, as we assumed this activity would not have taken place before 2033 under the original target.
- Reduce energy use in our buildings – This reduction will be achieved by improving energy performance in certain buildings. This activity would not have taken place in RIIO-ED2 without the new target and therefore all reductions in emissions as a result were considered as benefit. We modelled benefits for 10 years, as we assumed this activity would not have taken place before 2033 under the original target.
- Emissions offsetting at the end of RIIO-ED2 for those emissions that could not be reduced.

Distributional impact

9.18. In line with the breakdown above, this CVP delivers benefits for:

- WPD, in the form of avoided network costs from solar electricity generation, improved energy performance in buildings, avoided fuel, reduced maintenance cost for electric vehicles and avoided public charging costs.
- WPD's customers, due to reduced carbon emissions through the different initiatives which are part of our net zero strategy and improved air quality due to the conversion of fleet vehicles to EVs.

9.19. The chart below visualises this distribution, demonstrating the proportions of costs and benefits that fall in each category.



Approach to quantifying

Costs

9.20. We plan to spend the following for each net zero initiative:

Replacing 89% of our existing operational fleet with EVs

- £63.7m over RIIO-ED2. This includes the replacement costs for vehicles, assuming that during RIIO-ED2 we convert 221 small vehicles and 1,591 large/4x4 vehicles into EV. It represents the additional cost over the baseline in the same period of replacing 190 small vehicles, 676 large vehicles and 671 4x4 vehicles for ICE vehicles. Vehicle costs used:
    - Small EV (including fittings): £26,634
    - Large EV (including fittings): £66,288 (guide price, as costs of 4x4 EVs not currently available)
    - Small ICE vehicle (including fittings): £16,726
    - Large ICE vehicle (including fittings): £29,473
    - 4x4 ICE vehicle (including fittings): £37,175

Installing electric vehicle charging infrastructure

- £14.5m over RIIO-ED2. This includes the cost of installing 134 new chargers – 69 in Year 1 and 65 in Year 2. This consists of the cost of a 3rd party installing a 50kW charging point (£59,387 per charger), as well as the substation cost for the new chargers (£37,500 per charger). It also includes the charger maintenance cost, this is £2,484 per year per charger and adds up to £1.5m over RIIO-ED2.

Renewable generation at offices and depots

- £4m over RIIO-ED2. The cost of installing the solar panels will be £793,702 per year, with further maintenance costs after 8 years of installation. Since we are measuring benefits in this approach for a 10-year period, we have included these costs for years 9 and 10, which equal to £16,000 per year (£2,000 per site).

Reducing energy use in our buildings

- £6m over RIIO-ED2. Building energy performance works will be carried out at the locations identified as “easy wins” – where significant energy performance gains can be made through minimal spend. The cost is based on a detailed assessment by a trusted partner of the efficiency measures that can be applied in each site.

Non-carbon cars in company car-scheme

- £0m – this will not cost WPD more than what is currently being paid into this scheme. Electricity costs are covered as expenses, however this will be a saving when compared to the baseline of covering for petrol and diesel costs for business miles driven.

Offsetting of emissions

- £1m over RIIO-ED2. To achieve net zero by 2028 we will need to offset some of our emissions. To achieve this, WPD will have to invest from 2022 onwards to support current and new tree planting in local schemes. Each year a donation of £200,000 would result in carbon savings of 3,333 tonnes CO_2e per year (we only included costs for the RIIO-ED2 period).

9.21. Other initiatives that do not directly lead to a reduction in emissions (e.g. BREEAM certification) or that will contribute to net zero but will be delivered in RIIO-ED1 were not included in the modelling of benefits.

Number of stakeholders

9.22. Given the nature of this CVP, the number of stakeholders was replaced by the amount of emissions saved in tonnes of CO_2e, which vary from scheme to scheme and are detailed in sections below.

Approach to Quantifying Societal Benefits

Calculations and assumptions

EV Replacement of Operational Fleet – CO_2 emissions

- We have estimated the number of vehicles by type of vehicle that can be replaced with an EV alternative.
- Based on the number of vehicles to be converted each year (545, 591, 300, 240, 136), and an average mileage of 12,000 miles per year, we obtained the following amount of carbon emissions avoided per year:
  - 2023/2024: 1,968 tonnes CO_2e.
  - 2024/2025: 4,101 tonnes CO_2e.
  - 2025/2026: 5,184 tonnes CO_2e.
  - 2026/2027: 6,051 tonnes CO_2e.
  - 2027/2028 & 2028/2029: 6,542 tonnes CO_2e.
- The above assumes that further reductions would require additional investment or would have been achieved without this initiative (diesel vehicles would not be purchased from 2029/2030 onwards under baseline scenario).
- This includes saved emissions from vehicles replaced in RIIO-ED2 only.
- The traded carbon cost as per Ofgem's CBA template was used to obtain benefits per tonne of CO_2e saved.
- It was assumed benefits last for 6 years and that there is no benefit lag.
- This resulted in £1.76m of benefits over the 6-year period (non-discounted).

EV Replacement of Operational Fleet – Air quality

- There are air quality damage costs associated with both diesel car transportation and electricity. Using Green Book tables, we obtained the damage costs for each year in p/L and p/kWh, respectively.

- Based on the number of vehicles to be replaced per year (545, 591, 300, 240 and 136), an estimate of £2,100 fuel cost per year for ICE vehicles, and an estimate of £1.34 per litre of fuel, cumulative fuel savings per year were estimated. All current ICE vehicles to be converted use diesel as fuel. These do not include fuel by any cars converted in RIIO-ED1.
- In terms of electricity expected to be used, given the vehicles that will be purchased, we used an estimate of 3.5 miles/kWh. Given our working assumption that all vehicles travel 12,000 miles a year, the cumulative electricity needs per year were calculated. These do not include electricity used by cars converted in RIIO-ED1.
- Using the damage costs per litre and per kWh, we calculated the difference between diesel transportation and electricity damage costs per year.
- This resulted in £1.41m of benefits over the 6-year period (non-discounted).

Renewable generation at offices and depots:

- Natural Generation have assessed 39 of our sites to determine the amount of generation they can produce, as well as the expected emissions to be saved per year.
- The rollout of sites throughout RIIO-ED2 will be: (8, 8, 8, 8 and 7), with a benefit-lag of 1 year.
- Based on the above rollout, the expected generation per year in MWh will be: (0, 541, 1081, 1622, 2162 and 2703 onwards).
- Using a conversion factor, this translates to the following saved emissions for a 10-year period: (0, 119.03, 228.98, 329.83, 421.6, 504.27, 481.54, 458.82, 436.09 and 413.37). This was then costed using the traded cost of carbon to obtain total benefits.
- This resulted in £275k over the 10-year period (non-discounted).

Company Car Scheme – CO_2 emissions:

- We have set a target to have all company cars be non-carbon by December 2025, with a total of 1,055 cars. The car scheme is circa 10% EV at present, and 47% of the order bank is EV. Therefore circa 950 cars will have to change to a non-carbon option between now and 2025.

- We have considered that this target would have not been in place under the original 2043 target and therefore all emissions from RIIO-ED2 efforts relating to this initiative were included.
- Assuming that each car drives on average 9,169 business miles per year (based on 2019/2020 data), and also that 75% of cars left to convert are petrol and 25% are diesel (based on current split), we can calculate the emissions saved per year using the respective emissions factor for diesel and petrol cars, versus a battery-powered car.
- This results in 8,201 tonnes of CO_2e saved over 6 years, which valued at the traded carbon cost adds up to £482k (non-discounted).

Company Car Scheme – Air quality:

- There are air quality damage costs associated with diesel/petrol car transportation and electricity.
- Using Green Book tables, we obtained the damage costs for each year in p/L and p/kWh.
- Based on the number of vehicles to be replaced per year (see previous section), an average of 9,169 business miles per year for company vehicles, and the respective miles per gallon (49.2 for petrol and 55.4 for diesel), cumulative fuel savings per year were estimated. This assumes the same split of petrol/diesel cars as for the emissions calculations above (75%/25%). These do not include fuel by any cars converted in RIIO-ED1.
- In terms of electricity consumption, we used the number of vehicles converted per year and an estimate of 3.5 miles/kWh to calculate total consumption. Using our working assumption

that vehicles travel 9,169 business miles per year, the cumulative electricity needs per year were calculated. These do not include electricity used by cars converted in RIIO-ED1.

- Using the damage costs per litre and per kWh we calculated the difference between diesel and petrol transportation and electricity damage costs per year.
- This resulted in £78k in benefits over 6 years (non discounted).

Reduced Energy Use in Buildings:

- We have analysed our property portfolio to assess each building's energy usage and performance. Our 23 worst-performing properties from this analysis have been subject to further assessment, which showed that relatively inexpensive M&E upgrades, such as installing LED lighting, upgrading air conditioning systems and/or building control systems can be extremely cost-effective energy performance improvements. Based on this assessment, we estimate that across the 23 sites we can save up to 320 tonnes of CO_2e per year, with the following profile across RIIO-ED2: (0,160,320,320,320 tonnes).
- Using the traded cost of carbon this results in £212k saved over 10 years (non-discounted).

Emissions Offsetting:

- By the end of RIIO-ED2, we estimate that approximately 19,500 tonnes CO_2e would need to be offset to achieve net zero. This accounts for other reductions which have or will take place during RIIO-ED1 as well as the use of a REGO tariff for electricity.
- Given the level of offsetting required, we are working with a partner to understand how this can be achieved in the timeline we have. Based on these discussions, we have decided to start investing in tree planting schemes from 2022, achieving an extra 3,333 tonnes of CO_2e avoided each year, allowing us to reach our 19,500 target by the end of RIIO-ED2. We have only included costs and emissions saved from 2023 onwards.
- We have assumed the benefits last for 10 years, since this offsetting activity would have not happened before 2033 if it weren't for the new 2028 target.
- We have used a traded-carbon price to estimate the benefits of this, which equate to £10.5m over the 10-year period.

Calculation Factors

EV Replacement of Operational Fleet:

- Success: 100%, as we expect the target to be achieved.
- Drop off: 100%, since emissions savings reported per year.
- Attribution: 0%, since the initiative will be funded and delivered by WPD.
- Deadweight: 0%, since the benefits wouldn't be achieved without WPD's activity.
- Optimism Bias: 0% since estimates used are based on current fleet, and standard conversion factors and costs.

Renewable Generation at Offices and Depots

- Success: 100%, as it is expected that WPD will generate that amount of electricity per year.
- Drop off: 100%, since emissions savings reported per year.
- Attribution: 0%, since the initiative will be funded and delivered by WPD.
- Deadweight: 0%, since the benefits wouldn't be achieved without WPD's activity.
- Optimism Bias: 0%, since estimates are particular to our sites.

Company Car Scheme

- Success: 100%, as it is expected we will reach the target by 2025.
- Drop off: 100%, since emissions savings reported per year.
- Attribution: 0%, since the initiative will be funded and delivered by WPD. Even though there is an option in the company car scheme to choose a car that requires a personal contribution, the benchmark price is reviewed by HR and Transport on a quarterly basis to ensure that it covers the cost of a benchmark vehicle (for EVs this would be a Nissan Leaf) without the need of personal contributions. Therefore, the allowance provided is enough to allow for all the benefits to be materialised, and any extra costs covered by employees are optional and won't result in a different level of benefit than if there had been no personal contributions.
- Deadweight: 0%, since the benefits wouldn't be achieved without WPD's activity.
- Optimism Bias: 0%, since estimates used are based on current fleet, and standard conversion factors and costs.

Reduced Energy Use in Buildings

- Success: 100%, as it is expected we will achieve the reductions.
- Drop off: 100%, since emissions savings reported per year.
- Attribution: 0%, since the initiative will be funded and delivered by WPD.
- Deadweight: 0%, since the benefits wouldn't be achieved without WPD's activity.
- Optimism Bias: 0%, since estimates are particular to our sites.

Emissions Offsetting

- Success: 100%, as it is expected that WPD will offset any remaining emissions.
- Drop off: 100%, since emissions savings reported per year.
- Attribution: 0%, since the initiative will be funded and delivered by WPD.
- Deadweight: 0%, since the benefits wouldn't be achieved without WPD's activity.
- Optimism Bias: 0%, since estimates were provided by an expert partner.

Sources

EV Replacement of Operational Fleet

- Conversion Factor: 3.5 mile/kWh – WPD internal market research plus standardisation across EV OEMs
- Traded Carbon Cost: Ofgem CBA Template RIIO2 v6.0.
- Fuel cost per year for ICE vehicles: WPD estimates.
- Fuel cost per litre: AA, Fuel price report September 2021.
- Miles per kWh for EVs: Average based on battery and range of small and large vehicles.
- Damage costs: Treasury Green Book Supplementary Appraisal Guidance on Valuing Energy Use and Greenhouse Gas (GHG) Emissions, Tables 14 & 15.

Renewable Generation at Offices and Depots

- Traded Carbon Cost: Ofgem CBA Template RIIO2 v6.0.

- Avoided emissions per year: Natural Generation estimates (detailed assessment per site available in Annex A & B of EJP011).
- Conversion factor: 0.23314 $kgCO_2e$

Company Car Scheme

- UK Electricity Conversion Factor and Traded Carbon Cost: Ofgem CBA Template RIIO2 v6.0.
- Vehicle Conversion Factors: BEIS, 2020 UK Government GHG Conversion Factors for Company Reporting.
- Damage costs: Treasury Green Book Supplementary Appraisal Guidance on Valuing Energy Use and Greenhouse Gas (GHG) Emissions, Tables 14 & 15.
- Miles per gallon: Table ENV0103 (TSGB0303), Average new car and light goods vehicle (LGV) fuel consumption: Great Britain, 1997-2019, Department for Transport statistics.
- Miles per kWh: Average based on battery and range of small and large vehicles.

Reduced Energy Use in Buildings

- Traded Carbon Cost: Ofgem CBA Template RIIO2 v6.0.
- Avoided emissions per year: EJP009 General Building Refurbishment Programme, Annex B.
- Conversion factor: 0.23314 $kgCO_2e$

Emissions Offsetting

- Traded Carbon Cost: Ofgem CBA Template RIIO2 v6.0.
- Emissions saved: Based on estimates given by Heart of England Forest Scheme.

Approach to Quantifying Network Savings

Calculations and Assumptions

EV Replacement of Operational Fleet:

- We have calculated annual savings due to the replacement of 89% of our fleet to EV, which include: vehicle replacement savings, reduced servicing cost, avoided fuel cost, avoided excise duty, residual value at end of life and Clean Air Zone savings. These have all been calculated as incremental over the baseline of replacing vehicles for ICE ones. All calculated up to year 6 (2028/2029), assuming that EV replacement would have started in 2029/2030 under the baseline.
  - Vehicle replacement savings: These are the difference between the cost of replacing vehicles for ICE versions, versus replacing for EV. Based on costs of vehicles and number of vehicles to be replaced (as laid out in cost section), these amount to £4,230,151 over 6 years.
  - Residual value of vehicles: £585,137 over 6 years, represents the residual value of vehicles when sold at end of asset life, valued at 10% of vehicle purchase price (not including fittings costs).
  - Fuel Savings: £12,648,516 over 6 years. This is based on an average mileage per year of 12,000 miles, a cost of fuel for ICE vehicles of £2,100 per year and an electricity cost for EVs of £0.04 per mile.
  - Vehicle servicing: £1,880,274 over 6 years. Based on the cost of servicing each vehicle per year. This is £390.89 per ICE vehicles and £167.50 per EVs.
  - Vehicle Excise Duty: £2,314,675 over 6 years. This is a saving based on the excise duty paid for each ICE vehicle, which is £275 per vehicle per year.

- Clean Air Zone savings: £159,192 over 6 years. This cost arises when vehicles enter a Clean Air Zone with an ICE vehicle. It includes both Bath and Birmingham Clean Air zones, at a yearly cost of £4,752 and £24,192 respectively. This was estimated using the number of vehicles that entered each zone in July 2021 (44 and 252 respectively) and multiplying this cost by 12 to obtain a cost per year.

- Total savings over 6 years: £21.8m (non-discounted).

Renewable Generation at Offices and Depots:

- Natural Generation have assessed 39 of our sites to determine the amount of generation they can produce, which is up to 2,703 MWh per year. This valued at 17.5p/kWh results in £472,950 per year.
- Assuming a 1-year benefit lag, and considering that the rollout will be of 20% capacity each year across the 5 years, we obtain the following savings in a 10-year period (£0, £94500, £189180, £283770, £378360, £472950, £472950, £472950, £472950, £472950)
- This results in £3.3m benefit over 10 years (non-discounted).

Reduced Energy Use in Buildings:

- Avoided costs will be achieved through a reduction in energy spend from the building energy works.
- Our 23 worst-performing properties have been subject to a detailed assessment. This showed that relatively inexpensive M&E upgrades, such as installing LED lighting, upgrading air conditioning systems and/or building control systems can be extremely cost-effective energy performance improvements. We estimate that across the 23 sites we can save up to £239,836 per year (using an energy cost of £17.5p/kWh).
- A 1-year benefit lag was applied, and it is expected that half of benefits will be achieved by Year 2, with the full benefits from Year 3 onwards.
- These add up to £2.04m over 10 years (non-discounted).

Installing EV Charging Infrastructure:

- Savings will be incurred in the form of saved public charging costs and avoided lost time while charging.
  - Saved public charging costs: £1,894,860 over RIIO-ED2. This is costed at £0.09 per mile travelled by the vehicle. The average mileage for all vehicles is 12,000 miles per year and we estimate the percentage of EV miles using public charging stations will drop from 80% to just 10% after chargers are installed.
  - Avoided lost time while charging: £13,744,051 over RIIO-ED2. This is a benefit associated with the additional charger installation, which will reduce the time our technicians spend travelling to find charging points. This assumed the same % of EV miles using public charging points as above, a £32.64 rate per hour per technician, 2 technicians per van and 2.5h travelling time to a public charger.
- These add up to £15.6m over 5 years (non-discounted).

Sources

EV Replacement of Operational Fleet:

- Vehicle costs (ICE):
  - Small van costs based on Ford Connect diesel at £12,798, fit out costs for each vehicle valued at £3,928.94.

- Large van costs based on Iveco Daily Diesel at £23,733, fit out costs for each vehicle at £5,740.17.
- 4x4 vehicle costs based on Isuzu Dmax at £20,416, fit out costs for each vehicle at £16,759 (fitting includes a percentage of truck mounted personnel lifts).

- Vehicle costs (EV):
  - Small van costs based on Nissan eNV200 at £21,713.43, fit out costs for each vehicle at £4,921.
  - Large van costs based on Nissan Fiat eDucato at £58,166, fit out costs for each vehicle at £8,122.21.
- 4x4 costs based on Large van costs (no 4x4 EV costs available at time of writing).Cost of fuel for ICE vehicle: WPD estimates based on past data.
- Cost of electricity for EVs: HMRC, Advisory fuel rates (https://www.gov.uk/guidance/advisory-fuel-rates).
- Servicing costs: Based on WPD data from in-house servicing activity.

Renewable Generation at Offices and Depots and Reduced Energy Use in Buildings:

- Average electricity cost: Pending

Installing EV Charging Infrastructure:

- Electricity cost public charging: Average calculated based on assessment of the mean energy consumption (miles per kW/h) from the 16 most popular battery electric vehicles purchased. To calculate real world figures this energy consumption has been analysed by 1) Driving conditions a) City; b) Highway; c) Combined and 2) Weather Conditions – i) Cold weather; ii) Mild weather, which all have an effect on range, across different options of public chargers available.
- Time to travel to public charging point: Assumption based on battery life of vehicles. We would have to re-charge vehicles 2-3 times per week given their range and battery capacity. If the technicians are not near a main depot then they would have to travel 30mins each way to charge the vehicle.
- % of EV miles using public charging: WPD estimates based on rollout of EV charging points.

Changes from July's draft calculations

9.23. The results shown in this document represent the best estimate of the benefits that will be achieved through this CVP with the information available at this time. To achieve this, we have made a few changes from our previous submission which are detailed below:

9.24. We have included two different approaches for measuring the benefits of this CVP. The first approach focuses on the value that our customers place on us achieving this target, which is quite significant. The second approach highlights the hard savings that this initiative will bring to WPD and the value of the reduction of emissions that will result from it.

9.25. We believe using both approaches to quantify the benefits of this CVP gives a more holistic view of the value that can be delivered. It emphasises that even though the net present value of Approach 2 does not currently outweigh the cost, this is an initiative that is very important to a large proportion of our customers who are willing to pay a substantial amount to see this delivered.

9.26. We have reviewed our previous modelling and made changes where appropriate, such as:

- Revised the costs and avoided costs of the CVP to use our latest estimates.

- Removed two initiatives from the modelling of benefits: ‘Replace diesel used in generators with alternative fuel’ and ‘Reduce business travel by encouraging more remote working and virtual meetings’. The first one still needs to be piloted and therefore we don’t want to commit to benefits of something we may not be able to deliver. The second one was removed from the modelling since business travel has reduced significantly post-Covid, and decided to focus on the reduction of emissions from business travel through the conversion of company cars to EVs.
- We have clarified why we are attributing 100% of the benefits from our conversion to EV of company cars.
- We have shortened the benefit period for our EV initiatives, both our internal fleet conversion as well as company cars. This is to ensure we are only considering incremental benefits from the baseline and including benefits up to 2029, given that no diesel vehicles would be purchased after this date on our baseline scenario.

9.27. Also, following the audit on the DNO Social Value Framework, we have added an air quality benefit associated to the conversion of our EV fleet and company cars, as well as updated the carbon values used to align with Ofgem’s latest CBA template. We also clarified the sources of our calculations of costs and benefits.

Monitoring Social Value during RIIO-ED2

9.28. The quantification work shown in this document will allow us to track the benefits we are delivering during RIIO-ED2 and compare to the value we have forecasted. To monitor the delivery of benefits for this CVP, we will make sure to track:

- The progress of delivery of each of the initiatives laid out in this document. This will determine whether the social benefits (emission reductions and air quality benefits) are being delivered as well.
- The costs savings per year for each initiative.
- Any other benefits we have not detailed in this document.

9.29. We will use the information we collect to monitor how we are performing against the benefits we have calculated for each year. If there is a difference between benefits delivered and those forecasted, we will make it clear if this is because of a change in delivery or an update in the modelling approach (e.g., revised proxy values). This will ensure we are allowing for comparison of values in a like-for-like basis, while also keeping the modelling of benefits as accurate as possible.

5. Stakeholder support

Feedback from stakeholders

10.1. We have engaged closely with stakeholders throughout the development of our Business Plan to make sure their needs and preferences are reflected. When putting together our Business Plan for this regulatory period, we engaged more stakeholders than ever before – providing them with the opportunity to start with a 'blank sheet of paper' to define our plans from scratch. We set out in Supplementary Annex SA-05: Giving customers a stronger voice - Enhanced engagement and Supplementary Annex SA-02a: Our commitments – Justification analysis how we have engaged with stakeholders and how this has helped to shape the plan. The specific feedback we received from stakeholders that is relevant to this proposal is set out below.

10.2. In September 2021, we sought feedback on this CVP at a stakeholder event, which was attended by customers and customer representative groups, local authorities, community energy groups and charities from across our four licence areas. Of those stakeholders at the event, an overwhelming 87% 'agreed' or 'strongly agreed' that WPD was best placed to deliver this proposal. 81% of stakeholders at the event said that they 'agreed' or 'strongly agreed' that the proposal was acceptable.

10.3. Throughout the development of this Business Plans, we engaged with stakeholders to understand their views in relation to environmental priorities and net zero targets. Following WPD's initial target of 'net zero by 2043', a very high proportion of stakeholders (80%) wanted to see further ambition, with 52% supporting the maximum level of ambition (net zero by 2028). Additionally, a sample of end-user customers were surveyed, where 61% supported our 2028 ambition for net zero.

10.4. In relation to CVP-1, 55% of stakeholders wanted to see greater ambition in replacing the operational fleet with EVs given a range of percentages. WPD picked our mid-point option of '89%', as of the two higher ambition options, more customers wanted to see the lower option. Achieving 100% will also require new technological developments for larger vehicle for which there are currently no zero carbon alternatives.

10.5. 95% supported our commitment to install renewable local generation at all suitable offices and depots with a capability to save 3000 MWh per year, with no notable suggestions for alternatives. However, they requested the impact of these installations to be better quantified to ensure this is a meaningful action and not 'greenwash'.

10.6. There was a strong message from participants in the Social Contract forums that companies (especially large employers) should give something back to the community, environment and their people and that in order for a business to 'go over and above ', they must drive environmental change. Suggested pledges to achieve this included; repairing any damage caused by our activities, reducing pollutants/leaks, investing in electric vehicles, achieving Net Zero in our own operations well in advance of the Government's 2050 target, keeping communities powered, listening / understanding / involving / representing local issues and helping communities to thrive.

10.7. In the 'Youth – Measures of Success' deliberative focus group research (specifically targeting future customers) expectations were high in this category for WPD to deliver measures to support the battle against climate change, for fairer prices to be offered and for technological solutions to become second nature. There was a strong positive reaction to Science Based Targets being used, and they particularly welcomed measures that focused on reducing WPD's carbon footprint and for ambitious targets for landfill and waste to be included. As a group, they

were well informed and educated on environmental issues and were eager to push WPD to deliver the toughest measures possible. Overall, there was a positive response to the range of measures being proposed although a greater sense of urgency for WPD to address harmful pollutants was expressed.

10.8. CVP-1 addresses several of our stakeholders' top priorities for the environment (see Table 3), which will be directly or indirectly covered through the proposals set out in CVP-1.

Table 3: Stakeholder top priorities for the environment

	Stakeholder top priorities
1	**Set a target for zero carbon emissions from our fleet, for example, by 2030**
2	**Replace smaller vehicles with EVs and larger vehicles with biogas or hydrogen**
3	**Monitor all transport associated with your business, using telematics, to reduce the number of miles travelled**
4	**Eliminate the use of SF_6 and carry out research to find alternatives**
5	**Use Science Based Targets to improve biodiversity, aiming for a net gain**
6	**Put in an ambitious tree replacement programme and promote this good work**
7	**Ensure buildings are powered by renewable energy**
8	**Reduce the use of single use plastics**

10.9. Additionally, an Environmental Strategy Stakeholder panel was held in February 2021, comprising of representatives from utilities, local authorities, local organisations, parishes, and customers. Stakeholder feedback was incorporated into the Environmental Strategy and has prompted various schemes within CVP-1.

Supporting our Business Plan

10.10. This proposal is fully consistent with and contributes directly to the core commitments that WPD has put forward as part of this Business Plan. The plan sets out our commitment to **delivering an environmentally sustainable network** as one of the three high-level output categories for RIIO-ED2. Our overarching commitment in this category is to manage the impact of our activities on the environment and enable the transition towards a smart, flexible, low cost and low carbon energy system for all consumers and network users.

10.11. This initiative relates to the following core and wider Business Plan commitments, which set out at a more detailed level how we intend to deliver for our customers in RIIO-ED2. Further details on these commitments can be found in Supplementary Annex SA-02: Our commitments.

Delivering an environmentally sustainable network

Core Commitment 10	***Achieve net zero in our internal business carbon footprint by 2028 (excluding network losses) and follow a verified Science Based Target of 1.5°C to limit the climate impact of our activities.***

Wider commitment	***Replace a minimum of 89% of our existing operational fleet by 2028.***

Wider commitment	***Install low carbon technology (LCT) generation at all suitable depots and offices to produce electricity to meet operational demand.***

6. Accountability for delivery

What happens if outputs are not delivered

11.1. We are committed to delivering this proposal to deliver net zero in our internal business carbon footprint by 2028 so the benefits set out above can be secured for consumers. We see achieving net zero as a key priority for us and our consumers and we intend to play our part on helping the UK achieve its decarbonisation targets. We believe the steps we will take will ensure that the initiatives set out in this proposal will be a success.

11.2. If for any reason we are unable to deliver our commitment to achieve net zero by 2028, we propose to:

- Return a proportionate amount of any associated CVP reward under the business plan incentive to ensure that consumers do not pay for something that they have not received; and
- Undertake initiatives to minimise our environmental impact in other areas to ensure that WPD is well placed to help facilitate net zero.

11.3. We intend to engage with Ofgem to discuss how this may best be implemented in RIIO-ED2.

7. Eligibility checklist

Item	Description
Relevant CVP area (as per **Ofgem's RIIO-ED2 Business Plan Guidance)**	▪ Proposals that exceed the baseline expectations that we have set out for EAPs
Does this proposal entail new activities vs RIIO-ED1?	✓ **Yes** – see section 2.8 The schemes detailed as part of CVP-1 have either not been undertaken before or will significantly increase in scale.
Does this proposal go beyond BAU activities?	✓ **Yes** – see section 2.8 A net zero target date, and schemes to achieve this, have not been established as part of RIIO-ED1. Therefore, all schemes detailed as part of CVP-1 are above and beyond BAU activities or will significantly increase in scale as part of RIIO-ED2.
Does this proposal exceed RIIO-'s baseline expectations?	✓ **Yes** – see section 2.8 Our proposal significantly exceeds baseline expectations for EAPs by setting a net-zero date of 31 March 2028. The level of change that is required in our operations, practices and assets to achieve this is significant in order to be deliverable over the five years of RIIO-ED2: • Currently 10% of our operation fleet are EVs and we plan to increase this to 89% by the end of RIIO-ED2. • WPD is leading by example, enabling net zero through our employees by replacing all 1050 company cars with pure electric vehicles by December 2025 and updating company policy to minimise unnecessary business travel. • WPD are adopting a science-based target of 1.5 degrees, which would place us among the most ambitious companies, consistent with the Science Based Target initiative's 'Business Ambition for 1.5°C'.[5] • Our net zero schemes represent a step change from existing processes and initiatives. With this, WPD is going above and beyond what is expected for the EAP baseline expectations.
What additional value does this proposal provide to customers?	✓ **Meets Ofgem's criteria** – above £3 million threshold of net benefits. In particular, this CVP proposal brings £14.4m of additional value (based on our main quantification approach, which incorporates customer willingness to pay) to customers – see Section 4 for full detailed explanation.

[5] Business Ambition for 1.5°C - Science Based Targets (accessed May 2021)

8. Appendix: Joint Social Value Framework

13.1. During working groups in early 2020, all six DNOs, alongside Ofgem and key consumer groups discussed the (quantitative) measurement of social value, and the Consumer Value Proposition as part of the business plan incentive.

13.2. Under GD2, the four GDNs used different methodologies, values and reporting structures which led to results that are hard to compare. To prepare for the ED2 CVP process, and for changes to the SECV incentive, DNOs decided to develop a common approach to measuring social value a consistent mechanism that would allow for straightforward assessment and comparison.

13.3. To meet the DNOs' and Ofgem's requirements, the common approach needed to:

- Provide robust, consistent measurement of all social benefits DNOs deliver through their services.
- Deliver a framework for DNOs to measure their CVP values in 2021.
- Act as an ongoing solution – a framework applicable for the full RIIO-ED2 period.
- Drive innovation and ambition in the social value space.

13.4. To deliver against this need, the joint social value framework was created. In line with the Spackman approach and the Treasury's Green Book, the framework provides a structure through which the DNOs will deliver values that are consistent, comparable, and conservative. The framework includes:

- Standard values (from a DNO-specific proxy bank).
- Data quality guidelines.
- A set calculation template.
- Common figures that should be reported (as seen in **Section 4**).

13.5. This framework was tested throughout its development, agreed with consumer bodies and shared with Ofgem in December 2020 – with the framework referenced in Ofgem's Business Plan Guidance.

13.6. WPD has had the framework independently applied to each of their CVP proposals, ensuring that appropriate values and assumptions are applied. This provides confidence that the values presented in this document are a conservative estimate of the value generated.

13.7. In addition, an audit of the DNOs application of the joint Social Value Framework has been carried out in October 2021. The purpose of the audit is to ensure the rules and governance of the framework have been applied consistently across different DNOs.

13.8. This will make sure that values are consistent, comparable, and conservative, prior to Ofgem's review of the final business plan. This has led to some changes in the quantification of benefits that ensure we are aligned with other DNOs where we have calculated similar benefits. These changes are detailed in the benefits section of each CVP where appropriate.

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