

# Appendix 07.04.04

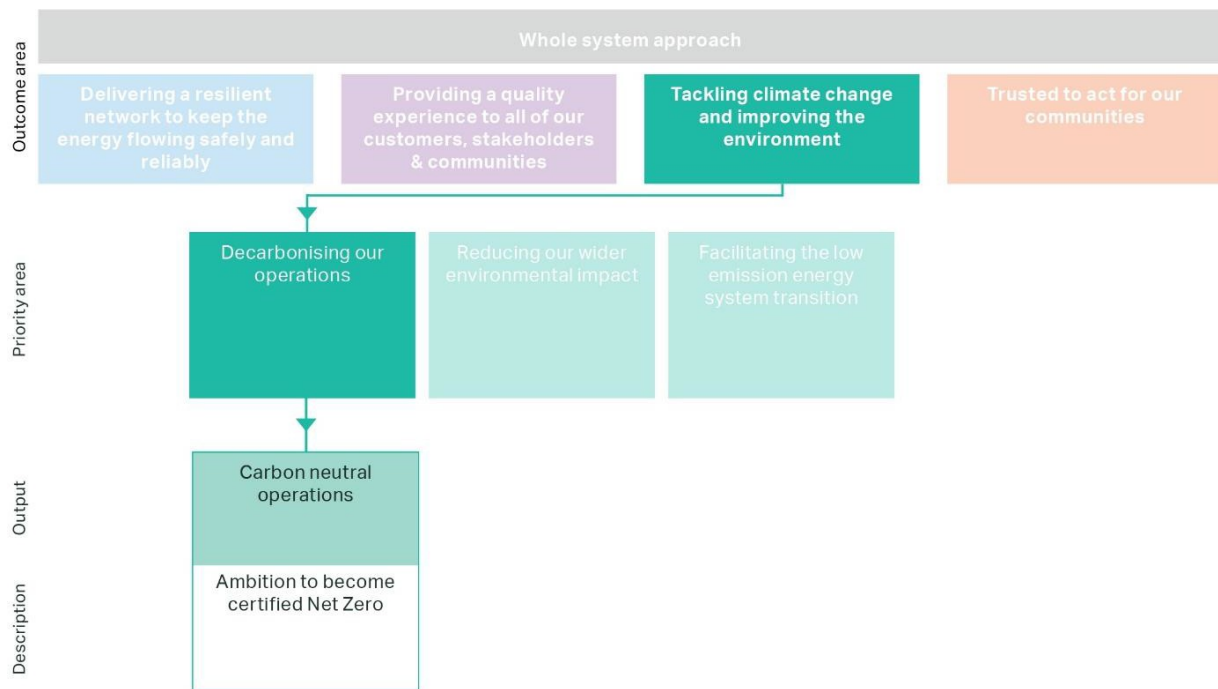
## Carbon Neutral Operations

**This output case describes the way we will reduce the carbon footprint of our business operations.**

**During RIIO-2 we will:**

- Purchase certified renewable energy for offices and depots and renewable gas for our thermal plant
- Reduce to zero avoidable waste sent to landfill
- Purchase the latest low emission Euro 6/7 diesel vehicles
- Deploy zero emissions cars for First Call Operatives (FCOs) in all networks
- Invest in Electric Vehicle (EV) charging infrastructure at every office and depot site
- Provide home EV charging for some of our employees
- Offset all unavoidable emissions to become a certified net-zero organisation.

We will deliver:



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## How we have developed our proposals

1. **We considered the context** – Greenhouse gas emissions, and their impact on our global climate, is one of the most pressing issues facing society. Cadent has made public commitments to reduce our emissions by 80% against a 1990 baseline.
2. **We reviewed how our operations contribute to carbon emissions** - Cadent has a significant carbon footprint (the total inventory of annual greenhouse gas emissions converted to a carbon dioxide equivalent, CO<sub>2</sub>e) from two sources. The first is shrinkage: losses from our pipeline and network assets. The second is our business carbon footprint: emissions as a result of the activities required to operate, run, repair and replace our networks, which we have the ability and authority to control.
3. **This provided us with a clear problem statement** – How do we reduce our carbon footprint in a cost-effective way?
4. **We looked at best practice** and noted that leading UK companies are committing to net-zero emissions or carbon neutrality in line with recent recommendations to Government by the Committee on Climate Change (CCC).
5. **We worked with experts and carried out extensive customer engagement as we developed our thinking**. Our customers and stakeholders told us they want us to reduce our carbon footprint by exploring alternative energy resources and modes of transport.
6. **We identified actions that can deliver the required outcome** – Drawing on expert input and our external engagement we developed and refined six actions which will reduce greenhouse gas emissions:
  - I. Sourcing renewable gas for space heating (for our offices and depots)
  - II. Procuring renewable energy for operational purposes
  - III. Investing in EV charging infrastructure to encourage greater uptake of EVs.
  - IV. Investing in establishing a zero-emissions commercial fleet.
  - V. Requiring our contract partners to follow our lead
  - VI. Accounting for emissions and developing offset programmes to achieve net-zero.
7. **We considered a range of research and analysis** – We tested our views with customers. All of the actions attracted customer support. Action ii was the most popular amongst all customers. Action iii was the most popular with customers in vulnerable situations (CIVs). We also tested customers' attitudes to different levels of ambition - they showed a preference for a medium level of ambition.
8. **We defined our commitments** – Taking account of the results from our engagement, but also the environmental goals set by Government and by Ofgem, we have adopted the most ambitious level of ambition in our plan.
9. **We confirmed our proposal in our October plan** and have tested this along with other aspects of the plan in our acceptability-testing process.
10. **We are seeking £55.6m in funding to deliver this** – and have calculated a -£36.3m net benefit of from this commitment based on carbon savings, nevertheless we feel this is enough of a priority to include in our plan.
11. **What will the future look like after we embed our RIIO-2 commitments?** – We will have made a material reduction in our carbon footprint to the long-term benefit of the environment.

The table below summarises our commitment in this area:

*Table 1 Our commitments*

<b>Output: Carbon neutral operations</b>	
<b>Common / Bespoke</b>	Bespoke
<b>Output type</b>	ODI(R)
<b>Comment</b>	Ambition to become certified Net Zero
<b>Target</b>	Achieve net zero BCF by the end of RIIO-2
<b>Cost implications (annual)</b>	Incremental costs of £11.1m
<b>Incentive range</b>	N/A
<b>CVP</b>	-£36.3m

## 1. Defining Our Customers' Needs



This output case addresses our business carbon footprint (BCF), a measure of the total greenhouse gas emissions (in tonnes of CO<sub>2</sub> equivalent) resulting from operations in which we have direct control to introduce and implement our operating policy and from contractors' emissions. This is a significantly smaller component of our total carbon footprint than the gas losses from our network, but it is no less important that we work to reduce carbon emissions in the area. The elements that comprise the BCF are currently defined by Ofgem, and subject to reduction targets through the current regulatory period.

Greenhouse gas emissions, and their impact on our global climate, is one of the most pressing issues facing society. The Paris Agreement, the UK's CCC and the Climate Change Act (2008) all stress the need for deep and urgent reductions in greenhouse gas emissions. The CCC recently stressed the need for radical reductions before 2030, if irreversible climate change is to be avoided.

Cadent has a significant carbon footprint (the total inventory of annual greenhouse gas emissions converted to a carbon dioxide equivalent, CO<sub>2e</sub>) from two sources. The first is shrinkage: losses from our pipeline and network assets. The second is our business carbon footprint: emissions as a result of the activities required to operate, run, repair and replace our networks, which we have the ability and authority to control.

Cadent has made public commitments to reduce our emissions by 80% against a 1990 baseline and has already made significant progress, cutting emissions by over 60% to date. The most important activity Cadent is undertaking is bringing down shrinkage related emissions through the replacement of leaky metallic pipelines with polyethylene (PE). While this is of significant environmental benefit and will enable Cadent to reach its 2050 target in the mid-2020s, there are strong environmental and societal reasons why we believe this delivery programme of replacement should be effectively optimised.

As a responsible business, committed to driving more sustainable outcomes for our environment and the communities we serve, it is incumbent on us to make a step-change in our business carbon footprint. We are committed to reducing the carbon emissions related to our operations, as measured through our business carbon footprint.

In 2019, Cadent published its first Safety & Sustainability Report as part of its commitment to improving transparency of its performance and wider access to key data. We will use this reporting channel to provide greater disclosure as we approach the RIIO-2 period. As we implement our RIIO-2 commitments and action plans, we will provide routine and regular performance updates through this reporting platform in addition to the annual reporting processes, including our Environmental Report, required by Ofgem

1.1. What insights are shaping our thinking?



Table 2 Engagement activities

Phase	Date	Source name	Source description	Questions asked	# of stakeholders	Score
Historical Engagement	May-18	YouGov / Energy Networks Association (ENA) survey results, May 2018	The ENA commissioned YouGov to conduct an online survey of the public to understand their views on heat in general. Results included that more people think electricity is the more expensive way to heat their home compared to gas, and that factors such as cost and controllability of heating were more important than a low carbon footprint. The majority of respondents also thought that the government should do more to improve production and use of green gas.	Respondents were asked whether they thought electricity or gas was the more expensive way to heat their homes, and then asked about a series of features of heating (e.g. cost, taking up minimal space) and asked how important they were. They were then asked whether the government should or shouldn't prioritise doing more to improve production and use of green gas.	1,660	2.0

<b>Historical Engagement</b>	May-18	Stakeholder advisory panel	As a precursor to our Customer Engagement Group (CEG), the Stakeholder Advisory Panel offered us a forum to raise and discuss issues with a range of interested parties including representatives from Citizens Advice, Age UK and the Energy and Utilities Alliance.	We presented to the panel on a range of topics across the years of its existence, including build up for our RIIO-2 business plan including areas such as the environment, vulnerability and fuel poverty.	11	1.0
	Sep-18	ENA Joint Gas Network stakeholder engagement (Cadent, National Grid, Northern Gas Networks (NGN), SGN, Wales and West Utilities (WWU))	The ENA jointly engaged with national stakeholders for all gas companies to avoid 'engagement fatigue' of all companies engaging separately in advance of RIIO-2, via a series of telephone interviews and some follow up surveys.	Rather than engaging stakeholders on pre-defined topics, the research allowed stakeholders to tell the gas network companies what they want to talk about and how they would like to engage with them. Semi-structured questionnaires we used to allow as much open dialogue as possible.	78	2.5
<b>Discovery</b>	Nov-17	2017 regional stakeholder workshops	We held four workshops in different regions to seek feedback from key stakeholders on the early development of our business plan. Each workshop began with a short presentation, followed by roundtable discussions. Electronic voting was also used to ask stakeholders about preferred options.	The workshops explored a number of topics, including: safeguarding (e.g. Priority Services Register (PSR) awareness, partnerships and innovation opportunities); the future role of gas and the decarbonisation of home heating. Cadent's general approach to its business plan was also discussed, for example the importance and coverage of the four outcome areas identified, the extent to which the plan should respond to the needs of specific customer groups or regions. - How strongly do you feel that networks should collaborate?	127	2.5

<b>Discovery</b>	Sep-18	Deliberative workshops	We delivered full day deliberative workshops in each of our regions to discuss what services customers find important, find our customer expectations of Gas Distribution Networks (GDNs) and gather feedback on our (at the time) four draft customer outcomes. The sessions began with information-giving and building knowledge of Cadent, then eliciting participants' views of services and priorities.	Participants were asked about their awareness of Cadent and expectations of a GDN. Participants were also asked for their views on the four draft outcomes in Cadent's business plan: keeping your energy flowing safely, reliably and hassle free; protecting the environment and creating a sustainable energy future; working for you and your community safeguarding those that need it most; value for money and customer satisfaction at the heart of all our services. The aim of the discussions was to shape these draft outcomes and identify any gaps.	206	2.5
	Oct-18	CIVs report	We interviewed customers in vulnerable situations and professionals working to support them (e.g. district nurses). We selected participants based on PSR needs codes and recruited via community organisations.	The interviews sought to understand what services were important to customers in vulnerable situations and what expectations such customers had of Cadent to safeguard them and accommodate their specific circumstances. Participants were also asked their views of the four draft outcomes in Cadent's business plan.	20	2.0
	Oct-18	Domestic survey	We ran an online survey of a representative sample of our domestic customers (and non-customers). This aimed to test the findings of the earlier deliberative workshops and focus groups.	Participants were asked closed questions on 14 topics we could cover in the business plan (e.g. minimising leaks, affordability) and asked to rate how important they are. They were then asked more open questions about the level of importance and whether anything was missing from the list of 14. Finally, they were asked a multiple-choice question on their preferred engagement methods for the future.	2,332	3.0



<b>Discovery</b>	Oct-18	Focus groups with hard to reach groups	We held focus groups with individuals considered 'hard to reach' in each of our regions. Each group contained 8-10 participants and lasted two hours. Participants covered three groups: urban customers with English as a Second Language, Future Generations and Non-Customers (predominantly from rural areas). These built on our previous deliberative workshops, whose voices could otherwise become 'lost within the crowd'.	Participants were asked what they expected of Cadent. The four draft outcomes for the business plan were shared with participants and they were asked for their views on these, what they wanted to see from Cadent and whether there were additional outcomes that Cadent should include.	57	2.5
	May-19	WWU regional community workshops	WWU hosted a series of regional workshops to seek feedback from stakeholders on its current and future business activities. These deliberative workshops explored: stakeholder priorities, value for money, mains replacement and the theft of gas, future energy solutions and social obligations.	These deliberative workshops explored: stakeholder priorities, value for money, mains replacement and the theft of gas, future energy solutions and social obligations.	52	1.0
	Aug-18	Ofgem's decarbonisation panel	Ofgem's workshop on decarbonisation focussed on the overall importance of the topic and the economic test for network extensions.	N/A	20	2.0
	Oct-18	Ofgem's RIIO-GT2 (Gas Transmission) policy working group	We engaged with Ofgem through participation in their RIIO-GT2 policy working group, which touched upon environmental incentives.	N/A	15	1.0

<b>Targeted</b>	Sep-19	Feedback from DNVGL	Brief feedback on our plan was provided by DNVGL who noted that references to hydrogen as a "renewable" gas were not accurate.	N/A	1	2.0
	Aug-19	Environmental and Sustainability commitments	We commissioned Enzen to compile a report on Cadent's environmental and sustainability commitments	N/A	N/A	3.0
<b>Willingness to Pay (WTP)</b>	Feb-19	Benefits Transfer Study	We commissioned NERA to draw on evidence from the gas, electricity and water sectors, and on published guidance from government departments and agencies to provide information that we can use to help value potential changes under consideration for our RIIO-2 business plan.	N/A	0	2.0

<p><b>Business Options Testing (BOT)</b></p>	<p>Jun-19</p>	<p>Cadent customer forum, round 4, Traverse</p>	<p>We held our fourth customer forum in Ipswich, London, Birmingham and Manchester to get customers' views on their priorities on a range of issues. This cross section of customers discussed with us various options (some proposed by us, some suggested by them) in a deliberative style session. Key topics discussed included: customer service, replacing pipes, reinstatement, interruptions, fuel poverty, carbon monoxide, decarbonising energy and becoming carbon neutral.</p>	<p>Participants were asked questions about a range of topics. On customer service, we explored what "great" looks like. We also asked about timeliness and communication with respect to reinstatements. We also tried to understand the level and type of service customers want during an unplanned interruption, including views on provisions, length of time without gas, and timeslots for getting the gas turned back on. We also asked for views on our options for addressing fuel poverty and carbon monoxide.</p> <p>With regards to resilience, we sought to understand what risks customers prioritise when replacing mains pipes and how this is influenced by bill impact as well as views on minimum standards of service.</p> <p>On the environment, we discussed: whether the theft of gas should be a priority (and who should benefit from successful recovery), whether connecting off-grid communities was a good way to decarbonise (and who should pay for this) and customer views on our plans to make our business operations carbon neutral.</p>	<p>200</p>	<p>3.0</p>
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<b>Business Options Testing (BOT)</b>	Aug-19	Future generations workshops, Traverse	<p>We commissioned Traverse to hold workshops with 45 "future generations" participants (aged between 13 and 18) to understand their priorities. This mainly involved younger people to specifically ascertain their input, given that decisions that we make in RIIO-2 will ultimately impact them. They supported the views of other customer segments but stressed more urgency and a higher priority on our Environmental Action Plan (EAP). Most saw this area as a core requirement (on their hierarchy of needs), whereas other customers saw it less as core and more as a psychological need.</p>	<p>Customers were asked about their priorities. We also sought to understand how they thought Cadent should best decarbonise their assets and services, and minimise environmental impact, how Cadent should best approach pipe replacement, their views of new proposals for length of interruptions, provisions and compensation for Multiple Occupancy Building (MOBs) customers, and their views of our proposals to protect customers in vulnerable situations.</p>	45	2.0
	Aug-19	Workshops with customers in MOBs, Traverse	<p>We commissioned Traverse to hold workshops with 41 customers who live in MOBs and have experienced unplanned interruptions in the last 18 months in order to understand the specific issues facing such customers given the atypically long duration of their interruptions relative to other customers.</p> <p>Themes emerging from the workshops included: the importance of coordination with the Council / housing management and communication with residents; the need for consistent and personalised provisions; and the need to recognise that MOBs (and London) are more complicated.</p>	<p>Customers who live in MOBs and have experienced unplanned interruptions in the last 18 months were asked about their priorities. We also sought to understand their experience of unplanned interruptions in MOBs, and their preferences for improving the process, provisions during an interruption and compensation. Customers were also asked what factors should be prioritised when replacing mains pipes.</p>	41	1.5

<p><b>Business Options Testing (BOT)</b></p>	<p>Aug-19</p>	<p>Workshops with English as a Second Language (ESL) customers and non-English speakers, Traverse</p>	<p>We commissioned Traverse to hold three workshops with ESL and non-English speaking customers: 22 Polish-speaking participants with English as a second language and 9 Bengali speaking participants. During this session we asked customers to tell us what role they thought that we should play in relation to carbon monoxide safety, provisions during an interruption and responding to climate change. They agreed that communication was critical with respect to interruptions. For provisions, all agreed oil filled radiators were important, but there were interesting differences too: the Bengali group prioritised hot meal vouchers &amp; kettles, both given low priority by the Polish group which favoured shower access &amp; hot plates. They confirmed that they believed, we as other big businesses should be acting responsibly and seeking to reduce our carbon footprint. The specific intention of this session was to ascertain the views of a different (typically hard to reach) group of customers to check if their views were consistent with other customer segments.</p>	<p>Customers were asked about their priorities. We also sought to understand their views on our business options in relation to carbon monoxide, provisions during interruptions, and decarbonisation.</p>	<p>31</p>	<p>2.5</p>
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Business Options Testing (BOT)	Aug-19	CIVS engagement, Traverse	<p>We commissioned Traverse to engage with 65 customers in vulnerable circumstances, through deliberative workshops and telephone interviews to understand their views on options for our business plan in relation to the protection of customers in vulnerable situations.</p> <p>The option with the highest delivery targets (option 3) was chosen for raising awareness of the PSR and charity partnerships. Both options 2 and 3 were popular for staff safeguarding training and using innovation to support customers. The specific intention of this session was to ascertain the views of a different (typically hard to reach) group of customers to check if their views were consistent with other customer segments.</p>	<p>Participants were asked about their priorities. We also sought to understand whether business options for a number of commitments were ambitious enough and identify and understand reasons behind their preferences. The business options discussed related to PSR awareness, partnerships with other organisations, training of Cadent staff, innovation around new technologies and services, the duration of, and provision of services during, interruptions and supporting customers in vulnerable situations.</p>	65	2.5
	Aug-19	Employee workshop, Traverse	<p>We commissioned Traverse to engage with 80 Cadent employees (across grades and geographies) in a full day workshop. We sought views on our July draft business plan and held several exercises to gain input into further iterations. We gained a number of useful insights: influencing contractors was highlighted as a challenge for achieving carbon reductions, communication was noted as critical to great customer service, internal silos were highlighted as a barrier and some argued that greater ambition was possible for interruptions and reinstatements.</p>	<p>We sought views on our July draft business plan and held a number of exercises to gain input into further iterations. Topics discussed included:</p> <ul style="list-style-type: none"> <li>improving the environment (including future hydrogen and carbon neutral options),</li> <li>achieving a quality customer experience (including the length of, and provisions during, interruptions; and reinstatements);</li> <li>what trusted to act for society means and our obligations to customers and society; and</li> <li>safety and resilience (including our business plan options and how realistic/ambitious they are).</li> </ul>	80	2.5

<p><b>Business Options Testing (BOT)</b></p>	<p>Aug-19</p>	<p>Cadent customer forum, round 5, Traverse</p>	<p>We held our fifth customer forum in Ipswich, London, Birmingham and Manchester with 130 participants to get customers' views on their priorities on a range of issues. This cross section of customers discussed with us various options (some proposed by us, some suggested by them) in a deliberative style session. Key topics discussed included: minimum standards and compensation; options for raising PSR awareness; interruptions - both acceptable length and appropriate provisions; supporting customers in vulnerable situations; options for Cadent's objective to become a carbon neutral business, the merits of connecting off-grid communities; and roadworks information and communication.</p>	<p>Participants were asked questions about a range of topics. On minimum standards, customers were asked whether current standards and levels of compensation were appropriate. With respect to PSR awareness, customers were asked about their preferred package of options. For interruptions, we discussed which provisions customers feel Cadent should provide as a core package and how customers would like to be informed of the availability of those provisions as what an acceptable duration for interruptions was. We also explored if there is an appetite for Cadent's engineers to be trained to do minor pipe and appliances repairs. On environmental options, we discussed Cadent's commitments around becoming a carbon neutral business and the connection of off-grid communities. Finally, we discussed which communications methods customers prefer with respect to roadworks.</p>	<p>130</p>	<p>2.0</p>
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<p><b>Business Options Testing (BOT)</b></p>	<p>Aug-19</p>	<p>Public consultation, BOT, qualitative phase, Traverse</p>	<p>We commissioned Traverse to conduct a survey of 2,605 members of the public to understand views on certain aspects of our business plan in each of the 4 outcome areas (environment, quality experience, trusted to act for society and resilience). The survey revealed strong support for utilities working together to minimise disruption and for outstanding customer service, as well as providing useful information on the relative importance to customers of different types of information and different environmental initiatives.</p>	<p>Participants were asked questions to understand their views and preferences on issues within each of the four outcome areas. On resilience, customers were asked which one single improvement we should make to reduce disruption the most. In relation to a "quality experience", customers were asked what level of service they'd love the most and how much they'd be willing to pay to ensure a vulnerable customer could get enhanced help if their gas stopped working. On the environment, customers were asked their relative preference for initiatives to achieve carbon neutrality and eliminate avoidable waste to landfill. Customers were also asked how much they knew about the decarbonisation challenge. Finally, for "trusted to act for society", customers were asked what the most important information to know about Cadent was and how we can help the customer / Cadent conversation flow. We also asked about their awareness of Cadent.</p>	<p>2,605</p>	<p>2.0</p>
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<p><b>Business Options Testing (BOT)</b></p>	<p>Aug-19</p>	<p>Domestic and business surveys, quantitative phase, Traverse</p>	<p>We commissioned Traverse to conduct a survey of more than 2000 domestic customers and more than 500 business customers to understand preferences between the different business options under consideration across 14 different service areas. The options presented combined service provisions e.g. educate 50,000 customers most at risk of CO poisoning and a monetary impact on the customer's annual bill. Across both the domestic and business surveys, the highest weighted average scores, supporting the most ambitious options, were achieved in areas relating to safety and protection of vulnerable customers: responding to carbon monoxide incidents, repairing and replacing faulty appliances, helping vulnerable customers without gas and carbon monoxide safety.</p>	<p>Domestic and business customers were asked their preferred options (with varying degrees of ambition / cost) for 14 commitments:</p> <ol style="list-style-type: none"> <li>1. Carbon Monoxide Safety</li> <li>2. Responding to Carbon Monoxide incidents</li> <li>3. Repairing and replacing faulty appliances</li> <li>4. Helping vulnerable customers without gas</li> <li>5. Helping all customers without gas</li> <li>6. Getting customers back on gas</li> <li>7. Carrying out safety checks</li> <li>8. Minimising disruption from our works</li> <li>9. Tackling Fuel Poverty</li> <li>10. Awareness of Priority Services Register</li> <li>11. Priority Services Register training</li> <li>12. Becoming a Carbon neutral business</li> <li>13. Communities not currently connected to gas</li> <li>14. Keeping the energy flowing reliably and safely</li> </ol>	<p>2,547</p>	<p>2.5</p>
<p><b>Acceptability Testing</b></p>	<p>Oct-19</p>	<p>Verve business plan consultation</p>	<p>We commissioned Verve to gather views on our plans to reduce our carbon footprint from 25 customers. We did this through an online forum with customers and stakeholders to discuss the key components that we shared on our EAP. This included our intentions to support our employees to make a positive difference to tackling climate change.</p>	<p>Participants were asked about their awareness of Cadent, discussed the three outcome areas (environment, quality experience and resilience), discussed the bill impact breakdown (both at present and as a result of the plan), risks and uncertainties and innovation funding.</p>	<p>25</p>	<p>3.0</p>

<b>Acceptability Testing</b>	Oct-19	Phase 4 - Business interviews and surveys	We commissioned Traverse to test the acceptability and affordability of Cadent's proposed plan amongst business customers. This consisted of an on-line / face to face survey of 504 business customers and in-depth qualitative telephone interviews with 45 business customers. This showed that the plan had achieved high levels of acceptability and affordability from a business customer perspective.	Business customers were asked about the acceptability and affordability of Cadent's overall plan. If they said that the plan was unacceptable, they were asked to explain their response. If they said that it was neither acceptable nor unacceptable, they were asked what they would like to see in order to find it acceptable. Business customers were also asked to rate the acceptability of the outcome areas (environment, quality experience and resilience). Then, having learnt about the outcome areas, customers were asked as "informed customers" to rate the overall acceptability and affordability of the plan.	549	2.5
	Oct-19	Acceptability testing - final survey report on domestic customers,	We commissioned Traverse to test the acceptability and affordability of Cadent's proposed plan amongst domestic customers. This consisted of surveying 4,446 domestic customers through on-line and face to face methods. This showed that the plan had achieved high levels of acceptability and affordability amongst domestic customers, including those who are fuel poor.	Customers were asked about the acceptability and affordability of Cadent's overall plan. If they said that the plan was unacceptable, they were asked to explain their response. If they said that it was neither acceptable nor unacceptable, they were asked what they would like to see in order to find it acceptable. Customers were also asked to rate the acceptability of the outcome areas (environment, quality experience and resilience). Then, having learnt about the outcome areas, customers were asked as "informed customers" to rate the overall acceptability and affordability of the plan.	4,446	2.0

<b>Acceptability Testing</b>	Oct-19	Acceptability testing - focus groups with the general population	We commissioned Traverse to explore the acceptability of our plans and commitments in each of the three outcome areas (environment, quality experience and resilience) with 79 members of the public in regional focus groups. Participants were supportive of our plans for quality experience and resilience, but no consensus was reached on our environmental plans.	A group discussion was facilitated to discuss views on Cadent's plans in each of the three outcome areas and participants were also asked to complete a survey to rank levels of acceptability and affordability.	79	2.5
	Oct-19	Acceptability testing - customer forum	We commissioned Traverse to explore the acceptability of our plans and commitments in each of the three outcome areas (environment, quality experience and resilience) with 109 customers who had attended previous customer forums. Overall, participants found our plans to be both acceptable and affordable.	A group discussion was facilitated to discuss views on Cadent's plans in each of the three outcome areas and participants were also asked to complete a survey to rank levels of acceptability and affordability.	109	3.0
	Oct-19	Acceptability testing - focus groups with future customers	We commissioned Traverse to explore the acceptability of our plans and commitments in each of the three outcome areas (environment, quality experience and resilience) with 20 "future customers" (16-18-year olds) in 2 focus groups. Participants were supportive of our plans for the environment and resilience but questioned whether helping vulnerable customers was part of our remit.	A group discussion was facilitated to discuss views on Cadent's plans in each of the three outcome areas and participants were also asked to complete a survey to rank levels of acceptability and affordability.	20	2.0

<b>Acceptability Testing</b>	Oct-19	Acceptability testing - interviews with CIVs	We commissioned Traverse to explore the acceptability of our plans and commitments in each of the three outcome areas (environment, quality experience and resilience) by interviewing 20 CIVs. Overall, our plans were supported, and all found the plans affordable.	Throughout the interviews the CIVs were explained the elements of the plan, asked to comment on whether they found each outcome acceptable, which particular elements were important to them, and whether they had any additional comments. They were also asked whether the new business plan was affordable.	20	2.0
	Oct-19	Acceptability testing - fuel poor focus groups	We commissioned Traverse to explore the acceptability of our plans and commitments in each of the three outcome areas (environment, quality experience and resilience) with 35 customers in fuel poverty in regional focus groups. Overall, participants were supportive of our plans in all three areas.	A group discussion was facilitated to discuss views on Cadent's plans in each of the three outcome areas and participants were also asked to complete a survey to rank levels of acceptability and affordability.	35	3.0

**Key to scoring**

Criteria	Robustness		Relevance
The score shown is based on a combination of the robustness of the source information (judged on whether it was recent, direct and representative) and the relevance to this area.	<1.5	One or zero criteria met	Limited relevance
	1.5 – 2.0	Two criteria met	Significantly relevant and contributory
	>2.0	All criteria met	Highly relevant and contributory

## 1.2. How engagement has shaped our thinking

Our engagement and research told us that decarbonisation and environmental topics are viewed as 'quite' important and that there is a range of ways we could expand our efforts and activities, primarily through increased innovation and investment.

Respondents to our phase 1 domestic survey assigned the environment 'medium' importance. Some were either supportive of replacing gas with renewable sources or sceptical of climate change and uninterested in green solutions. 83% thought that green company policies were 'very' or 'quite' important, which is lower than other areas such as safety or reliability.

Although some respondents supported overall efforts to reduce our carbon footprint, they felt that disruption to customers would have to be minimised.

Some customers in vulnerable situations who were interviewed said protecting the environment was the most important outcome for them, as it protects everyone. This view is in-line with what stakeholders told us at our 2017 regional workshops, stating that Cadent should take their environmental obligations more seriously.

In an online survey by YouGov for the ENA, however, support was lower. 8% said that it was important that their heating system had a small carbon footprint, with 22% being neutral and 10% saying it was not important. When asked what the most important considerations would be when looking to change how to heat their homes in the future, 19% stated the environmental impact, with the cost of the energy bill being the most popular choice, chosen by 74%, and reliability with 41%.

The importance of this area is also reflected in the direction provided by our Customer Engagement Group who have indicated their desire that we should put in place targets that not just prevent environmental damage but also improve the environment.

### The need for investment and innovation

Focus groups with hard-to-reach groups talked about investment in renewable energy and participants said Cadent should inform customers about its environmental policy and progress. A few suggested Cadent should lobby the government to encourage the reduction of greenhouse gases.

Stakeholders engaged by the ENA mentioned that innovation in environmentally friendly solutions was one reason for positive views on gas networks. The stakeholder advisory panel also discussed long-term commitments and targets for the environment, such as the use of carbon-based accounting methods, and the need to communicate these.

### Suggested improvements

Some domestic customer survey respondents think Cadent should consider alternative energy resources to reduce its operational carbon footprint.

During our deliberative workshops, it was suggested that Cadent could reduce its carbon footprint through the use of greener vehicles and the recycling of old pipes.

Renewable energy investment could go towards electric vans, solar energy and heat pumps, as suggested by the hard-to-reach groups.

## 2. Assessing the Measurement Options



We currently assess our overall success in reducing all our sources of greenhouse gas emissions by measuring these against a 1990 baseline. We have an overarching target of reducing our scope 1 and 2 emissions by 80% by 2050.

Cadent has already publicly committed to emissions reduction targets, as above, that meet the level of ambition set by the Science Based Targets Initiative (SBTI). These state that ‘as a minimum, scope 1 and 2 targets will be consistent with the level of decarbonisation required to keep global temperatures to well below 20C compared with pre-industrial temperatures, though companies are encouraged to pursue greater efforts towards a 1.50 trajectory. Both the target timeframe ambition (base year to target year) and the forward-looking ambition (most recent year to target year) must meet this ambition criteria’. We remain on target to achieve our goal of an 80% reduction in emissions by the end of RIIO-2 based on delivery of our mains replacement programme and will reach a reduction of closer to a 90% reduction by the end of the Iron Mains Replacement Programme (IMRP).

Through our proposed outputs and actions defined in the EAP we will exceed our current science-based target and be firmly on a trajectory to meet the enhanced SBTi ambition. In keeping with Ofgem requirements we will also introduce a deeper focus on managing and reducing our scope 3 (embedded carbon) emissions, again in alignment with the SBTi.

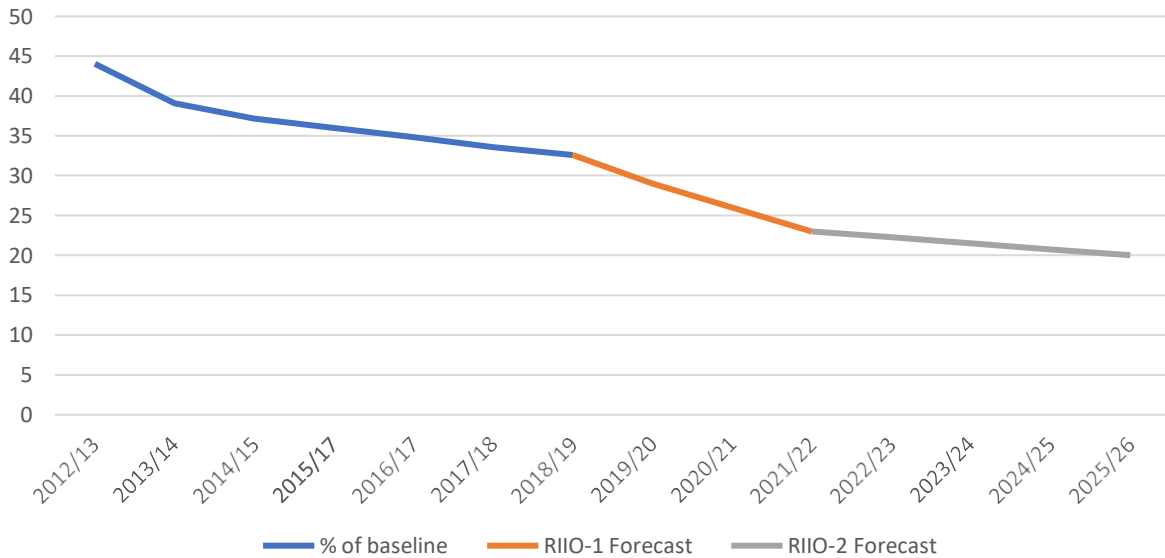
However, in setting Cadent’s delivery targets we have gone further. We are aligning our delivery targets to a net-zero outcome (after considering alternative options, discussed below).

In addition, the biggest direct influence we have on emissions is mains replacement and we have optimised our programme in RIIO-2, to go above and beyond our statutory requirements.

We have already made and enacted our current science-based target and are on target to outperform delivery timescales. Our proposals for RIIO-2 and into RIIO-3 take use beyond the 1.5°C trajectory into a net-zero environment. We will seek full ratification and certification of a revised emissions reduction programme against the full SBTi process before the end of RIIO-1 or early in RIIO-2.

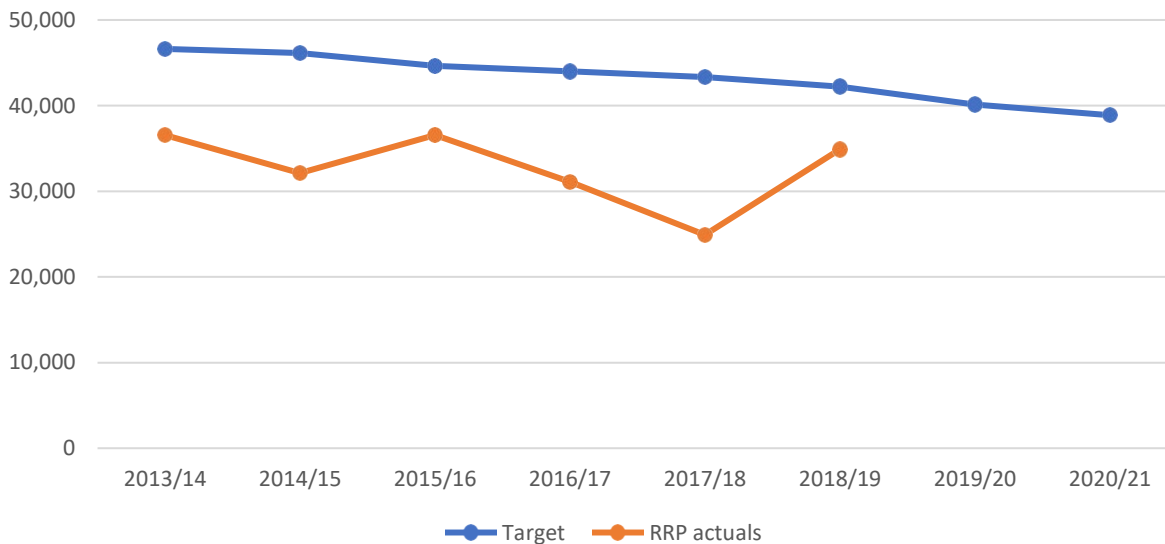
Our past performance levels against our 1990 baseline, delivering against a below 2°C ambition, are illustrated in Figure 1.

*Figure 1 Greenhouse gas emissions reductions against 1990 baseline (tCO2e)*



Our business carbon footprint is a subset of our total emissions and is tracked as part of our overarching targets, as above. We also manage this aspect of our emissions against a shorter term regulatory target. Our progress against that baseline set at the beginning of RIIO-1 and our forecast performance is outlined in Figure 2 below. We remain on target to at least meet our target for RIIO-1, to reduce our business carbon footprint by 27% by 2021 – 2022.

*Figure 2 RIIO-1 Business Carbon Footprint compared to target (tCO2e)*



**2.1. Assessing Good Practice**

Best practice in the management of greenhouse gasses is set through international guidelines on accounting for, and transparently reporting on, emissions. Cadent conforms with the requirements of the WRI (World Resources Institute) Greenhouse Gas Protocol recording and reporting through our

Annual Report and Accounts and to our Regulator on emissions of all gasses within the Kyoto Protocol, particularly carbon dioxide and methane.

Greenhouse gas emission reduction targets should be judged against national and international standards, particularly in the UK, meeting the targets set by the Climate Change Act. These targets drive real reductions in emissions, with the scale of reductions based on scientific evidence at the time to reduce warming in the global climate to below 2 degrees centigrade. With the UK Government now committed to net-zero carbon emissions by 2050, our commitment to a net-zero business carbon footprint aligns to this goal.

The Paris Agreement reached in 2015 proposed deeper reductions in emissions, limiting changes in global temperatures to 1.5 degrees centigrade. A number of organisations are involved in setting 'science-based targets' to meet this more challenging target. On the basis of the actions proposed in this and our related commitments relating to shrinkage (see 07.04.00 Detailed Environmental Action Plan), we will consider redrafting and accrediting its emissions reduction targets against this newer science base and alignment to UK Government goals.

Driving real emissions reductions is critical to reducing any organisation's impact on the global climate (and in many cases local air quality). A number of organisations have committed to being 'zero carbon'. Few, however, will attain net greenhouse gas emissions of zero.

Best practice centres on net-zero emissions or on carbon neutrality, through which an organisation or entity commits to minimising their footprint through real emissions reduction and then offsets the residual, unavoidable emissions through other emissions-reduction schemes, such as tree planting, habitat conversion, and renewable energy nationally or internationally. This is consistent with the recommendations to Government made by the Committee on Climate Change in May 2019.

## 2.2. What Options have we Considered?

We identified 6 proposals to reduce our business carbon footprint in RIIO-2. These reflect some of the suggestions made by customers and stakeholders, such as using renewable energy and low emissions vehicles. In combination, these would bring us into line with best practice of organisations aiming for carbon neutrality.

Some of the suggestions discussed in section 1 above (e.g. publishing information on environmental progress and considering emissions from our use of pipes) are not covered below but are explained in Appendix 07.04.00 Detailed Environmental Action Plan.

*Table 3 Proposals for emissions reduction*

<b>Proposal 1: Procure renewable electricity</b>		
<b>Description</b>	<b>Pros</b>	<b>Cons (Costs)</b>
<p>Amend existing and future energy supply contracts to commit to 100% renewable energy contracts. The current impact due to electricity is around 12,000 tonnes CO<sub>2</sub>e. This will be reduced to close to zero. However, due to uncertainties in market capacity to meet renewable demand and other factors, there may be a small residual footprint.</p> <p>This change would be on top of reductions in consumption.</p>	<ul style="list-style-type: none"> <li>Reduce annual emissions from around 12,000 tonnes CO<sub>2</sub>e today to around 500.</li> </ul>	<ul style="list-style-type: none"> <li>An additional £1.00 /MWh, implying a total of c.£143,000.</li> <li>These costs take into account the reduction in utility energy consumption included in our EAP</li> </ul>



**Proposal 2: Source renewable gas to fuel an increasingly efficient operational thermal plant:**

Description	Pros	Cons (Costs)
<p>Procure certified renewable gas to meet consumption at offices and depots.</p> <p>Whilst our energy supplier has not indicated we will have a challenge in securing sufficient green gas certificates, we are well aware that there is uncertainty in the capacity of the renewable gas markets to meet this increase in demand immediately without impacting on demands for transport or other needs. A major component of this uncertainty arises from the future of the Renewable Heat Incentive, which has supported the bulk of existing biomethane investments. The current scheme runs out in 2021, with no replacements yet in place. A Government policy consultation signposted for 2019 on a replacement scheme is yet to be published. The main political parties have stated their support for green gas, so we would expect a replacement scheme to be in place in time to support our green gas certificate purchase plans in RIIO-2. We have recognised this uncertainty by proposing a phased approach to reach our green gas target by the end of the five-year period.</p> <p>Currently, this energy is considered part of the shrinkage settlement and is passed through to consumers. Real reductions in energy demand and hence emissions will also be driven through investment in new, more efficient plant during the same period, mitigating the impact on consumer bills.</p>	<ul style="list-style-type: none"> <li>• Reduce annual emissions from around 6,750 to close to zero.</li> </ul>	<ul style="list-style-type: none"> <li>• An additional £2.50 /MWh implying a total of c.£245,000.</li> <li>• These costs take into account the reduction in utility energy consumption included in our EAP</li> </ul>

**Proposal 3: Invest in EV charging infrastructure to encourage greater uptake of EVs**

Description	Pros	Cons (Costs)
<p>Government incentives to encourage low emission vehicles have begun to drive reductions in average business mileage emissions. Since 2016, these schemes have helped to reduce the average emissions of our company cars from 106 g/km to 93 g/km.</p> <p>We propose to invest in EV charging infrastructure to provide EV charging at every office and depot site. This step will facilitate the transition to zero-emission vehicles for many of our first call operatives (FCOs) (see below) and enables our other employees to choose more environmentally friendly and/or fuel-efficient vehicles.</p> <p>A number of FCOs currently start their working day from home. We will support the installation of home EV charging points to facilitate this where dedicated parking is available. Where this is not the case, extra EV charging points can be installed at specific depots. Provision of home EV charging points, to enable FCOs to start shifts from home in their electric vehicle, is</p>	<ul style="list-style-type: none"> <li>• Reduce annual emissions from business mileage by around 15%, equating to around 500 tonnes CO<sub>2</sub>e.</li> </ul>	<ul style="list-style-type: none"> <li>• Total investment of around £4.8m to roll out charging points at all offices and depots.</li> </ul>

<p>linked to our output case 07.04.07 our people and their emissions.</p> <p>We continue to encourage our employees to avoid unnecessary travel and to use options such as video meetings as an alternative.</p>		
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**Proposal 4: Invest in our commercial fleet to meet Government targets, and target being the first zero-emissions first responder service**

Description	Pros	Cons (Costs)
<p>Our commercial fleet is predominantly made up of diesel-fuelled 3.5-tonne vans, required to meet the varied workloads of gas operatives on the networks. A key requirement is payload capacity, with vans transporting on-board power, compressors, road breaking equipment and other tools. While the range of vehicles on the market is growing there is currently no practicable alternative that can provide zero tail-pipe emissions. We will continue to monitor the market and will review our fleet purchasing decisions if low-emission vehicles become available.</p> <p>However, our fleet purchasing strategy will mirror the UK Government targets to ensure we source and operate the most efficient and lowest-emissions vehicles (EU 6 and beyond), thus meeting the requirements of Ultra Low Emissions Vehicle (ULEV) zones.</p> <p>Our overall strategy will target a fleet composed of at least 40% non-fossil-fuelled vehicles by 2030.</p> <p>Specific operational teams within Cadent have less stringent vehicle and payload requirements. Light, fully electric vans with ranges and payloads that meet the needs of our emergency first responders (First Call Operatives, FCO) are now becoming available. Cadent proposes to accelerate investment in this component of our fleet through the RII0-2 period, establishing the first zero-emissions first responders.</p> <p>There are some operational challenges to the adoption of FCO EVs in networks including: range; performance in cold weather, and; availability and access to charging points (especially for engineers</p>	<ul style="list-style-type: none"> <li>• Reduce annual emissions from our fleet from around 16,000 tonnes CO<sub>2</sub>e to 12,000.</li> <li>• Further benefits from reduced emissions including NOx and particulate matter</li> <li>• Lower Fuel costs associated with electric vehicle charging compared with fossil fuel alternatives</li> </ul>	<ul style="list-style-type: none"> <li>• The capital cost of EVs is significantly higher than diesel vans at around £70,000. There would be additional costs involved for backup diesel vehicles during transition.</li> <li>• This results in around £51m additional costs.<sup>1</sup></li> <li>• However, savings from fuel costs would reduce the net impact by around £1.4m, and these savings would continue into future price controls.</li> <li>• We also considered a reduced form of this proposal, to focus on rolling out EVs only in our London network, which would result in cost increases of around £13m, but reductions in fuel costs of around £330,000.</li> </ul>

<sup>1</sup> These costs are over and above those described in Appendix 09.34 Corporate vehicles (avoided costs for diesel vans that would otherwise have been replaced are removed)

<p>who have call-out responsibilities and must take their vehicle home, but where there obstacles to the installation of a charging point that can be depended on e.g. for those who have no alternative other than street parking). Due to these constraints, in RIIO-2 we will explore all options that move our fleet environmental performance towards our ambition of zero emissions. This will likely include the use of hybrid, non-fossil fuels and electric vehicles so that the delivery of our core services, including our gas emergency service are not compromised unduly as we improve our fleet environmental performance.</p>		
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**Proposal 5: Require our contract partners to follow our lead:**

Description	Pros	Cons (Costs)
<p>A significant component of our business carbon footprint comes from the carbon released in the manufacture of the polyethylene pipe and fittings we procure to support our repair and replacement programmes.</p> <p>While the use of polyethylene is driven by regulatory requirements, there are opportunities for Cadent to improve the environmental efficiency of this operation.</p> <p>However, the use of polyethylene pipe will remain a feature of our business as we deliver the mains replacement programme. It therefore represents an unavoidable source of residual emissions. We propose that Cadent continues to robustly account for and offset the embedded carbon impacts of the polyethylene pipe and fittings procured for our replacement programme and requires our contract partners to do likewise.</p> <p>We will also measure our contractors' fuel usage and apply the same targets we use for our own operations.</p>	<ul style="list-style-type: none"> <li>Reduce emissions from PE pipe from around 15,000 tonnes CO<sub>2</sub>e to 13,000 tonnes.</li> <li>Reduce emissions from contractors' fuel use from 10,000 tonnes CO<sub>2</sub>e to 8,000 tonnes.</li> </ul>	<ul style="list-style-type: none"> <li>n/a</li> </ul>

**Proposal 6: Account for our emissions and develop offset programmes to achieve net-zero BCF**

Description	Pros (CO <sub>2</sub> saving)	Cons (Costs)
<p>The options above provide effective routes to real emissions reductions but, in instances where we are unable to achieve zero emissions, we will pursue certified emissions offsets. There is a range of offsetting opportunities but Cadent will only offset through certified emissions reduction programmes, such as the UN Gold Standard.</p> <p>Energy-efficiency programmes will drive reductions in the cost of Cadent's utility energy bill, which is currently in the order of £4 million per year. In the absence of cost</p>	<ul style="list-style-type: none"> <li>Residual emissions approximately 35,000 tonnes per year</li> </ul>	<ul style="list-style-type: none"> <li>Options from UK based tree planting schemes are £9.25/tonne offset)</li> <li>This implies a cost of</li> </ul>

<p>inflation in energy prices, there is a potentially cost-neutral position between the costs described in the 'cons' column, on the basis of a 3% to 10% reduction in energy consumption) and the impact of offsetting on the business (i.e. if we save 10% of consumption, the saving of £400k would cover the anticipated costs of offsetting). Energy prices will, however, increase, making this more of a challenge. Cadent will report on both change (reduction) in energy consumption and it's unavoidable emissions (to be offset) to demonstrate how it is closing the gap in costs of offsetting by cost saving in consumption reduction.</p>		<p>£760,000 to build up to net-zero by the end of RIIO-2</p> <ul style="list-style-type: none"> <li>Alternative global options could reduce this cost, e.g. clean fuel cookstove projects in Kenya at £3.50/tonne offset</li> </ul>
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**2.3. How these proposals deliver against our objectives**

Each of the proposals above will contribute to our objective of achieving business carbon footprint neutrality, reaching and maintaining net zero emissions within the RIIO-2 period.

We tested different combinations of these options with customers to inform our decision on which to take forward for RIIO-2 (see section 4 below). These combinations are described below.

**3. Assessing Performance Levels**



Our objectives for emissions reduction in RIIO-2 are to prioritise sustainable outcomes for our environment and customers in business decision-making, to drive down emissions related to our business operations; and to seek cost-neutral solutions to emissions reduction where possible.

**3.1. What level of ambition did we test with customers and why?**

While our current preference is to be as ambitious as possible in our commitment to deliver carbon reductions, the results from our engagement to date has not been fully supportive of this position.

Given this, we want to test different levels of delivery with customers

These also included related commitments as part of a wider environmental package, such as waste ambitions covered in Appendix 07.04.06 Zero avoidable waste to landfill and our other plans for our fleet described in Appendix 09.34 Corporate vehicles.

The three target delivery levels and associated costs we considered are:

Table 4 target delivery levels tested with customers

Customer proposal A – Low Carbon saving	
Description	<p>Purchase certified renewable energy for offices and depots.</p> <p>Zero avoidable waste to landfill.</p> <p>Purchase latest low emission Euro 6/7 diesel vehicles.</p>
<b>Bill Impact: £0.02<sup>2</sup></b>	

Customer proposal B – Medium Carbon saving	
Description	<p>Purchase certified renewable energy for offices and depots and renewable gas for our thermal plant.</p> <p>Zero avoidable waste to landfill.</p> <p>Purchase latest low emission Euro 6/7 diesel vehicles.</p> <p>Zero-emission FCO vehicles in London.</p> <p>Electric vehicle charging infrastructure at every office and depot site.</p>
<b>Bill impact – London: £0.90<sup>2</sup></b> <b>Bill Impact – other networks: £0.04<sup>2</sup></b>	

Customer proposal C – High Carbon saving	
Description	<p>Purchase certified renewable energy for offices and depots and renewable gas for our thermal plant.</p> <p>Zero avoidable waste to landfill.</p> <p>Purchase latest low emission Euro 6/7 diesel vehicles.</p> <p>Zero emissions for FCO in all networks.</p> <p>EV charging points at every depot and office site.</p> <p>Electric vehicle charging infrastructure (every office and depot).</p> <p>Provision of home EV charging (FCOs)/subsidised EV charging.</p> <p>Offset all unavoidable emissions to become a certified net-zero organisation.</p>
<b>Bill Impact – London: £0.93<sup>2</sup></b> <b>Bill impact – other networks: £0.40<sup>2</sup></b>	

<sup>2</sup> These bill impacts were based on cost estimates that have subsequently been revised, and so differ from the final amounts described in other sections of this document. The difference does not significantly alter the results.

## 4. Customer Testing



As described in section 1, initial feedback we received demonstrated that customers are interested in environmental protection and that most see this as important.

However, the results from business options testing was less decisive. This engagement demonstrated a near-even balance of customer opinion across the three target delivery levels presented:

- As part of the August 2019 Business Options Testing with over 2,500 domestic and business customers, the proposal with the lowest delivery targets (proposal A) was marginally more popular in the results of our domestic BOT survey, receiving 38% of the vote, compared to 34% and 28% for the medium and high delivery targets proposed in options B and C respectively.
- Customers in vulnerable situations also preferred the option with the lowest delivery targets (Proposal A), as did those in fuel poverty by similar percentage amounts.
- Proposal B was the most popular with business customers, receiving 36% of votes (compared to 33% and 30% for the more extreme proposals A and C).

However, when we tested these customers' strength of preference, proposal B proved to be the most preferable for customers. This leads us to think that while customers do wish Cadent to reduce our carbon footprint they are also conscious of the cost of their fuel bill.

Further reinforcing this feedback, when we tested this qualitatively in follow up workshops, proposal C, the package with the highest delivery targets, was the most popular option in both London and Ipswich, with Ipswich participants particularly strongly in favour. Participants felt that Option 3 delivered the biggest impact with some suggesting that Cadent should be even more ambitious. Even though Option 3 was widely endorsed, many participants clarified that they would like it to be delivered at no or lower cost to them.

The feedback provides us with a challenge given Ofgem's key aim of the RIIO-2 framework is that network companies support the transition to a smarter, more flexible, sustainable low-carbon energy system and take the appropriate steps to mitigate our environmental impact.

Ofgem's aim is reinforced by the Government policy commitment that the UK become net zero in carbon emissions by 2050. Achievement of this target can only be achieved if large businesses like Cadent take a proactive role in reducing emissions.

As we continued with our customer engagement, initial customer preference for proposals A and B increased slightly with both options being chosen by an additional 1% of domestic customers.

Notably, however, customers' strength of preference changed markedly with those who demonstrated support for the higher delivery targets of proposal C.

In our more detailed deliberative workshop sessions with consumers, where we were able to consider the issues in more detail, customers suggested that Cadent could reduce its carbon footprint through the use of greener vehicles and renewable energy, again demonstrating considerable support for reductions to carbon emissions.

### 4.1. Managing Competing Priorities

Given the mixed views coming forward from customers and stakeholders, we undertook a dedicated triangulation session to determine the final proposal we would choose to prioritise.

In doing so we considered the key factors in favour of proposal C, for which customers demonstrated greater strength of preference and which also best aligns with our ambition, Ofgem directives and Government policy.

*Table 5 Assessing competing priorities*

Key factors for pursuing the proposal with the highest delivery targets (Option C)	Key factors against pursuing the proposal with the highest delivery targets (Option C)
<p>Aligns with our company (including the Board's) ambition to stretch ourselves to reduce our impact on the environment.</p> <p>Customers at qualitative BOT workshops preferred the option with the highest delivery targets.</p> <p>Customers' strength of preference during BOT was higher for proposals with higher delivery targets.</p> <p>Best practice from other organisations and government policy is to move toward net-zero emissions.</p> <p>In our engagement with future customers, they have strongly prioritised the environment.</p> <p>The elements of this commitment relating to low emissions vehicles also help reduce air pollution (highlighted as an issue by stakeholders such as regional mayors).</p>	<p>Ultimately, despite customers demonstrating a strength of preference for proposal 3 that evidence cannot be seen as decisive given the broad spectrum of customer opinion.</p> <p>The proposal with the highest delivery targets was the least preferred by customers during quantitative BOT testing, with only 31% of customers supporting the level of investment required to deliver carbon neutrality.</p>

In coming to our decision, we also considered key delivery challenges related to the most ambitious proposal.

- **Air quality is more of an urban issue than rural, could we target only urban areas?**

We ruled out this option as FCOs may travel across areas in the course of a day, so this would be difficult to deliver.

Moreover, air quality is only a small part of the benefit, reducing CO2 emissions is a pan-national concern not just an urban one. In addition, we would be exposing some of our colleagues to older, polluting vehicles still.

- **Is the range of EVs a potential issue for FCOs?**

Currently, the range of an EV van of this type is around 100 miles and while this is improving all the time, range may and length of time required to recharge vehicle batteries may cause deliverability difficulties. For these reasons, we will explore options that support our transition to our ambition of zero emissions and this will likely include hybrid and non-fossil fuel vehicles in addition to EVs. We will balance the performance of different options against our service obligations.

- **Have we aligned the deployment of EVs with the life of existing FCO vehicles?**

Our initial proposal was that EVs would be phased in over the five years of RIIO-2, which is slightly shorter than the seven- to eight-year replacement cycle for current vans. This approach will be taken forward after an initial two-year trial.

**Have we considered the resale value of existing vans?**

Generally, after FCOs have used vans for seven to eight years, they have no resale value. However, we chose to further scope the financial impact of phasing that would result in decommissioning of FCO vans ahead of their seven-to eight-year lifespan.

- **Have we considered all emissions instead of the other options?**

We considered using biogas to offset shrinkage losses, but this would double shrinkage-related costs for consumers. If we used carbon offsets instead, the cost would be prohibitive.

Having considered the pros and cons of proposal C as outlined above and considered the key challenges, for which we decided to undertake further deliverability assessment outlined in Section 6 of this case, we decided it was still important to prioritise the the option with the highest delivery targets of the three options we proposed.

In doing so, we recognised that it is especially important to look to the leadership provided by Ofgem and the Government. In this regard, Ofgem’s direction is clear, that we should be ambitious in our work to deliver an environmentally sustainable network. This direction also clearly aligns with the overarching Government policy ambitions on carbon reduction.

**4.2. Acceptability of our proposals**

We tested the acceptability of this proposal with customers as part of our acceptability testing of our entire plan.

- 83% of domestic customers surveyed found the environment section of the plan acceptable. When asked what would make it acceptable, those who had answered that they found it neither acceptable nor unacceptable suggested a further reduction in process (11%) or wanted even more to be done for the environment (7%).
- 36% of business customers surveyed of respondents found the environmental aspects of the plan "very acceptable" and 47% "fairly acceptable" (83% in total).

Qualitative follow-up workshops with different groups were also generally supportive of our environmental commitments. Examples of specific comments related to this commitment included:

- As part of the business plan consultation run for us by Verve, customers saw the environment as a high priority, derived from increasing call-to-action pressures from society to make changes. Customers viewed Cadent as a leading contributor to carbon emissions due to the nature of our product, and thus we have a clear responsibility to take action. Focusing funding on decarbonisation was felt to be a step in the right direction. However, customers felt that specific priorities throughout the plan seemed very ambitious (e.g. carbon neutral by 2026 and zero avoidable waste to landfill) and were concerned that not all commitments were realistically achievable.
- At our focus group with fuel poor customers in Cambridge, participants discussed how electric vehicles add to congestion and producing more vehicles has negative impact.
- Carbon offsetting was a particularly popular element to Cadent’s proposals for becoming a carbon neutral business at the acceptability testing workshops with those in fuel poverty. Customers felt that planting trees and combatting deforestation was particularly important. Although some raised the concern about how effective this is. However, there were exceptions, in Liverpool and London, participants noted that carbon offsets pushed the problem elsewhere, and puts plantations in parts of the world that do not need them.



- At focus groups with fuel poor customers in London, participants generally thought introducing zero emissions vehicles for Cadent employees was a good idea, but in other regions opinions were split. For example, in Peterborough customers challenged the feasibility of transferring the Cadent van fleet to electric vehicles and one customer expressed concern over the potential impact of electric vehicles on the environment. In Liverpool it was felt that the mainstreaming of electric vehicles was ‘a long way off’ and there was a concern that it could be more expensive for customers.

The overall positive response to our environmental commitments means we have not altered our proposal following acceptability testing, however in response to the points raised by customers we note:

- We have considered the deliverability of our commitment, particularly with respect to electric vehicles, which is discussed in section 6.
- While customers suggested that electric vehicles might add to congestion, we are not adding any additional vehicles but rather replacing diesels with electric.
- We acknowledge concerns raised by some customers around offsetting, and our current proposal includes reductions to our emissions before offsetting emissions rather than offsetting everything.

## 5. Our Commitments



The commentary above demonstrates how Cadent has developed and tested options to deliver a step change in its business carbon footprint through the RIIO-2 period. This has resulted in a series of clear commitments for delivery.

Across the RIIO-2 period we will drive a real reduction in each component of the emissions making up our business carbon footprint, as shown in the schematic below. The residual emissions which are not currently practicable to address will be pursued as innovation or emerging technologies emerge. In order to meet our commitment to a net-zero business carbon footprint by the end of RIIO-2 we will offset all unavoidable emissions.

These commitments also interact with two other environmentally focused output documents and our EAP. The related documents address shrinkage including theft of gas, scope 3 or embedded emissions that arise from our procurement of goods or services, particularly plastic pipe and fittings for our mains replacement programme, use of transport fuels by our contract partners and supporting our employees and communities to address and address their environmental footprints. Our EAP provides a consolidated picture of how we will address our wider impacts, our commitments and outputs.

Overall, we will deliver:

*Table 6 Our commitments*

Output commitment	Measure definition	Benefits to current customers	Benefits to future customers	SROI/WTP value over RIIO-2 period
Net zero carbon emissions in non-shrinkage footprint across all networks by the end of RIIO-2	Reduction in Business Carbon Footprint	<ul style="list-style-type: none"> <li>Reduced carbon emissions</li> <li>Improvements in air quality</li> </ul>	<ul style="list-style-type: none"> <li>Reduced carbon emissions</li> </ul>	-£36.3m <sup>[1]</sup>

While the SROI-based value delivered by this commitment is negative in net present value terms, our customers find them acceptable and they are in line with our ambition, Government policy and Ofgem's expectations.

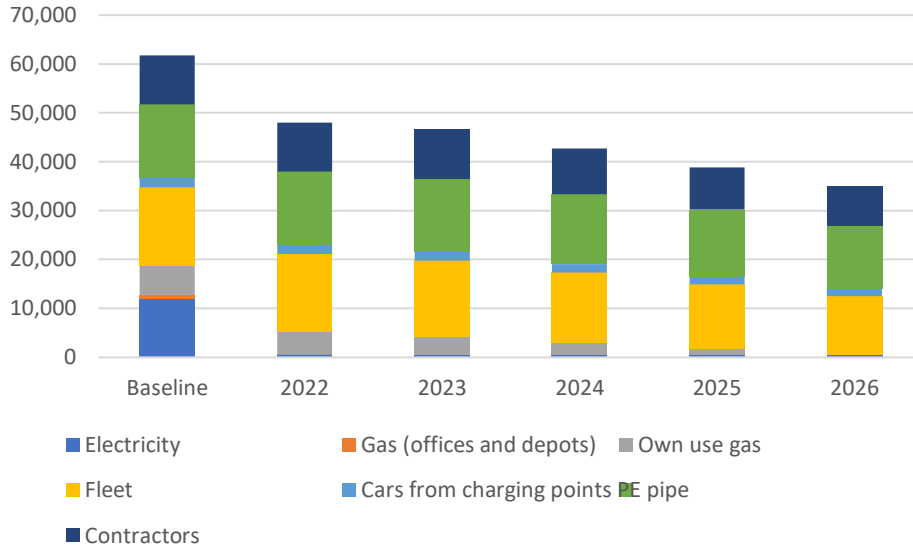
The actions that will deliver this are:

*Table 7 Breakdown of emissions reductions and costs*

	Baseline	2022	2023	2024	2025	2026	Cost to deliver in RIIO-2
Renewable electricity	12,000	11,500	11,500	11,500	11,500	11,500	£0.39m
Renewable gas	750	750	750	750	750	750	
Own use gas	6,000	1,200	2,400	3,600	4,800	6,000	
Fleet electric vehicles	16,000	160	320	1,540	2,772	4,000	£49.6m
Business mileage (including charging points at sites)	2,000	164	254	343	425	500	£4.8m
PE pipe	15,000	0	0	667	1,333	2,000	-
Contractors' fuel use	10,000	0	0	667	1,333	2,000	-
<b>Total emissions savings</b>	-	<b>13,774</b>	<b>15,224</b>	<b>19,067</b>	<b>22,914</b>	<b>26,750</b>	
Offsets	-	5,000	5,000	15,000	20,000	35,000	£0.76m

<sup>[1]</sup> Note that this is a net present value rather than gross present values, therefore it will differ from the figures quoted in Business Plan Data Tables

Figure 3 Carbon emissions before offsetting (tonnes)



The related actions in our Environmental Action Plan (Appendix 07.04.00) are:

<b>Action</b>
<b>We will reduce all utility energy consumption by at least 10% by 2024.</b>
<b>Action</b>
<b>We will procure 100% certified renewable energy to meet our energy needs by 2026.</b>
<b>Action</b>
<b>We will deliver reductions in our business mileage emissions intensity through RIIO-2</b>
<b>Action</b>
<b>We will deliver a zero emission first responder vehicle fleet across all our networks by the end of RIIO-2</b>
<b>Action</b>
<b>Introduce electric charging points at every office and depot and home charging for emergency response</b>
<b>Action</b>
<b>We will regularly review our long-term targets beyond RIIO-2 and pursue accreditation of our goals and programme from the Science Based Targets Institute.</b>
<b>Action</b>
<b>Offset any residual unavoidable emissions to become a certified net zero organisation</b>

**Assessment of how to treat commitments**

Ofgem have already indicated in their RIIO-2 Framework decisions that they expect a reputational incentive to be in place for the gas networks in RIIO-2.

We have proposed a range of new standards we intend to meet in RIIO-2, including achieving a net-zero BCF. We have evaluated these proposals against our outputs framework to determine the most appropriate and effective option:

*Table 8 Regulatory treatment*

Regulatory treatment	Criteria	Rating	Further explanation of assessment
<b>Reputational ODI</b>	Demonstrate this is important to customers and/or stakeholders	Green	This output is high on the government agenda, and important more broadly for society. We have a significant carbon footprint and are committed to delivering a more sustainable outcome for our environment and communities.
	Funded elsewhere in our plan, or inappropriate for funding	Green	This output and our proposed targets will be funded within our baseline Business Plan costs.
	Can robustly measure performance improvement	Green	This output is already measured through RIIO-1.
<b>Financial Output Delivery Incentive (ODI)</b>	Demonstrate this is important to customers and/or stakeholders and they are willing to pay	Green	As described for Reputational ODI.
	Not funded elsewhere in our plan	Red	This output and our proposed targets will be funded within our baseline Business Plan costs.
	Can robustly measure performance improvement	Green	As described for Reputational ODI.
<b>Price control deliverable</b>	Specific deliverable with a clear timeline and targets	Red	This output does not relate to a specific deliverable. Instead, it covers our ambition to continue reducing our emissions in RIIO-2.
	Demonstrable benefit to customers which they support	Light Green	This output will bring about further reductions in our BCF and introduce measures to further offset this. Our customers and environment will benefit from more sustainable outcomes.
<b>Licence obligation</b>	Absolute minimum, with significant customer harm if we do not deliver it	Red	This output does not relate to a minimum standard. Instead, it relates to an ambition to introduce elements of best practice on waste management into how we operate.
	Applicable to all GDNs	Yellow	While other GDNs may also focus on reducing their BCF, the proposals we have made for this output are bespoke to our business and reflects our current performance.

<b>Business Plan Incentive</b>	Adds to the quality of our plan, but not a specific deliverable or performance measure		Our preferred option is a specific performance measure.
	Funded elsewhere in our plan, or inappropriate for funding		This output and our proposed targets will be funded within our baseline Business Plan costs.

Doesn't meet criteria	Weakly meets criteria	Partially meets criteria	Meets criteria	Strongly meets criteria
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We are therefore proposing a reputational ODI for this output. This recognises that the costs to deliver our ambition are already included in our baseline Business Plan costs and will incentivise us to continue making improvements in RIIO-2.

## 6. Delivering Our Commitments



We have developed a separate delivery plan for each aspect of this commitment.

### Renewable electricity and gas for offices and depots

We will contract with our suppliers for renewable supplies of electricity and gas. As a high proportion of our energy is already from low carbon sources, we expect to be able to implement this commitment from the start of the price control.

Year	21/22	22/23	23/24	24/25	25/26
Proportion from renewable sources	100%	100%	100%	100%	100%

### Source renewable gas for own use in thermal plant

We anticipate that while sources of renewable gas are available, it will be more difficult to roll this out across our thermal plant. Therefore, we have adopted a phased approach to this commitment:

Year	21/22	22/23	23/24	24/25	25/26
Proportion from renewable gas	20%	40%	60%	80%	100%

### Replace FCO vehicles with EVs (or alternatives as they become available)

This commitment represents the majority of the costs relating to this output. We anticipate this will also require significant operational changes to embed within our operations teams, particularly since we must not compromise the performance of this critical service. As described above we will explore hybrid and other non-fossil fuelled vehicle alternatives to support cases where EVs are not operationally feasible.

Region	21/22	22/23	23/24	24/25	25/26
East of England	4	8	115	222	330
North London	28	32	101	171	240
North West	4	8	88	169	250
West Midlands	4	32	81	131	180
<b>Total</b>	<b>40</b>	<b>80</b>	<b>385</b>	<b>693</b>	<b>1000</b>

We will begin with trials of around 30 vehicles, first in our London network and then in the West Midlands, since we believe are particularly well suited to EV use. This will also include a smaller number of EVs in the other regions. After this period of learning, we will deploy vehicles on a larger scale, to go as far as possible to meet our ambition of replacing all FCO vehicles with EVs by the end of RIIO-2.

Since this deployment approach involves a period of learning, we will retain additional diesel vans as backups and we will explore hybrid and non-fossil alternatives that reduce environmental damage to ensure that if there is an issue with an EV, we can still meet our performance requirements.

We will fully back-up FCO vehicles during the first two years, and then retain 10% of vehicles as backups in years three, four and five.

Year	21/22	22/23	23/24	24/25	25/26
East of England	4	8	12	23	33
North London	28	32	11	18	24
North West	4	8	9	17	25
West Midlands	4	32	9	14	18
<b>Total</b>	<b>40</b>	<b>80</b>	<b>41</b>	<b>72</b>	<b>100</b>

Where possible, we will replace vehicles that would have otherwise been retired with EVs and move vehicles between networks to avoid retiring diesel vehicles early.

However, in some cases to deliver our ambition to replace all FCO vehicles with EVs we will need to retire diesel vans early. The increased cost due to retirements earlier than the most efficient date has been built into the cost of delivering this commitment.

### Deploy charging points at our offices and depots

In order to deliver the infrastructure to enable the deployment of EVs for FCOs, we will require charging infrastructure at our sites. Therefore, we have front-loaded the deployment schedule for charging points.

Year	21/22	22/23	23/24	24/25	25/26
EE	10	6	6	6	4
LO	6	2	0	0	0
NW	3	2	3	3	4
WM	3	2	3	2	2
<b>Total</b>	<b>22</b>	<b>12</b>	<b>12</b>	<b>11</b>	<b>10</b>

The deployment of charging points is initially focussed in London (by a proportion of total sites) since the initial trial deployment of EVs is in that network.

**Carbon offsets**

We anticipate that after the other steps described in this case, our residual non-shrinkage emissions will be around 35,000 tonnes per year. Offsetting is a relatively low- cost route enable organisations to deliver a net-zero outcome in their accounting. The costs vary depending on the offsetting mechanism deployed from approximately £3.50 to £10.00 per tonne. This is a cost-effective route to carbon abatement, the costs being significantly lower than other measures proposed in this plan. However, the use of offsets are not viewed as emissions reduction as part of a company’s science based targets.

The significant costs in this plan result from real emissions removal, rather than offsetting, which is rightly at the core of these plans. Our entire business carbon footprint could have been offset at lower cost than those in the plan but would not deliver such real reduction of the contingent value of carbon removed or, in the case of EVs the societal value from reduction in public health impacts of poor local air quality.

Rather than waiting for the final year to offset these emissions, we will purchase offsets through the period to build to a point at which we offset all residual, unavoidable at the end of the period.

Year	21/22	22/23	23/24	24/25	25/26
Tonnes offset	5,000	5,000	15,000	20,000	35,000

Offsetting will be achieved through partnership with third parties and will exploit certified or UN Gold Standard offset mechanisms. Our offsetting programme costs are estimated on the basis of UK tree planting, supported by Climate Change, the Government’s appointed offsetting partner (although we may contract with another partner).

The costings provided in this plan are based on the most expensive option, that of tree planting in the UK. Should Ofgem and stakeholders support more cost effective overseas offsetting programmes, all accredited to UN Gold Standard, the offsetting plan can be accelerated through the earlier years of the plan.

**Working with Our Suppliers**

We have an established Global Supplier Code of Conduct which requires all suppliers to meet the standards we set in environmental and social performance. As part of this, we require specific disclosure of data relating to the impact of emissions.

We will also work with our pipe and fittings suppliers to attempt to reduce embedded carbon at source and we will work with our energy suppliers to procure 100% renewable gas equivalent to our own use gas consumption.

This will effectively reduce this component of our BCF to zero. We will contract for the provision of 100% certified renewable electricity and gas. Should a supplier not be able to guarantee 100% renewables, we will offset any residual related emissions.

We are trialling alternatives to plastics for packaging and transport of fittings and we are working with our suppliers to address the use of plastics in our supply chain, demonstrating that they drive positive economic and environmental solutions.

As set out in our EAP we are committed to managing and reducing our scope 3 (embedded carbon) emissions through the RIIO-2 period. A key element of this is to understand the emissions impact of delivering our construction and replacement projects. We are piloting this approach through the

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Integrated Security System (ISS) project, installing improved physical security at critical network sites. Project management teams have been trained in carbon accounting methods [tools provided by one of our principal contractors] and will support Cadent in developing these skills and developing benchmark data and inform the development of targets ahead of the start of RIIO-2 and a wider roll out of carbon accounting.

### **Protecting against Non-delivery**

We will measure our success in achieving this commitment by assessing our progress against a path to carbon neutrality and the rollout of our new EV first-responders fleet.

To protect against non-delivery in the costly rollout of the EV fleet we have chosen to undertake a detailed field trial during the first two years of RIIO-2.

This will primarily ensure that EV vehicles are suitable for use in this manner, that they provide sufficient reliability and range to cope with the demands placed upon our first response vehicles.

The supply and suitability of zero tail pipe emission vehicles is a potential challenge to full delivery of our goal. In the eventuality we will report on the issues in our annual environment report, and we'd anticipate funding deferment into RIIO-3.

While actual progress will not follow a smooth trajectory and will instead depend on major step-changes, a more complex approach to assessing our progress to net-zero is not required. As we will not progress the proposed option with the highest level of delivery targets listed above, carbon neutrality is unlikely to be achieved during RIIO-2 unless significant cost reductions result from advancements to EVs, which would enable us to introduce a higher proportion of such vehicles into our FCO fleet than planned during RIIO-2.