Annex A16.18

Low Carbon Vehicle Fleet Engineering Justification Paper

December 2019

As a part of the NGGT Business Plan Submission

nationalgrid

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Executive Summary

This paper outlines the detailed justification behind the expenditure of £16.63m to transition the GT operational vehicle fleet to 30% low carbon alternatives by the end of RIIO-2. The total cost for the vehicle fleet and associated charging infrastructure is £16.63m, and this represents an incremental £2.47m in Totex over an option retaining a 100% Internal Combustion Engine (ICE) fleet. By the final year of RIIO-2, our annual vehicle-related CO_2 emissions will be reduced by 22% when compared to annual vehicle-related CO_2 emissions at the start of RIIO-2, as well as seeing a 30% reduction in annual vehicle-related air pollution. This investment also provides ongoing benefit into RIIO-3 and beyond. We therefore believe this Totex proposal efficiently delivers wider UK environmental value, whilst remaining efficient for consumers.

Asset Family	Fleet Vehicles		
Primary Investment Driver	Environment		
Reference	Annex A16.22		
Output Asset Types	N/A		
Cost	£16.63m total cost, £2.47m decarbonisation incremental cost		
Delivery Year(s)	2021-2026		
Reporting Table	-		
Outputs included in T1 Business Plan	N/A		
Spend Apportionment	**RIIO-1**	**RIIO-2**	**RIIO-3**
	N/A for low carbon vehicles	£16.63m / £2.47m decarbonisation incremental	TBD

1. Problem Statement

1.1. In June 2019, UK became the first major economy to legislate for net-zero emissions by 2050. Transport is the largest single sector contributing to Britain's emissions, with surface transport accounting for 23% of 2018 greenhouse gas emissions *[source: CCC 2019 Parliamentary Report].* Transport is also a major contributor to poor air quality in many of our cities, which according to the Royal College of Physicians, is responsible for 40,000 early deaths per year.

1.2. The need to rapidly decarbonise the transport sector is recognised. In the Government's 'Road to Zero' strategy, all new vans are to be zero tailpipe emissions from 2040. The Committee on Climate Change stated that this switch needs to happen even earlier – with no new petrol & diesel sales called for by ideally 2030, and 2035 at the latest – to meet legislated net-zero ambitions

1.3. We as National Grid are in complete support of the net-zero commitment and seek to play our critical role enabling this transition to happen in the best way for consumers. This also includes making our own contribution and demonstrating leadership by reducing our own controllable emissions. Gas Transmission stakeholders have consistently highlighted environment and sustainability as a key issue through our regulatory engagement programmes and the expectation of our stakeholders is that we actively manage the environmental impact in all our investment decisions and operations.

1.4. Gas Transmission has a van fleet of 185 commercial vehicles today, increasing to 268 by the first year of RIIO-2. This increase is due to an efficiency program to move level 5 technicians over from company cars into small commercial vans. Therefore, decarbonising our fleet is important to reducing our environmental impact in line with our stakeholder priorities, as well as setting an example for other companies and wider UK society around the need to transition to achieve net-zero. Many other companies are making this move, including energy industry peers such as SSE, EDF and Centrica. This is increasingly achievable, with the costs of low emission alternatives such as electric vehicles falling and an increasing range of models coming to market.

1.5. Our ambition is to replace as many of our ICE vehicles with zero-emissions alternatives such as EVs where we believe it is efficient for consumers. There is a proportion of our fleet however where zero-emissions alternatives are not yet available on the market. For 30% of Gas Transmission's fleet, alternatives (in this case EVs) are available on the market today. This 30% is composed of 10% small-panel vans, 6% medium-panel vans, 14% large-panel vans. For the remaining 70%, no alternatives are available on the market today. This 70% is composed of 40% 4x4 vehicles, 20% large-panel vans with on-board power, 4% HGVs over 16 tonnes, 3% large <3.5 tonne drop-side/tippers, and 3% 7-7.5 tonne flatbed/tippers. Gas Transmission's current vehicles replacement programme is 6 Years for light commercial vehicles and 8 Years for heavy goods vehicles.

1.6. This composition of our fleet naturally limits our ability to predict when we'll be able to convert anywhere beyond 30% of our fleet. We do continue to engage with vehicle manufacturers and the wider industry to keep pace of developments, so that we can assess when it's economically efficient to convert further vehicles in line with our ambition to enable net-zero, and play our own part towards it too. We will also explore other low-carbon alternatives, including EVs, hydrogen vehicles and biomethane vehicles, as the most efficient option for consumers may differ between lighter & heavier weight classes and mileage requirements.

1.7. When considering converting our fleet to electric vehicle alternatives, it is important that the required charging infrastructure is available. The deployment of charging infrastructure across Britain will occur as EV uptake grows in the 2020s, and this infrastructure is likely to be spread across a range of locations e.g. home, work, supermarkets, hotels, depots, motorway. We have considered, for our own fleet, whether suitable charging infrastructure for our drivers to use will be deployed at the right location, speed and accessibility near our sites, or whether we need to provide charging infrastructure ourselves. Our operational locations are mostly very rural therefore we are not anticipating early rollout of charging infrastructure in these areas. Hence, our proposals include investment in charging infrastructure at our own sites. This is key to enabling the conversion to EVs and reducing our environmental impact in line with stakeholder priorities.

1.8. This paper explores costed options for vehicles, and makes a proposal, for [1] converting 30% of our commercial vehicles to zero-emissions alternatives, and [2] the charging infrastructure required to enable this conversion.

2. Vehicles Summary

2.1. We are proposing converting 30% of our fleet, amounting to 80 vehicles, in the RIIO2 time period, to electric vehicle (EV) alternatives, with the remaining 70% to remain as internal combustion engine (ICE) vehicles. This proposed 30% accounts for where replacement models are currently available on the market. This proposition is also in line with reducing our environmental impact per our stakeholder priorities.

2.2. To deliver this, we are requesting £15.15m in vehicle Totex over the course of RIIO-2 (vs £14.16m over the course of RIIO-2 if we were to retain a 100% ICE fleet), plus £1.48m in charging infrastructure Totex over RIIO-2. By the final year of RIIO-2, our annual CO_2 emissions will be reduced by 22% when compared to annual CO_2 emissions at the start of RIIO-2, as well as seeing a 30% reduction in annual air pollution. We therefore believe this Totex proposal efficiently delivers wider UK environmental value, whilst remaining efficient for consumers.

2.3. As the EV and other decarbonised vehicles markets continue to expand in the 2020s, we will naturally seek further opportunities to convert our remaining ICE vehicles, and ensure we're making the most efficient choices for consumers and the environment in our vehicle replacement year-on-year.

3. Charging Infrastructure Summary

3.1. Suitable charging infrastructure is required so that our fleet can carry out its operational duties efficiently. Our ICE vehicle fleet is currently able to refuel at a wide range of petrol/diesel stations spread across the UK, whereas the development of electric vehicle charging infrastructure during the RIIO-2 timeframe and beyond remains uncertain – in terms of charging speed, location and access.

3.2. There are likely to be cases where public charging is available, or drivers can charge at home, but there are also likely to be cases where this is not available, and thus some level of on-site charging is needed for our fleet to efficiently perform its operational duties. This is particularly the case for National Grid Gas Transmission, given that many of our sites are very remote, where public charging infrastructure may not be deployed as rapidly or extensively as in populated areas. Battery range developments in the 2020s may also reduce charging requirements. Costs of on-site charging infrastructure have been estimated through surveys at our sites by a third party, but these may have some variability site-by-site and may evolve as infrastructure technology develops.

3.3. We do not want to be in a place where our vehicles are unable to perform their operational duties, so we are requesting ex-ante funding for this charging infrastructure, with a size of £1.48m capex. This is based on cost estimates for charging infrastructure needed at 45 rural sites (24 compressor sites, 3 area offices, 8 Pipeline Maintenance Centre (PMC) sites and 10 Above Ground Installations).

3.4. To ensure this is an efficient cost, we will build in learnings and savings we can draw from ET's trial of 30 small electric vans being conducted in 2019/20. This will be supplemented by our own experiences as we take up EVs during the RIIO-2 period, assuring that the costs of reducing our own emissions are efficient.

3.5. The table below summarises vehicle and charging infrastructure Totex.Our request is for option 2:

Table 1: Vehicle and charging infrastructure

	Option 1: 100% ICE	**Option 2: 30% EV, 70% ICE**
Vehicle Totex	£14.16m	£15.15m
Charging Infrastructure Totex	n/a	£1.48m

4. Vehicles - Options Considered

4.1. Below is a table of the summary of options considered

Table 2: Vehicle and charging infrastructure

1. Maintain a 100% ICE fleet and don't purchase EVs
2. Convert vehicles where an efficient alternative is available today i.e. 30%
3. Lease EVs instead of purchase them outright (up to 30%)

4.2. We assessed the first two options on a total cost of ownership basis to ensure like-for-like comparison of the two options, and to determine the required Totex to fund the desired option. We also considered the environmental impact of these two options, to help guide consideration of the costs & benefits in line with our stakeholder priority to reduce our environmental impact.

4.3. Option 3 has been discounted due the financing costs applicable to leasing vehicles via vehicle hire companies. The finance cost that vehicle hire companies offer is more expensive than what National Grid can get on the corporate bond market, due to National Grid's strong credit rating (from rating agencies), meaning our interest cost is low. Leasing vehicles would lose that credit rating advantage and we would pay additional financing costs through a lease agreement. Therefore, leasing is not an efficient way to manage our fleet.

4.4. The table below summarises points 2.2 and 2.3

Table 3: Summary of points discussed

Option 1: Maintain ICE	only vehicles: £14.16m totex and approximately £744,000 total whole	life environmental societal impact from this investment
Option 2: Convert vehicles to 30%: £15.15m totex and approximately £573,000 total whole	life environmental societal impact from this investment	

Optioneering - Methodology used

4.5. A total cost of ownership basis was used in considering options on a like-for-like basis between ICE and EV options, and to determine the required Totex to fund each option. Both options laid out a replacement trajectory in each year of RIIO-2 to achieve the desired end-states (retain 100% ICE for option 1; 30% EVs for option 2), from which the vehicle purchase (capex) and ongoing vehicle costs (opex) were calculated, which together form the total cost of ownership of vehicles in that year. Summing this up across the 5 years of RIIO-2 achieves the RIIO-2 total Totex requirement for that option. In addition, to assess the environmental societal impact of our vehicles, we monetise the tailpipe emissions of our fleet in each year.

- Vehicle purchase of new vehicles (capex): The number of ICE vehicles and EVs purchased in that year, multiplied by the vehicle purchase price
- Ongoing vehicle costs of entire fleet (opex): the cost of running each vehicle owned within that year, which is divided into vehicle fuel, vehicle hire (hiring an alternative when our owned vehicle is in for repairs) and vehicle

maintenance. These cost components will naturally be slightly different for ICE vehicles when compared to EVs

- Environmental benefit: the monetised value of emissions from vehicles in our fleet that year, looking at the NOx pollutant. EVs have zero tailpipe emissions, but BEIS electricity data is used to determine emissions of the electricity consumed by EVs.

4.6. Over the course of RIIO-2, this will require £14.16m Totex for ICE vehicle purchasing and ongoing costs. The environmental impact of this option (for the 268 vehicle fleet) is shown in the table below.

Table 4: Option 1: 100% ICE Costs (counterfactual)

Costs in 18/19 prices		2021/22	2022/23	2023/24	2024/25	2025/26	**RIIO-2 total**
EV	# bought	0	0	0	0	0	0
	# cumulative	0	0	0	0	0	0
	Purchase cost (£m)	-	-	-	-	-	-
	Ongoing costs (£m)	-	-	-	-	-	-
ICE	# bought	78	46	48	83	78	333
	# cumulative	268	268	268	268	268	268
	Purchase cost (£m)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Ongoing costs (£m)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	TOTAL (£m)	**£3.08**	**£2.51**	**£3.30**	**£2.48**	**£2.79**	**£14.16**

Table 5: Option 2: 30% EV costs

Costs in 18/19 prices		**2021/22**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**RIIO-2 total**
EV	# bought	6	5	7	28	34	80
	# cumulative	6	11	18	46	80	80
	Purchase cost (£m)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Ongoing costs (£m)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
ICE	# bought	72	41	41	55	44	253
	# cumulative	262	257	250	222	188	188
	Purchase cost (£m)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Ongoing costs (£m)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	TOTEX (£m)	**£3.15**	**£2.57**	**£3.39**	**£2.83**	**£3.21**	**£15.15**

4.7. Note all EVs purchased are small panel vans (80 purchased). EV purchases are profiled to be purchased mostly in the last 2 years of RIIO-2 to enable operational

trials with GT staff to be undertaken. These are needed, as other industry trials have focussed on urban area use, and not rural use.

4.8. The total societal cost of these environmental impacts, based on the non-traded price of carbon and air pollution damage costs (BEIS, 2019) is just under £500,000 over the RIIO-2 period. The cost to society in the final year of RIIO-2 is £98,000, with no improvement from the start of the RIIO-2 period. Alternatively, it is possible to estimate the whole-life emissions generated from the 333 vehicles bought from the £14.16m Totex, using a 6 year vehicle life. Over their 6-year life, these 333 vehicles would emit approximately 9,730 tonnes CO2e, 3,090 kg NOx and 190 kg PM. The total whole-life environmental societal impact of this is £744,000.

4.9. Over the course of RIIO-2, this option will purchase 80 EVs to take the total to 80 EVs out of GT's 268 total vehicles, taking us to 30% EV. This will require a £15.15m Totex (EV and ICE purchasing & ongoing costs. Note this excludes charging infrastructure, considered in section 7). The environmental impact of this option (for the 268 vehicle fleet) is shown in the table below.

Table 6: Environmental impact

Environmental Impact	RIIO-2					RIIO-2 Total	RIIO-3					RIIO-2 & RIIO-3 Total
	21/22	22/23	23/24	24/25	25/26		26/27	27/28	28/29	29/30	30/31	
tonnes CO2e	1,283	1,265	1,239	1,137	1,012	5,936	1,012	1,012	1,012	1,012	1,012	10,996
kg Nox	405	397	386	343	290	1,822	290	290	290	290	290	3,271
kg PM	25	25	24	21	18	114	18	18	18	18	18	203

4.10. The total societal cost of these environmental impacts, based on the non-traded price of carbon and air pollution damage costs (BEIS, 2019) is £454,000 during RIIO-2 (based on using electricity at grid intensity). In this option, the annual cost to society in the final year of RIIO-2 is 22% lower than that at the beginning of RIIO-2. As we are purchasing the bulk of our EVs towards the back-end of RIIO-2 (to enable trials earlier in RIIO-2), this annual 22% reduction is sustained into RIIO-3 and beyond, as shown in the table above. This 22% difference is seen when comparing whole-life emissions, which in this case is a fairer comparison for environmental impact of the two options, given that EVs are purchased at the back-end of T2. In T2, 333 vehicles are bought (253 ICE, 80 EV) requiring £15.15m Totex. Over their 6-year life, these 333 vehicles would emit approximately 7,530 tonnes CO2e, 2,160 kg NOx and 134 kg PM. The total whole-life environmental societal impact of this is £573,000. Comparing to option 1 the societal benefits from choosing option 2 would equate to up to £46,000 in environmental value to consumers over the course of RIIO-2, and £171,000 over the lifetime of the purchased vehicles. This is both from a reduction in greenhouse gas emissions and a reduction in air pollutants that are known to damage human health. Once we have converted 30% of our fleet to EV we will maintain this as a minimum, andas the market evolves in future we are likely to be able to convert even more of our fleet.

5. Assumptions in vehicle profile

5.1. Purchase costs are outlined below, full detail given in appendix 1

- ICE: [redacted] for a small panel van vehicle, [redacted] for a 4x4, [redacted] for a medium vehicle and [redacted] for a 26t HGV. Note all of these costs include chassis and build conversion costs.
    - EV: [redacted] for a small panel EV (based on [redacted])
- Assumes EV purchase price stays the same (which has potential to change with EV technology maturity)
- Assumes we replace all medium & small panel ICE vehicles with small panel EVs, in line with current fleet strategy.

Ongoing Vehicle costs

5.2. Ongoing vehicle costs has been broken down into three components: vehicle fuel, vehicle hire (hiring a vehicle temporarily when one's vehicle is in repairs/maintenance), and vehicle maintenance

- An attractive benefit of EVs over ICE vehicles is that EV fuel costs are lower than that of ICE vehicle fuel costs – the extent of the benefit naturally depending on electricity and diesel prices.
- However, when an operational vehicle is being repaired and a replacement vehicle is hired in the interim, the cost of hiring a replacement EV (for an EV undergoing repairs) will be higher than hiring an ICE vehicle (for an ICE undergoing repairs).
    - This is because: [1] EV technology is new and commercial know-how may be lower than for ICE vehicles, meaning vehicles spend longer off the road, and [2] whereas previously some repairs we could diagnose and fix ourselves, we may not yet know how to do this for EVs, meaning more garage visits hence more hire. We will of course train our staff to minimise the costs of the latter reason.
- Vehicle maintenance assumed to remain flat, as EVs need to be maintained less frequently, but when they do the costs may be slightly higher due to developing commercial know-how.
- As we purchase the majority of our EVs towards the back-end of RIIO-2, the differences in fuel costs and hire costs are likely to be small, and are assumed to offset each other. By the start of RIIO-3 however, commercial know-how should have increased, and thus our vehicle opex request should be lower from RIIO-3, enjoying the benefit of lower fuel and maintenance costs.

5.3. Note this ongoing cost also assumes that no penalties for use of ICE vehicles emerge over the course of RIIO-2 e.g. zero emissions zones within cities not rolled out (where any ICE vehicles that enter these zones would be subject to fees not accounted for in this analysis, though this is unlikely to impact GT given the rural nature of the majority of our sites).

Environmental societal impact

5.4. The BEIS conversion factors 2019 have been used for all CO_2e calculations, taking average values from the freighting goods table, 0.406 $kgCO_2e$/mile for diesel and 0.101 $kgCO_2e$/mile for battery electric vehicle. This factor has been used for all years of RIIO-2. As grid electricity decarbonises, the battery electric vehicle factor should fall

5.5. The Governments non-traded price of carbon, central scenario, has been used to calculate the societal impact costs from expected greenhouse emissions. This increases from £70 to £75 over the RIIO-2 period

5.6. The Government damage costs for air pollution have been used calculate the societal impact costs from expected air pollution of NOx (£6/kg) and Particulates (£106/kg)

5.7. The NOx and Particulate emissions from ICE vehicles has been estimated based on the assumption that all of our ICE vehicle fleet will be Euro 6 standard. The emissions limits for Euro 6 has then been used to estimate future emissions.

6. Key Risks and Opportunities

Risks and Mitigations

6.1. Charging infrastructure, and the best way of delivering this to users is not fully understood and there is a risk of charging/vehicle availability issues, see next section for further details

- Mitigation: We will assume a requirement for on-site charging at the specified 45 sites due to the nature of our sites predominantly located away from populated areas
- Mitigation: For any additional chargepoints required we will work with ET colleagues, other networks etc to build an efficient network of vehicle charging infrastructure by avoiding duplication.

6.2. The types of electric vehicles available and the current mileage range means certain vehicles may not be suitable at more remote locations.

- Mitigation: through initial trials of vans in the early years of RIIO-2, and maintaining an ongoing dialogue with vehicle manufacturers on latest & upcoming vehicle availability through our fleet team.

6.3. Emissions limits on new ICE vehicles may become stricter therefore the savings in air pollution or and greenhouse gas emissions may become lower than currently estimated

- Mitigation: We believe uptake of alternative-fuel vehicles (for which the best available alternatives are currently EVs) and reducing reliance on ICE vehicles remains the optimum strategy towards net-zero.

6.4. The costs of of running an ICE fleet could increase with potential environmental taxes or other Government action to reduce reliance on ICE, ahead of its 2040 ban on new ICE sales

- We have not included any provision for this in our calculations.

Opportunities

6.5. Reductions in air pollution, especially in built up areas, will be beneficial for local communities and aligns to both government and local authority strategies around air quality improvement. Transitioning to a low carbon fleet will help the UK in its ambition to Net Zero, supporting the CCC's statement on transitioning away from new ICE vehicles from 2030. Costs are lower and in future it is expected that EV's will achieve overall price parity with ICE vehicles in the mid-2020s, therefore there is a future (past RIIO-2) opportunity for cost savings for both National Grid and the end consumer. Our RIIO-2 plan includes the installation of solar panels, generating own use electricity, on our compressor sites. This will enable a proportion of our vehicle charging to be carbon neutral.

7. Charging Infrastructure – Options considered

7.1. The EVs we are proposing to convert to in our vehicle proposal will need to charge, with suitable charging infrastructure required so that our fleet can carry out its operational duties efficiently. Our ICE vehicle fleet is currently able to refuel at a wide range of petrol/diesel stations spread across the UK, whereas the development of electric vehicle charging infrastructure during the RIIO-2 timeframe and beyond remains uncertain – in terms of charging speed, location and access. In the context of this uncertainty, there are three options we have for charging infrastructure:

Table 7: Options for charging infrastructure

Option 1	Utilise public charging (e.g. at nearby motorways, supermarkets etc)
Option 2	Home charging installed at our drivers' homes
Option 3	On-site charging infrastructure provision

7.2. There are likely to be cases where we need to use options 1 and/or 2 to charge our EVs. However, vehicle users may have no access to off-road parking, live in flats or rented accommodation, may need to drive longer distances than enabled by home-charging alone. Relying on option 1 alone is risky, as public infrastructure (of appropriate speed, location & access) is currently uncertain, and may limit our operational fleet's ability to perform their required duties, including emergency response. This is especially true for National Grid Gas Transmission, given the remote nature of many of our sites away from densely populated areas where initial charging deployment is perhaps more likely to be concentrated. There are also potential tax issues associated with option 2 relating to perceived potential benefits-in-kind.

7.3. As such, relying on options 1 and 2 alone is unlikely to meet the entirety of our charging needs, therefore there is some requirement for on-site charging to enable our fleet to perform its operational duties – per option 3. As we cannot predict the extent to which options 1 and 2 will cover our needs, we are requesting ex-ante funding based on option 3 as the main mode of charging. We outline the scale of this request below.

7.4. To identify the amount of charging infrastructure needed, a survey of the number of chargepoints needed was conducted, which yielded a need for [redacted] chargepoints per site at 24 compressor sites, 3 area offices, 8 Pipeline Maintenance Centre (PMC) sites and 10 frequently visited Above Ground installations (AGIs). This total of 45 sites with

[redacted] chargepoints per site is [redacted] chargepoints in total, which are to be deployed across the first two years of RIIO-2 to enable a smooth rollout of our 80 EVs. This number of chargepoints ensures our teams (which carry out work across multiple sites) can access any given site and have sufficient charging infrastructure in place to carry out their duties. These chargepoints may also play a key role enabling further efficient, EV uptake at the sites beyond RIIO-2, and also enable our employees to switch to driving electric vehicles, further enhancing the environmental benefits of this investment.

7.5. The costs of charging infrastructure per site have also been estimated through numerous surveys at our sites by third parties, as well as being informed by the cost per chargepoint of those deployed at our Warwick HQ offices (representing recent market-based costs).

7.6. From our site surveys to date, the charging infrastructure costs are:

- Chargepoint per unit cost of [redacted] (Capex)
- Maintenance costs (competent person): [redacted] per chargepoint per annum. We've absorbed these costs into our own opex costs.
- Site surveys carried out from Actemium at Lockerley, Cambridge and Wormington based on 4off, 7kW EV chargers and associated installation kits.
- [redacted] chargepoints at [redacted] (capex) each, the total capex request in RIIO-2 is £1.48m. As mentioned above, we will absorb the 5-year total opex of £0.15m (opex for [redacted] chargepoints in 22/23, [redacted] from 23/24-25/26).

Risks and Mitigations

7.7. Charging infrastructure costs may have variability site-by-site (both upwards & downwards), as some sites may require longer cable runs, additional earthing, DNO upgrades etc, and these costs may also evolve as infrastructure technology develops.

- Mitigation: We will continue to monitor the fast pace of charging infrastructure development and ensure that the most efficient choice is installed at each site.

7.8. Emergence of other charging options (e.g. work, supermarkets, hotels, depots, motorway)

- Mitigation: We will continue to monitor developments in-range of our sites, but given the rural nature of many of these sites, it is likely that this infrastructure may not be deployed by the time it is needed in RIIO-2.

Opportunities

7.9. This charging infrastructure may enable further efficient, EV uptake at the sites beyond RIIO-2, and enable our employees to switch to driving electric vehicles, further enhancing the environmental benefits of this investment.

8. Conclusion

8.1. We are proposing to transition the GT operational vehicle fleet to 30% EV and retain 70% Internal Combustion Engine (ICE) vehicles in RIIO-2. This and associated charging infrastructure represents an incremental £2.47m in Totex over an option retaining a 100% ICE fleet. By the final year of RIIO-2, our annual vehicle-related CO2 emissions will be reduced by 22% when compared to annual vehicle-related CO2 emissions at the start of RIIO-2, as well as seeing a 30% reduction in annual vehicle-related air pollution. This investment also provides these reductions in annual CO2 emissions and air pollution into RIIO-3 and beyond. We therefore believe this Totex proposal of £16.63m (£2.47m incremental cost against an 100% ICE vehicle fleet) efficiently delivers wider UK environmental value towards net-zero targets, whilst remaining efficient for consumers.

Table 8: RIIO-2 vehicle and infrastructure cost request

Total RIIO-2 vehicle and infrastructure cost request	**21/22**	**22/23**	**23/24**	**24/25**	**25/26**	**TOTAL**
Capex - vehicle purchases	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Opex - vehicle maintenance	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Capex - charging infrastructure install	£0.74	£0.74	-	-	-	£1.48
TOTAL	£3.89	£3.31	£3.39	£2.83	£3.21	£16.63

9. Appendix 1 – Vehicle Cost Sources

9.1. The vehicle purchase prices used in sizing the capex request is based on two aspects: base vehicle price and conversion cost. Base vehicle price is based on our discount pricing matrix that we have with vehicle manufacturers, and conversion cost is based on our contract we have with a vehicle conversion supplier.

Table 9: Base Vehicle and conversion costs