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Electric Vehicle Fleets: An Impact Opportunity for Investors

ShareAction»

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About ShareAction

ShareAction is a UK registered charity working globally to lay the tracks for responsible investment across the investment system. Its vision is a world where ordinary savers and institutional investors work together to ensure our communities and environment are safe and sustainable for all.

In particular, ShareAction encourages institutional investors to be active owners and responsible providers of financial capital to investee companies, while engaging meaningfully with the individual savers whose money they manage. Since 2005, ShareAction has ranked the largest UK asset owners and asset managers on their responsible investment performance.

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Executive summary

Decarbonising road transport will be crucial for meeting the goals of the Paris Agreement. Transportation accounts for 23% of global CO2 emissions, of which 74% comes from road vehicles[1]. Yet despite improvements in vehicle fuel efficiency, emissions have continued to rise. GDP growth, the ownership of fuel-intensive SUVs, and the proliferation of online commerce have increased emissions from both light- and heavy-duty vehicles[2].

However, the automobile industry is currently in flux. The market for electric vehicles (EVs) is growing rapidly, accounting for 2.5% of new vehicle sales in 2018[3] - marking a 68% year-on-year increase[4]. This rapidly growing market, propelled by falling costs and supportive government policy, has the potential to turn the tide of rising transport emissions.

To accelerate the transition to an EV based transport system, corporate fleets will be key. Companies throughout the economy, from retail to heavy industry, own and operate road vehicles or rely on them within supply chains. At present, over 60% of all new vehicles sales in Europe are to corporate fleets[5]. With this figure set to grow, ensuring that these fleets are electric is of critical importance. Corporates also have a vital role to play in building out the EV charging infrastructure needed for fleets, customers, and employees.

Alongside the environmental impact, there is also a business case for switching to EV fleets. There is the potential to cut operational expenditures, improve reputations, and manage a changing regulatory environment. For example, in London, the Ultra-Low Emission Zone (ULEZ) penalises high emission vehicles[6], while on a global scale, 34 cities have pledged zero-emission zones by 2030[7].

For institutional investors, engagement on EV adoption can therefore not only make financial sense but also generate positive impact. As the share of new vehicles entering the corporate channel grows, fleets have the potential to stimulate demand for EVs, driving down costs, mitigating emissions and accelerating widespread EV adoption. As a result, this report argues that EV fleets should be firmly on the investor agenda.

Investor Recommendations

1. Engage with investee companies with large operational corporate fleets on EV adoption.
2. Engage with investee companies on the provision of EV charging infrastructure for corporate fleets, employees and customers.
3. Engage with companies on membership of EV100, a global corporate initiative covering recommendation (1) and (2).
4. Amplify the power of engagement by collaborating with other investors, for example through the Investor Decarbonisation Initiative (IDI).
5. Consider broader issues related to EVs when engaging with corporates, the mining sector and automobiles sector, for example, social impact and a just transition.

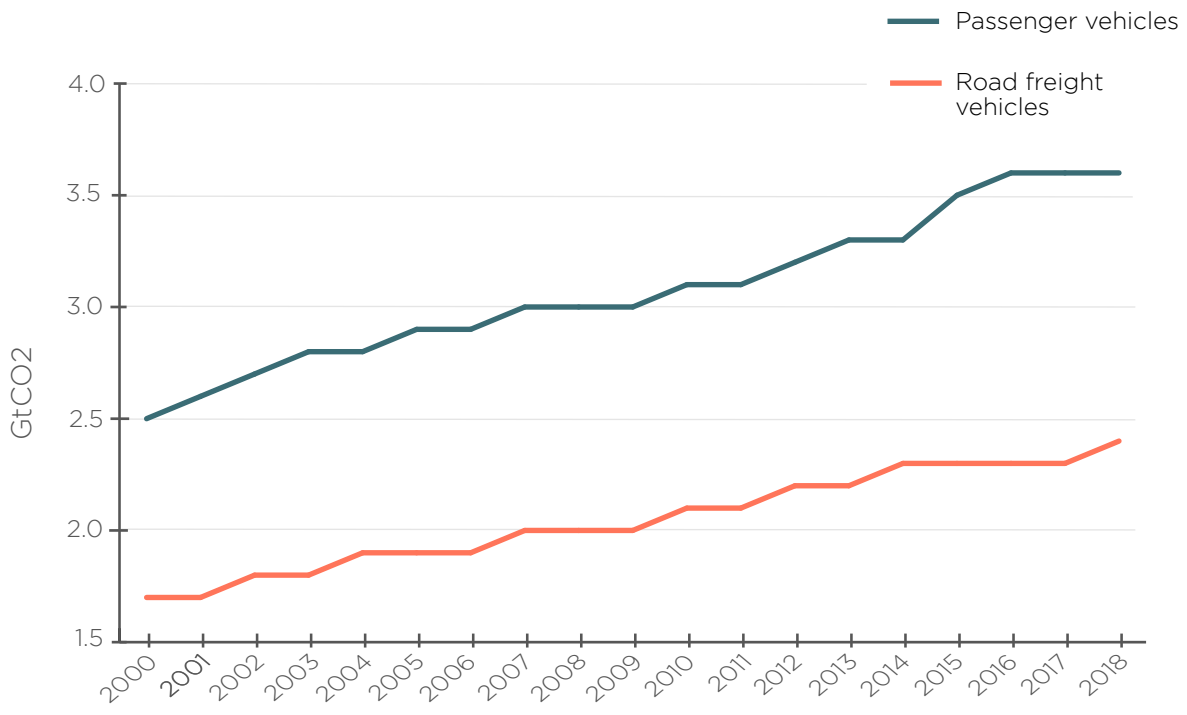
Introduction

This section outlines why EV adoption is needed to decarbonise road transport.

Growing demand, growing emissions

Between 2005 and 2017, the fuel economy of light-duty vehicles (LDVs) dropped 18%[8]. Yet, despite this drop in carbon intensity, emissions have continued to rise due to increased demand. Emissions from LDVs are up 44% since the turn of the century, while emissions from trucks and buses in the heavy-duty vehicles (HDVs) segment have risen by 41% (Figure 1).

Figure 1: Transport sector CO_2 emissions

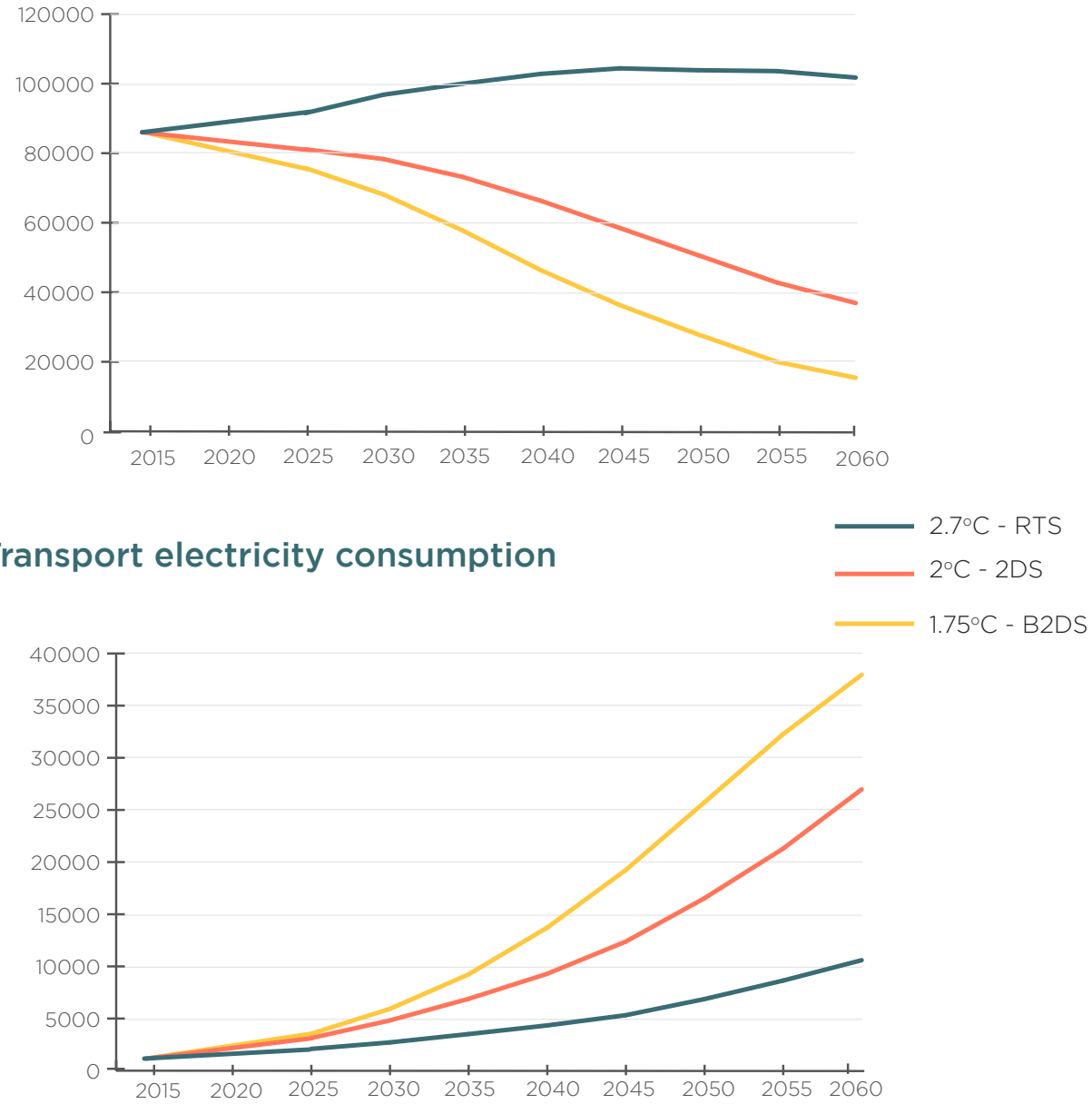


Source: IEA

Demand for transport is not set to subside. In fact, in the International Energy Agency (IEA) Reference Technology Scenario (RTS), which considers existing country-level climate commitments formed under the Paris Agreement, annual passenger kilometres from light- and heavy-duty road transport increase by 93% and 69% respectively from 2014 to 2050[9].

In order to reduce absolute emissions against this backdrop, widespread EV adoption will be vital. This is demonstrated by Figure 2, which compares the consumption of gasoline, diesel, and electricity in the transport sector under different scenarios. When global temperatures rises are limited to or kept below 2°C, in line with the Paris Goals, demand for electricity increases at the expense of conventional fuels.

Figure 2:
Transport gasoline and diesel consumption



Source: IEA

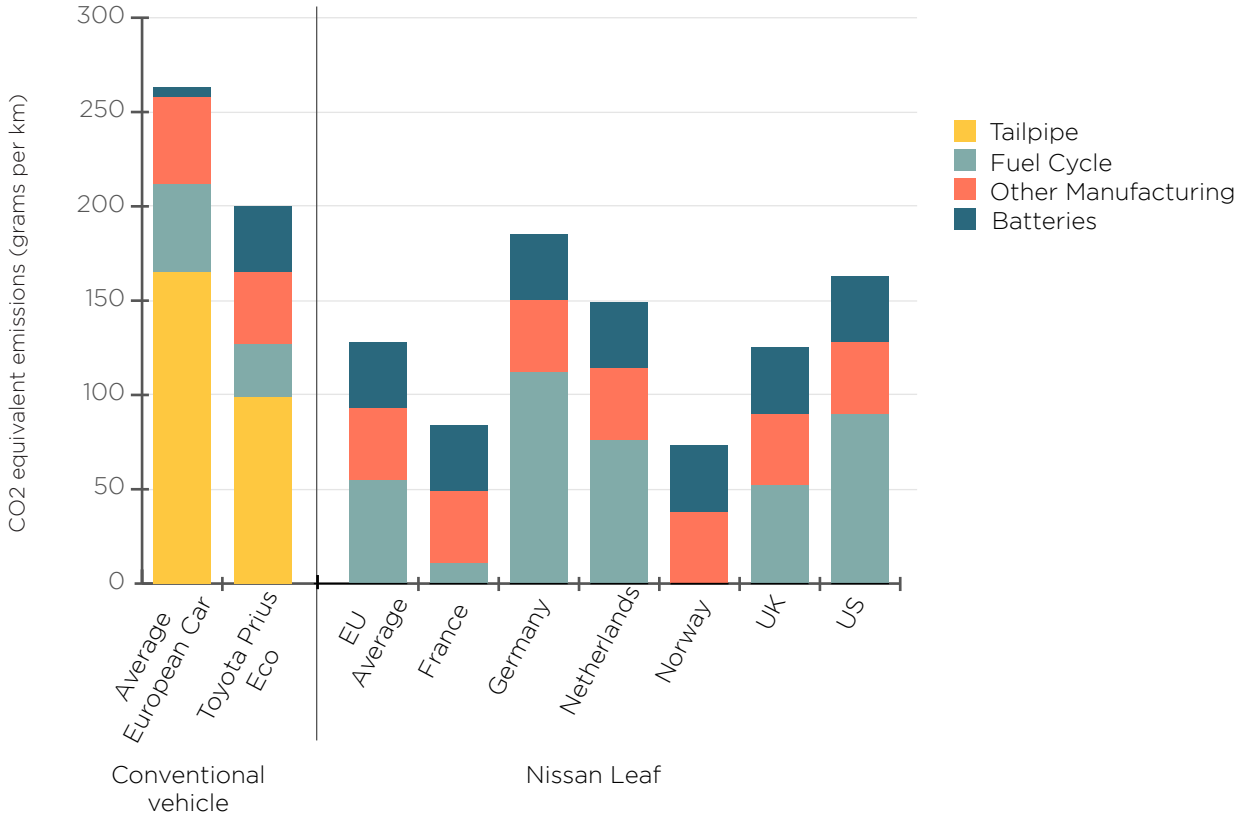
Decarbonising road transport

Unlike fossil fuel powered vehicles with internal combustion engines (ICE), EVs produce zero direct emissions through the tailpipe of exhaust systems. However, fossils fuels can still be burnt upstream to generate electricity. When considering the environmental impact of EVs, it is therefore important to assess lifecycle emissions, rather than direct emissions.

Lifecycle emissions for road vehicles can be broken down into different sources. For example, those originating from vehicle manufacturing, battery production, the fuel cycle and the tailpipe. Fuel cycle emissions arise from the production of electricity used to charge EVs, while tailpipe emissions arise from the burning of fossil fuels.

Figure 3 visualises these sources of emissions for a Nissan Leaf, the bestselling European EV in 2018[10]. In countries such as Norway and France, lifecycle EV emissions are significantly lower than conventional vehicles. This is due to a relatively low-carbon electricity mix, which lowers fuel cycle emissions compared to countries such as Germany and the US, where the electricity mix is more carbon-intensive. However, even in countries with carbon-intensive electricity, EV adoption can lay the groundwork for future emission reductions as electric grids are decarbonised over time.

Figure 3: Lifecycle emissions: Conventional vehicle vs. Nissan Leaf



Source: ICCT

It is clear that to realise the full potential of EVs to cut emissions, existing and new electricity supply needs to be decarbonised. In the IEA New Policies Scenario (NPS) derived from existing climate commitments, electricity demand from the global EV fleet reaches almost 640 TWh in 2030, while in the more ambitious EV30@30 scenario, where EVs account for 30% of car sales by 2030, electricity demand reaches 1,110 TWh by 2030[11]. For context, global electricity consumption neared 23,000 TWh in 2018[12].

Alongside the extra electricity capacity requirements arising from large-scale EV adoption, electric grids may have to adapt to changing patterns in energy consumption. For example, uncontrolled EV charging at times of peak demand could add to grid instability. However, controlled charging, for example at times of low demand, could have the opposite effect and smooth load curves. Furthermore, the ability of EVs to absorb and discharge power into the grid has the potential to improve grid flexibility and store energy from intermittent renewables.

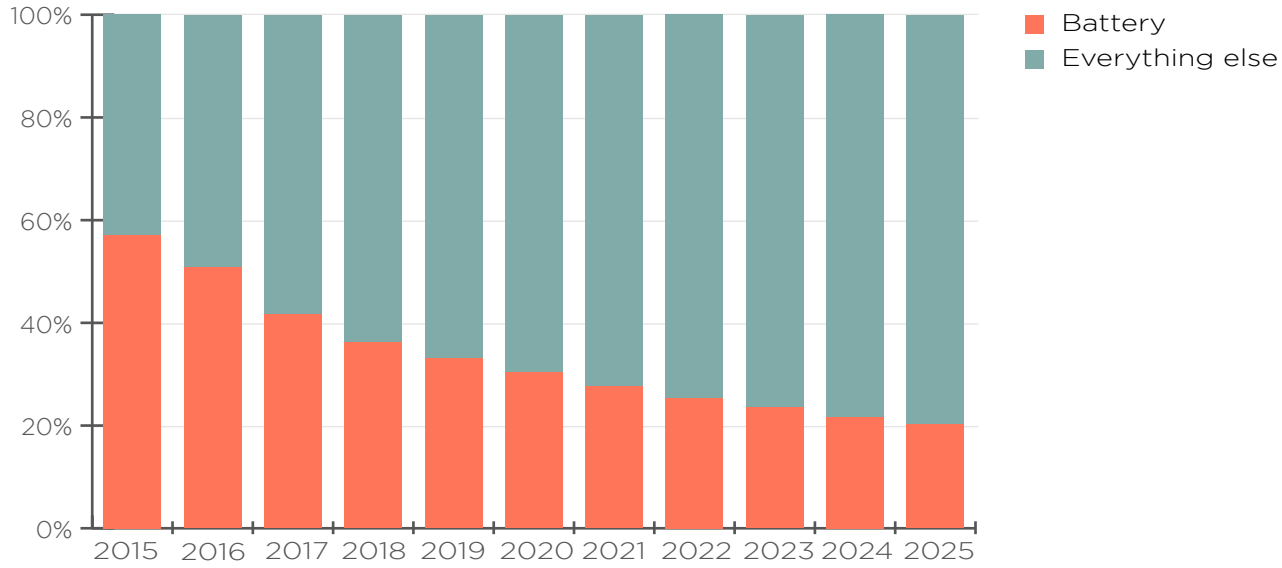
The Business Case for EV Fleets

This section outlines some of the direct advantages of EV fleets for businesses. For example, economies of scale can enable corporate fleets to capitalise on cost savings, while on-site charging infrastructure can remove structural barriers to EV adoption. Fleet owners also tend to have predictable and repeated journeys, reducing the potential for range anxiety.

Financial incentives

Cost savings are a key motivator for many business decisions. When comparing EVs with ICE vehicles, cost parity, which occurs when purchase prices are equal, is expected to occur in the coming decade with McKinsey predicting cost parity by around 2025[13]. This cost competitiveness is being driven by sharp falls in the cost of batteries, the key component in EVs. According to BloombergNEF, for a US mid-sized car, EV batteries made up 57% of the total cost in 2015. In 2018, this figure dropped to 33% and is forecast to fall to 20% by 2025 (Figure 4)[14].

Figure 4: EV battery cost relative to retail price - US mid-sized car



Source: BloombergNEF

On a total cost of ownership (TCO) basis, taking into account lifecycle costs[15], EVs are in some cases already cost-competitive or cheaper than ICE vehicles. This is down to several factors, including cheaper refuelling, regulatory support and lower servicing costs due to fewer moving parts. Figure 5 shows the cost-competitiveness of EVs in certain regions by comparing the combined cost of purchase, fuel, and taxes over four years for a VW Golf – Europe's most popular car.

Figure 5: Four year cost - electric vs. diesel (VW Golf)

Source: ICCT

In addition to light-duty vehicles, heavy-duty vehicles such as trucks and buses play a crucial role in many corporate fleets and supply chains. Relative to light-duty vehicles, there are fewer heavy-duty vehicles on the road, yet they account for an outsized share of emissions. For example in Europe, trucks represent 2% of all vehicles but account for 22% of road transport emissions[16]. This is due to the heavy loads and long journeys associated with trucking, which makes the segment the last expected to achieve cost parity with ICE vehicles. McKinsey predicts that cost parity for heavy-duty trucks will occur in Europe by 2027 and after 2030 elsewhere[17].

Regulatory risk

In many regions, EVs benefit from a supportive policy landscape. In part, this is due to the damage caused by traditional ICE vehicles, which cause pollution and associated public health issues with an estimated annual welfare cost of $5 trillion globally[18]. A large proportion of this pollution is concentrated in cities and urban areas. Consequently, 34 cities in the C40 initiative have pledged to deliver Fossil-Fuel-Free Streets by 2030[19]. For businesses working in these areas, switching to EV fleets might be the only way to continue to operate.

National policies also influence the TCO differential between EVs and ICE vehicles. China and India, which together already account for 40% of new vehicle sales[20], are grappling with severe public health issues with transport an exacerbating factor. For example, in China, road vehicles account for 15-35% of PM2.5 pollution in cities[21]. Partly in response to these issues, numerous governments have implemented policies supporting EV development (Figure 6).

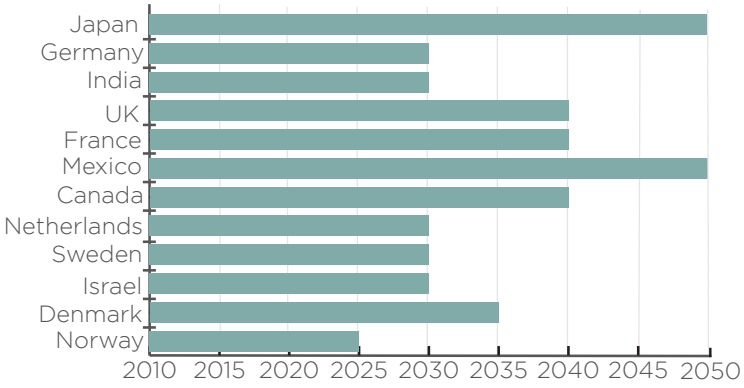
Figure 6: EV related policies

	EU	China	India	US	Japan
Fuel Economy Standards	✓	✓	✓	✓	✓
Tax Incentives	✓	✓	✓	✓	
EV Targets	✓	✓	✓	✓	✓
Subsidies		✓		✓	✓

Source: IEA

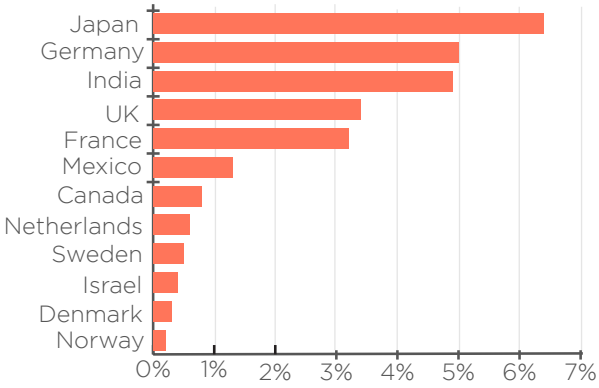
Many countries have translated policy support into formal targets. A total of 11 countries are signatories of the IEA EV30@30 campaign, aiming for at least 30% new electric vehicle sales by 2030[22], while many countries are aiming to completely phase-out new ICE vehicle sales. A number of these phase-out targets are shown below, collectively covering 27% of global passenger vehicle sales. China, which made up 34% of global passenger vehicles sales in 2018, is aiming to ensure that EVs account for 40% of car sales by 2030[23].

Figure 7: Targets to phase-out fossil fuel passenger vehicle sales



Source: SLoCaT

Figure 8: Global passenger vehicle sales



Source: OICA

Given that transport emissions have continued to rise and that a large share of global sales occurs in countries with ambitious EV targets, businesses operating large ICE fleets are likely to face headwinds from new policies going forward[24]. For example, through vehicle excise duty (VED) or fines for using high-emission vehicles in clean air zones.

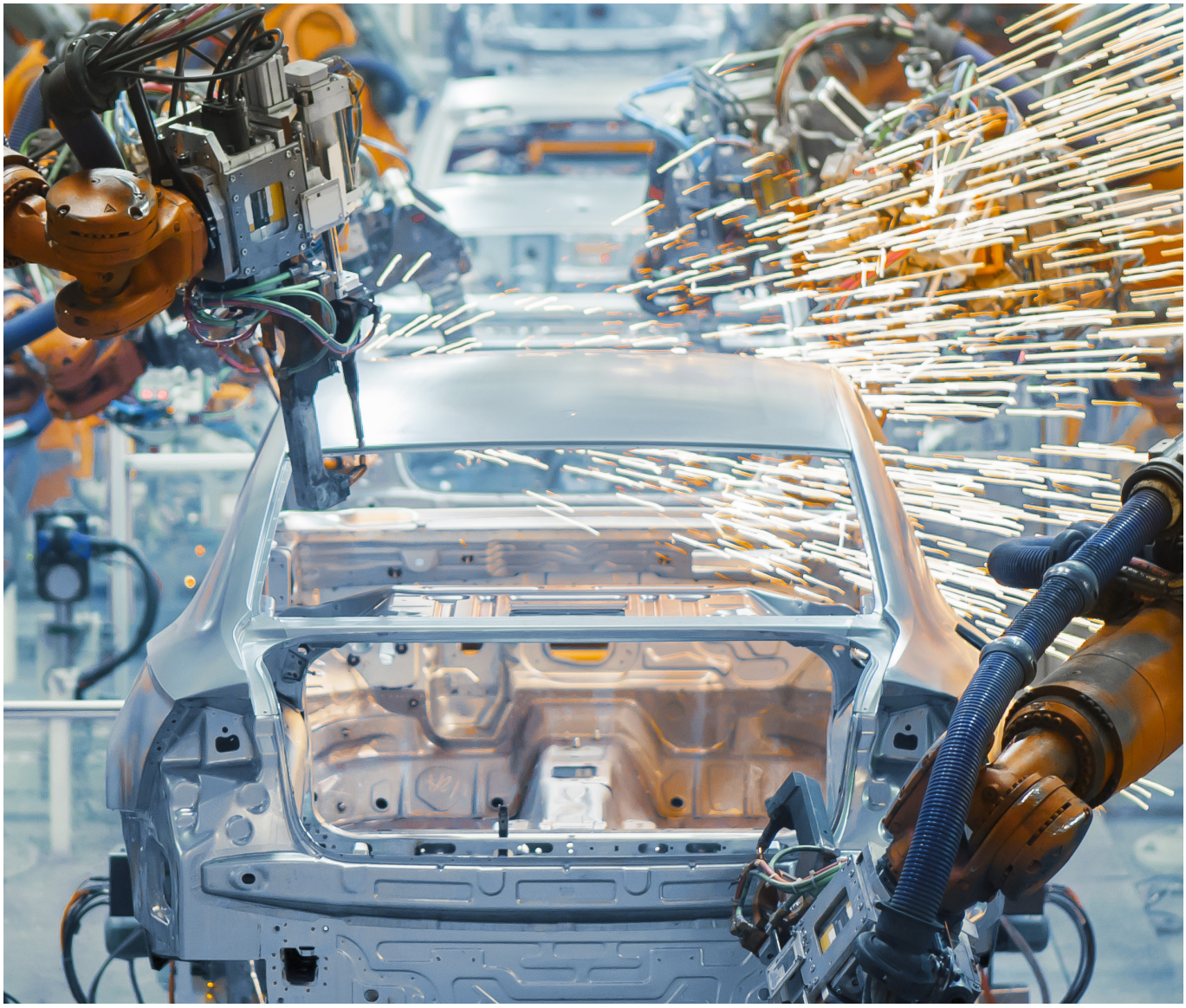
In fact, anticipated regulatory changes rank ahead of cost savings as the main motivator for EV adoption in corporate fleets. A survey undertaken by Geotab of UK fleet managers found that 88%

of respondents listed expectations of new government regulations as a motivator for switching to an EV based fleet, whilst 31% listed operational costs[25].

Reputational benefit

Transitioning to an EV based fleet and installing charging infrastructure can enhance a companies reputation with key stakeholders such as customers or investors. In a survey of EV100 members, a group of corporates committed to transitioning to EVs, reputational benefits ranked in the top five reasons for going electric[26]. For example, UK supermarkets are installing EV charging points in their stores for customers. Tesco is collaborating with Volkswagen to install 2,500 charging points in 600 UK stores by 2020[27], while supermarkets Morrisons and Lidl have made similar commitments[28, 29].

Companies can also enhance their reputation among employees[30]. Strong corporate social responsibility (CSR) performance can help to both attract and retain employees. For example, at technology company HP Inc., where employees rank sustainability in the top three reasons for enjoying their workplace, EV charging infrastructure has been installed in 20% of global offices[31].



Impact Opportunities

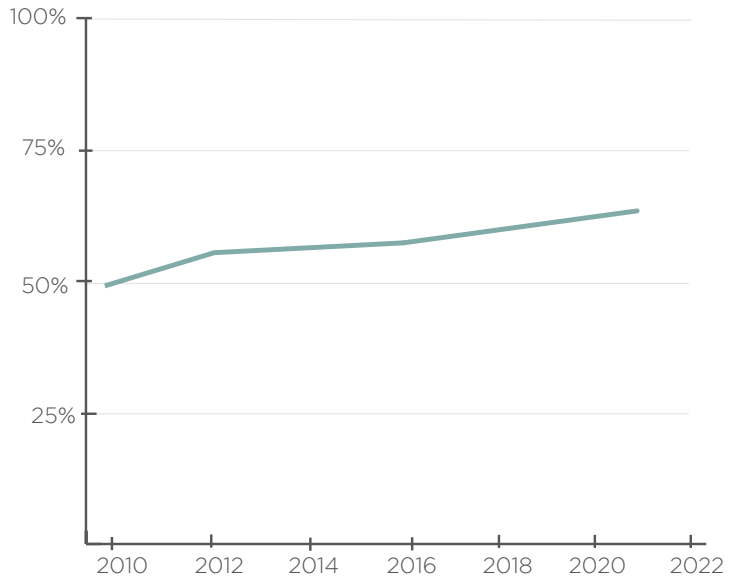
This section of the report outlines the growing importance of corporate fleets in the automobile industry and how this presents an opportunity for investors to generate positive impact. This section also covers broader considerations, such as social impact and a just transition.

The importance of fleets

In the coming decades, corporate fleets are set to form a growing share of vehicle ownership. In Europe, the share of new vehicle sales to corporate fleets has risen steadily since 2010 and now accounts for close to two-thirds of new sales (Figure 9)[32].

This trend is set to continue and accelerate. Structural changes, such as changing car ownership, will bolster the importance of fleets in the global economy. Unlike older generations that prioritise private ownership, younger generations tend to prioritise cost and flexibility, opting for alternatives such as ride-hailing and car-sharing. This points to "transport-as-a-service," with vehicles owned by fleets rather than individuals – a trend likely to be reinforced by urbanisation. In 2018, 55% of the world's population lived in cities, and in 2050, this figure is forecast to reach 68%[33].

Figure 9: New car registrations Europe - corporate market share



Source: Deloitte

Another structural shift underway is the proliferation of online commerce and just-in-time delivery services that require vast corporate fleets. For example, in London, usage of light goods vehicles has grown rapidly[34], and in New York, the number of daily household deliveries has tripled to 1.1 million from 2009 to 2017[35]. Not only do these deliveries add directly to pollution, but they also worsen congestion, indirectly adding to pollution.

In light of these issues, EV adoption must be a focus for investors. As the share of new vehicles entering the corporate channel grows, corporate fleets have the potential to stimulate demand EVs and charging infrastructure. This will drive down costs, mitigate emissions and accelerate widespread EV adoption.

Environmental impact

The objective of reducing emissions is a key motivator for many corporates when adopting EV based fleets. This is an important step for cutting Scope 1 emissions arising from direct operations, but for many businesses, indirect emissions within supply chains outweigh direct emissions. Research by CDP found that on average, the ratio of supply chain emissions to direct emissions is 5.5[36]. Given that road transport, which accounts for 17% of global emissions[37], plays an integral role in many supply chains, encouraging or requiring the use of EVs upstream and downstream of direct operations will be crucial for cutting Scope 3 emissions. For investors, effective engagement on this issue with companies across sectors provides the opportunity to deliver positive environmental impact.

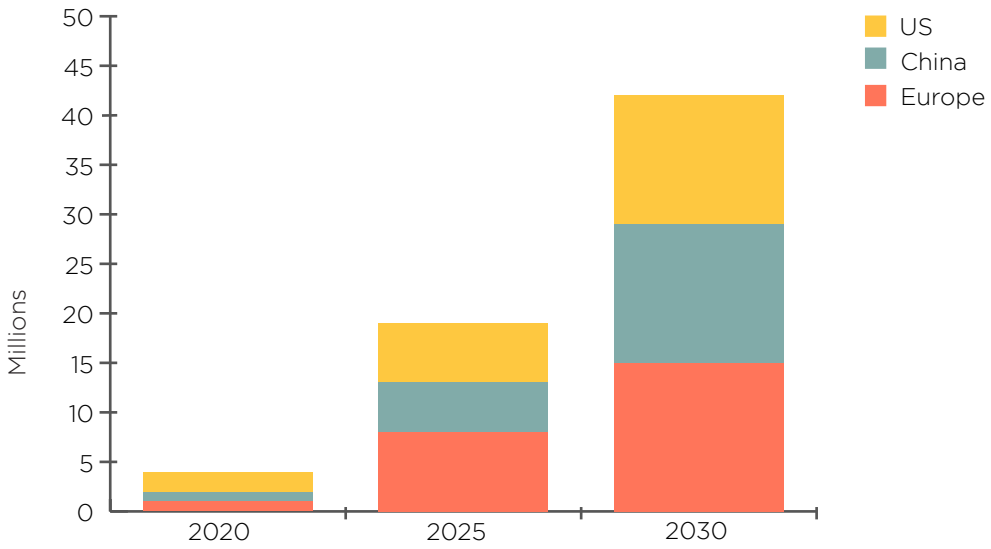
Scope 1: Emissions from direct or controlled sources

Scope 2: Indirect emissions from the generation of purchased energy

Scope 3: Indirect emissions (not include in scope 2) that occur both upstream and downstream in the value chain

Another avenue for corporates to deliver positive environmental impact is to build out critical EV infrastructure. Huge increases in the number of EV charging points are required for widespread EV adoption. Consultancy Wood Mackenzie estimates that nearly 40 million charging points will be deployed globally by 2030 (Figure 10)[38]. However, not all households have access to private parking to charge EVs. For example, in the UK, 43% of households do not have off-street parking[39]. To enable these households to transition to EVs a combination of solutions are needed, such as charging points in lampposts and at petrol stations. Alongside these measures, corporates have a vital role to play in installing EV charging points in offices for employees and at retail stores for customers. In the UK alone, 1-3 million commercial and industrial charging points could be required by 2040, while 2-4 million could be required in Germany[40].

Figure 10: EV charging infrastructure needs



Source: McKinsey

Social impact

Investor engagement with corporates on EVs and charging points can bring social as well as environmental benefits. In the UK alone, air pollution accounts for 28,000-36,000 early deaths each year, with an associated cost of £20 billion[41]. This effect is more evident in urban areas, where road vehicles account for 80% of nitrous oxide pollution[42]. On a global scale, it is estimated that transportation accounts for 11% of the 3.4 million premature deaths caused by pollution each year, of which diesel vehicles account for 50%[43].

The health impacts of air pollution are also linked to social deprivation, with poorer communities the most exposed to the negative health effects at both the national and global level[44, 45]. As a result, the decarbonisation of transport systems provides an opportunity to address health equity and ensure a just transition for affected communities.

Just transition

Investors that promote EV fleets should also be aware of the broader economic and social impact of EVs domestically and in international supply chains. A transition to a low-carbon transport system should be centred around the principles of a just transition; focusing on the provision of decent work, social inclusion and poverty eradication[46] - as stated in the Paris Agreement[47].

Economic impact

The transition to a low-carbon transport system has the potential to disrupt communities dependent on the automobile industry for employment. Battery cells are the main component in EVs and at present, Asia is the market leader, with China, Japan and Korea accounting for 97% of the EV battery market in 2018[48]. This raises the prospect of job losses in other regions as international supply chains adjust. However, analysis by the European Climate Foundation (ECF)

predicts that in Europe, jobs in the automobile sector will remain stable up until 2030 and that the net impact on employment, taking into account energy and EV related infrastructure, will be an additional 206,000 jobs[49]. Yet even with this net increase, ECF stresses that workforces will need to retrain as production methods change.

As well as the impact on jobs, it is important to consider the broader economic impact. For oil-importing countries, large cost savings can be realised through EV adoption - increasing disposable incomes. For example, in the UK, the implementation of a 2035 ban on conventional vehicle sales would reduce oil imports by 50%, producing £6.6 billion in savings annually[50]. In Europe, which imports 89% of its crude oil consumption, €49 billion could be saved by 2030[51]. In fact, ECF predicts that overall, the combination of new jobs, investment in EV infrastructure and higher disposable incomes will lead to higher GDP growth in Europe.

Supply chain risks

The automobile industry relies on global supply chains and as EVs displace ICE vehicles, those supply chains will change. As EVs displace ICE vehicles, those supply chains will change. An acceleration in the demand for EVs will increase demand for commodities such as lithium, nickel and cobalt that are found in EV batteries. The mining of these commodities often brings environmental and social costs. For example, lithium extraction is water-intensive and produces toxic chemicals that can pollute the surrounding soil – affecting both the health and livelihoods of the local population[52].

Mining for these commodities can also result in human rights issues. Countries such as Bolivia and Argentina with large lithium reserves have weak workforce standards relative to developed countries. Cobalt production is particularly high risk. In the Democratic Republic of Congo (DRC), home to the world's largest cobalt reserves[53], 20% of extraction is performed by independent artisanal miners at risk of human rights violations and child labour[54]. When investing in and engaging with the mining and automobile sector, and when thinking about EV adoption more broadly, investors should keep these issues in mind. For example, the Principles for Responsible Investment (PRI) provide guidance for investors when engaging with the cobalt sector[55].

PRI: Cobalt - Investor expectations and engagement

Investor expectations towards companies with regards to the responsible sourcing of cobalt centre on three main areas:

- Human rights risk assessments and comprehensive due diligence efforts;
- Provision of remedy;
- Participation in collective initiatives.

Investors expect greater disclosure from companies around their commitment to responsible sourcing of cobalt and prioritisation of risk mitigation over risk avoidance.

Source: Principles for Responsible Investment

Investor Engagement

Investors should take note of both the business case and the opportunity to generate positive impact with regard to EVs. Already we have seen investors collaborate via the Investor Decarbonisation Initiative (IDI) to collectively engage with companies on this issue.

EV100

EV100 is a corporate initiative launched by The Climate Group bringing together companies committed to transitioning to electric vehicles. To become a signatory of EV100, members make a public commitment to achieve one of the following goals by 2030:

- Integrate EVs into owned or leased commercial fleets
- Place requirements in service contracts for EV usage
- Support EV usage among staff by installing charging points at all premises
- Support EV usage among customers by installing charging point at all premises

To date, 59 companies have joined EV100, including companies in the energy, delivery and retail sectors. Under the initiative, well over two million vehicles will be EVs by 2030.

As a corporate member of EV100, companies can send a strong signal to investors, customers, policymakers and auto-manufactures about their level of commitment to EVs and sustainability. The initiative enables like-minded companies to share best practice and maximise their collective voice when engaging with governments and other stakeholders that are essential to the EV transition.

Investor Decarbonisation Initiative

The Investor Decarbonisation Initiative (IDI), coordinated by ShareAction, represents investor signatories with over $2.0trn in assets. The IDI engages with corporates on Science Based Targets, as well as membership of Climate Group initiatives EV100, RE100 and EP100. This is achieved by sending investor letters, engaging directly with companies and by asking AGM questions. An example of a company becoming an EV100 signatory following IDI engagement is BT, with the company pledging to electrify its fleet of 34,000 vehicles by 2030.

Investor Recommendations

1. Engage with investee companies with large operational corporate fleets on EV adoption.
2. Engage with investee companies on the provision of EV charging infrastructure for corporate fleets, employees and costumers.
3. Engage with companies on membership of EV100, a global corporate initiative covering recommendation (1) and (2).
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5. Consider broader issues related to EVs when engaging with corporates, the mining sector and automobiles sector, for example, social impact and a just transition.

References

1 Keller, S. (2016). "A world of thoughts on Phase 2," ICCT. Available online at: https://theicct.org/blogs/staff/a-world-of-thoughts-on-phase-2 [Accessed 9 December 2019]
2 IEA (2019). "Tracking Transport." Available online at: https://www.iea.org/reports/tracking-transport-2019 [Accessed 9 December 2019]
3 Duff & Phelps (2019). Millennials and Auto Trends Report: Will Millennials Drive the Automotive Industry Forward? Available online at https://www.duffandphelps.com/-/media/assets/pdfs/publications/mergers-and-acquisitions/will-millennials-drive-automotive-industry-forward.ashx [Accessed 9 December 2019]
4 See 2.
5 Deloitte (2019). Fleet Management in Europe: Growing importance in a world of changing mobility. Available online at: https://www2.deloitte.com/content/dam/Deloitte/us/Documents/consumer-business/us-fleet-management-europe.pd [Accessed 9 December 2019]
6 BBC (2019). "ULEZ: New pollution charge begins in London." Available online a https://www.bbc.co.uk/news/uk-england-london-47815117 [Accessed 9 December 2019]
7 C40 (2019). "Amsterdam, Austin, Berlin, Jakarta and Liverpool commit to rid fossil fuels from city streets by 2030." Available online at: https://www.c40.org/other/green-and-healthy-streets [Accessed 9 December 2019]
8 See 2.
9 IEA (2017). Energy Technology Perspectives 2017. Available ohline at: www.iea.org/etp2017 [Accessed 9 December 2019]
10 Green Car Congress (2019). "Nissan LEAF best-selling car in Norway, top-selling EV in Europe in 2018." Available online at: https://www.greencarcongress.com/2019/01/20190122-leaf.html [Accessed 9 December 2019]
11 IEA (2019). "Global EV Outlook 2019." Available online at: https://www.iea.org/reports/global-ev-outlook-2019 [Accessed 9 December 2019]
12 IEA (2019). "Global energy demand rose by 2.3% in 2018, its fastest pace in the last decade." Available online at: https://www.iea.org/newsroom/news/2019/march/global-energy-demand-rose-by-23-in-2018-its-fastest-pace-in-the-last-decade.html [Accessed 9 December 2019]
13 Mckinsey (2019). "Making electric vehicles profitable." Available online at: https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/making-electric-vehicles-profitable [Accessed 9 December 2019]
14 Bullar, N. (2019). "Electric Car Price Tag Shrinks Along With Battery Cost." Available online at: https://www.bloomberg.com/opinion/articles/2019-04-12/electric-vehicle-battery-shrinks-and-so-does-the-total-cost [Accessed 9 December 2019]
15 Bristol Street Motors (2018). "Understanding an EV's total cost of ownership." Available online at: https://www.bristolstreet.co.uk/news/understanding-an-evs-total-cost-of-ownership/ [Accessed 9 December 2019]
16 Transport & Enviroment (n.d). "Cleaner, safer trucks." Available online at: https://www.transportenvironment.org/what-we-do/cleaner-safer-trucks [Accessed 9 December 2019]
17 McKinsey (2017). "New reality: electric trucks and their implications on energy demand." Available online at: https://www.mckinseyenergyinsights.com/insights/new-reality-electric-trucks-and-their-implications-on-energy-demand/ [Accessed 9 December 2019]
18 World Bank (2016). The Cost of Air Pollution : Strengthening the Economic Case for Action. Available online at: https://openknowledge.worldbank.org/handle/10986/25013 [Accessed 9 December 2019]
19 See 6
20 OICA (2018). New PC Registrations or Sales. Available online at: http://www.oica.net/wp-content/uploads/pc_sales_2018.pdf [Accessed 9 December 2019]
21 OECD (2014). The Cost of Air Pollution: Health Impacts of Road Transport. Available online at: https://doi.org/10.1787/9789264210448-en [Accessed 9 December 2019]
22 IEA (2019). EV30@30 Campaign. Available online at: https://iea.blob.core.windows.net/assets/a7571ce8-70dd-43a8-9ed7-915cb05fc638/3030CampaignDocumentFinal.pdf [Accessed 9 December 2019]
23 Narayanan, A. (2019). "China Mulls Mandating 60% Electric Car Sales," Investor's Business Daily. Available online at: https://www.investors.com/news/electric-car-sales-china-mulls-60-percent-electric-vehicles-mandate/ [Accessed 9 December 2019]

24 Wang, S. and Mengpin, G. (2019). "Everything You Need to Know About the Fastest-Growing Source of Global Emissions: Transport," World Resources Institute. Available online at: https://www.wri.org/blog/2019/10/everything-you-need-know-about-fastest-growing-source-global-emissions-transport [Accessed 9 December 2019]
25 Middleton, N. (2018). "Nine in 10 fleets plan to go electric in next decade," Fleet World. Available online at: https://fleetworld.co.uk/nine-in-10-fleets-plan-to-go-electric-in-next-decade/ [Accessed 9 December 2019]
26 The Climate Group (2019). Business Driving Demand for Electric Vehicles: EV100 Progress and Insights Annual Report, February 2019. Available online at: https://www.theclimategroup.org/sites/default/files/ev100_annual_report_pdf.pdf [Accessed 9 December 2019]
27 BBC (2018). "Tesco and VW plan free electric car charging points." Available online at: https://www.bbc.co.uk/news/business-46386858 [Accessed 9 December 2019]
28 Morrisons (2019). "Morrisons invests in rapid EV charging points." Available online at: https://www.morrisons-corporate.com/cr/corporate-responsibility/ev-charging-points/ [Accessed 9 December 2019]
29 Fleet News (2019). "Lidl to install rapid EV charging points at all new stores." Available online at: https://www.fleetnews.co.uk/news/environment/2019/10/28/lidl-to-install-rapid-ev-charging-points-at-all-new-stores [Accessed 9 December 2019]
30 Hall, B. (2019). "We need to be shouting about CSR – to our employees," Interact. Available online at: https://www.interact-intranet.com/blog/we-need-to-be-shouting-about-csr-to-our-employees/ [Accessed 9 Decmember 2019]
31 See 26
32 See 5.
33 UN (2018). "68% of the world population projected to live in urban areas by 2050, says UN." Available online at: https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html [Accessed 9 December 2019]
34 Allena, M., Piecyka, M., Piotrowskaa, M., McLeod, F., Cherrett,T., Ghalib, K., Nguyenc, T., Bektasc, T., Batesd, O., Friday, A., Wisee, S., Austwicke, M. (2018). Understanding the impact of e-commerce on last-mile light goods vehicle activity in urban areas: The case of London. Available online at: https://www.sciencedirect.com/science/article/pii/S136192091730305X [Accessed 9 December 2019]
35 Hang, M. and Hi, W. (2019). "1.5 Million Packages a Day: The Internet Brings Chaos to N.Y. Streets," The New York Times. Available online at: https://www.nytimes.com/2019/10/27/nyregion/nyc-amazon-delivery.html [Accessed 9 December 2019]
36 CDP (2019). Cascading Commitments: Driving ambitious action through supply chain engagement. Available online at: https://6fefcbb86e61af1b2fc4-c70d8ead6ced550b4d987d7c03fcdd1d.ssl.cf3.rackcdn.com/cms/reports/documents/000/004/072/original/CDP_Supply_Chain_Report_2019.pdf?1550490556 [Accessed 9 Decmeber 2019]
37 Keller, S. (2016). "A world of thoughts on Phase 2," ICCT. Available online at: https://theicct.org/blogs/staff/a-world-of-thoughts-on-phase-2 [Accessed 9 December 2019]
38 Wood Mackenzie (2018). "EV growth will require massive charging infrastructure build-out." Available online at: https://www.woodmac.com/news/editorial/growth-of-evs-will-require-massive-charging-infrastructure-build-out/ [Accessed 9 December 2019]
39 Thomas, N. and Campbell, P. (2017). "Five ways to solve UK's electric car 'charging conundrum'," Financial Times. Available online at: https://www.ft.com/content/b9cd3dbc-e406-11e7-97e2-916d4fbac0da [Accessed 9 December 2019]
40 Aurora (2018). Opportunities in Electric Vehicle Charging at Commercial and Industrial Sites. Available online at: https://www.auroraer.com/wp-content/uploads/2018/10/Aurora-Report-Full-Opportunities-in-EV-charging-at-CI-sites-October-2018.pdf [Accessed 9 December 2019]
41 Wood Mackenzie (2018). "EV growth will require massive charging infrastructure build-out." Available online at: https://www.woodmac.com/news/editorial/growth-of-evs-will-require-massive-charging-infrastructure-build-out/ [Accessed 9 December 2019]
42 DEFRA (2017). UK plan for tackling roadside nitrogen dioxide concentrations. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/633269/air-quality-plan-overview.pdf [Accessed 9 December 2019]
43 Phys.org (2019). "Nearly 50% of transport pollution deaths linked to diesel: study." Available online at: https://phys.org/news/2019-02-pollution-deaths-linked-diesel.html [Accessed 9 December 2019]
44 DEFRA (2006). Air Quality and Social Deprivation in the UK: an environmental inequalities analysis. Available online at: https://uk-air.defra.gov.uk/assets/documents/reports/cat09/0701110944_AQinequalitiesFNL_AEAT_0506.pdf [Accessed 9 December]
45 Watts, J. (2018). "Air pollution inequality widens between rich and poor nations," Guardian. Available online at: https://www.theguardian.com/environment/2018/may/01/air-pollution-inequality-

widens-between-rich-and-poor-nations [Accessed 9 December 2019]
46 OECD (2017). Just Transition: A report for the OECD. Available online at : https://www.oecd.org/environment/cc/g20-climate/collapsecontents/Just-Transition-Centre-report-just-transition.pdf [Accessed 9 December 2019]
47 UNFCCC (2015). Paris Agreement. Available online at: https://unfccc.int/sites/default/files/english_paris_agreement.pdf [Accessed 9 December 2019]
48 Mckinsey (2019). Recharging economies: The EV-battery manufacturing outlook for Europe. Available online at: https://www.mckinsey.com/industries/oil-and-gas/our-insights/recharging-economies-the-ev-battery-manufacturing-outlook-for-europe [Accessed 9 December 2019]
49 ECF (2018). Fuelling Europe's Future: How the transition from oil strengthens the economy. Available online at: https://europeanclimate.org/wp-content/uploads/2018/02/FEF_transition.pdf [Accessed 9 December 2019]
50 Green Alliance (2018). How the UK can lead the electric vehicle revolution. Available online at: https://www.green-alliance.org.uk/resources/How_the_UK_can_lead_the_electric_vehicle_revolution.pdf [Accessed 9 December 2019]
51 See 50.
52 Sustainalytics (2016). ESG Spotlight - The electric vehicle boom: Towards supply chain transparency. Available online at: https://marketing.sustainalytics.com/acton/attachment/5105/f-08b5/1/-/-/-/-/ESG%20Spotlight%202016%2006%20The%20electric%20vehicle%20boom.pdf [Accessed 9 December 2019]
53 Felter, C. (2018). "The Cobalt Boom," Council on Foreign Relations. Available online at: https://www.cfr.org/backgrounder/cobalt-boom [Accessed 9 December 2019]
54 UNPRI (2018). Drilling Down into the Cobalt Supply Chain: How Investors can Promote Responsbile Sourcing Practices. Available online at: https://www.unpri.org/download?ac=4502 [Accessed 9 December 2019]

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ShareAction (Fairshare Educational Foundation) is a registered charity that promotes responsible investment practices by pension providers and fund managers. ShareAction believes that responsible investment helps to safeguard investments as well as securing environmental and social benefits.

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