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EV100

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EV100 GLOBAL POLICY POSITION STATEMENT

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1. Introduction

EV100 is a global initiative, run by the Climate Group, bringing together forward-looking companies committed to accelerating the transition to electric vehicles (EVs) and making electric transport the new normal by 2030. EV100 currently comprises over 90 corporate members, operating across 80 global markets, committed to electrifying 4.8 million vehicles and rolling out EV charging at over 5,500 company locations worldwide, all by 2030.

As well as transforming their own operations, EV100 member companies are also engaging in public policy debates around the world to shape public policy frameworks to accelerate the transition to zero emission mobility. This paper, drafted by the Climate Group in consultation with EV100 members, summarises the overall views of EV100 on key issues relating to the transition to zero emission vehicles (ZEVs).

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2. Key policy recommendations

2.1 Set ambitious targets backed by robust policy frameworks

We recommend governments should set goals for 100% of new light duty vehicle sales to be fully zero emission, ideally by 2030, in line with the ambition required to achieve the goals of the Paris Agreement.

2.2 Stimulate supply of zero emission vehicles

We recommend governments should take steps to stimulate the supply of ZEVs, for example, by setting stretching vehicle emissions standards decreasing over time to 0g CO2, and/or ZEV mandates increasing over time to 100% ZEV sales / ICE phase-out.

2.3 Drive demand for zero emission vehicles

We recommend governments should introduce or extend incentives for ZEV use and purchase, gradually tapering them down in line with anticipated EV cost reductions until purchase price parity is reached with ICE vehicles. These incentives should be open to businesses as well as private individuals, with special consideration for commercial vehicles. Special efforts should be made to bridge adoption barriers faced by disadvantaged communities. Policymakers should give as much forward visibility as possible of these incentives to help businesses plan their investments.

2.4 Invest in infrastructure to facilitate EV charging for all

We recommend governments should work with businesses and communities to target policy support and investment towards viable business models for priority charging challenges, for instance: minimising costs and administrative burden for the installation of charging in leased premises; providing charging solutions for workers who park their vehicle at home overnight; and ensuring adequate provision of route-based rapid charging on major roads to support long distance journeys. Policymakers should also ensure charging networks are user-friendly and interoperable.

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3. Policy messages

3.1 The role of electromobility in achieving net zero emissions

EVs have zero tailpipe greenhouse gas (GHG) emissions (except PHEVs when driven off the engine). Electric motors are inherently more efficient than internal combustion engines (ICE)[1] as they have fewer moving parts and lose much less energy as heat and sound. This greater efficiency means that EVs deliver CO2 benefits compared with ICE vehicles even in regions that still rely heavily on high-carbon electricity, such as coal power[2], and of course deliver even higher emissions benefits in countries with greener electricity systems. To maximise the emissions benefits, the switch to EVs should be accompanied by significant expansion of renewable electricity. As grids decarbonise, the in-use emissions of EVs will continue to trend down to zero. The key role of EVs in reducing emissions is well understood globally[3].

3.2 The role of electromobility in achieving clean air objectives

With zero tailpipe emissions, **ZEVs eliminate most of the local air pollution** caused by ICE vehicles. This means they play an important role in preventing avoidable deaths caused by air pollution, as well as the related costs to healthcare systems and workforce productivity. Eliminating exhaust emissions will particularly increase the health and well-being of lower-income communities, who are often the ones living near highways or in urban areas.

NOx emissions are completely eliminated and particulate emissions significantly reduced with ZEVs compared to ICEs[4]. BEVs do tend to cause more particulate emissions from tyre wear and road abrasion (due to the weight of the battery, which makes the BEVs heavier

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[1] https://www.fueleconomy.gov/feg/evtech.shtml

[2] https://www.bloomberg.com/news/articles/2019-01-15/electric-cars-seen-getting-cleaner-even-where-grids-rely-on-coal

[3] https://www.iea.org/reports/global-ev-outlook-2020

[4] https://www.wwf.org.uk/sites/default/files/2018-03/Final%20-%20WWF%20-%20accelerating%20the%20EV%20transition%20-%20part%201.pdf

compared to similar ICE vehicles), but they also cause fewer particulate emissions from brake wear thanks to regenerative braking.

Overall the air pollution benefits of ZEVs are clear for both NOx and particulate matter[5], but since they do still cause some particulate emissions, we emphasise the importance of promoting ZEVs as part of a wider sustainable mobility system that prioritises shared and active transport. The quietness of EVs in use also help to reduce noise pollution.

3.3 The economics of electric vehicles

EVs are already competitive with ICEs in many markets when considered on the basis of total cost of ownership (TCO) rather than sticker price. For example, mid-size electric cars are already cost-competitive on a TCO basis in 14 out of 18 European countries[6].

EVs are getting cheaper and will soon compete with ICEs on purchase price. Lithium-ion battery prices have fallen by 87% between 2010 and 2019 and these cost reductions are expected to continue in the coming years[7]. Lithium-ion batteries are expected to cost less than $100/kWh by 2023 (widely seen as the tipping point with ICE vehicles)[8]. Up front price parity with ICE vehicles will vary by market segment and geography. On average parity is expected by around 2025, starting with 2022 for large cars in Europe[9].

The more smart policies facilitate the rapid scale-up of markets in the next few years – including measures to bridge still existing price gaps where necessary – the faster we will reach the price tipping point.

3.4 The role of business in driving the transition to e-mobility

[5] https://www.eea.europa.eu/publications/electric-vehicles-from-life-cycle

[6] https://www.leaseplan.com/en-es/blog/2020-car-cost-index/

[7] https://about.bnef.com/electric-vehicle-outlook/

[8] https://news.ihsmarkit.com/prviewer/release_only/slug/2020-09-23-milestone-average-cost-of-lithium-ion-battery-cell-to-fall-below-100-per-kilowatt-hour-in-2023

[9] https://about.bnef.com/blog/electric-vehicle-sales-to-fall-18-in-2020-but-long-term-prospects-remain-undimmed/

Businesses play a crucial role in setting the pace and direction of the EV transition for three main reasons.

Firstly, businesses are major buyers of new vehicles, and their users are high-mileage drivers. Across Europe, almost two in three new cars are sold to corporates (along with virtually all new vans and trucks)[10], mainly as company cars.These cars are typically kept on-fleet for three to five years before entering the second hand market, where individuals typically buy their cars. Business demand for EVs therefore means more second hand EVs will be available for everyday drivers.

Second, businesses can help raise public awareness of, and trust in, EV technology. They can give their drivers experience of EV driving that they wouldn't otherwise have been able to access. Brand association also boosts public perception of reliability e.g. when taxis or delivery vehicles are clearly badged as electric, people can see that EVs really work. Similarly, business action on EVs can give governments confidence to raise their ambition.

And finally, businesses play a key role in supporting EV charging infrastructure deployment. They do this directly by providing EV charging for their staff and customers, for example, at offices or retail and hospitality locations. This is particularly important for people who can't easily charge at home, for example, due to a lack of off-street parking. They also do this indirectly by supporting the business case for EV charging infrasture as high, regular users of infrastructure, and can support this directly through service contracts.

3.5 The role of governments at all levels

Governments at all levels have an important role to play in developing the EV market, from city and regional authorities through to national and supranational institutions.

National governments can set laws and regulations, as well as sending market signals and raising consumer awareness (e.g. through commitments to end ICE sales/achieve 100% ZEV sales), and potentially regulate corporate fleets and first/laste mile operations directly.

[10] https://www2.deloitte.com/content/dam/Deloitte/us/Documents/consumer-business/us-fleet-management-europe.pdf

Supranational governments, such as the European Union, are also instrumental (e.g. by setting vehicle emissions standards that apply across the whole EU single market).

States, regions and cities also have a key role to play in driving the EV transition. For example, states hold key policy levers on transport and often set ambitions ahead of their national governments (as seen in e.g. California11, Scotland and Québec12), as well as their own policy measures to support the EV transition, such as ZEV Mandates (as seen in e.g. British Columbia and California13). Cities likewise play a key role in promoting ZEVs, for example, by introducing zero emission zones14. Governments should engage across these different levels to ensure a harmonised policy framework, rather than a patchwork approach.

3.6 The role of battery electric vehicles

A battery electric vehicle (BEV) is a true zero emission vehicle (ZEV) because it has zero tailpipe emissions, and because electricity can be a zero-carbon fuel (with power grids around the world getting progressively cleaner as more renewable energy is deployed). They therefore offer maximum environmental benefits, as well as minimum ongoing fuel and maintenance costs. This is because electricity is cheaper than petrol or diesel, and because BEVs have less wear and tear due to their increased efficiency and fewer moving parts. BEVs therefore have a major role to play in a zero-emission transport system.

3.7 The role of hybrid electric vehicles

Plug-in hybrids (PHEVs) and extended range EVs (EREVs) have a limited transitional role in certain contexts, but policies should mainly promote zero emission vehicles (ZEVs). PHEVs and EREVs contain both a battery/electric motor, and an internal combustion

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[11] https://www.gov.ca.gov/2020/09/23/governor-newsom-announces-california-will-phase-out-gasoline-powered-cars-drastically-reduce-demand-for-fossil-fuel-in-californias-fight-against-climate-change

[12] https://www.gov.scot/publications/programme-for-government-2017-2018-first-ministers-speech/

[13] https://policyexchange.org.uk/wp-content/uploads/Route-%E2%80%9835.pdf

[14] https://www.c40.org/other/green-and-healthy-streets

engine. PHEVs run directly off the ICE when the battery is depleted, whereas EREVs always run off the battery, but the battery is recharged by the ICE when it is depleted. EREVs tend to offer improved emissions performance over PHEVs, but both ultimately run on fossil fuels as well as electricity (unlike a BEV), and cannot therefore be accurately described as ZEVs.

PHEVs and EREVs can offer low or zero emission driving for certain use cases, but it is crucial to optimise the use of the vehicle's electric range to ensure an economic and environmental benefit. Indeed, due to the weight cost of both the battery and the ICE, running a PHEV off the ICE makes it even more polluting and expensive to run than a conventional ICE. Studies have shown that real world emissions performance of PHEVs can be worse than conventional ICEs overall, due to a failure to optimise electric range[15]. Non-plug-in hybrids should not be considered an EV, but rather a more efficient ICE vehicle.

3.8 The role of hydrogen fuel cell electric vehicles

Hydrogen has the potential to be a zero-emission fuel. Hydrogen produced through reformation or gasification (usually from natural gas), with or without carbon capture and storage (known as blue hydrogen and brown/grey hydrogen respectively), is not zero-emission and not suitable for use in fuel cells16. Green hydrogen, produced through water electrolysis powered by renewable energy, can be zero-emission and is suitable for use in fuel cells.Given the need for additional renewable capacity to produce zero-emission hydrogen, it's important to ensure hydrogen is used where it's most needed (i.e. 'hard-to-abate' sectors). **Given the rapid cost reductions and market penetration of light duty BEVs, we expect hydrogen to play a limited role in light duty transport, but potentially an important role in heavy duty transport.**

[15] https://www.transportenvironment.org/press/plug-hybrids-new-emissions-scandal-tests-show-higher-pollution-claimed

[16] https://www.tno.nl/en/focus-areas/energy-transition/roadmaps/towards-co2-neutral-fuels-and-feedstock/hydrogen-for-a-sustainable-energy-supply/ten-things-you-need-to-know-about-hydrogen

3.9 Targets for 100% zero emission vehicles

A shift to 100% of light vehicle sales to ZEVs ideally by 2030 is one of the biggest opportunities to dramatically reduce emissions in the transport sector[17]. **Government targets for 100% of new light duty vehicles to be ZEVs (also known as ICE bans/phase-outs) send a powerful policy signal to encourage auto manufacturers to redirect investment away from ICE production and into EV production**. These targets also require supportive enabling policies to ensure delivery. Securing an ambitious target is a logical first step, so that all subsequent enabling policies can be designed to deliver the appropriate level of ambition.

As EV100 develops its work on heavy duty vehicles, we expect to take a similar approach in this more challenging segment, noting positive policy developments in California[18] and the UK[19], as well as encouraging commitments from European truck manufacturers[20].

3.10 The role of regulation and fiscal policy

A blend of policy measures is needed to accelerate the EV transition, varying with regional and sectoral policy and market characteristics – there is no one size fits all solution.

Regulating vehicle manufacturers has been shown to be an effective approach to stimulating EV deployment[21], for example through vehicle emissions standards (as in the

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17 https://exponentialroadmap.org/wp-content/uploads/2020/03/ExponentialRoadmap_1.5.1_216x279_08_AW_Download_Singles_Small.pdf

18 https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks

19 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/936567/10_POINT_PLAN_BOOKLET.pdf

20 https://www.acea.be/press-releases/article/all-new-trucks-sold-must-be-fossil-free-by-2040-agree-truck-makers-and-clim

21 https://theicct.org/sites/default/files/publications/Zero%20Emission%20Vehicle%20Mandate%20Briefing%20v2.pdf

EU) or a ZEV Mandate (as in China). Support should also be considered for retrofitting ICEs to EVs, where appropriate.

Additionally, **policymakers should introduce measures to encourage the use and purchase of ZEVs**, such as grants, low-cost loans, tax relief, preferential road use/parking measures, zero emission zones and investment in charging infrastructure. Such measures are crucial in areas where cost differences remain a major obstacle, helping markets quickly grow to the tipping point where price parity is reached. They can also help with social equity, enabling lower-income communities to benefit from clean transport.

Financial incentives should gradually taper down to zero in line with technology cost reductions, but it's important to give maximum forward visibility to ensure a stable market (rather than sudden changes, which can create unsustainable boom-and-bust cycles). Policymakers can also explore funding EV incentives with penalties on the use and/or purchase of ICE vehicles – but they should be sensitive to the social equity considerations involved. Support should also be considered for procurement of second hand EVs on this basis.

The shift to EVs can have an impact on government revenues e.g. from fuel duties. This can be compensated by reducing government spending (e.g. on fossil fuel subsidies) or raising taxes. It's reasonable that EVs should be subject to some taxation, since their use relies on public goods and carries externalities (e.g. congestion). However, given their benefits to climate change and air quality, EVs should be treated favourably in taxation relative to ICEs.

3.11 The role of carbon pricing

Carbon pricing can be another useful policy tool to support decarbonisation. Harmonised and robust carbon pricing can be an effective policy tool (especially when revenues are used to further boost the EV market, as in the Transportation & Climate Initiative[22]). As a general rule, policy should aim to internalise environmental externalities (including air pollution) in line with the polluter pays principle. Conversely, **subsidies for the use of fossil fuels should be rapidly phased out**.

[22] https://www.transportationandclimate.org/

Robust carbon pricing can be difficult to achieve in practice, due to political challenges in policy design. When carbon pricing is presented as a policy solution instead of, or in addition to, regulation, the strongest possible policy mechanism should be favoured, while avoiding 'double regulation' (e.g. standards and carbon pricing both targeting the same outcome).

3.12 Priorities for EV charging infrastructure

Businesses have an important role to play in providing EV charging for their employees and customers. This is especially useful for drivers who are unable to charge at home (e.g. because they don't have off-street parking). **It's important that policymakers engage both property owners and occupiers to support the investment case for rolling out EV charging** in a way that fairly distributes costs (e.g. grid connection) and benefits (e.g. charging revenue). Policymakers should support the deployment of EV charging by businesses at convenient sites, such as filling stations, coffee shops, service areas, etc.

Given the important role of businesses in driving the new vehicle market, **it makes sense to design policy so as to facilitate EV charging for these early adopters in particular**. Key challenges requiring attention include the need for destination charging solutions for dispersed fleets (where workers park their company vehicle at home overnight rather than in a depot), and route-based rapid charging for workers who regularly drive long distances. Governments should aim to guarantee a minimum basic provision of charging infrastructure, including covering the needs of disavantaged communities.

It's important to design and site charging networks to support, rather than strain, the electricity system. This means taking a flexibility-focused approach that realises the benefits of smart charging and vehicle-to-grid solutions, which can substantially reduce energy costs. Developing EV charging infarstructrue in colloboration with electricity distibution networks can reduce grid reinforcements and connections costs. Policymakers should also ensure charging networks are open access, user-friendly and interoperable.

Finally, battery swapping is a viable solution in some segments, such as two and three wheelers, and should be supported at convenient locations for users of these vehicles.

3.13 The importance of a just transition for the auto industry

The rapid transition from ICE to EV will have major impacts on workers in the auto industry. Many jobs will be minimally affected, such as those in vehicle assembly and transferrable components (e.g. wheels, steering wheels). However, some skills will no longer be needed, including the production and servicing of ICE-specific components (e.g. engines, gearboxes, exhausts) as well as the production and sale of fossil fuels. New jobs will also be created, e.g. in producing EV batteries and the installation and management of EV charging. Various studies have pointed to a potential net employment gain in the EU[23] and UK[24].

Policymakers should be sensitive to the distribution of costs and benefits arising from this rapid change, and collaborate with vehicle manufacturers, unions and civil society to ensure a just transition for workers – for example, by providing reskilling in green jobs[25].

3.14 The importance of sustainable EV supply chains

The environmental benefits of EVs are clear, but businesses can play a leading role in demanding socially and environmentally sustainable EV battery supply chains. It's crucial that workers involved in the extraction of the raw materials, such as lithium and cobalt, have adequate rights and protections. There is evidence this is not always the case e.g. for cobalt sourced from the Democratic Republic of the Congo[26]. Mining projects must also be managed to minimise adverse environmental impacts (e.g. on biodiversity and water quality), and should only be developed with the support of local and indigenous stakeholders.

Downstream, it's vital to stimulate markets for both battery reuse and recycling. Given the growing need for dispatchable electricity storage, there is plenty of opportunity for EV batteries to be reused, either in domestic or commercial/industrial settings, for electricity

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[23] https://www.camecon.com/what/our-work/fuelling-europes-future/

[24] https://www.wwf.org.uk/updates/wwf-2018-electric-vehicles-report
https://www.greenpeace.org.uk/resources/the-impact-of-a-2030-ice-phase-out-in-the-uk/

[25] https://www.corporateleadersgroup.com/reports-evidence-and-insights/Jobs-and-skills-in-a-changing-world

[26] https://www.amnesty.org/en/latest/news/2019/03/amnesty-challenges-industry-leaders-to-clean-up-their-batteries/

storage even once they're no longer roadworthy[27]. Around 90% of the cobalt and lithium in a lithium-ion battery can be recycled[28], and it's important to take a 'circular economy' approach when setting market framework conditions to maximise the potential of battery recycling.

When compared like for like with the social and environmental impacts of the fossil fuel supply chain, the EV battery supply chain is indisputably more sustainable. Nevertheless, the industry should aim for continuous improvement and the highest possible standards.

3.15 How ZEVs can support a green recovery from COVID-19

The COVID-19 pandemic has had a devastating effect on the global economy, but investing in the EV transition can support job creation and economic recovery. For example, EV charging infrastructure investment can support quality jobs in both urban and rural settings, while well-designed stimulus incentives for EV purchase can have a strong multiplier effect[29].

[27] https://www.wwf.org.uk/sites/default/files/2018-07/Vivid-Economics-Accelerating-the-EV-Transition-Summary-Presentation.pdf

[28] https://www.nature.com/articles/s41560-019-0376-4

[29] https://www.wemeanbusinesscoalition.org/wp-content/uploads/2020/10/Green-Recovery-Assessment-v2.pdf

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4. Scope of this paper

4.1 In-scope: Light- and medium-duty electric vehicles

EV100 members' fleet electrification commitments cover passenger and commercial vehicles up to 7.5 tonnes (15,000 lbs). Similarly, members' charging commitments are intended to support employees and customers assumed to be driving electric cars or vans.

Our definition of electric vehicle (EV) includes battery electric vehicles (BEV), plug-in hybrid electric vehicles (PHEV) and hydrogen fuel cell electric vehicles (FCEV), all with a minimum electric range of 30 miles / 50km.

4.2 Out of scope: Other low carbon transport fuels

EV100 is focused on electric batteries and hydrogen fuel cells, as technologies with the potential to deliver zero-emission surface mobility. We see only a limited transitional role for other alternative fuels and technologies, such as biofuels, e-fuels and CNG/LNG, in order to avoid lock-in to technologies that either cannot deliver zero-emission mobility, or may be needed more by other sectors to achieve zero emissions, such as industry or aviation.

4.3 Out of scope: Other sustainable mobility solutions

We recognise that EVs are not a silver bullet for decarbonising surface transport. A blend of solutions will be required, including greater uptake of public transport, shared and active travel, mobility-as-a-service solutions, and shifting freight from road to rail. We support these measures, and many EV100 members integrate options such as e-cargo bikes into their operations. Nonetheless, rapidly transitioning fossil fuelled vehicles to EVs is a needed step on the path to net-zero emissions globally, and remains the core focus of EV100.

4.4 Out of scope: Heavy duty vehicles

Several EV100 members are taking steps to switch vehicles to zero-emission solutions even beyond the weight threshold of the EV100 commitment (up to 7.5 tonnes). We applaud these efforts, given the crucial importance of decarbonising heavy duty vehicles. We will continue to investigate opportunities to expand the EV100 scope of activities to include heavy duty vehicles, and aim to bring them fully within scope of this paper as this work develops.