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Partnership on Sustainable
Low Carbon Transport

E-Mobility Trends and Targets

As of January 2020 (constantly updated)

Insights of 55 market trend reports and targets by 70 countries, 81 cities or regions and 50 companies. Visions by 23 automobile companies.



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This document compiles information on the development of electric mobility with regard to market trend reports; official targets by countries, cities, and companies; and industry plans. This document is a **work-in-progress** and will be expanded with additional narrative and data on e-mobility.

If you have any news or relevant developments to share or want to reference the document, please send an email to nikola.medimorec@slocatpartnership.org.

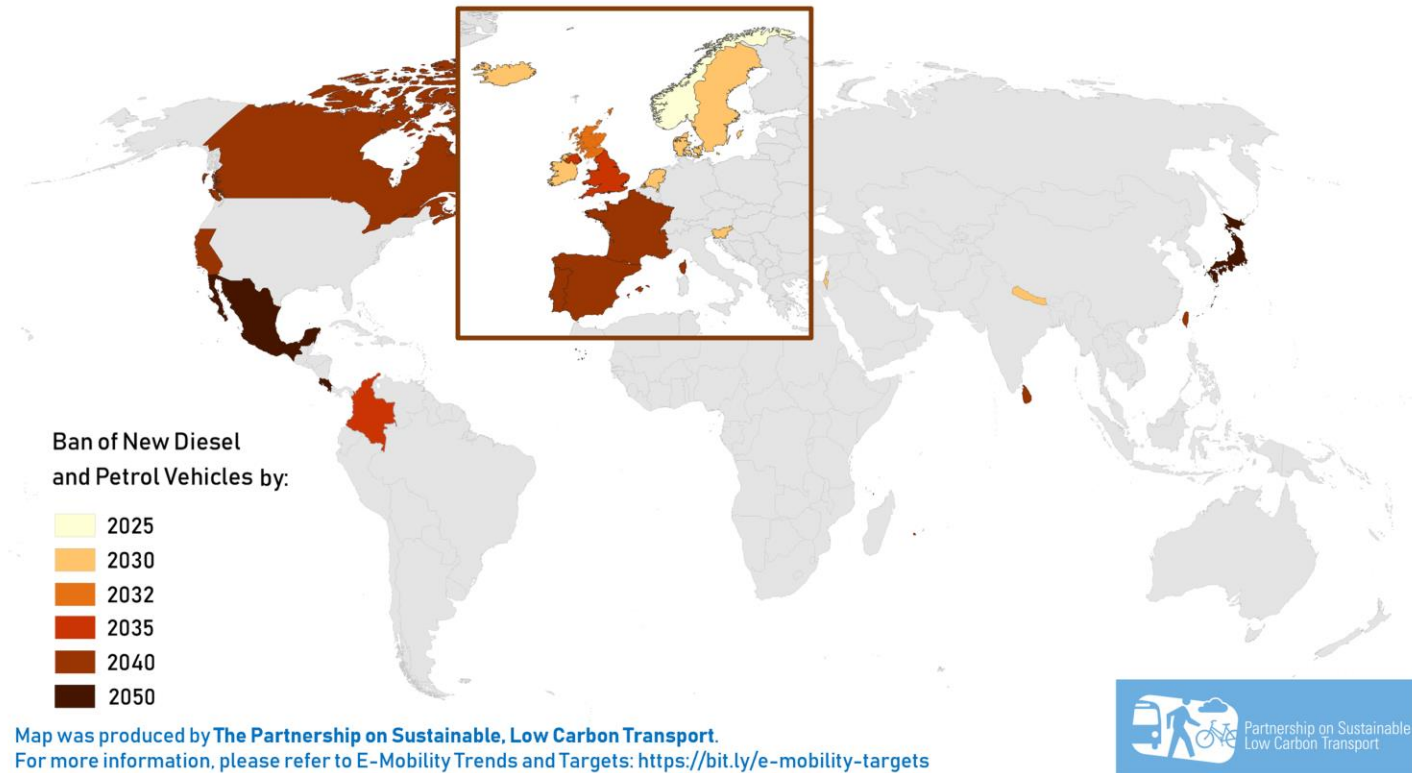
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E-mobility Targets by Countries

Policy plans by countries and cities can work as catalysts towards e-mobility. From January to July 2017 alone, 16 policy announcements were recorded, more than in any previous year. The overview below indicates that the ambition level has increased over time, and in 2017 some of the most progressive announcements have been made.

Policy initiatives on the phase-out of fossil fuel vehicles



A few countries and regions have announced plans to phase-out fossil fuel vehicles and shift to e-mobility. Leading examples are shown in the map above. Countries and regions with the intention to phase out fossil fuel-powered vehicles by year:

- 2025:** Norway
- 2030:** Denmark, Ireland, Israel, Nepal, Netherlands, Slovenia, Sweden
- 2032:** Scotland
- 2035:** Colombia, United Kingdom
- 2040:** British Columbia, California, Canada, France, Portugal, Spain, Sri Lanka, Taiwan
- 2050:** Cabo Verde, Costa Rica, Japan, Mexico

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Most of the countries plan to ban sales of internal combustion engines. India has previously made statements regarding a possible phase-out by 2030 but the most recent EV roadmap does not include any phase-out targets. China works on a phase-out plan as well but most likely sub-regional level will set phase-out plans.

Other countries have set targets for absolute number or overall share of electric vehicles by a certain year. 2020 is a major target year, with Spain aiming for 2.5 million electric vehicles, Germany and India aiming for 1 million, Portugal targeting 750,000 and South Korea aiming for 200,000 electric cars. Country targets for 2030 include Finland's goal of 250,000 electric vehicles, Malaysia aiming for 100,000 electric cars, and South Africa's targeting a 20% share of electric cars. Norway is a leading country in terms of e-mobility thanks to financial incentives.

Country	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
United Kingdom	February 2020	Petrol and diesel car sales ban brought forward to 2035	✓		✓			
	September 2018	Subsidies for e-cargobikes to be provided					✓	
	July 2018	<ul style="list-style-type: none"> Expects that 100% of cars to be zero-emission by 2040 Want to see at least 50 to 70% of new car sales and 40% of vans to be ultra low emission by 2030 25% of government fleet to be ultra low emission by 2022	✓	✓	✓			✓
	March 2018	Encouraging ULEV uptake to realize every new car an ULEV from 2040 and an effectively decarbonised fleet by 2050	✓					
	July 2017	New diesel and petrol cars and vans to be banned from 2040 in UK	✓		✓			
	June 2017	<ul style="list-style-type: none"> 60% of new cars and vans to be electric vehicles by 2030. 100% of new cars electric by 2040. The United Kingdom established a target of 1.55 million vehicles by 2020. € 300 million will be devoted to promoting electric cars between 2009 and 2014.	✓	✓				
	January 2013	1,550,000 electric vehicles and 122,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)	✓					✓

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Country	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
Pakistan	November 2019	Electric vehicles capture 30% of all the passenger vehicle and heavy-duty truck sales by 2030, and 90% by 2040; for two- and three-wheelers and buses: 50% of new sales by 2030 and 90% by 2040.	✓	✓		✓		
	April 2018	Pakistan to cut import tax on EVs by 25% to stimulate EV Uptake	✓					
Colombia	August 2019	10% of vehicle sales to be zero emission by 2025, 600,000 electric vehicles by and government fleet to be 100% electric by 2030. No more fossil fuel cars to be sold after 2035.	✓					
Hungary	July 2019	In the next 2-3 years, every sixth bus will be replaced by an electric one and all public transport to be electric by 2029		✓				
	January 2013	7,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)						✓
Singapore	May 2019	All buses to run on clean energy by 2040, 60 electric buses to be introduced by 2020		✓				
	December 2017	Singapore's first electric car-sharing service was officially launched with 80 cars and 32 charging stations	✓					✓
	June 2016	1,000 electric cars will be rolled out across Singapore, powered by 2,000 charging points by 2020	✓					✓
Chile	May 2019	Chile to electrify all buses by 2040		✓				
	2016	Target to electrify 25% of public transport bus fleet in the capital Santiago by 2025 (National Climate Action Plan 2017-2022)		✓				
India	May 2019	To sell only electric three-wheeler from 2023, and two-wheelers from 2025				✓		
	March 2019	India has now more than 100 electric buses		✓				
	March 2018	Indian Government program FAME II with \$ 1.3 billion, to support demand-side incentives, buses, cars, two/three-wheelers	✓	✓		✓		

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Country	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
		Launch of National E-Mobility Program to have more than 30% of EVs by 2030						
	May 2017	Every car sold in India from 2030 will be electric	✓					
	2013	The 2020 target: 2W - 5 million vehicles, 3W - 30,000, 4W - 1 million vehicles, LCV - 50,000, Buses - 30,000 = Total 5 to 7 million vehicles	✓	✓	✓	✓		
South Korea	March 2019	To shift commercial vehicles (including trucks and construction machinery) to run on fuel cell energy by 2035			✓	✓		
	July 2018	1,000 hydrogen-powered buses to be on road in Korea by 2022		✓				
	December 2014	The government will strive to boost the number of battery-powered cars on the road from the current 800 to 3,000 in 2015 and 200,000 in 2020 and diversify the portfolio to taxis, buses and trucks. The initial target was 1 million vehicles by 2020.	✓	✓	✓			
Cabo Verde	February 2019	E-Mobility policy chapter includes to stop import of ICE vehicles by 2035 and to have only EVs by 2050, 100% public fleet by 2030					✓	
	May 2015	Making government vehicles electrically powered by 2030.					✓	
Costa Rica	February 2019	Costa Rica's 2050 decarbonisation plan includes 25% of vehicles, 70% of buses and taxis to be zero emission by 2035; 100% of vehicle sales, 60% of vehicles and 100% of buses to be zero emission by 2050					✓	
	January 2018	Signed law about tax exemption to promote e-mobility	✓					
	December 2017	Costa Rica aims for 37,000 new EVs within 5 years	✓					
	June 2017	Preparing bill to ban import of fossil fuel cars by 2030	✓					
	November 2015	greater use of electric transportation, both public and private	✓	✓				
Portugal	February 2019	Government supports purchase of 1000 e-bikes					✓	

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Country	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
	November 2018	Portugal intends to ban sales of ICE vehicles by 2040	✓					
	July 2017	Portugal will soon be fully covered by electric car charging stations, one in each municipality						✓
	January 2013	200,000 electric vehicles and 12,000 publicly accessible infrastructure stations by 2020						✓
	2009	The Portuguese State also committed to play an educational role and defined that EV's will have a 20% share of the annual renewal of the public car fleet, starting in 2011. It is estimated approximately 130,000 EVs will in circulation in Portugal by 2015 and 750,000 by 2020.					✓	
Sweden	January 2019	To ban fossil fuel cars by 2030	✓					
	October 2017	E-bikes are now subsidized with 25% purchase grant				✓		
	January 2013	600,000 electric vehicles and 14000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)					✓	✓
Canada	January 2019	100% zero-emission vehicle sales by 2040	✓					
	October 2013	Highway 401 (900 km) electrified with 20 public charging stations						✓
Indonesia	January 2019	Target to have 2.1 million electric motorcycles and 2,200 electric cars by 2025						
	August 2017	Indonesia to introduce tax breaks for low-carbon cars to achieve 29% less emissions by 2030	✓					
	October 2015	Electric vehicle and hybrid, each 1% and 5% share in 2050					✓	
Netherlands	January 2019	In 2018, sales of e-bikes higher than normal bikes				✓		
	January 2018	First electric container ship to start operating in summer 2018 between Belgium and the Netherlands				✓		
	October 2017	New government confirms plan to ban new petrol and diesel cars by 2030	✓					
	April 2016	Netherlands moots electric car future with petrol and diesel ban by 2025	✓					

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Country	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
	2015	75,000 privately owned electric vehicles on the country's roads by 2020, and 50% of all new cars sales plug-in electric—with at least 30% of these vehicles fully electric—by 2025	✓					
	January 2013	200,000 electric vehicles and 32,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)						✓
	July 2009	65 million euros to make “the Netherlands the guide and international laboratory for electric driving”					✓	
Spain	November 2018	Spain to propose ban sales of ICE vehicles by 2040	✓					
	August 2014	Spain offers 200 Euro purchase subsidy for e-bikes				✓		
	January 2013	2,500,000 electric vehicles and 82000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)					✓	✓
	January 2013	Spain established a target of 250,000 BEVs and PHEVs by 2014 and 2.5 million EVs by 2020					✓	
Israel	October 2018	Phase out new diesel and gasoline cars by 2030 To have 177,000 electric cars by 2025 and 1.5 million by 2030					✓	
	February 2018	To eliminate use of coal, gasoline and diesel for energy production and transport by 2030 but continue using natural gas					✓	
Denmark	October 2018	Ban of sales of new ICEs is planned, starting with only hybrids, EVs and fuel cell cars by 2030 and only EVs and fuel cells by 2035 By 2030, there will be more than one million EVs on the roads	✓					
	January 2013	200,000 electric vehicles and 5,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)					✓	✓

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Country	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
Iceland	September 2018	Iceland is to ban registrations of fossil fuel cars by 2030	✓					
Mexico	September 2018	By 2050, to sell only zero emission vehicle (5% of new vehicle sales by 2030 and 50% by 2040)	✓					
Japan	July 2018	All Japanese cars to be electric by 2050	✓					
	June 2017	To increase the share of electric vehicles and plug-in hybrid vehicles to between 20 and 30 percent and also the share of fuel cell vehicles up to 3 percent among total new passenger vehicle sales by 2030.	✓	✓			✓	✓
	June 2014	To develop technologies to produce battery packs whose energy density stands at 250Wh/kg and output density at 1500W/kg for EVs; and energy density at 200Wh/kg and output density at 2500W/kg for PHEVs; and the cost at ¥20,000/kWh for both in the year 2020.						
	2010	20% sales by 2020 and Charging station target of 2 million (normal) and 5000 (fast)						
Kyrgyzstan	July 2018	No import taxes on EVs from July	✓					
Uzbekistan	July 2018	Uzbekistan introduces zero duty on import of electric vehicles from January 2019	✓					
China	July 2018	New target to see 2 million EVs per year by 2020	✓					
	December 2017	China extends EV rebate to 2020	✓					
	September 2017	<ul style="list-style-type: none"> China considers to phase out diesel and petrol cars China builds world’s largest EV charging network with 167,000 stations To introduce new energy vehicle quota in 2019 					✓	✓
	2015	<ul style="list-style-type: none"> NEVs will reach 5% of the total vehicle market demand by 2020, and 20% by 2025, China issued the “Electric vehicle charging infrastructure development 	✓				✓	✓

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Country	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
		guide (2015-2020)” targeting 12,000 new centralized charging and switch station and >4.8 million charging spots (accommodating for needs of 5M NEVs by 2020) <ul style="list-style-type: none"> • The country's future roadmap of new-car sales projects 7 million ZEVs by the year 2025 						
	September 2013	Second phase of e-bus subsidy policies: all-electric buses to receive 38,000 to 64,000 euros, hybrids 32,000 euros and fuel cell buses 64,000 euros		✓				
	January 2009	<ul style="list-style-type: none"> • “Ten Cities, Thousands of Vehicles” demonstration program • Pure battery vehicle purchase subsidy of 64,000 euros and 77,000 euros respectively per vehicle hybrid bus could receive 64,100 euros to 54,000 euros 		✓				
Uruguay	July 2018	To introduce 110 electric buses and 550 electric buses by 2025	✓	✓				
Scotland	June 2018	Two new funds with a total of 1.3 million GBP are being announced to encourage more people to use electric bicycles				✓		
	September 2017	Scotland to ban sales of fossil fuel-powered vehicles by 2032 40% of car sales by 2032 to be EVs and other low emission vehicles					✓	
	June 2009	Almost complete decarbonisation of road transport by 2050 with significant progress by 2030 through wholesale adoption of electric cars and vans, and significant decarbonisation of rail by 2050	✓			✓		
Norway	May, 2018	To have emission-free vessels in Fjords and near harbors by 2026				✓		

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Country	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
	January 2018	All short-haul flights 100% to be electric by 2040				✓		
	September 2016	Differentiated purchase and use taxes on vehicles are essential for a quick introduction of zero-emission vehicles and plug-in hybrids. Shoreside electric power and electric charging power is to be available in ports where traffic and ship types provide a great potential for emission cuts, both in order to reduce greenhouse gas emissions and local air pollution while at berth, and to make hybrid solutions a viable option for ships. Within rail transport diesel is to be replaced by carbon-neutral fuels or low- and zero-emission technology. After 2025, all new light vehicles, new city buses and new light commercial vans should be ZEVs. By 2030, all new heavy commercial vans, 75 percent of new long-distance buses and 50 percent of new lorries should be ZEVs. By 2030, distribution of goods should take place almost without emissions in the largest city areas in line with the EU’s White Paper on transport	✓	✓	✓	✓		
Nepal	April 2018	Government announces intention to replace all fuel vehicles by EVs until 2030	✓					
Australia	March 2018	Opposition proposes to ban sales of diesel and petrol cars by 2030	✓					
Jordan	March 2018	10,000 electric car charging stations to be built in Jordan						✓
	September 2015	Introduce electric cars and build 3,000 charging stations over the next ten years						✓
Germany	March 2018	New government targets 100,000 public electric charging stations to be installed by 2020 Vehicle taxes for company EVs will be reduced	✓					✓

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Country	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
	February 2018	EU Commission approves €70 million public support scheme for electric buses and charging infrastructure in Germany		✓				
	July 2017	1,000 new EV charging stations on German Autobahn by 2020						✓
	October 2016	<ul style="list-style-type: none"> • Only zero-emission passenger vehicles will be approved” for use in 2030. • One million electric cars on German roads by 2020. • Make all passenger vehicles sales ZEVs by no later than 2050 	✓				✓	
	January 2013	150,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)						✓
	April 2011	Germany aims for 1 million EVs by 2020	✓					
	January 2009	Germany has set itself a battery density by volume level of 280 to 300 Wh/l by 2025					✓	
Fiji	February 2018	By 2030, to have more hybrid and electric vehicles in the private and public transportation sector	✓	✓				✓
Ireland	February 2018	National Development Plan 2018-2027 includes target of 500,000 EVs by 2030, no new non-zero emission vehicle to be sold in 2030, more electric buses and no diesel only buses purchased from 2019	✓	✓				✓
	July 2017	Ireland wants to electrify all vehicles (cars and vans) by 2030	✓					
	January 2013	350,000 electric vehicles and 2,000 publicly accessible infrastructure stations by 2020						✓
	2011	By 2020 the EV contribution to the passenger car segment is 10%, growing to 60% by 2050 in the medium scenario	✓					✓

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Country	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
Thailand	February 2018	ChargeNow expands charging network in Thailand						✓
	March 2016	The goal for Thailand is to get 1.2 million electric vehicles and build 690 charging stations on its roads by 2036					✓	✓
Ukraine	January 2018	Ukrainian Parliament has adopted a provisional exemption on value-added tax and excise tax for all electric vehicles for 2018	✓					
Poland	December 2017	Polish government adopts e-mobility draft with no excise tax on electric vehicles, zero parking fees for e-car drivers and clean transport zones and 6,000 charging stations	✓					✓
	September 2017	By 2025, there will be a million electric cars on polish roads, as well as introducing the concept of electrification of public transport.	✓	✓				
	April 2017	Roadmap for Deployment of E-mobility Charging Infrastructure in Poland	✓					✓
	February 2017	41 cities and municipalities signed an agreement to buy fleets of electric buses by 2020		✓				
	September 2016	Poland aims to have 1 million electric cars on its roads by 2025	✓					
	January 2013	46,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)						✓
Sri Lanka	November 2017	Replace all state-owned vehicles with electric or hybrid models by 2025 and all private vehicles by 2040					✓	
	November 2017	To cut taxes on electric cars by at least one million rupees (6,500 USD), also less for electric buses and two/three-wheelers	✓	✓		✓		
	April 2015	10% of vehicle fleet to be electric by 2020	✓					
Iran	November 2017	Tax exemptions planned for hybrid electric vehicles	✓					

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Country	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
Slovenia	October 2017	Slovenia to ban new fossil-fuel cars from 2030, reduce debt	✓					
	January 2013	14,000 electric vehicles and 3000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)					✓	✓
United Arab Emirates	September 2017	Aims for 42,000 electric vehicles (EVs) on the emirate's streets by 2030						
	May 2017	10 per cent of car fleets of federal ministries and agencies to be electric vehicles, long-term plan aims for up to 20 per cent of government fleets to have electric vehicles	✓					
Malaysia	August 2017	By 2030, 100,000 electric cars, 100,000 electric motorcycles on the road, along with 2,000 electric buses and 125,000 charging stations in the country	✓	✓		✓		✓
Georgia	July 2017	€5.5 million sovereign loan to Georgia to be on-lent to the City of Batumi to acquire 10 battery-electric buses		✓				
	January 2017	Import taxes for Hybrids reduced by 60%, BEVs completely free of import duties	✓					
France	July 2017	The French government has set out an ambitious goal for no more petrol or diesel cars to be sold in the country by 2040.	✓					
	February 2017	France offers 200 Euro subsidy on electric bicycles				✓		
	November 2015	7 million charging points for plug-in hybrid and electric vehicles by 2030						✓
	January 2013	97000 publicly accessible infrastructure stations by 2020						✓
	October 2009	France in 2009 had established 2 million by 2020 target						
Austria	April 2017	Austria renews e-bike support: 500 Euro for e-cargo bike and 200 for e-bike				✓		
	January 2013	250,000 electric vehicles and 12,000 publicly accessible infrastructure stations by 2020. 5% share of all registered passenger vehicles.					✓	✓

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Country	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
South Africa	April 2017	Country will have more than 2.9-million electric cars on the road by 2050, with R6.5-trillion invested in the industry over the next four decades.	✓					
	November 2015	Target 20% hybrid-electric vehicles by 2030.						
Finland	November 2016	250 000 electric vehicles by 2030 (street or parking lot charging station)					✓	
	January 2013	7,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)						✓
Slovakia	September 2016	Slovakia's target is for 31 per cent of all new vehicles in the country to be electric by 2030. The Ministry plans in the future to build one charging station for every 10 EVs.	✓					
	January 2013	4,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)					✓	✓
New Zealand	May 2016	A goal of reaching approximately 64,000 electric vehicles on our roads by the end of 2021					✓	
Andorra	June 2016	Andorra Approves €9,000 Subsidy For Electric Cars, €11,000 For Electric Pickup Trucks	✓		✓			
Belarus	June 2016	<ul style="list-style-type: none"> • At least 10,000 electric vehicles in Belarus by 2025 • Two scenarios: 30,800 electric cars and 1,880 electric buses (optimistic scenario) or 9,960 electric cars and 590 electric buses (pessimistic scenario) 	✓					
Azerbaijan	November 2015	Enhance the use of electric vehicles at public transportation		✓				
Cambodia	November 2015	Increase use of hybrid cars and electric vehicles	✓					
Colombia	2015	96 vehicles using electricity	✓	✓				
Dominica	September 2015	government vehicles to be replaced by hybrids vehicles	✓					

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Country	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
Ecuador	May 2015	<ul style="list-style-type: none"> Clean Mobility plan includes integrated urban transport system and all new taxis must be electric All new vehicles on Galapagos to be electric 	✓					
	February 2015	Government plans to promote electric mobility					✓	
Marshall Islands	July 2015	Introduction of electric vehicles	✓					
Mongolia	November 2015	Increase the share of private hybrid road vehicles from approximately 6.5% in 2014 to approximately 13% by 2030	✓					
Seychelles	November 2015	More use of electric vehicles charged with renewable energy technology	✓					
Mali	2015	Replace more than one-third of fossil fuels (with renewables) for transport by 2030					✓	
Bhutan	November 2014	Bhutan is a 70 percent reduction in fossil fuel imports by 2020 & enhance market share of EV substantially in 5 years					✓	
Brunei Darussalam	December 2014	White paper on Land Transport considering zero-emission electric vehicles, electric buses	✓	✓				
Philippines	March 2014	<ul style="list-style-type: none"> Bill promoting Electric Vehicle and Hybrids which has been under the Senate since 2014 Electric Vehicle Association of the Philippines (EVAP) aspires for the establishment of a national development program for EVs 					✓	
Belgium	January 2013	21,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)						✓
Bulgaria	January 2013	7,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)						✓
Cyprus	January 2013	2,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)						✓

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Country	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
Czech Republic	January 2013	13,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)						✓
Estonia	January 2013	<ul style="list-style-type: none"> • 1,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station) • World's first nationwide network of fast chargers (165 quick charging stations) 						✓
Greece	January 2013	13,000 publicly accessible infrastructure stations by 2020						✓
Italy	January 2013	125,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)						✓
Lithuania	January 2013	4,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)						✓
Luxembourg	January 2013	40,000 electric vehicles and 1000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)					✓	✓
Latvia	January 2013	2,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)						✓
Malta	January 2013	1,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)						✓
Romania	January 2013	10,000 publicly accessible infrastructure stations by 2020 (street or parking lot charging station)						✓
Viet Nam	August 2013	100,000 electric cars as part of 6 million environmentally-friendly vehicles by 2020	✓					
EU	March 2011	Halve the use of 'conventionally-fuelled' cars in urban transport by 2030; phase them out in cities by 2050; achieve essentially CO2-free city logistics in major urban centres by 2030	✓		✓			
Antigua and Barbuda	August 2011	Strategic Intent for support of hybrid, flex-fuel or electric vehicles					✓	
United States of America	February 2011	One million electric vehicles on the road by 2015		✓			✓	

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E-Mobility Targets by Cities and Regions

Numerous cities are following similar bold actions as taken by national governments. For instance, by 2030, Seattle aims for a 30% share for electric vehicles, and Dubai is targeting a 10% share. Hong Kong wants to replace all conventional buses with zero emission buses. An outstanding example is London, which plans for a zero-emission transport system by 2050.

City/Region	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
New Delhi	December 2019	Delhi rolls out electric vehicle policy, aiming for 500,000 electric vehicles by 2025, 25% of registrations to be electric by 2024, 100% of last-mile delivery to be electric by 2025	✓		✓	✓		✓
	November 2018	Draft Electric Vehicle Policy aims for 25% of all new vehicle registrations by 2023 to be battery-electric vehicle	✓					
	March 2018	1000 fully-electric buses in Delhi during the 2018-19 fiscal year, 905 electric feeder vehicle and E-rickshaw subsidy		✓				
Colorado	August 2019	Colorado will require electric cars to make up 5% percent of an automaker's lineups by 2023.	✓					
Ahmedabad	July 2019	To procure 300 electric buses		✓				
British Columbia	July 2019	To replace 1,200 existing buses with e-buses and adding another 350 over the next 10 years, goal is to have entire fleet of electric buses by 2040.		✓				
	November 2018	To only sell zero-emission vehicles (cars and trucks) by 2040 (10 % by 2025 and 30 % by 2030)	✓		✓			
	December 2015	Make all passenger vehicles sales ZEVs by no later than 2050	✓	✓				
Balearic Islands	July 2019	Target is 100% renewables by 2050 and will stop sale of new gasoline and diesel cars by 2035, car hire business will go all-electric	✓					
Gurugam	July 2019	To add 100 electric minibuses		✓				
San Francisco	July 2019	San Francisco aims for emission-free transportation by 2040 and wants to ban sales of ICE vehicles by 2030	✓	✓				

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City/Region	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
	April 2017	Starting January 2018, the ordinance requires new residential, commercial, and municipal buildings to have sufficient electrical infrastructure to simultaneously charge vehicles in 20% of parking spaces.					<input checked="" type="checkbox"/>	
Milan	July 2019	Milan to receive 250 electric buses, 40 buses to be delivered by 2020		<input checked="" type="checkbox"/>				
	October 2017	Signed C40 Fossil-Fuel-Free Streets Declaration (to procure only zero-emission buses from 2025)		<input checked="" type="checkbox"/>				
Kerala	June 2019	1 million EVs (buses, cars, ferries, two/three-wheelers and freight vehicle) by 2022					<input checked="" type="checkbox"/>	
Toronto	June 2019	Introduces first electric bus, to have 60 e-buses by 2020		<input checked="" type="checkbox"/>				
Los Angeles	April 2019	Los Angeles aims to increase the percentage of electric and zero emission vehicles in the city to 25% by 2025, 80% by 2035, and 100% by 2050; electrify 10% of its taxi fleet by 2022, and 100% of its fleet by 2028. LA wants to electrify all of its Metro and LADOT buses by 2030, and it plans to introduce 155 new electric buses into its fleet in 2021; wants to install 10,000 publicly available EV chargers by 2022; and 28,000 chargers by 2028.					<input checked="" type="checkbox"/>	
	October 2017	Signed C40 Fossil-Fuel-Free Streets Declaration (to procure only zero-emission buses from 2025)		<input checked="" type="checkbox"/>				
	July 2017	Move to 2,300 electric buses for emission-free public transport fleet by 2030						
	March 2017	Increase the percentage of electric and zero emission vehicles in the city to 10% in 2025 and 25% in 2035					<input checked="" type="checkbox"/>	
Seoul	April 2019	Seoul plans to replace 100,000 motorcycles in the capital with electric ones by 2025				<input checked="" type="checkbox"/>		
	July 2018	Seoul Capital Region to transform all diesel buses to CNG, electric or hydrogen buses by 2027		<input checked="" type="checkbox"/>				
	January 2011	Seoul's Bus Fleet Plans to Turn Half Electric by 2020 and 120,000 EVs on Seoul streets by 2020		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	

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City/Region	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
Hainan	March 2019	China's island province of Hainan will ban the sale of oil-fueled automobiles throughout the province by 2030 and shift all government fleets by 2020	✓					
California	December 2018	California announces transition to all-electric buses by 2040		✓				
	February 2018	Lawmakers wants all Uber, Lyft cars to be electric by 2028	✓					
	January 2018	Seeks Ban on Fossil-Fueled Vehicles by 2040	✓					
	January 2017	over 4 million zero-emission vehicles by 2030	✓	✓				
	October 2016	An updated roadmap toward 1.5 million zero-emission vehicles on California roadways by 2025	✓	✓				
	December 2015	Make all passenger vehicles sales ZEVs by no later than 2050	✓	✓				
Santiago	November 2018	100 new electric buses introduced, plans to have 500 more electric buses by 2020		✓				
	December 2017	Introduced 3 full electric buses in December 2017 and plans to have 90 buses in 2018		✓				
Porto	November 2018	Will have 86 new electric buses, representing 41% of bus fleet within next two years		✓				
Bengalore	September 2018	Bengalore to have 100% electric buses by 2023		✓				
Rotterdam	July 2018	Rotterdam announced to make its busses 100% zero emission by 2029, starting with 55 new busses by the end of next year		✓				
Medellin	July 2018	Committed to change all buses to 100% electric		✓				
Gothenburg	July 2018	Gothenburg purchases 30 more electric buses to achieve target of 80% less transport emission by 2020, 95% of transport to be powered by renewable energy by 2025		✓				
Maharashtra	May 2018	E-Mobility programme launched, 10 EVs in Mumbai, target is to have 500,00 EVs and 100,000 jobs	✓	✓				
Ulsan	May 2018	Transform all 741 buses to fuel-cell buses by 2035		✓				
Washington, D.C.	April 2018	14 EV buses put into service		✓				
Oslo	April 2018	To add 70 electric buses by summer of 2019		✓				

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City/Region	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
	January 2017	Subsidy of \$1,200 for citizens to buy electric cargo bikes and \$600 for normal e-bikes				✓		
	June 2016	City of Oslo shall facilitate a city logistics system where traffic demand is reduced, and where all new cars and light freight vehicles in Oslo shall use renewable fuels or be plug-in hybrids from 2020.	✓		✓			
Cardiff	April 2018	Cardiff's city light vehicle fleet to be zero emission by 2022	✓					
Australian Capital Territory	April 2018	Transition to Zero Emissions Vehicles Action Plan 2018-2021 was announced, government fleet to be zero emission vehicles by 2021, zero emissions vehicles allowed to drive in transit lanes until 2023 and charging infrastructure to be expanded	✓			✓		✓
Katowice	March 2018	Acquires 300 battery electric buses, now 30% of bus fleet electrified		✓				
Paris	March 2018	Citizens can receive 400 Euro for purchasing an e-bike, 600 Euro for electric or conventional cargo bikes				✓		
	February 2018	800 hybrid buses employed in Paris, to have 100% clean fleet (4,700 clean buses) by 2025						
	November 2017	Climate Action Plan: zero diesel vehicles by 2024, no more petrol-fueled cars by 2030, Zero local emissions by 2050		✓			✓	
	October 2017	Signed C40 Fossil-Fuel-Free Streets Declaration (to procure only zero-emission buses from 2025)		✓				
	December 2016	Ban diesel cars and vans by 2025	✓					
	July 2015	Program to give \$11,400 incentive for people trading in an old diesel for an EV	✓					
Buenos Aires	March 2018	Buenos Aires to introduce 8 electric buses on four lines in trial phase, part of Clean Mobility Plan 2035		✓				
Rome	March 2018	Rome is banning all oil-burning cars by 2024					✓	
	October 2017	Signed C40 Fossil-Fuel-Free Streets Declaration (to procure only zero-emission buses from 2025)		✓				

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City/Region	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
Lhasa	March 2018	312 hybrid (gas-electric) buses now in operation and by end of 2018 over 80% of buses to be clean vehicles		✓				
Salt Lake City	March 2018	City removes fees at all 28 electric charging stations						✓
Karnataka	February 2018	<ul style="list-style-type: none"> Developed Electric Vehicle and Energy Storage Policy 2017 Achieve 100% electric mobility for auto rickshaws, cab aggregators, corporate fleets and school buses in Bengaluru by 2030 Introduce 1,000 EV buses Good transport with electric vehicles 	✓	✓	✓	✓		✓
Alexandria	January 2018	Purchasing 15 all-electric buses and 18 charging points	✓					✓
	March 2018	London Police added first ever zero-emission vehicles, goal is to have 550 vehicles by 2020	✓					
London	January 2018	First EV taxis start service	✓					
	October 2017	Signed C40 Fossil-Fuel-Free Streets Declaration (to procure only zero-emission buses from 2025)		✓				
	June 2017	<ul style="list-style-type: none"> 1500 electric vehicle charging points to be installed across London The Mayor’s aims are for all taxis and Private Hire Vehicles (PHVs) to be zero emission capable by 2033, for all buses to be zero emission by 2037, for all new road vehicles driven in London to be zero emission by 2040, and for London’s entire transport system to be zero emission by 2050. 	✓	✓	✓	✓		✓
Oregon	January 2018	Electric Vehicle Rebate beginning	✓					
Taiyuan	January 2018	Electrified entire taxi fleet in 2016, buses in 2018 and plans to ban ICE cars	✓	✓				
Chisinau	December 2017	NAMA on Hybrid and Electric Buses		✓				

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City/Region	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
Hawaii	December 2017	Hawaii committed to 100% renewable transport by 2045, Hawaii Clean Energy Initiative					<input checked="" type="checkbox"/>	
Cologne	December 2017	50 electric buses to be purchased		<input checked="" type="checkbox"/>				
Havana	November 2017	Trial run of Cuba's first electric bus started on November 27		<input checked="" type="checkbox"/>				
Tirana	October 2017	Started testing electric buses after introducing electric taxis	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Vermont	September 2017	To receive two electric buses as part of federal grant		<input checked="" type="checkbox"/>				
Utrecht	September 2017	<ul style="list-style-type: none"> Utrecht introducing electric buses 		<input checked="" type="checkbox"/>				
Beijing	October 2017 February 2017 November 2016	<ul style="list-style-type: none"> Study shows that without technological breakthrough and policies EVs will have market share of 7% by 2030, with new technology and supporting policies 70% of new vehicle sales will be electric, 50% of vehicle stock will be electric by 2030 All newly added or replaced taxis in the city of Beijing will be converted from gasoline to electricity. Beijing plans to install 435,000 charging stations between 2016 and 2020 	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Barcelona	October 2017	Signed C40 Fossil-Fuel-Free Streets Declaration (to procure only zero-emission buses from 2025)		<input checked="" type="checkbox"/>				
	October 2014	Barcelona supports e-bike buyers with 250 Euro (support was provided until end of 2017)				<input checked="" type="checkbox"/>		
Cape Town	October 2017	Signed C40 Fossil-Fuel-Free Streets Declaration (to procure only zero-emission buses from 2025)		<input checked="" type="checkbox"/>				
	September 2017	First electric buses have been introduced		<input checked="" type="checkbox"/>				
Copenhagen	October 2017	Signed C40 Fossil-Fuel-Free Streets Declaration (to procure only zero-emission buses from 2025)		<input checked="" type="checkbox"/>				
	July 2017	Copenhagen to procure only electric buses from 2019		<input checked="" type="checkbox"/>				

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City/Region	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
	September 2012	By 2025, public transport is carbon neutral, 20-30% LDVs and 30 to 40% HDV's use low carbon fuel (including electric)	✓	✓	✓			
Heidelberg	October 2017	Signed C40 Fossil-Fuel-Free Streets Declaration (to procure only zero-emission buses from 2025)		✓				
Mexico City	October 2017	Signed C40 Fossil-Fuel-Free Streets Declaration (to procure only zero-emission buses from 2025)		✓				
	December 2016	Ban diesel cars and vans by 2025					✓	
Quito	October 2017	Signed C40 Fossil-Fuel-Free Streets Declaration (to procure only zero-emission buses from 2025)		✓				
Seattle	October 2017	Signed C40 Fossil-Fuel-Free Streets Declaration (to procure only zero-emission buses from 2025)		✓				
	September 2016	30% of all light-duty vehicles in Seattle operate under electric power by the year 2030	✓				✓	
Vancouver	October 2017	Signed C40 Fossil-Fuel-Free Streets Declaration (to procure only zero-emission buses from 2025)		✓				
	November 2016	Approximately 70 per cent of light-duty vehicles will plug into an external power source in 2050	✓					
Bridgetown	September 2017	Bridgetown, the capital of Barbados, introduced solar-powered electric vehicle	✓					
Oxford	August 2017	100 electric vehicle charging points in "first on-street charging pilot of its size in the world" beginning in 2017						✓
Quebec	January 2017	<ul style="list-style-type: none"> Starting with the 2018 model year, 3.5 per cent of all auto sales in the province will have to be from those types of vehicles. That threshold will rise to 15.5 per cent for 2025 models. Quebec sets target of 100,000 electric and plug-in hybrids by 2020 Make all passenger vehicles sales ZEVs by no later than 2050 					✓	
	April 2016							
	December 2015							
Queensland	July 2017	Queensland will have a 2,000km network with 18 electric vehicle charging stations	✓					✓

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City/Region	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
New York City	April 2017	20% of the motor vehicles sold for use in New York City to be electric by 2025, up from less than 1% today					<input checked="" type="checkbox"/>	
	December 2015	Add 2,000 electric vehicles (EVs) to its municipal vehicle fleet by 2025	<input checked="" type="checkbox"/>					
Hong Kong	April 2017	The ultimate objective of the Government is to have zero emission buses running across the territory.		<input checked="" type="checkbox"/>				
Dubai	January 2017	A 10 per cent share for hybrid and electric vehicles among all new cars purchased between 2016 and 2020. It also targets that 2 per cent of all cars in Dubai will be either electric or hybrid vehicles by 2020 and it will reach 10 per cent by 2030	<input checked="" type="checkbox"/>					
Mexico City	December 2016	Ban diesel cars and vans by 2025					<input checked="" type="checkbox"/>	
Madrid	December 2016	Ban diesel cars and vans by 2025					<input checked="" type="checkbox"/>	
Athens	December 2016	Ban diesel cars and vans by 2025					<input checked="" type="checkbox"/>	
Amsterdam	September 2016	The target is to become a zero emissions city by 2025, with opportunities for everyone to adopt electric transport.						
Belgrade	September 2016	Purchase of electric buses		<input checked="" type="checkbox"/>				
Montreal	June 2016	10-point plan, among are converting municipal fleet to electric until 2020, electrify public transport (purchase only electric by 2025, set up 1000 charging stations by 2020	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>
US states (Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode	December 2015	<ul style="list-style-type: none"> Make all passenger vehicles sales ZEVs by no later than 2050 Commit to 1.8 million zero-emission vehicles by 2025 (3.3 million including California). 	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	
	May 2014							

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City/Region	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
Island, Vermont)								
Reykjavik	September 2016	<ul style="list-style-type: none"> All municipal vehicles will be powered through GHG emission-free energy by 2025 Modal split will consist of 58% private vehicles, 12% public transport, 30% walking and cycling by 2030 Vehicle traffic and public transport will be emission-free by 2040 Long-term goal: reduce GHG emissions by 73% before 2050 					✓	✓
US States (Washington, Oregon, California)	2016	West Coast Electric Highway with thousands of fast-charging stations						✓
Portland	June 2015	<ul style="list-style-type: none"> Electric vehicles will displace 10 percent of all miles driven by 2030 and an additional 15 percent of all miles driven by 2050. An estimated 50,000 electric vehicles in the metro area 					✓	
Brussels	May 2016	Brussels aims to fully electrify its bus fleet by 2030		✓				
Washington	December 2015 February 2015	<ul style="list-style-type: none"> 20 percent of new vehicles electric by 2017 50,000 Plug-In Electric Vehicles by 2020 					✓	
Stockholm	May 2011	Ambition to be one of the world’s leading clean vehicle cities by 2030 with electric vehicles playing important role in this transformation.					✓	
Jeju	May 2012	<ul style="list-style-type: none"> 371,000 electric cars and 225,000 rechargers will be available across the island by 2030 All its vehicles to be electric by 2030 	✓				✓	
Illinois	2009	By July 1, 2015, at least 20% of new passenger vehicles purchased must be hybrid electric vehicles					✓	

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City/Region	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
		(HEVs) and 5% must be battery electric vehicles (EVs); and by July 1, 2025, at least 60% of new passenger vehicles purchased must be HEVs and 15% must be EVs.						

E-Mobility Targets by Companies

A leading company in the field of e-mobility is Deutsche Post DHL, which has set a long-term goal to reduce all logistics-related emissions to zero by 2050 through its Go Green Program, in which electric mobility is poised to play a major role. The overview also includes all members of the EV100 group by The Climate Group.

Company	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
16 of UK's largest van fleet operators join Clean Van Commitment	September 2018	<ul style="list-style-type: none"> By 2020, these 16 fleets alone will put more electric vans on the road than have been purchased by the whole UK industry in the last year (2,400 in total) First time fleets collaborate to kickstart the replacement of UK's 4 million diesel vans by investing £40 million sending clear demand signal to manufacturers Further commitment for 18,000 electric vans to replace diesel vans by 2028 			✓			
Signify (Philips Lighting)	September 2018	Joined EV100 with the goal to electrify company fleet by 2030	✓					
Swedavia	July 2018	<ul style="list-style-type: none"> Swedish airport operator Swedavia made operations at Visby Airport fossil fuel free 10 more airports to follow until 2020 					✓	
Uber	June 2018	Uber launches EV Champions program, aims to deliver at least 5 million rides by EV in 7 pilot cities in USA	✓					

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Company	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
	September 2017	UberX has to be offered through hybrid and electric vehicles in London from 2020, for other UK cities, the goal is 2022	✓					
Christchurch Airport	June 2018	Airport aims to transition its vehicle fleet to 100% electric by 2030, member of EV100 Group					✓	
Chicago Transit Authority	June 2018	Purchase of 20 new, all-electric buses		✓				
Meru	April 2018	Meru, a ride-hailing service in India, partners with Mahindra in a pilot project to use EVs in Hyderabad and intention to transform fleet	✓					
Amsterdam Schiphol Airport	April 2018	Launches Green-Mobility Fleet with 100 electric buses, plans to have 260 by 2021 and to have zero-emission on the ground by 2040		✓				
UPS	April 2018	UPS Germany began testing two new electric VW Crafter vans			✓			
	February 2018	<ul style="list-style-type: none"> 50 plug-in electric delivery trucks will be comparable in acquisition cost to conventional-fueled trucks without any subsidies Company has more than 300 electric vehicles, and 700 hybrid electric vehicles Goal is that one in four new vehicles purchased by 2020 being an alternative fuel By 2025, 25 percent of the electricity it consumes from renewable energy			✓			
AB InBev	March 2018	By 2025, 100% of used electricity will come from renewable sources and a 25% reduction in CO2 emissions across value chain (science-based), also including transport			✓			
Flixbus	March 2018	Introduces first all-electric, long-distances buses on a 150 km route		✓				
AEON Mall	March 2018	<ul style="list-style-type: none"> EV100 member, commitment to install charging at all premises by 2030 						✓

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Company	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
		<ul style="list-style-type: none"> Already has 751 EV chargers installed at 135 malls in Japan, and 348 chargers at six malls in China 						
Askul Corporation	March 2018	EV100 member; commitment to transition transport fleets by 2030	✓					
Air New Zealand	March 2018	<ul style="list-style-type: none"> EV100 member; committed to fleet transition and charging infrastructure rollout by 2030 Already has transitioned 100% of its light vehicle fleet and more than half of its heavy airport service vehicles 					✓	✓
EDF Group	March 2018	As an EV100 member EDF Group is committed to fleet transition and charging infrastructure roll out by 2030					✓	
Mercury	March 2018	<ul style="list-style-type: none"> EV100 member; committed to transitioning fleets and rolling out charging infrastructure by 2030 Already has one of the largest EV fleets in New Zealand 					✓	
Royal HaskoningDHV	March 2018	<ul style="list-style-type: none"> EV100 member; committed to transitioning fleets and rolling out charging infrastructure by 2030 Commitment to transition staff fleet in the Netherlands to BEVs by 2021 	✓					✓
Zoomcar	February 2018	EV pilot in Mysore with Mahindra, plans to launch 500 more EVs across 20 cities in the coming months	✓					
RATP and Île-de-France Mobilités	February 2018	Plans to transform public transport fleet of Paris by having 4,700 clean buses by 2025		✓				
Auckland Transport	January 2018	Auckland Transport acquired 20 EVs and 26 charging stations, plans to have only emission-free vehicle by 2025	✓					✓

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Company	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
Shenzhen Bus Company	January 2018	Bus Fleet completely electric by end of 2017, over 16,000 vehicles		✓				
	June 2016	Shenzhen Targets to Go 100% Electric Buses by 2017		✓				
Deutsche Post DHL	September 2017	Member of EV100			✓	✓		
	March 2017	To reduce all logistics-related emissions to zero by the year 2050. One of the key actions under this strategy is reduce local air pollution emissions by operating 70% of our own first and last mile services with clean pick-up and delivery solutions, such as bicycles and electric vehicles by 2025						
Lyft	July 2017	By 2025, Lyft’s shared platform will provide at least 1 billion rides per year using electric autonomous vehicles.	✓					
Baidu	September 2017	Member of EV100, committing to transition its own fleets to EV as well as enabling staff to use electrified transport	✓	✓				
Heathrow Airport	September 2017	EV100 member, zero-carbon airport by 2050,						
HP INC.	September 2017	EV100 member, charging stations for employees in several countries						✓
IKEA	September 2017	EV100 member, EV charging stations at stores and planned transition of delivery vehicles to all electric fleet			✓			✓
LEASEPLAN	September 2017	<ul style="list-style-type: none"> EV100 member Leasing company recommending customers to use electric vehicles and transforming own vehicle fleet Commitment to electrify its employee vehicle fleet by 2021; working with customers to achieve zero net emissions from corporate automotive sector by 2030 					✓	

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Company	Announcement Date	Description	Modes					Charging Infrastructure
			Car/Taxi	Bus	Trucks	Others	No Mention/All	
Metro AG	September 2017	EV100 member, charging stations at stores and company car fleet to be electrified					✓	✓
Pacific Gas and Oil Company	September 2017	EV100 member, 1,600 electric-based vehicles, including a pioneering hybrid-electric bucket truck, program to install 7,500 level 2 EV charging stations at multi-family dwellings and workplaces					✓	✓
Unilever	September 2017	Member of EV100, plans to prioritize EVs and transition to all-EV fleet by 2030					✓	
Vattenfall	September 2017 February 2017	<ul style="list-style-type: none"> Joined EV100 initiative In February 2017 Vattenfall pledged to transition its entire vehicle fleet to EVs within the next five years (2022) 					✓	✓
Zion National Park, Utah	August 2017	First electric bus to the transit fleet at Zion National Park in southern Utah		✓				
Ola	May 2017	Powering India's first electric mass mobility ecosystem, together with Mahindra, Ola to use 200 EVs and 100 e-riskahws in Nagpur	✓			✓		
Companies in New Zealand	October 2016	New Zealand's largest companies are committing to at least 30 per cent of their corporate fleets being electric vehicles by 2019	✓					
Heineken	March 2016	To have by 2020 100% electric truck distribution for secondary distribution from the nine distribution centres in the Netherlands, using renewable energy		✓				

Market Trend Reports

The earliest report about the impact of e-mobility in this overview is from 2006 and over the years the number of publications has increased significantly. So far in 2017 there were 16 reports trying to predict the e-mobility growth. The findings are divided into sales penetration rates, price parity, battery costs and charging infrastructure. These market reports assume that electric vehicles will be cost competitive with internal combustion engine vehicles around 2030.

Regarding penetration rates, all market reports agree that the sales rate of electric vehicles will increase in the coming years, but different assumptions are made about the extent of the growth rates, with absolute projections for electric vehicles on the roads in 2030 varying from 71 to 160 million.

For instance, while Bloomberg’s *Electric Vehicles Outlook* believes that 50% of vehicle sales will be

electric by 2040, ITDP says that by 2050 very few non-electric vehicles will be sold. McKinsey even suggests that 100% of vehicles sold in 2025 will be electric due to economic trends, consumer demand, and strong regulatory intervention.

We also note that, few reports include details on charging infrastructure, while the development of charging points will be an essential factor for the growth of electric vehicles.

Year	Author	Title	Findings				Remarks/ Key Assumptions
			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity	Charging Infrastructure	
2019	IEA	Global EV Outlook 2019	In 2030, in the New Policies Scenario, global electric car sales to reach 23 million and the stock to exceed 130 million vehicles.				GHG emissions of the EV fleet reach almost 230 million tonnes of carbon-dioxide equivalent in 2030, offsetting about 220 Mt CO2-eq emissions
2018	Bloomberg	New Energy Outlook 2018	Sales of electric vehicles (EVs) expected to increase from a record 1.1 million worldwide in 2017, to 30 million by 2030		battery packs for stationary storage applications are set to experience a 66 % drop in cost from 2017 to 2030		Electric vehicles add around 3,461TWh of new electricity demand globally by 2050, equal to 9% of total demand. About half of the necessary charging for EVs will be dynamic, taking advantage of times when electricity prices are low because of high renewables output.
2018	IEA	Global EV Outlook 2018	In the New Policies Scenario, EV LDV stock could reach 125 million		Current costs in average around 360 USD/kWh for small	In 2017, there were 3.5 million charging outlets	

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Year	Author	Title	Findings				Remarks/ Key Assumptions
			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity	Charging Infrastructure	
			by 2030. In the EV30@30 scenario EV stock could even reach 220 million.		batteries, 155 USD/kWh for large batteries.	around the world, majority are private slow-chargers.	
2018	Bloomberg	Electric Vehicle Outlook 2018	There were 155 EV models in 2017 and it will grow to 289 by 2022. Sales will increase to 11 million in 2025, 30 million in 2030. By 2040, 60 million EVs (55% of new car sales) will be sold each year, total fleet will be 559 million (33% of global vehicle fleet). 80% of buses to be electric by 2040.	EVs will become competitive in 2024 on an unsubsidized basis and by 2029 EVs will reach parity due to lower battery prices. Buses will go faster electric than private vehicles.	Average price of batteries was 209 USD/kWh, 79% less than seven years ago. Energy density increased at around 5 to 7% per year. By 2040, batteries will cost 70 USD/kWh.		Electric buses and cars will displace 7.3 million barrels per day of transport fuel by 2040.
2018	Bloomberg	Electric Buses in Cities: Driving Towards Cleaner Air and Lower CO2	Global fleet of municipal buses totaled around 3 million units in 2017, 13% of all buses are electric.	Upfront cost parity of electric buses will be reached in 2030 but TCO parity will arrive sooner.	Assuming that currently a 250kWh battery has initial battery price of \$600/kWh.		
2018	WWF and Vivid Economics	Accelerating the EV transition	Under the 2040 phase out scenario for UK, there could be 13 million EVs in UK, annual EV sales to be at 60% in 2030.			Private charging infrastructure to account for 95% of charging. 34 million chargers needed by 2040	Study on UK.
2018	IEA	Nordic EV Outlook	Based on current market trends, EV stock will reach 4 million vehicles in Nordic countries (Denmark, Finland, Iceland, Norway, Sweden)			There could be 210,000 to 400,000 public charging stations by 2030.	

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Year	Author	Title	Findings				Remarks/ Key Assumptions
			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity	Charging Infrastructure	
2018	European Climate Foundation	Fueling Europe's Future	By 2050, the share of EV sales will be 74% in Europe. There will be 17 million EVs in 2030, 170 million EVs deployed in 2050.	By 2030, conventional cars will become more expensive and price parity to be reached soon after.			Employment in automobile sector to increase due to higher labor intensity of hybrid vehicles, but decrease expected after 2030
2018	BP	Energy Outlook 2018	By 2040, EVs will have 25% of sales and 190 million EVs in 2035, 320 million in 2040 In alternative scenario with ICE bans 100% of sales are EVs by 2040.				
2018	Fitch Ratings	Batteries Update: Oil Demand Could Peak by 2030	By 2025, 10 million battery EVs will be sold annually, EV sales to have a 33% annual growth rate. Global EV stock to be at 1 billion in 2040.				Increase of EVs will lead to a peak of oil demand by 2030.
2017	Wood Mackenzie	Future of renewables: a radical disruption?	By 2035, the EV stock will be at 350 million and 21% of total fleet will be EVs.				
2017	National Grid	Future Energy Scenarios	By 2050, 90% of all car sales will be electric vehicles. In two degree scenario, all cars sold post-2040 will be electric	EV vehicles to overtake ICE around 2033-2037. Super rapid EV charging and inductive EV charging already available to buy today	Price of EV batteries has fallen by 65 per cent since 2010	In this year's model we have made the assumption that 7 kW chargers become the standard whereas in last year's FES we assumed 3.5 kW. A number of companies are	The growth in EVs will have a significant impact on electricity demand. If not managed carefully the additional demand will create challenges across all sections of the energy system, particularly at peak times. In two degree scenario, 50% of cars will be

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Year	Author	Title	Findings				Remarks/ Key Assumptions
			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity	Charging Infrastructure	
						developing flash battery technology that could allow an electric vehicle to run for a long distance from a five minute charge.	autonomous shared vehicles.
2017	ING	Breakthrough of electric vehicle threatens European car industry	By 2035, 100% of car sales will be electric in Europe	High range BEV will be cost competitive by 2024	Battery cost to decline: battery pack prices should go towards \$100/kWh in 2025, range could be pushed towards 500km	Ultrafast charging of batteries will enable a 300km charge in 20 minutes	Electric vehicle will have large impact on value chain and job market, Europe's automobile industry in disadvantage
2017	Bloomberg	Electric Vehicle Outlook 2017	By 2040, 54% of new car sales and 33% of the global car fleet will be electric.	By 2029, EV's will have reached price parity with comparable internal combustion engine (ICE) vehicles	Lithium-ion battery demand from EVs will grow from 21GWh in 2016 to 1,300GWh in 2030. 270GWh of large format battery cell production to be online globally by 2021		We expect 80% of all autonomous vehicles in shared applications to be electric by 2040 due to lower operating costs. While we expect PHEV sales to play a role in EV adoption from now to 2025, after this we expect BEVs to take over and account for the vast majority of EV sales. Electricity consumption from EVs will rise to 1,800TWh by 2040 from 6TWh in 2016. While this represents just 5% of our projected global power consumption in 2040
2017	IEA	ETP-2017, B2DS	In B2DS, nearly all two- and three-wheelers are				

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			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity	Charging Infrastructure	
			electric by the mid-2040s, and more than 90% of all cars on the road are electric by 2060				
2017	IEA	Global EV Outlook	Electric car stock will range between 9 million and 20 million by 2020 and between 40 million and 70 million by 2025. By 2060, the 2DS projects that 1.2 billion electric cars, representing more than 60% of the total PLDV stock, will be in circulation. In the same scenario, the stock of electric two-wheelers is projected to exceed 400 million in 2030 (around 40% of the global total), and two-wheelers become fully electrified by 2055 (IEA, 2017b). Under the B2DS, transport electrification happens at an even faster pace: electric cars represent 85% of the total PLDV stock by 2060, and two-wheelers are fully electrified by 2045.	2015 powertrain investment costs for European vehicle characteristics range from USD 3 500 for ICEs to USD 7 800 for PHEVs and USD 12 400 for BEVs. The 2030 powertrain investment costs for European vehicle characteristics range from USD 4 700 for ICEs to USD 7 000 for PHEVs and USD 9 600 for BEVs. By 2030, BEVs and PHEVs will become fully cost competitive with ICEs in Europe, where fuel taxes are estimated to be high and vehicle attributes (namely power) more favourable to electrification than in other regions. High yearly mileage electric cars have clearly lower first-owner TCOs for almost all cases when compared with ICEs. This underlines the interesting synergies between shared mobility services and vehicle electrification	In 2015, the battery pack cost is USD 200/kWh for BEVs and 255 USD/kWh for PHEVs. In 2030, the battery pack cost decreases to USD 100/kWh for BEVs and USD 125/kWh for PHEVs	Publicly available EVSE outlets need to grow by a factor that ranges between 8 in the RTS and 25 in the B2DS by 2025, amounting to between 4 million and 14 million outlets globally in 2030. Projections for fast chargers suggest that EVI markets will need to see the deployment of 0.1 million additional outlets by 2025 in the RTS and 0.6 million in the B2DS. Extending the period to 2030 corresponds with 0.2 million outlets in the RTS and 0.7 million outlets in the B2DS.	BEV batteries have a range of 200 km in 2015; PHEV batteries have a range of 40 km. The electric range increases to 350 km for BEVs and 46 km for PHEVs by 2030. In 2015, PHEVs drive 30% of their annual mileage on the electric motor. This rate increases to 80% by 2030. The narrowing cost gap between electric cars and ICEs suggests that as electric car sales keep growing in the 2020s, governments will need to gradually revise their approach to electric car support, phasing out incentives in cases where BEVs and PHEVs actually rival ICE costs.

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			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity	Charging Infrastructure	
2017	UBS Evidence Lab	Electric Car Teardown – Disruption Ahead?	The share of EVs in global annual new car sales is 3% in 2021E and 14% in 2025E (30% in Europe, 5% in US, 13% in Japan) i.e. 23% of global car sales	EV powertrain \$9k more expensive today, going down to \$4k by 2025E. True TCO parity (true meaning the OEM makes a 5% EBIT margin) should be reached in Europe in 2023E, and in China in 2026E ex subsidies, 2-3 years earlier than previously expected	The battery pack, which is the largest cost item in the Bolt, is likely to become 36% cheaper by 2025E, from ~\$12.5k today to ~\$8.0k.	We estimate that \$14bn investments into charging infrastructure will meet requirements for 19m EVs on European roads in 2025.	Downside scenario: We forecast 5.7m EVs sold in 2025, or 5.5% of global car sales. This scenario discounts a low-to-zero political support level, sustained low gasoline prices and a slower-than-expected consumer response to EVs (TCO concept is not well understood as consumers are focused on vehicle selling prices only).
2017	Morgan Stanley and IHS	Morgan Stanley	16% penetration in 2030 accelerates to 51% by 2040 and 69% by 2050. In our bull case, based on an even more aggressive regulatory regime to accelerate the reduction of emissions, we get to 60% penetration by 2040 and 90% by 2045. Our bear case BEV penetration model assumes that BEV development proves too expensive, or technically not viable and governments are forced to delay regulatory tightening. In this case, new BEV models grow global share to 9% by 2025, but fade after that				

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2017	RethinkX	Rethinking Transportation	New ICE vehicle sales are finished by 2024, just three years after the regulatory approval and commercial availability of A-EV technology. In 2024, the pre-existing vehicle stock can more than meet the passengermile requirement for transport under individual ownership. ICE vehicles eliminated from fleet by end of 2030s at the latest		For EVs we assume that the vehicle will have a 250-mile range by 2020 by increasing the battery size of current vehicles (if required) and applying estimates of increasing battery power density. The other major adjustment we make for EVs is to apply a battery cost of \$200/kWh from 2017	
2017	Goldman Sachs	Rethinking Mobility (Equity Research)	.			VW plans to launch more than ten electric vehicle models by end-2018 and over 30 new battery electric vehicles (BEVs) by 2025. VW’s targets that 20%-25% of group sales will be electric vehicles in 2025, and in China alone, c.1.5 mn cars sold will be NEVs (mostly electric) in the same year
2017	McKinsey	An integrated perspective on the future of mobility	The Seamless Mobility system assumes that electric vehicles will comprise nearly 100 percent of light vehicle sales by 2025, driven by a mix of economics, consumer demand, and strong regulatory		The expected cost reduction per cumulative doubling of manufactured volumes of EV lithium-ion batteries is around 16–20 percent. Repurposed second-life EV battery	By 2030, electric vehicles could represent 3 percent of global electricity demand – assuming all 50 metropolitan areas marked as potential early adopters accelerate to the future states

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			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity		Charging Infrastructure
			intervention. As a consequence, by 2030 electrification levels in the vehicle parc in Seamless Mobility regions may have reached as high as 60 percent. The cumulative market size for EVs for 2015–30 would rise to 180 million vehicles, out of 1,700 million total light vehicles sales. If local systems accelerate rapidly, global 2015–30 EV sales may reach around 240 million		volumes will rise dramatically. By the mid-2020s a large quantity of used EV batteries will become available for stationary applications. Costs of new batteries could possibly fall as low as \$50/kWh– \$60/kWh in the longer term (1000 in 2010, 350 in 2015). Early estimates place the cost of repurposing them at around \$49/kWh, undercutting the price of new batteries.		outlined in this whitepaper, and that the rest of the world’s vehicle parc electrifies more gradually
2017	UC Davis, ITDP	3R Report	By 2020, 5 million EVs are sold annually worldwide (compared to 750,000 in 2016), with sales continuing to rise sharply thereafter. By 2050 few non-EVs are sold anywhere. Some EVs may well be plug-in hybrids, but even these we assume are basically phased out by 2050 as longer range EVs and fast charging become ubiquitous.	By 2030, EVs will have an average range of 250 miles (400 kilometers) and an incremental cost of about \$10,000 per vehicle. Costs could decline more than this, but our assumed increase in driving range requires larger battery packs, which we consider in our cost estimates. These incremental costs continue to decline to near zero in 2050. EVs in 2030 save enough on energy costs to pay back	Electrification of the drivetrain and cost of batteries together may cost about \$10,000 more than a conventional vehicle, reflecting declining battery costs but rising energy storage of batteries on the average EV. Our EV cost projections are roughly consistent with reports such as (McKerracher et al., 2016), though somewhat lower than reports that use		In 2016, the number of different (4-wheel) models available in countries around the world exceeded 100, including everything from electric minicars to plug-in hybrid sport-utility vehicles. the 2017 BMW i3 EV with a 94 Amp-hour battery offers 114 miles of electric range, up from 81 miles in the 2016 model. Notably, the 2017 Chevrolet Bolt EV offers 238 miles of range, a substantial improvement

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			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity		Charging Infrastructure
				within five years, even less for high-distance drivers.	higher future battery cost projections such as (Elgowainy et al., 2016)		over the 82-mile range of the smaller 2016 Chevrolet Spark EV.
2017	GFEI	Can we reach 100 million electric cars worldwide by 2030? A modelling/scenario analysis	To reach a global stock of 100 million PEVs by 2030, sales growth will need to be very rapid and reach somewhere between 20 and 40 million per year by 2030, depending on the shape of the sales growth curve. From their current levels of about 550,000 units per year worldwide, sales would need to grow by about 28% per year, every year from 2015 to 2030. Along the way they must reach nearly 2 million in 2020, nearly 10 million in 2025, and about 30 million in 2030 – with a combined	In 2013 PEVs were very expensive for vehicles within this class. While the “modal” price range for these cars was \$15-19k, followed closely by vehicles priced at \$19-23k, plug-in vehicles in this class were priced at \$27k-35k. PEVs were actually very competitive with vehicles in the \$31-34k price range, accounting for more than 1/3 of sales; but this is a tiny market segment with total sales of about 50,000 cars out of the 15 million sold in 2013			IEA ETP 2 degree scenario, which targets 140 million PEV light-duty vehicles by 2030. The 100 million target can be thought of in terms of numbers of PEV models multiplied by the average sales per model. For example, 30 million sales could be achieved with 100 models of PEV selling 300,000 units each around the world in that year, or 300 models selling 100,000 units each; either way a daunting challenge.

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			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity	
			effect (including some retirements over that time frame) that hits the stock target of 100 million in that year.			
2017	IRENA	Electric Vehicles – Technology Brief	<p>A 160 million EVs by 2030. EV markets achieve a “tipping point” between 2020 and 2025, when they start to rapidly increase market share relative to ICE vehicles. Annual EV sales would need to reach 40 million to 50 million by 2030, out of an expected overall market of 120 million to 130 million vehicles, in order for stocks to reach 160 million.</p> <p>EVs would become dominant by 2040, accounting for well over half of LDV sales around the world.</p>	<p>To achieve a tipping point in sales, EVs will likely need to achieve near parity on a first cost basis with ICE vehicles. In the 2015 calculation, with battery pack costs set at USD 350/kWh, EVs typically USD 10 000 more than conventional ICE vehicles, and the hybrids USD 3 000 more. By 2025 or even 2020, with battery costs dropping to USD 50/kWh and the incremental first cost of the EV down to USD 5 000 per vehicle. Fuel costs are somewhat higher by then (USD 1.25 per litre for gasoline and USD 0.14/kWh for electricity). In this case, anyone driving more than 15 000 km breaks even on ownership cost. In 2030, with the changes in vehicle costs (particularly the lower battery costs), the breakeven point is</p>	<p>For BEVs, a vehicle with 40 kWh of battery capacity may have a battery cost of USD 14 000, leading to a vehicle incremental cost of at least USD 12 000 compared to similar ICE vehicles, depending on retail mark-ups, incentives and other factors. New models to be introduced in 2017 and 2018 will be able to drive up to 300 kilometres (km) per recharge, but battery packs up to 60 kilowatt-hour (kWh), even if battery costs drop from their current levels of around USD 350/kWh to USD 150 kWh in the future, would cost USD 9 000, much more than the drive systems of today’s</p>	<p>Assuming all these new electric vehicles were to consume 100% renewable electricity, around 450 terawatt-hours (TWh) per year of additional renewable electricity would be required by 2030. This is equivalent to 1.5% of today’s total global electricity generation</p>

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			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity	
				much more attractive for EVs: USD 1.25/litre matched with USD 0.16/kWh	internal combustion engine vehicles.	
2017	Exxon Mobil	2017 Outlook for Energy: A View to 2040	<p>Falling battery costs will enable small, shorter-range electric cars to exceed more than 10 percent of new car sales in the U.S. by 2040, as high cost differentials begin to narrow versus conventional cars</p> <p>Full hybrid vehicles reach approximately 15 percent of the fleet, though many hybrid features, such as start-stop engines, penetrate into conventional vehicles. BEV share could be around 5%</p>			
2017	Carbon Tracker	Expect the Unexpected: The Disruptive Power of Low-carbon Technology	In scenarios applying our lower-cost assumptions, in which EVs achieve cost parity with conventional internal combustion engine vehicles (ICEs) by 2020, EVs take a 19-21% share of the road transport market over the subsequent ten years. To put this in perspective, BP's 2017 energy outlook sees EVs only commanding a 6%	This cost projection is credible given that most studies believe EVs will be cost competitive with ICEs when battery costs are between \$150-300/kWh and Tesla already claims that batteries will cost as little as US\$100/kWh by 2020. By 2050, the EV should cost around 20,000 to 30,000 \$/vehicle		1.1 billion EVs in the global vehicle fleet by 2040, compared to 150 million in the IEA NPS

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			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity	Charging Infrastructure	
			(100 million vehicles) share of the market five years later than this in 2035. Along with the emergence of hydrogen fuel and more efficient ICEs with an on-board battery ('oil hybrids'), lower-cost EVs contribute to ICEs losing market share to 45%/46% by 2030. EVs occupy over half the road transport market in 2040 and ICEs just a fifth. By 2050, BEVs have saturated the passenger vehicle fleet, which accounts for 69% of the road transport market. ICEs now account for just 12%/13% of vehicles, almost exclusively due to demand in medium-duty vehicles and commercial trucks				
2017	Roland Berger	E-mobility Index Q1/2017					Market watcher report on industry, technology and EV market for China, France, Germany, Italy, Japan, Korea and USA.
2016	Cycling Industry News	Electric Bikes Worldwide Report	200 Million Electric Bicycles Ridden Today– Poised to Grow to 2 Billion by 2050				

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2016	IDB	The incorporation of electric cars in Latin America	Frost & Sullivan (2015) estimate the market size of these six countries to 2023. According to their estimation, annual sales of PEVs in these six countries could range between 52,000 and 220.000 units in 2023, depending on regulatory changes, consumer acceptance and technology development ⁵ . This represents a market penetration between 0.3% and 2,5%.	Price premiums that range between 10% and 30% for HEVs, 50% to 80% for PHEVs and 80% to 150% for BEVs. The difference for the HEV ranges from 6,5% in Mexico to 26,4% in Peru (roughly USD 2.300 and USD 12.000 respectively), with the exception of Argentina, where the difference is remarkably high (172% or USD 88.000) ¹² . The difference for the BEV ranges from 55% in Mexico to 87% in Peru (roughly USD 19.000 and USD 35.000 respectively), again with the exception of Argentina, where the difference is 320% (USD 163.000).	The current cost of lithium-ion batteries for BEVs is approximately USD 400 per kWh and cost projections point to USD 200 to 250 by 2030 and USD 150 to 160 by 2050. The battery cost for PHEVs is likely to be USD 60 to 70 per kWh higher than for BEVs		The estimated emissions in terms of gCO ₂ per kWh are 165,3 for Brazil, 231,1 for Colombia, 364,9 for Peru, 425 for Argentina, 459,6 for Chile and 471,7 in Mexico.
2016	Marco Miotti, Geoffrey J. Supran, Ella J. Kim and Jessika E. Trancik	Personal Vehicles Evaluated against Climate Change Mitigation Targets	The 2050 target is likely to require a virtually ICEV-free fleet consisting almost entirely of BEVs and PHEVs	From lifecycle perspective, our results show that consumers are not required to pay more for a low-carbon-emitting vehicle. Across the diverse set of vehicle models and powertrain technologies examined, a clean vehicle is usually a low-cost vehicle			An all-electric fleet would increase 2050 electricity consumption in the U.S. by an estimated 1315 TWh per year, or about 28%
2016	The European Consumer Organization	‘Low carbon cars in the 2020s: Consumer impacts		Between 2020 and 2030 the costs associated with buying and running a	A replacement battery for a 2020 C Segment electric car is		

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			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity		Charging Infrastructure
		and EU policy implications' (Element Energy, Europe)		conventional and alternatively powered car will converge. Electric cars will fall in price rapidly between 2020 and 2030. By 2020, the difference in cost is expected to fall to 4% before narrowing further to around 1.5% by 2025 and ending up at less than a 0.5% gap by the end of the 2020s. This gap equates to a difference of around €100 by 2030, representing a remarkable fall from just under €2,000 in 2015. To put this €100 cost difference into context, it should be recognised that the range of electric vehicles should also increase from 200km to 320km.	predicted to cost upward of €5,000		
2016	BP	Back to the future: electric vehicles and oil demand	Global Electric Car Fleet to grow to 26 million by 2025 and 71 million by 2035 accounting for a little under a tenth of the total increase in the global car fleet.				In the IEA 450 scenario, the stock of EVs is presumed to reach around 450 million by 2035, some 380 million vehicles more than we envisage in our Outlook, with EVs accounting for half of the total increase in passenger vehicles over the next 20 years. In BP's 2016 Energy Outlook, we assumed a roughly even split

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							<p>between BEVs and PHEVs.</p> <p>EVs not likely to act as a major disrupter to oil demand over the next 20 years</p>
2016	OPEC	World Oil Outlook	<p>By 2040, hybrids (both HEV and PHEV) are anticipated to represent 28% of total passenger car sales in OECD Europe, ~26% in OECD America, 31% in OECD Asia Oceania, 19% in China, ~15% in developing countries, ~18% in China, 8% in India, 16% in Eurasia.</p> <p>BEVs rate's of total passenger car sales: 21% in OECD America, 19% OECD Asia Oceania ~15% in OECD Europe, ~4% in developing countries, ~15% in China, ~6% in India and ~5% in Eurasia.</p> <p>266 million EVs in 2040 (125 million PHEVs, 141 million BEVs) will be part of passenger car fleet; 15 million PHEVs and BEVs</p>		expected \$150/kWh by the early 2020s		

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Year	Author	Title	Findings			Remarks/ Key Assumptions
			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity	
2016	ICCT and ZEV Alliance	Assessment of next-generation EV technologies, and Evolution of incentives	2.3 million annual global vehicle sales by 2020 (3% of global vehicle sales). 4 million annual global sales per year 2023 (5% of global vehicle sales).	EVs cost-competitive for first vehicle owner (including fuel saving for five years) in 2020-2025 timeframe, depending on electric vehicle range, vehicle market, gas price	\$140/kWh battery pack level cost in 2023 (\$175/kWh for lower volume companies)	
2016	WWF	No Middle Road - The growth of electric vehicles and their impact on oil	Base projections for China – by 2040- 100% of sales, Optimistic projections for China- by 2035,100% of sales. Pessimistic projections for China – by 2045, 100% sales	EVs to become a cost competitive alternative to ICE vehicles in the mid-2020s.	Tesla forecasting that its batteries will cost US\$100/kWh by 2020	If we assume that EVs consume, on average, 0.3 kWh of electricity per mile travelled and that each EV travels 10,000 miles a year, our EV sales forecasts for China suggest that by 2050, the incremental power demand will be 914 to 1,079 TWh a year
2015	Goldman Sachs	A growing Low Carbon Economy	Grid connected vehicles (electric vehicles and plug-in hybrids) grow from c.\$12 bn in sales in 2015 to \$88 bn by 2020 and \$244 bn by 2025 i.e. 22% of market share amounting to almost 25 million vehicles. Hybrids will account for the lion's share of sales.		The battery range for lower performance EVs to increase by over 70%, while battery costs are expected to fall by more than 60% over the next five years	
2015	ICCT and ZEV Alliance	Global climate change mitigation potential from a transition to electric vehicles	30 million cumulative electric vehicles by 2025 (10-15% electric vehicle share in leading markets).			
2015	OPEC	World Oil Outlook	The share of hybrid electric cars is projected			

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			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity	
			<p>to grow from 1% to 14% in the period 2013–2040.</p> <p>BEVs are not expected to gain significant market share due to initial purchase price and convenience issues.</p>			
2015	Björn Nykvist and Måns Nilsson	Rapidly falling costs of battery packs for electric vehicles		<p>At US\$150 per kWh, BEVs are commonly understood as becoming cost competitive with internal combustion vehicle.</p> <p>International Energy Agency (IEA) estimates that parity with internal combustion cars in general is reached at US\$300 per kWh</p>	<p>We show that industry-wide cost estimates declined by approximately 14% annually between 2007 and 2014, from above US\$1,000 per kWh to around US\$410 per kWh, and that the cost of battery packs used by market-leading BEV manufacturers are even lower, at US\$300 per kWh, and has declined by 8% annually. Learning rate, the cost reduction following a cumulative doubling of production, is found to be between 6 and 9%, in line with earlier studies on vehicle battery technology. We reveal that the costs of Li-ion battery packs continue to decline and that the</p>	

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Year	Author	Title	Findings			Remarks/ Key Assumptions
			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity	
					costs among market leaders are much lower than previously reported. There is a convergence of estimates of battery cost for the whole industry and costs for market-leading car manufacturers in 2017–2018 at around US\$230 per kWh	
2014	Argonne National Laboratory	Vehicle Technologies Program Government Performance and Results Act (GPRA) Report for Fiscal Year 2015 (ANL-US)	<p>Battery Electric Vehicle penetration to reach 0.4% to 3.2% by 2050 (with or without program)</p> <p>Hybrid electric vehicle penetration to reach 66% to 77%.</p> <p>Medium- and Heavy-Duty Truck Market Penetration estimates range from 8% to 24% by 2050</p>			
2014	Accenture	The Electric Vehicle Challenge	EVs are projected to become 10 to 15 percent of the global auto market by 2020 from a current base of ca. 0.2 percent. In Europe, the market share of EVs including BEVs, PHEVs, and E-REVs, is expected to represent the lion’s share of the market by 2040 in terms			In the Accenture, global study of over 7,000 people in 13 countries” Plug-in electric vehicles: Changing perceptions, hedging bets,” 60 percent of those respondents who intend to purchase a car within the next decade say that they will probably or

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Year	Author	Title	Findings				Remarks/ Key Assumptions
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			of drive technologies compared to internal combustion engines (ICE), fuel cells, and other alternative fuels				certainly consider EVs as an option. This includes both plug-in hybrid electric vehicles and full-electric models.
2014	McKinsey	Electric vehicles in Europe: Gearing up for a new phase?	76% of vehicle sales could be electric in 2030 with a strong regulatory push. However, with inadequate regulatory support, the electric vehicles could constitute 48% share	Currently, estimates for difference in the TCO of EV compared to ICE vehicles vary widely, from ~EUR 5,000 to 20,000 per vehicle (for annual mileage of 20,000 km and a holding period of four years), depending on powertrain type, model, and country, as well as fuel price and other variables.	In the near term (towards 2015), battery costs (large format Li-ion battery packs) are expected to go down to ~USD 350-500/kWh. The main long-term drop, however, will come from technology evolution. The commercial scale introduction of the layered-layer cathode with a Si-anode, for example, could bring prices down to less than under USD 200 by 2020.	The Costs for the large-scale deployment of charging infrastructure in Europe are too significant to be borne by public sector alone (one slow two-plug charging station costs ~EUR 2,000 in hardware alone, two charges per vehicle required)	The number of EV model launches doubled in 2013 compared to 2012, and is projected to grow by 50% in 2014.
2013	IEA	Global EV Outlook 2013	2DS - three-fourths of all vehicle sales by 2050 would need to be plug-in electric of some type	For Price parity with ICE, IEA suggests 300 \$/kWh by 2020	Price per usable kilowatt hour of a lithium-ion battery ranges between USD 500-650 and thus makes up a large portion of a vehicle's cost, depending on the size of the battery pack. According to the U.S. Department of Energy (U.S. DOE), battery costs based on		

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			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity	
					development efforts have gone from USD 1,000 per kilowatt hour (kWh) in 2008 to USD 485/kWh of usable energy at the end of 2012. IEA estimates a learning rate of 9.5% which describes the reduction in cost of batteries through economies of scale.	
2011	Google	The Impact of Clean Energy Innovation	EV, PHEV and HEV LDV's could constitute 58% of LDV's by 2030	Gasoline costs of \$3.50/gal., breakeven TCO is reached at battery costs of ~\$255/kWh for a 125-mile range BEV, while at \$5/gal., breakeven TCO is reached at ~\$355/kWh	Average battery costs could reduce to (\$/Vehicle) 8000 by 2020, 5000 by 2030, 4308 by 2040 and 4000 by 2050. The battery energy Capacity Cost (\$/kWh) could reduce from 500 (2010) to 200 (2020), 100 (2030), 80 (2040), 70 (2050). The Energy Density (Wh/kg) increases from 100 (2010) to 300 (2020), 400 (2030) and 500 (2050)	
2010	European Commission Joint	Plug-in Hybrid and Battery Electric Vehicles- Market	The deployment of pure electric cars is expected to remain very limited at		Typical densities are currently around 140 Wh/kg and 730 W/kg.	In the Batt1 scenario, technical progress is slow and limited to a better

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Year	Author	Title	Findings			Remarks/ Key Assumptions	
			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity		Charging Infrastructure
	Research Centre Institute for Prospective Technological Studies	penetration scenarios of electric drive vehicles	least until 2020. The access to charging infrastructures at home, in working and urban public places will be the first barrier to a large-scale market development of electric cars. This holds true both in the near and longer term. Faster market penetration would be achieved in the case of PHEVs as soon as they are commercialised (~2020). A voluntarist development of standards and charging infrastructure would contribute to doubling the market penetration of both BEVs and PHEVs by 2030 compared with what would happen under a much more limited development. By 2020, 5.5 to 14% share. By 2030, 15% to 62% share		While current price is in a range 700-1000 \$/kWh, costs as low as 300\$-400\$ are seen achievable by 2020.		durability while the usable SOC window remains unchanged. A continuous cost reduction is assumed, up to ~300 €/kWh. In the Batt2 scenario, progress is faster and more radical (200 €/kWh by 2030)
2010	Boston Consulting Group	Batteries for Electric Cars	Fully electric vehicles as convenient as ICE-based cars are unlikely to be available for the mass market by 2020.	To reach price parity in US by 2020, three important conditions (in full or some combination with less degree) – 300\$ per Barrel, 200% increase in gasoline prices due to higher oil price or increased tax or	Battery cells today can reach nominal energy density of 140 to 170 watt-hours per kg, compared with 13000 Wh/kg. Even if energy density were to double in the next 10	Infrastructure charging costs at 2020 to be \$ 20 billion	

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Year	Author	Title	Findings				Remarks/ Key Assumptions
			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity	Charging Infrastructure	
				both and \$7500 in governmental incentives available per car.	years, battery packs would still store only about 200 Wh/kg of weight. Assuming 250 kg, 20-25% of total weight of small cars, doubling of energy density would give a range of about 300km. Considerable challenges to reach battery costs of \$250 per kWh by 2020.		
2010	J.D. Power and Associates	Drive Green 2020: More Hope than Reality?	By 2020, 5.2 million units (7.3% of the total) will feature some type of battery-powered configuration. The United States is forecasted to account for 53% of the global HEV total, followed by Japan (20%) and Europe (16%), while the remaining 11% will be spread among all other countries. On a regional basis, Europe is expected to account for 56% of BEV sales by 2020, followed by China (25%), the United States (8%), and Japan (5%).	Compared with a traditional compact vehicle powered by an internal combustion engine (ICE), a comparably sized HEV is typically priced 30%-40% higher, and a BEV is priced 50%-100% higher (depending on the subsidies received)	A Li-ion battery, for example, is expected to have a useful life of up to 200,000 km (124,000 miles), and the cost to replace the battery pack is expected to range from US \$10,000 to US \$15,000		More than 30 global vehicle automakers are expected to be manufacturing and selling BEVs by 2020, but only one—the Renault-Nissan Group—is expected to have more than a double-digit share of the global BEV market by that time. Renault-Nissan is forecasted to account for 34% of all BEV sales by 2020, followed by the PSA Group (6.1%) and the Volkswagen Group (6.0%)
2010	HIS Global Insight	Battery Electric and Plug-in Hybrid Vehicles: The Definitive	Business-as-Expected: PHEV Share 8.6% BEV Share 9.9% Cornutopia:	By 2030, with all of this third party assistance (from governments, utilities, employers, etc.) it is expected that the urban			

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Year	Author	Title	Findings			Remarks/ Key Assumptions	
			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity		Charging Infrastructure
		Assessment of the Business Case	<p>PHEV Share 31.3% BEV Share 29.2%</p> <p>Disruptive: PHEV Share 21.6% BEV Share 30.0%</p>	transport sector can be largely converted to BEVs			
2009	Boston Consulting Group	The Comeback of Electric Car	BEV share to 3% to 10%, Range extender EV to be 3% to 6% and Hybrid electric vehicle share to be 20% to 26% by 2020 (share of new sales)	At the battery cost of 700\$ per kWh, the electric car costs more than advanced ICE vehicles and hybrids when oil prices are below \$ 280 per barrel. Only if the battery costs drops low, to \$500 per kWh, will the electric vehicle become attractive at an oil price between \$100 and \$120 per barrel	500\$ to 700\$/kWh by 2020		
2009	Transport and Environment	How to avoid an electric shock Electric cars: from hype to reality	<p>it usually takes 10 to 20 years to achieve 5% of new sales.</p> <p>Most scenarios even think it unlikely that electric vehicles will number more than 25% of new sales by 2050. Faster market penetration would require a combination of competitive technologies and strong policy incentives or regulations.</p>	The cost and range factors outlined are likely to persist until 2030. As such, without a dramatic shift in consumer expectations, the electric vehicle is likely to remain a niche vehicle (Kromer and Haywood 2007: 90).	Graph 15 shows that, in the decade 1991-2001, the cost of lithium ion batteries decreased substantially, while capacity increased. However, battery prices are still unlikely to fall sufficiently in the medium term to enable pure EVs to compete with conventionally-powered vehicles.		
2009	EUCAR	The Electrification of the Vehicle and			A cost less than 150 €/kWh has to be		Even if a lot of progress has occurred in terms of

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Year	Author	Title	Findings			Remarks/ Key Assumptions	
			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity		Charging Infrastructure
		the Urban Transport System			<p>achieved in 2020 (300 €/kWh in 2015) for a widespread dissemination of EVs</p> <p>Energy density has to be improved at least to 200 Wh/kg in 2020 (150 Wh/kg in 2015). Current technologies achieve below 100 Wh/kg</p>		energy content related to volume and weight of a modern battery, these characteristics remain about hundred times lower than that of fuels for combustion engines. This fact is one of the main challenges for electric mobility, as it influences both costs and usability. For this reason, the Battery Electric Vehicle (BEV) will mainly be used for urban and near-urban transportation.
2008	IEA	ETP-2008	ACT Map - Beginning in 2020, electric vehicles reach 20% of travel on electricity by 2050 (LDV's) to Blue EV success scenario with 90% of LDV sales by 2050				130 Mtoe of electricity (ACT Map) to 650 Mtoe (Blue EV success scenario). Electric vehicles are assumed to penetrate at 5 to 10 years lag in non-OECD countries when compared with OECD countries.
2008	Deutsche Bank	Electric Cars: Plugged In	We project hybridized/electric vehicles will represent 20% of new vehicle sales in the U.S. (slightly above NHTSA's 20% estimate) and 50% of Western European sales (in line with Roland Berger and JD Power estimates). By	Over time, we believe the switch to lithium technology will reduce the cost of the battery to approximately \$500 per kWh and additional volume should reduce other costs to approximately \$1000 per unit. This would reduce	Following cost per lithium ion battery: mild hybrid \$500 (1kWh), full hybrid \$1000 (2 kWh), PHEV \$6,000 (12kWh) and EV \$11,000 (22 kWh).		

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Year	Author	Title	Findings				Remarks/ Key Assumptions
			Sales/Fleet Penetration Dimension	Price Parity	Battery Costs/ Battery Capacity	Charging Infrastructure	
			2020, we estimate penetration rates could increase to 49% in the U.S. and 65% in Europe.	the payback to approximately 3 years. However, the lighter weight and smaller size of lithium ion batteries could allow automakers to install a more powerful battery, thereby increasing fuel economy. We believe a 2 kWh battery could improve fuel economy to 65mpg for \$700 of additional cost which would further improve the payback to 2.8 years. We believe the current payback of PHEVs and EVs of 7.4 years and 8.1 years remains too high for these technologies to dominate the U.S. market at current gasoline prices, without other incentives, or new business models			
2006	Arthur D. Little	Market and Technology Study – Automotive Power Electronics 2015	In the view of European manufacturers up to 2030 the car market will be characterised by 83% domination of conventional gasoline and diesel propulsion technology. The remaining 17% market segment will be divided between alternative forms of propulsion. The hybrid drive will take				The hybrid share of the car market will rise to 2.8 million in 2011 and increase to 6 million by 2015

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Year	Author	Title	Findings				Remarks/ Key Assumptions
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			over market leadership with 15%. The residual 2% will be covered by vehicles using fuel cell technology.				

Automobile Manufacturer/OEM Targets

The automobile industry is quickly embracing electric vehicle technology and the majority of global car manufacturers are developing long-term EV targets, though the scale of these targets differs widely. For example, the German automobile companies BMW, Daimler and Volkswagen expect that electric vehicles will account for up to 25% of sales by 2025, and Volvo and Peugeot are targeting a higher share as they quickly move to scale up development of electric models

Auto companies are actively working on introducing electric car models. Hyundai is planning for 26 hybrid, fuel cells and battery electric vehicles models by 2020, and GM aims for 10 different electric vehicle models in the same year,

In the absence of a specific target, Rolls-Royce has announced that they plan to skip hybrid-electric vehicles and move directly to producing electric vehicles once the technology has reached a certain

level of maturity. Volvo has already ramped up its research and plans for all new models to be at least partially electric from 2019.

While Tesla is commonly seen as a major influencer in the electric mobility market, currently, the most dominant electric car company is Renault-Nissan, which sold nearly half a million electric vehicles in 2016 and has set an ambitious target to sell 1.5 million electric vehicles in 2020.

Company	Date	Targets and Projections
Ashok Leyland	July 2017	Target of clocking 10-15 per cent of its total volumes from electric mobility solutions by 2020
BMW	September 2017	Plans to have 25 electrified vehicles, of which 12 will be fully-electric by 2025
	June 2017	0.1 million electric car sales in 2017 and 15-25% of the BMW group's sales by 2025
	May 2017	EV sales account for three percent of BMW's overall sales
Chinese OEMs	June 2017	4.52 million annual electric car sales by 2020
Daimler	February 2018	<ul style="list-style-type: none"> • To invest 2.6 billion Euros (\$3.2 billion) in research on electric trucks by 2019 • effort to mass produce electric heavy-duty commercial vehicles from 2021
	June 2017	<ul style="list-style-type: none"> • 0.1 million annual electric car sales by 2020, • Plans for 10 new all-electric models and 15 to 25% of all their production being electric by 2025
Daimler-Bosch joint venture	November 2012	The Daimler-Bosch joint venture increased their original target of building 1 million motors by 2020, to 2 million units.
Delphi	August 2016	Electric vehicles (including hybrid) sales to reach 22 million by 2025
Einride	January 2018	Company developing self-driving trucks, named T-Pods, plans to deliver 200 vehicles in 2020
Fiat Chrysler Automobiles	February 2018	Fiat won't develop any diesel cars from 2022
	August 2017	After 2019 all Maseratis will be electrified
Ferrari	January 2018	To develop hybrid cars and eventually transition to fully electric cars (no timeline given)

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Company	Date	Targets and Projections
Ford	January 2018	To invest \$11bn and have 24 hybrid and 16 fully electric vehicles by 2022
	June 2017	13 new EV models by 2020
	January 2017	To spend \$4.5 billion in electrified vehicles by 2020, 40% of its model to have electric version by 2020
General Motors	October 2017	20 new EV models by 2023
	June 2017	30 thousand annual electric car sales by 2017
	May 2017	GM has plans to introduce 10 different electric models by 2020
Honda	March 2019	Honda to sell only electric vehicles in Europe by 2025
	October 2016	Two-thirds of the 2030 sales to be electrified vehicles (including hybrids, PHEVs, BEVs and FCEVs) The electric vehicles (mostly gas-electric hybrids) currently account for 5% of Honda's sales
Hyundai	August 2017	Hyundai to introduce new electric cars for 2022
	April 2016	By 2020, 26 planned vehicles include at least 12 hybrids, six plug-in hybrids, two EVs and two fuel cell vehicles spread across the Hyundai and Kia lineups
Jaguar Land Rover	March 2018	Jaguar Land Rover and Waymo will work together to design and engineer autonomous vehicles, 20,000 I-Paces to be build in two years
	November 2016	Half of all new Jaguar Land Rover vehicles will be available in an electric version by 2020
Mercedes-Benz	September 2017	Mercedes-Benz will electrify its entire car lineup by 2022
	March 2017	Mercedes-Benz Cars to bring more than 10 new electric cars to market by 2022 through 10 billion euros (\$10.8 billion) of investment, having previously aimed to achieve the target by 2025.
Nissan	March 2018	To sell 1 million electrified vehicles a year by 2022
Peugeot and Citroen cars	July 2017	Hybrid or electric versions of 80 per cent of its cars by 2023
Renault-Nissan Alliance with Mitsubishi Motors	June 2018	Commits 1 billion euros to four factories in northern France
	March 2018	Aims for 2025 to use the next generation of batteries within its automobile range
	January 2018	Sets up Billion-Dollar Venture Fund for Car Technology (incl. self-driving and electric cars)
	July 2017	Electric vehicles will be 20% of sales by 2020 where market conditions are right
	June 2017	1.5 million cumulative sales of electric cars by 2020

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Company	Date	Targets and Projections
	February 2017	Cumulative sales reach 424,797 electric vehicles worldwide
Rolls-Royce	July 2017	Rolls-Royce is skipping hybrids and going straight to electric cars
Schaffler	November 2016	46% by 2030 with 120 Million vehicles
Tesla	March 2018	Tesla shows electric semi truck at a first event, 140 orders so far
	August 2017	Tesla has now 380 Superchargers in the USA, 921 worldwide
	July 2017	First mass-market electric model of Tesla (Model 3) gets delivered
	June 2017	0.5 million annual electric car sales by 2018, 1 million annual electric car sales by 2020
	January 2014	Tesla has now 58 Superchargers in the USA
Toyota	March 2018	Toyota will stop selling diesel cars in Europe in 2018
	July 2017	Toyota set to sell long-range, fast-charging electric cars in 2022
	September 2016	Toyota's target is to reach 50% of its European sales with hybrid vehicles by 2020, with a hybrid version in every major market segment.
	October 2015	Achieving sales of 1.5 million hybrids annually and 15 million hybrids cumulatively by 2020.
Volkswagen	April 2018	To invest 15 billion Euro by 2022 in EVs for Chinese market
	March 2018	Volkswagen pours \$25 billion into electric-car batteries
	September 2017	VW plans to roll out 80 electric and hybrid models by 2025
	June 2017	2-3 million annual electric car sales by 2025, Volkswagen, 25% sales in 2025
	October 2016	The Volkswagen group target is for 30 new EV models by 2025
Volvo	January 2018	Electric medium-duty delivery trucks to sell in 2019
	July 2017	Every Volvo it launches from 2019 will have an electric motor, marking the end of cars that only have an internal combustion engine (ICE) and placing electrification at the core of its future business.
	October 2015	By 2020, 10% of Volvo's global sales will be electrified cars