Driving the Next Phase of Electric Mobility in Europe

Tools for a fully decarbonized on-demand transport industry

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Uber

BloombergNEF

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About this report

More than three years after the launch of Uber's sustainability commitment to build a ride-hailing platform supported 100% by zero-emission vehicles by 2030 in Europe, the US and Canada, and globally by 2040, there is demonstrable progress. Drivers on Uber in Europe are shifting to zero-emission vehicles, nearly exclusively battery electric vehicles (BEVs), about 5x faster than those in the general population.

However, in order to reach 100% vehicle electrification in Europe by 2030, it is clear that more must be done.

Most of the challenges in increasing the number of battery electric vehicles on the roads are not entirely unique to Uber or the ride-hailing sector. The purpose of this report is not just to identify the challenges and opportunities associated with a pathway to 100% BEVs by 2030 for the on-demand mobility sector, including Uber and other ride-hailing platforms, the measures proposed could be considered a catalyst for broader societal benefits and change across the entire mobility ecosystem and other industries.

This report was commissioned by Uber and produced by BloombergNEF (BNEF) following a roundtable at Bloomberg's offices in London in which the key issues were highlighted and potential solutions were discussed in detail with various stakeholders. The recommendations included are not necessarily reflective of the views of the organizations who have contributed to the report.

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Uber

About Uber

Uber's mission is to reimagine the way the world moves for the better. We started in 2010 to solve a simple problem: how do you get access to a ride at the touch of a button? More than 42 billion trips later, we're building products to get people closer to where they want to be. By changing how people, food, and things move through cities, Uber is a platform that opens up the world to new possibilities.

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About BloombergNEF

BloombergNEF (BNEF) is a strategic research provider covering global commodity markets and the disruptive technologies driving the transition to a low-carbon economy. Our expert coverage assesses pathways for the power, transport, industry, buildings and agriculture sectors to adapt to the energy transition. We help commodity trading, corporate strategy, finance and policy professionals navigate change and generate opportunities.

Executive summary

Governments around the world have committed to reducing CO2 emissions in line with the Paris Agreement goal of keeping global temperature increases well below 2C. Such challenging ambition will require some industries to achieve decarbonization targets well ahead of 2050. The road transportation sector is large and fragmented, with over 2.5 billion cars, trucks, buses, two- and three-wheelers plying global roads. Road transport currently accounts for around 18% of global CO2 emissions. A range of solutions will be required to reduce emissions across the sector including more public transport, walking and other active travel options like micromobility. Widespread adoption of zero-emission vehicles will also be required, and early adopters will need to plot a course and show that fully zero-emissions transport is possible.

Regional, national and local decision-makers throughout Europe have laid out bold plans and investments such as the EU Green Deal and the UK's zero emission vehicle (ZEV) mandate. Most major automakers have announced big investment plans and collectively have targeted selling more than 47 million electric vehicles globally by 2030. However, in a challenging economic environment with a changing political landscape, many of these targets are now being adjusted or pushed back. There are other difficulties, including highly variable resale prices in the second-hand electric vehicle market, a dearth of affordable electric vehicles, and insufficient charging infrastructure. Maintaining momentum on the road to decarbonizing the transport sector in Europe will require creative solutions to overcome these challenges.

One way to maximize impact is to focus efforts on key segments in the transport space that will have outsized results. **Supporting an accelerated electrification pathway for ride-hailing and other point-to-point, on-demand and shared mobility services is key to these efforts because working drivers such as ride-hailing and taxi drivers use their vehicles much more intensively than typical car owners**. Potential electric vehicle (EV) adopters often have their first EV experience as passengers in on-demand transport vehicles.

In 2020, Uber set the ambitious goal to have 100% of rides in Europe, Canada and the US taking place in zero-emission vehicles by 2030, along with laying out a blueprint for how to achieve these targets through its SPARK! report. There has been early progress with ride-hailing going electric quicker than other driver groups. In Europe, nearly 10% of ride-hailing kilometers are now in battery electric vehicles (BEVs) compared to about 2% of the kilometers traveled in other passenger vehicles. There are also examples of other segments in the point-to-point mobility business outpacing the general population: in London more than half of the taxis are plug-in hybrids or BEVs, Amsterdam's Schiphol airport taxi fleet comprises only electric vehicles.

Despite notable progress, further adoption and acceleration is required to reach these targets and for the whole transport industry to progress towards zero emissions. This report lays out four key challenges and opportunities to accelerate the electrification of ride-hailing and other similar industries, with a focus on the European market. Each opportunity requires both industry and policy actions. The report proposes solutions, along with key metrics that should be tracked to monitor progress.

Note: *Battery Electric Vehicles or BEVs are 100% electric. Hybrid vehicles are only partly electric.*

Challenge 1: Increase the supply of more affordable BEVs suitable for ride-hailing

Boosting the availability of affordable BEVs that are suitable for ride-hailing will require clear guidance for industry stakeholders in the automotive sector for them to make the type of long-term investments that will be necessary. For this to happen, both regulatory and industry commitments need to be as consistent as possible, even in the face of changing political landscapes. Resolving concerns around the supply of BEVs will also require providing information, advice and guidance for drivers on how existing and recently introduced vehicles can meet their needs.

Challenge 2: Reduce the costs of transitioning to BEVs relative to ICE vehicles

Overall, subsidies are winding down in Europe, notably in France and Germany. However, when in place, subsidies should prioritize high-mileage drivers for more impact. Taxes should be tied to vehicle usage and performance to prevent internal combustion engine or ICE vehicles from lingering in the passenger vehicle population and delaying the transition to BEVs, with exemptions or relief measures for lower income households. Additionally, corporate fleet policies can be modified to incentivize faster turnover of BEVs to supply the vitally important secondary market that many working drivers rely upon for acquiring vehicles.

Challenge 3: Lower the cost of charging for BEVs, particularly for drivers without access to domestic charging

Working drivers are more sensitive to the limited availability of public BEV charging because they are essentially losing earning potential when charging during work hours. More fast charging is needed, which can be achieved by simplifying tender processes and speeding up construction in a way that suits both public and private partners. There are also options to drive down public fast charging costs by bundling power demand in groups of vehicles across industries that are electrifying, with fleets acting as an anchor client for charging operators. Governments should also consider adjusting the value added tax (VAT) on electricity used for public charging, so long as consumers can benefit.

Access to affordable overnight, at- or near-home charging is a powerful incentive for switching to a BEV. National and local authorities should look at ways to make overnight street charging closer in cost to charging using residential electricity to help drive continued uptake. Approaches will need to vary across markets in Europe, but broadening the use of off-peak charging prices where grids are capable of adapting to varying demand is a measure that can be applied in many regions. For instance, at-home charging is subject to a lower tax rate in the UK but many working drivers lack off-street parking or affordable access to at- or near-home charging and, therefore, cannot take advantage of this. Adjustments to taxes, combined with "right to plug" initiatives that allow drivers to request on-street charging be installed within reasonable distance of their home, will provide an equitable solution to this challenge.

Challenge 4: Ensure opportunities to incentivize BEV uptake are factored into urban policymaking

Urban initiatives such as traffic and parking policies offering privileged access for BEVs to city centers, or driving rights on priority lanes such as bus lanes, are opportunities to further incentivize vehicle electrification for professional drivers. These are best used to stimulate markets in the early stage of development and can be removed once BEV adoption reaches scale.

Table 1: Summary of challenges to ride-hailing electrification and recommendations

Challenge	Recommendation
Increase **the supply of more affordable BEVs suitable for ride-hailing**	Policymakers and automakers need to hold firm to industry decarbonization commitments, ICE vehicle phase-outs and model launch plans
	Provide information, advice and guidance for drivers on the capabilities and benefits of the current BEV supply
Reduce **the costs of transitioning to BEVs relative to ICE vehicles**	As upfront purchase incentives are phased down across Europe, incentives for high-mileage drivers should be prioritized
	Tie subsidies and taxes to vehicle performance, usage, battery health and other key vehicle metrics such as vehicle size and carbon footprint
	Stimulate the supply of used BEVs with corporate electrification targets and mandates that increase vehicle turnover
Lower **the cost of charging for BEVs, particularly for drivers without access to domestic charging**	Make public overnight charging more affordable and readily available with wider off-peak electricity access, adjustments to the value added tax code and "right to plug" initiatives
	Arrange streamlined tender and build processes, that suit both public and private partners, to speed public EV charging deployments
	Drive down DC fast charging costs by bundling power demand from groups of vehicles
Ensure **opportunities to incentivize BEV uptake are factored into urban policymaking**	Emphasize the upsides of restricted vehicle access zones, that allow for preferred pricing and access for BEVs over ICE vehicles in the early years, to improve public acceptance and spur BEV adoption
	Use access or preferred pricing to priority lanes and parking to incentivize BEV adoption in nascent markets

Source: BloombergNEF, Uber. Note: BEV refers to battery vehicles that are 100% electric.

Ride-hailing's electric journey so far

Uber has unique global scale and reach. It has over 142 million monthly active platform customers and provides nearly 10 billion trips per year. To decarbonize its service offering, Uber has pledged to reach 100% zero emission rides in Europe, Canada, and the US by 2030, and 100% zero-emission travel globally by 2040.

Uber has committed $800 million in resources to help drivers transition to zero-emission vehicles. As of the end of 2023, the company had set aside or invested more than $400 million in the form of discounts on EVs and charging, BEV passenger trip incentives and schemes such as the Clean Air Plan in the UK or the Electric Mobility Plan in France to support vehicle acquisition.

Ride-hailing is going electric much quicker than other driver groups.

The early results are positive. Ride-hailing is now going electric much quicker than other driver groups**.** In Europe, nearly 10% of ride-hailing kilometers are now in battery electric vehicles in the chosen seven capitals (Figure 1). This share is smaller in the US and Canada (Figure 2), but is still well ahead of the rest of the passenger vehicle kilometers in the region. Despite notable progress, acceleration is still required for the ride-hailing vehicle fleet to reach 100% electrification by 2030.

Figure 1: BEV share of ride-hailing and private vehicle kilometers traveled in Europe

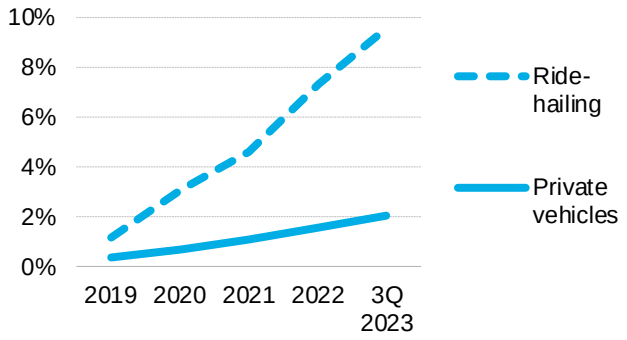
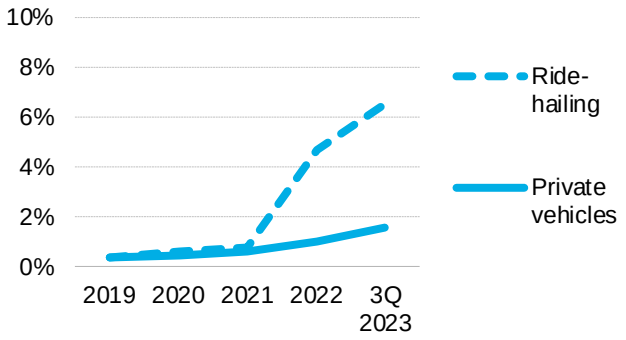


Figure 2: BEV share of ride-hailing and private vehicle kilometers traveled in US and Canada



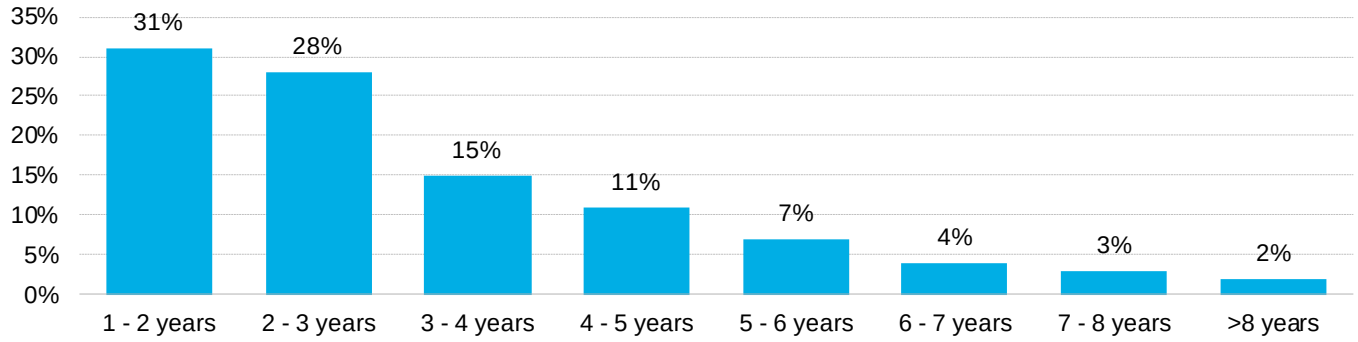
Source: BloombergNEF, Uber. Note: In 2020, Uber's SPARK! report focused on rapid electrification in seven European capitals: Amsterdam, Berlin, Brussels, Lisbon, London, Madrid, and Paris. For this reason, mentions of "Europe" for ride-hailing refers to all passenger mobility trips completed in the country-level markets corresponding to these seven European capitals: the Netherlands, Germany, Belgium, Portugal, the UK, Spain, and France, respectively.

The time for acceleration

The climate is sensitive to the cumulative volume of greenhouse gases in the atmosphere (the 'carbon budget'), not just the emissions in any one year. Reducing emissions faster early on will result in fewer cumulative emissions and help the world stay on track for an energy transition pathway consistent with the Paris Agreement goal of keeping global warming well below 2C by 2050. Pursuing the more ambitious 1.5C target and achieving net-zero emissions worldwide will require some industries to achieve decarbonization targets well ahead of 2050. As described in BloombergNEF's New Energy Outlook, the transport sector will need to reduce a meaningful share of its emissions prior to 2030 or greenhouse gases emitted in the near-to-medium term will make achieving a 1.5C target impossible. Starting with some of the highest utilization vehicles is a logical and impactful place to make meaningful progress.

There is a further degree of urgency needed to accelerate the electric transition of working drivers, such as ride-hailing drivers. Ride-hailing vehicles are driven more than typical consumer-owned vehicles, which means an earlier and greater impact on emissions comes from transitioning these high-utilization vehicles to BEVs. These vehicles are also returned to the used vehicle market in a shorter timeframe than the general passenger vehicle fleet, which provides the benefit of boosting the supply of BEVs. The average ride-hailing vehicle in Europe has been on the Uber platform for three years, meaning that it could take multiple years for the final internal combustion engine (ICE) ride-hailing vehicles to leave the roads (Figure 3). This effectively sets a deadline for policy and industry conditions to be prime for BEV adoption by 2027 to increase the likelihood that all rideshare drivers can transition to BEVs by the end of the decade.

Figure 3: Uber European vehicle tenure distribution



Source: Uber. Note: Shows vehicles that have been on the platform for longer than a year in Paris, London, Lisbon, Berlin Amsterdam, Madrid or Brussels. Covid years may have impacted this data. Mean: 3 years, Median: 2.5

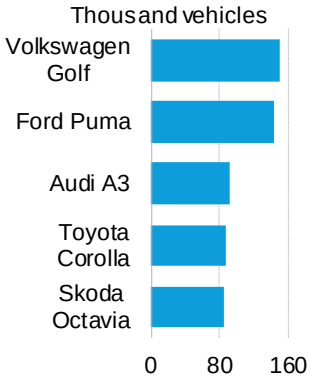
A note on the definition of zero-emission vehicles

Zero-emission vehicles (ZEVs) are vehicles that never emit carbon dioxide from their tailpipes. This means that in our categorization, ZEVs only include battery electric vehicles (BEVs) and fuel-cell vehicles (FCVs), neither of which have internal combustion engines. Plug-in hybrids are thus excluded from the scope of this report.

It is becoming increasingly clear that in the passenger vehicle segment, BEVs will be favored over FCVs. According to data gathered by BloombergNEF, MarkLines, Hydrogen Analysis Resource Center (HYARC) and Japan's Ministry of Economy, Trade and Industry, passenger FCV sales have declined in successive years since 2021 and are outnumbered by BEV sales globally 815-to-one.

Challenge 1: Increase the supply of more affordable BEVs

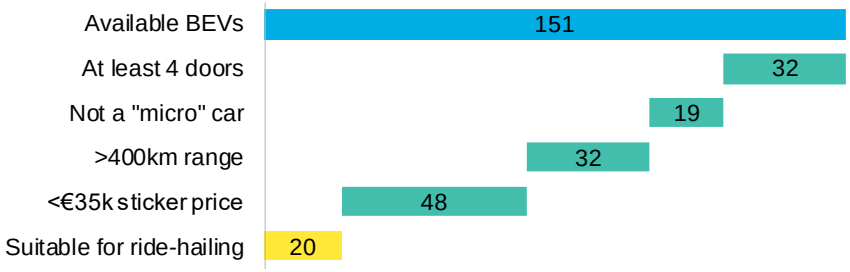
Figure 4: Top five mid-segment vehicles sold in Europe in 2023



Source: MarkLines, BloombergNEF.

A significant problem faced by ride-hailing drivers is the availability, affordability and suitability of battery electric vehicles (BEVs) for the daily rigors of their work. Ideal electric vehicles for ride-hailing drivers have four doors, are spacious enough to seat four passengers (not including the driver) comfortably, have good driving ranges, and are affordable. Features like the ability to charge quickly and model design being capable of catering to multiple service categories like the higher passenger capacity UberXL offering are also desirable. Even with several new vehicles coming to market, the criteria for an ideal electric ride-hailing vehicle dramatically limits the number of suitable models.

Figure 5: Suitability of BEV models due to be available in Europe in 2025 for ride-hailing



Source: BloombergNEF Note: BEV refers to battery vehicles that are 100% electric.

Of the BEVs currently on offer, the majority are targeted towards the premium market. This makes it challenging for drivers looking to provide services in non-premium categories who may not be able to afford the upfront price of a BEV today. Of the BEVs that were sold in France in the first three quarters of 2023, 47% were compatible with premium Uber offerings like *Uber Comfort* or *Comfort Electric* and just 29% were compatible with the standard *UberX* offering (Figure 6). In the UK, 10% of BEVs sold in 2023 were suitable for standard services, with a further 73% capable of also providing premium services (Figure 7).

Figure 6: France BEV sales by Uber suitability

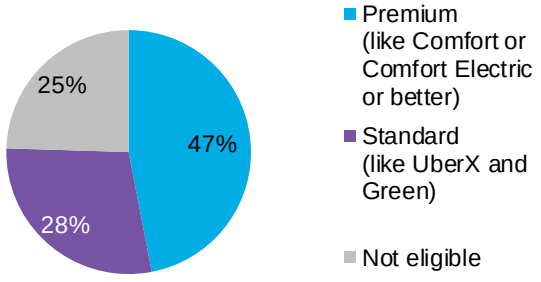
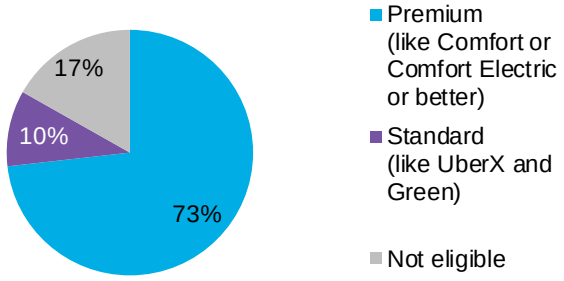


Figure 7: UK BEV sales by Uber suitability



Source: BloombergNEF, company websites. Note: Data for 1Q-3Q 2023. Premium vehicles are also usable for standard ride services but standard vehicles cannot be used for premium services. BEV refers to battery vehicles which are 100% electric.

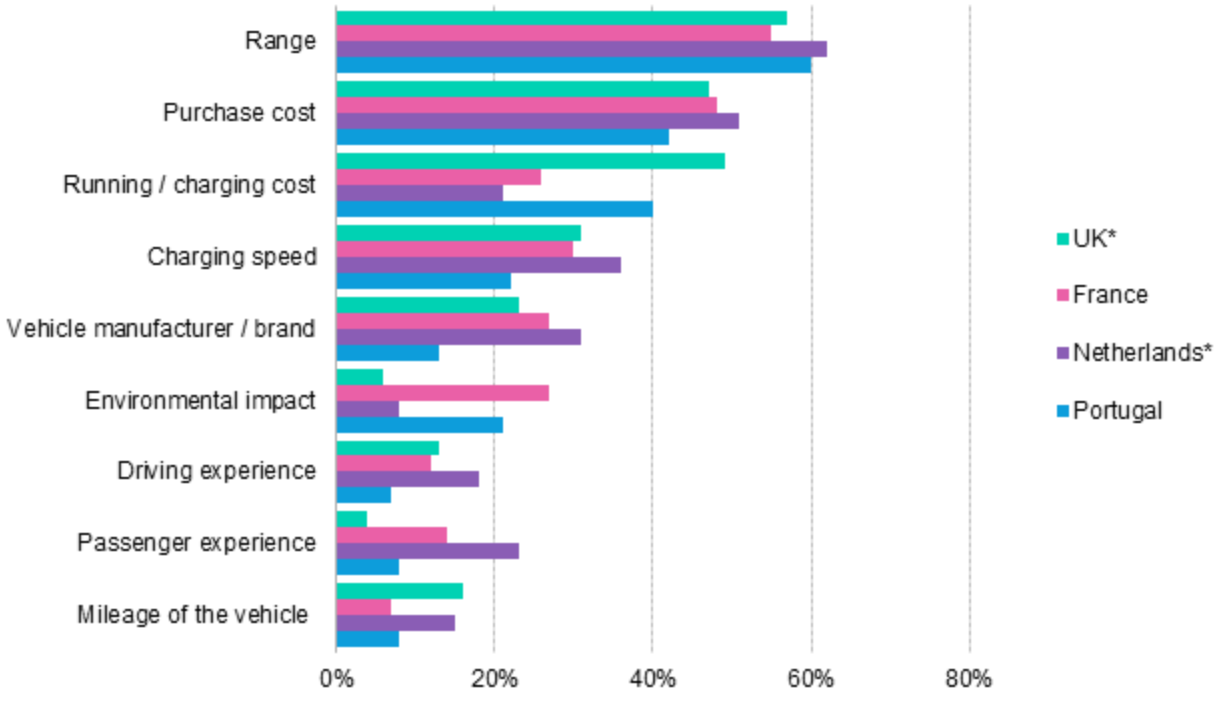
In order to encourage a greater supply of suitable electric ride-hailing vehicles, automakers need clear and consistent guidance. There are 69 governments and government bodies targeting a phaseout of new internal combustion engine (ICE) sales – 37 national governments and 32 regional and municipal authorities. This includes the countries that fall within the European Union's 2035 ICE phase-out plan. There have also been attempts to delay ICE phaseouts, such as the UK's change in timing, or meaningfully alter them, for example with the EU's target, including an exemption for e-fuels made using captured carbon and renewable power, which leaves uncertainty in the automotive industry.

Suggested BEV supply solution 1: Policymakers and automakers need to hold firm to industry decarbonization commitments, ICE vehicle phase-outs and model launch plans

Clear directional guidance for the automotive ecosystem is necessary for industry to produce the types of vehicles that will have the greatest benefit and to help de-risk long-term investment. For this to happen, both regulatory and industry commitments need to be as consistent as possible. Specific steps include maintaining support for the UK zero-emission vehicle mandate and the EU's Fit for 55 through its 2026 review.

Ride-hailing drivers, just like many other vehicle drivers, are susceptible to range anxiety. Range is the number one issue of concern for current Uber drivers when considering whether their next car should be a BEV (Figure 8). There are indications that range anxiety is higher for rideshare and other working drivers – such as taxi and delivery drivers – as available range is directly correlated with the ability to continuously offer services. The global average BEV range in 2022 was 337 kilometers, up from 230 kilometers in 2018. This is sufficient for the majority of trips and working patterns of ride-hailing drivers. It is a significant constraint for the most active ride-hailing drivers such as those who work around 40 hours per week.

Figure 8: Uber driver survey on key considerations when switching to a BEV



*Source: Uber. Note: *Low base size (n=<100), results are directional only. BEV refers to battery vehicles which are 100% electric.*

Suggested BEV supply solution 2: Provide information, advice and guidance for drivers on the capabilities and benefits of the current BEV supply

Providing drivers with information, advice and guidance on the capabilities of BEVs and how they line up with their needs is important in ensuring that the transition to electric vehicles is not delayed. There will be a natural temptation for drivers to wait for newer models with ranges that can meet all possible variations of trips, but by encouraging more early adopters, there is an opportunity to align charging infrastructure to the needs of ride-hailing, and potentially forgo the need to produce vehicles with large and expensive batteries.

Metrics to monitor

Improving the availability of high-quality BEVs that are suitable for on-demand mobility services will require announced product lineups of automakers to be met on schedule, along with new models introduced that cater to a wider array of drivers. In order to track progress, there are three key datapoints to monitor:

- **Percentage of the automotive market covered by binding mandates of 100% zero-emission vehicles (ZEV) sales by 2035 or sooner:** The automotive supply chain will be more willing to make long-term investments in developing new vehicle models if there is a high degree of certainty about the direction of policy. ZEV mandates need binding mechanisms that ensure they are more than just targets.
- **Average driving range of BEVs:** Average medium segment BEV driving range will need to increase. A suggested target is for this average to exceed 400km on a single charge by 2025, up from 337km in 2022.
- **Number of *ride-hailing-suitable* BEVs:** While ride-hailing and other on-demand mobility drivers do not need an array of offerings as broad as the general driving population, there should be at least five spacious and affordable battery electric vehicle models, all with four doors, with upfront purchase prices below €35,000 (in real 2023 euros), available in all European markets by 2027.

Challenge 2: Reduce the costs of transitioning to BEVs relative to ICE vehicles

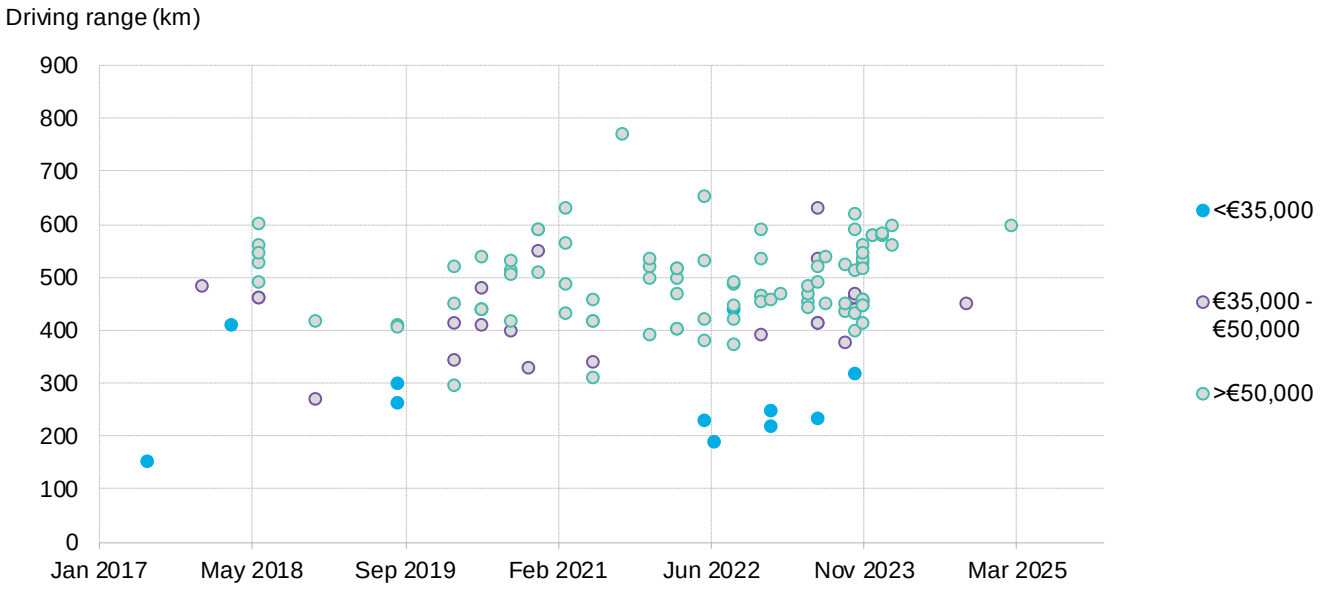
The price to access battery electric vehicles (BEVs) in many situations can be prohibitive. Finding ways to make BEVs compare more favorably with both new and used internal combustion engine vehicles is crucial to increasing electrification in ride-hailing.

1.1. New vehicles

Retail prices of new electric vehicles are a critical factor in both the pace of mass adoption and the profitability of the automakers that produce these cars. Yet the point at which BEVs will reach upfront price parity with their internal combustion counterparts has moved further away than that predicted by prior analyses, largely as a result of higher than expected battery costs and larger than average battery pack sizes. In BNEF's newest modeled cost estimates for battery electric vehicles, the moment of upfront price parity is now forecast to begin in 2025 in Europe, two years later than previously estimated.

Automakers have introduced or have plans to release many new BEVs to the market before 2025 with driving ranges above 400 km on a single charge (Figure 9). However, many of these vehicles have starting prices above €50,000. These prices are still far higher than comparable internal combustion engine (ICE) vehicles.

Figure 9: Range of launched and upcoming BEV models in Europe



Source: BloombergNEF. Note: BEV refers to battery vehicles which are 100% electric.

Working drivers use vehicles more than the average car owner, which presents an opportunity for focusing policy on high-mileage drivers. For example, there are more than 126,000 monthly active BEV drivers on the Uber platform and those drivers have taken more than 287 million trips over the last three years. This provides increased consumer exposure to BEVs, increased usage of nascent public EV charging investments, increased fossil fuel and emissions displacement as well as local economic activity. Therefore, as governments look to cut spend on electric vehicle

incentives, while still desiring a continued positive impact, they can focus more on high mileage, working drivers and lower income segments of the population to save on their budgets while increasing the efficiency of their spending.

Suggested BEV purchase affordability solution 1: As upfront purchase incentives are phased down across Europe, incentives for high-mileage drivers should be prioritized

Across Europe, governments such as Germany are dialing back upfront purchase incentives for BEVs. There is likely to be further push back on subsidies and incentives, but high-mileage drivers present the most compelling use of public funds. High mileage vehicles going electric lead to more emissions reductions. With frequent consumer impressions, these vehicles also have an impact on public awareness of EVs. The first EV experience of many consumers is via ride-hailing. While subsidies are still in place, they can be redirected for more impact. Looking further out, governments may need to introduce more schemes in which drivers of high emitting vehicles pay additional fees, such as those implemented by France and Sweden. These are sometimes referred to as bonus-malus schemes.

Metrics to monitor

Improving the affordability of new BEVs will require improvements in the price of batteries and other electric vehicle components. The key metric is the final price of vehicles that are offered to buyers. For that reason, in order to track progress towards a goal of truly affordable BEVs, it is important to monitor when BEVs become cost competitive with the equivalent ICE vehicles and how fast the entirety of the passenger vehicle fleet is transitioning to BEVs.

- **Upfront price differential:** Upfront price parity between BEVs and ICE vehicles is getting closer but is still not here. Ideally, the typical medium segment passenger BEV reaches upfront price parity with ICE vehicles in 2025, but this may take several additional years in some cases. Monitoring the premium paid for BEVs over comparable ICEs will be important to track progress.
- **BEV share of passenger fleet:** The BEV fleet in Europe is growing quickly and BNEF expects it to surpass 10% of the total passenger vehicle fleet by 2028. This will be a strong indication that interventions in key segments are filtering through to the mass market.

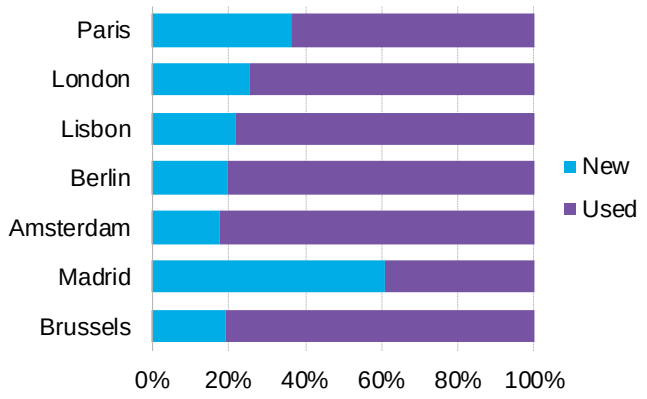
1.2. Used vehicles

The used BEV market is lacking in terms of quality, pricing, and volume

Ride-hailing drivers in Europe show a strong preference for used vehicles in most major markets (Figure 10). Used ICE vehicle purchases outnumber new ICE vehicle purchase about 3:1, and the favoring of used over new vehicles can be even greater in some ride-hailing markets.

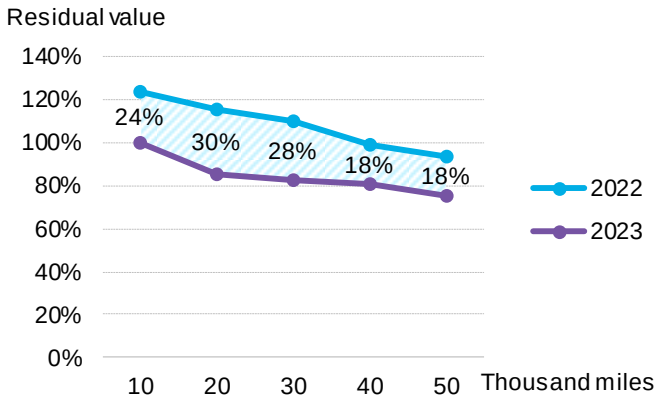
With BEVs being a more recent introduction to the vehicle market, the used-to-new vehicle ratio is closer to 2:1. Lower BEV quality compared to used ICE vehicles, and limited supply is preventing more widespread acceptance of used BEVs. The pricing of used vehicles in the market can also be highly volatile, with comparable vehicles falling in price by up to 30% between March 2022 and November 2023 (Figure 11). The used-BEV market is very small compared to the rest of the used vehicle market. Less than 3% of used vehicle sales are BEVs according to analysis of used vehicle sales websites conducted by BNEF.

Figure 10: Share of bought new and used vehicles on the Uber platform



Source: Uber. Note: Shows Jan-Nov 2023 data. Based on inferred state of vehicle when joining the Uber platform.

Figure 11: US median used BEV residual values and mileage



Source: Edmunds, BloombergNEF. Note: 2022 data collected in March 2022, and 2023 data collected in November 2023. Residual values account for upfront purchase subsidies. BEV refers to battery vehicles which are 100% electric.

Governments have introduced far fewer policies to regulate or boost the used BEV market than they have for new passenger vehicle sales. France gives subsidies and the US offers tax credits aimed at stimulating the used BEV market. Automakers offer some guarantees around used BEVs, but much must be done to reassure buyers that a used electric vehicle is a solid financial investment. Additionally, to ensure a vibrant secondary market, government policies regulating BEV supply to the primary markets should be embedded in ZEV mandates and include minimum warranty standards on used vehicle batteries, battery state of health checks and other right-to-repair standards, which will provide consumers with greater confidence on the quality of the vehicle they are purchasing.

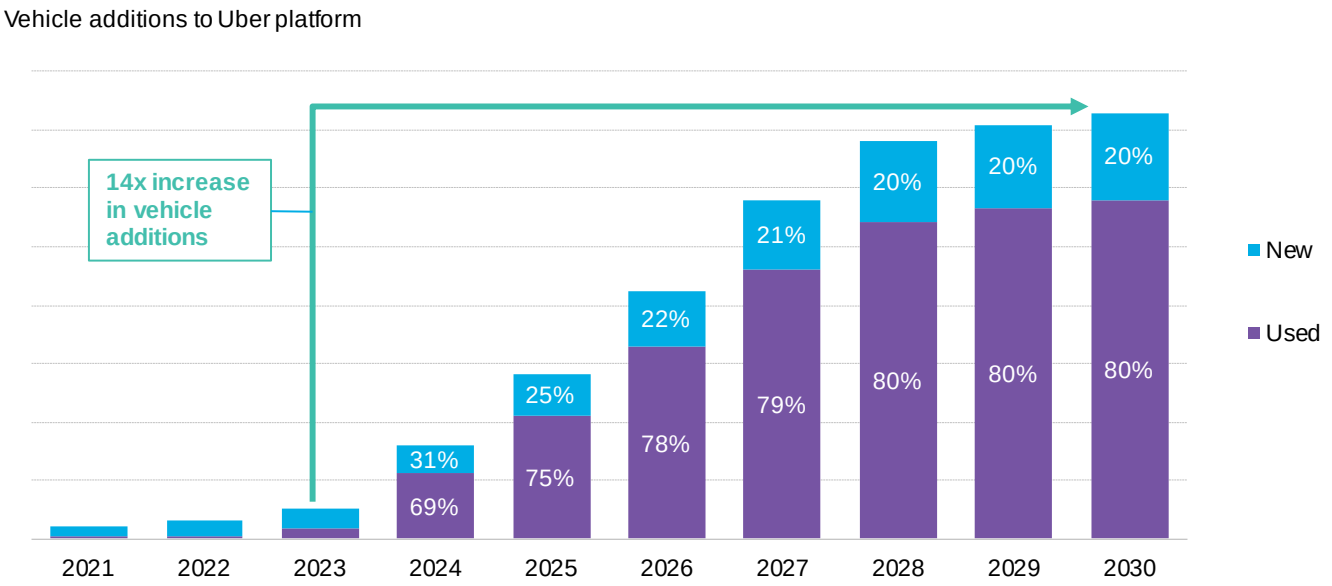
Suggested BEV purchase affordability solution 2: Tie subsidies and taxes to vehicle performance, usage, battery health and other key vehicle metrics such as vehicle size and carbon footprint

Governments should alter the way the annual road and/or registration fees are calculated and tie them to a carbon footprint which is revised with the age and mileage of the vehicle. This would help remove vehicles from the road when they are no longer delivering the fuel efficiency levels from when they were new. Critically, such programs should offer discounts or exemptions for lower income households. This mechanism could also be applied to track the battery state of health metrics and other provisions such as those included in California's ACC II regulations. Tracking these metrics effectively, along with providing minimum performance guarantees, will help boost consumer confidence in used BEVs.

The challenge with used vehicles is even more acute when set against the affordability of used hybrids, particularly in markets like Eastern Europe. The initial climate policies incentivizing hybrids, in addition to the high reliability and low maintenance costs of these cars, get in the way of the deeper decarbonization of the transport industry. New policy measures and incentives are required to remove hybrids and the most fuel-efficient ICE vehicles from the passenger vehicle fleet and replace them with even cleaner alternatives.

To transition to 100% electric ride-hailing in Europe, several hundreds of thousands of BEVs need to join the Uber platform each year in the late 2020s. If current patterns hold, over 80% of these BEVs would be used models.

Figure 12: BEVs required to join the Uber platform in Europe each year for a 100% BEV share by 2030



Source: Uber. Note: Assumes the ratio of new to used battery electric vehicles converges to levels similar to new to used internal combustion vehicles currently seen on the Uber platform in key European markets. BEV refers to battery vehicles which are 100% electric.

Suggested BEV purchase affordability solution 3: Stimulate the supply of used BEVs with corporate electrification targets and mandates that increase vehicle turnover

A steady flow of high quality BEVs into the used vehicle market will boost consumer confidence in purchasing a used BEV. Since corporate fleets often have faster vehicle turnover than private vehicles, engaging mechanisms to push corporates towards more aggressive electrification targets – such as the corporate electrification mandate in France's LOI Mobilites – will help more BEVs flow into the used vehicle market.

This would help pass upfront purchase incentives – which have historically mostly benefited the new vehicle market – over to the used vehicle market. More stable used vehicle residual values will also help set better leasing terms for the initial corporate customers, creating a positive feedback loop.

Metrics to monitor

Improving the availability and affordability of used BEVs requires an effective flow of vehicles from new purchases and leasing into the used vehicle market. While there are many ways to stimulate that progress, the best measure to track progress will be the upfront prices of used vehicles and how they compare to equivalent vehicles both in absolute value and volatility:

- **Average used BEV price relative to equivalent ICE or hybrid**: The used BEV price should ideally not fluctuate significantly more than the price for an equivalent ICE or hybrid vehicle. The market rate for a four-door, medium-sized BEV should ideally begin to converge to a similar price for a vehicle like a used Toyota Prius.

1.3. Alternatives to ownership

There are many ways to access a vehicle, so incentives should be allocated more evenly across rental, leasing, purchasing, financing and company cars.

Vehicle access does not necessarily need to be through the purchase of a vehicle. Car rental companies offer short-term rental services that provide vehicle access that is best measured in days. Rental companies are also active in providing vehicles for periods that are as short as a few hours in the form of car-sharing divisions such as Avis's Zipcar, Europcar's Ubeeqo and Enterprise's Car Club. However, the hourly pricing models of these services are not necessarily designed for full-time ride-hailing drivers and are thus unlikely to be a suitable option.

There is also a new crop of subscription-specialist companies such as Moove, which provides Uber drivers with rent-to-buy BEVs. Moove aims to be the largest BEV partner on Uber's platform in London, with plans to scale to 10,000 BEVs by the end of 2025. Other companies such as Otto Car, Splend, Vemo and WeFlex offer subscription-based vehicle access for several weeks or months. All these offerings are likely to be considered useful tools for ride-hailing drivers to access BEVs in the event they are unwilling or unable to purchase a new or used BEV.

Table 2: Routes to accessing a car without purchasing it

Offering	Car-sharing	Short-term rental	Subscription	Long-term rental	Leasing
Typical time frame	*Hours*	*Days*	*Weeks/months*	*Months*	*Years*
Car-sharing specialists	FREE2MOVE, Zoomcar, SOCAR				
Rental companies	enterprise, AVIS, Hertz, SIXT, Europcar				
Subscription specialists			otto, moove, weflex, splend		
Leasing companies			ayvens, ARVAL A BNP PARIBAS company, LEASYS		

Source: BloombergNEF. Note: Some offerings include rent-to-buy initiatives.

Another alternative to directly purchasing a vehicle is when a company assists its employees in accessing vehicles in the form of a company car or by providing a salary sacrifice program. In the UK, company cars are subject to benefit in kind (BiK) taxes. The BiK tax on company cars varies by the CO2 emissions of the vehicle, with a maximum 2% of the list price of a BEV being taxable while typically between 30-40% of the list price of most ICE vehicles is taxable[1]. The taxable amount is then subject to the varying personal income tax rate.

In the salary sacrifice scheme, lease payments on a vehicle flow directly from an employee's pre-tax salary. This reduces the total taxable salary, which is often a significant saving. The vehicle payments are still subject to BiK tax. The salary sacrifice is dependent on the employer, and is tied to salary payments, so independent contractors do not have access to it. Approximately 40% of BEV sales across Europe benefited from corporate incentives like lower BiK taxes or salary sacrifice schemes[2]. In February 2024, the EU Commission launched a public consultation to look into the introduction of a green mandate for fleets. If this consultation was to be turned into a regulation, this would significantly accelerate the decarbonization of corporate cars.

[1] UK Government: Tax on company benefits

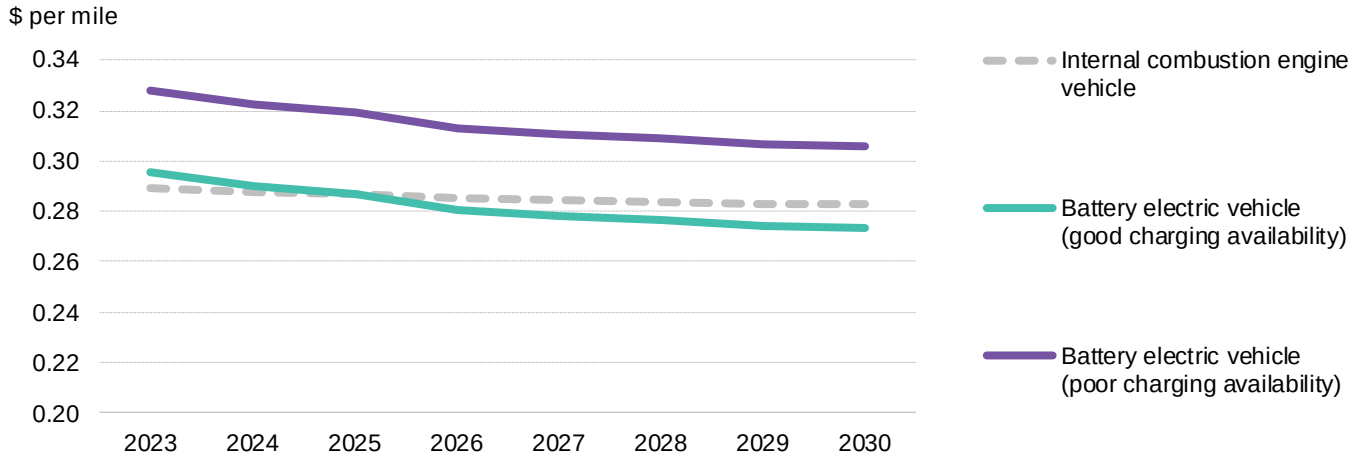
[2] Transport & Environment: Accelerating and democratising the electric car for the 80%

Challenge 3: Lower the cost of charging for BEVs

The upfront purchase price of a vehicle is important, but owning and operating costs are vital for people who earn money from driving. This means an important metric in judging how an electric ride-hailing vehicle compares to an ICE equivalent is the total cost of ownership (TCO).

The TCO includes the purchase price of a vehicle, operating costs, fuel prices and vehicle depreciation over its life span, all normalized by the total distance driven over the years of use. There are additional considerations for the TCO of a ride-hailing vehicle compared to a typical car owner. Ride-hailing drivers tend to accrue more daily or weekly vehicle-miles than other consumers, meaning they can take advantage of the cheaper operating costs of BEVs. However, they are also more price sensitive than the average driver as BEV ride-hailing drivers are essentially forgoing potential revenue while searching for public chargers, queuing and waiting for their vehicles to charge. This opportunity cost can be detrimental to the cost competitiveness of BEVs.

Figure 13: Expected total cost of ownership for new ride-hailing vehicles in Europe



Source: BloombergNEF. Note: Under good charging availability scenario, drivers forgo up to 15 minutes of revenue per day waiting for their vehicle to charge. Under a poor charging availability scenario, lost earning time is up to 60 minutes per day.

1.4. Overnight charging

Access to affordable charging is an equity issue.

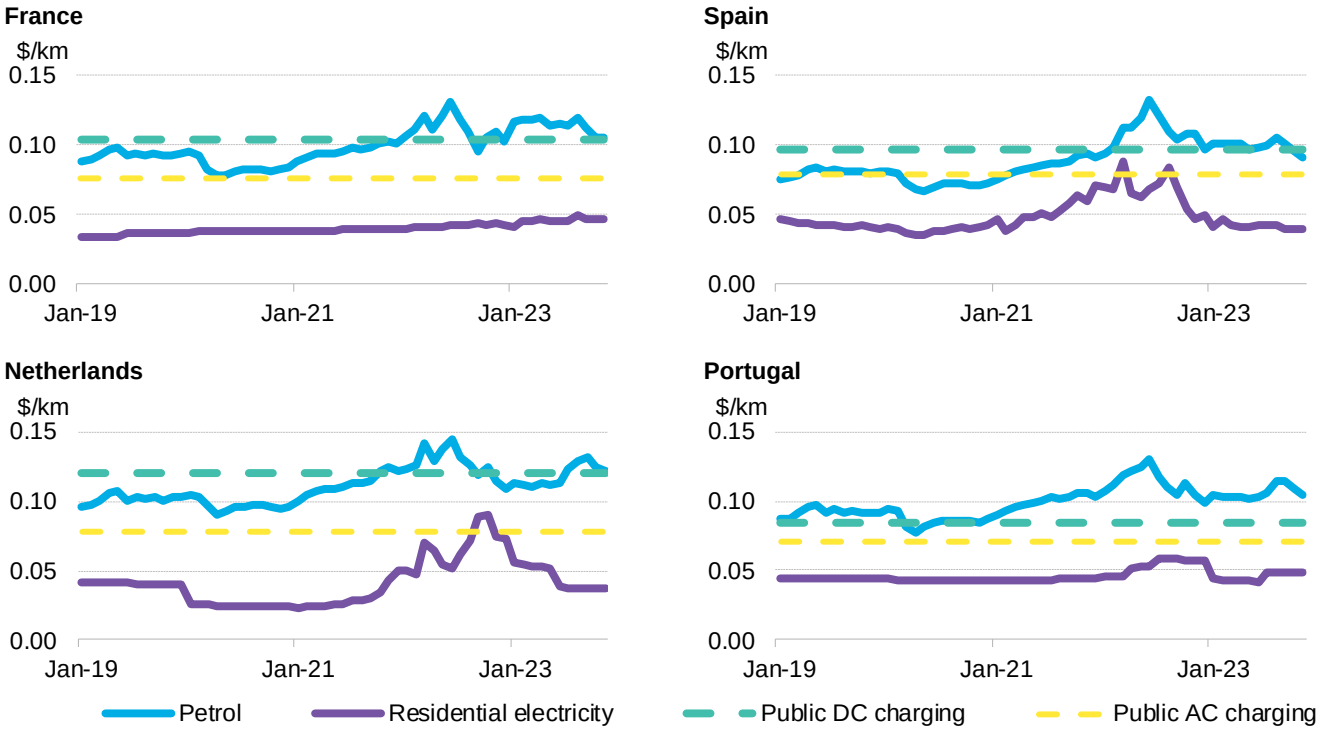
In general, BEVs are cheaper to operate than ICE vehicles. Maintenance costs are lower than comparable ICE vehicles[3] and the per kilometer cost of powering a BEV is usually less than the cost of the equivalent fuel for an ICE vehicle (Figure 14). However, for BEVs to unlock the maximum savings from running on electricity rather than fossil fuels, drivers need to have the ability to charge at home or wherever the car is consistently parked for long periods such as overnight. Even near-home charging on public streets is considerably more expensive per kilometer than charging using the standard residential electricity price. In part, this cost is due to public charging infrastructure being installed, operated and maintained by companies which will

[3] British Vehicle Rental & Leasing Association (BVRLA): *Repair prices rise but BEV service costs cheaper*

include these costs in the prices they charge to consumers, while the charger purchase and maintenance costs from charging at home are accounted for separately, usually by the homeowner. However, there is also a difference in the electricity prices between public charging and private residential charging which goes beyond the differences in charging infrastructure costs. In many cases across Europe this electricity price discrepancy is due to the way electricity consumption is taxed depending on whether it is in a public setting or in a private residence.

Near-home on-street charging should be closer in price to residential charging especially when those homes cannot install home charging. For users not charging at or near home, the DC fast charging pricing is even less competitive, with per kilometer values equivalent, or in some cases even surpassing the cost of petrol.

Figure 14: Comparison of gasoline, residential electricity and average public charging prices



Source: Bloomberg, BloombergNEF, Eurostat, Eco Movement, Energy Price Index. Note: DC charging price is the price offered by the operator with most charging connectors in each market as of December 5, 2023. Efficiency of Tesla Model 3 is used.

Suggested overnight charging solution 1: Make public overnight charging more affordable and readily available with wider off-peak electricity access, adjustments to the value added tax code, and "right to plug" initiatives

The ability to charge at home, or at least at similar prices to home charging, will help drive much more rapid BEV adoption. Many people do not have access to residential charging that unlocks the savings potential of a BEV because they do not have off-street parking where they can install a home charger. In a survey among Uber drivers conducted in November 2023, 50% of ICE vehicle drivers in the UK, 69% of drivers in France and 67% of drivers in Portugal listed the lower cost of electricity as the main reason they would consider switching to an electric vehicle. This discrepancy is an equity issue, and consumers who do not have access to a driveway or private parking should not be penalized with higher charging rates. "Right-to-plug" initiatives – such as those available in the Netherlands – which allow drivers to request on-street charging be installed within a reasonable distance of their home, are important steps in making overnight charging more readily available.

To make overnight charging more affordable, one approach could be adjustments to value added tax (VAT) on public charging where rates are sufficiently higher compared to those on residential electricity, so long as policymakers can assure savings are passed on to consumers. In markets where there is suitable grid flexibility, governments should encourage businesses to broaden access to off-peak power prices when there is low demand, in a similar manner to what is being trialed in the Agile Street Project.

Metrics to monitor

Improving the availability and affordability of overnight charging will be crucial in accelerating BEV adoption among ride-hailing drivers and the general public. Monitoring availability will require measuring not just the increase in the absolute number of public charging stations, but the number per BEV. Affordability of BEVs should also be measured not just in the upfront purchase price of vehicles, but also in the price to power vehicles per kilometer.

- **Percentage of automotive market covered by "right to plug" and other charging access policies:** While there is a lot of variety in the specifics of programs that provide on-street charging access, the ambitious target should be to ensure 100% of residents in urban areas have access to some degree of "right to plug" coverage.
- **Average electricity cost per kilometer relative to petrol:** There have been instances in some markets where the cost to charge a BEV at home using the residential electricity price has approached the petrol price. Governments should aim to keep the price of powering a BEV through residential electricity below the petrol equivalent, and if they get close, governments should intervene. China for example, places a floor on how low retail petrol prices go even if the underlying commodity price falls, and Spain and Portugal have intervened to limit increases in electricity prices.

1.5. Fast charging

According to a November 2023 survey of Uber drivers, 38% of BEV drivers in the UK, 46% of drivers in France and 47% of drivers in Portugal find it necessary to charge during work periods. This high volume of charging occasions means that working drivers require ready access to affordable fast charging.

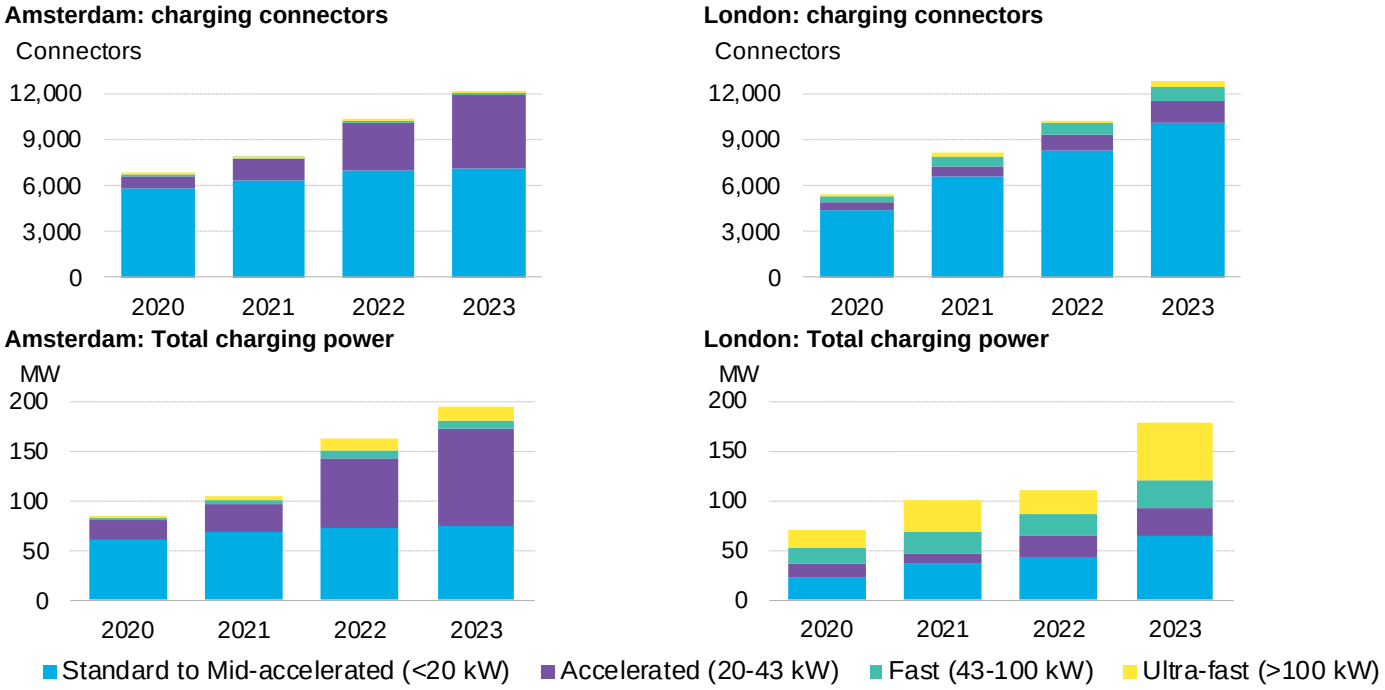
DC fast charging across Europe is currently similar in price per kilometer to fossil fuels (Figure 14). Over time, increased energy delivery should decrease the price to charge from fast chargers. This has been seen in China where public DC charging is cheaper than public AC charging and is around 50% of the cost of gasoline. However, China's central government is providing subsidies to local governments which are required to construct and operate the charging infrastructure, maintain and update battery-charging networks, and improve the overall level of charging services.

Working drivers have greater charging demand than the average vehicle owner, but where they need that charging is also different. Working drivers need DC fast charging in or near high traffic urban mobility areas such as business districts, popular neighborhoods for weekend outings and events as well as transit hubs such as airports and train stations.

DC charger pricing is similar to gasoline in most markets across Europe.

Fast and ultra-fast charging can dramatically alter the shape of a charging network. There has been a big scale up in the UK over the course of 2023. One third of all high-powered chargers in London were installed this year and infrastructure is continuing to come up quickly, with many of the high-powered chargers taking the form of large charging hubs where users can charge in 15-20 mins depending on the EV make and model.

Figure 15: EV charging connectors and combined power level for London and Amsterdam



Source: BloombergNEF, Ecomovement.

At present, the majority of investment in fast charging is made by private entities on private land, something which is a problem in many UK cities as much of the land is owned by local authorities. In cases such as these, it is important to build capacity for authorities to run tender processes for charging deployment that generate long-term financially viable opportunities for businesses. For example, the UK government announced a pilot charging scheme for £70 million ($88 million) on December 6, 2023 which will be delivered by National Highways. The announcement states it will support 10 trial sites and the program will gather evidence to inform design of a full fund with a value of £950 million ($1.2 billion). Municipalities are able to access £381 million ($480 million) in Local Electric Vehicle Infrastructure (LEVI) funding which also includes a portion set aside to aid in building capacity and expertise in local authorities for tendering and procuring charging.

Contract length is of primary concern in charging infrastructure tenders, as many tenders have historically been for three years, which does not align with the payback timeframe of a charging hub, which would typically be in the seven-to-10 year range. On top of this, operators often need the ability to increase the capacity of a charging hub over time – an option which has not always been available.

Suggested fast charging solution 1: Arrange streamlined tender and build processes that suit both public and private partners to speed public EV charging deployments

Several measures can be taken to smooth the tender process for charging infrastructure developers and operators, some of which have been tested in Germany and the Netherlands. Simplifying these processes and creating some consistencies across Europe will aid in the expansion of networks of charging hubs.

Contract length and ownership at the end of the contract: Charging hub contracts can be as short as three years, which creates uncertainty for developers that are making large infrastructure investments. In Germany, the Deutschlandnetz contract

is 12 years and the operator owns the infrastructure after this period. In municipality tenders in the Netherlands, the government owns the infrastructure when the contract ends and they can re-tender.

Revenue share and pricing clauses: In Germany, whilst the Deutschlandnetz contract covers OPEX and Capex, there is a revenue share clause where the government can recoup funds. In the Netherlands operators will also deliver a share of revenues back to municipalities. Some contracts also include maximum pricing caps that are index-linked to energy prices.

Automatic expansion of network: The Netherlands municipalities have included clauses that require operators to install more infrastructure when certain utilization and availability metrics have been met.

Suggested fast charging solution 2: Drive down DC fast charging costs by bundling power demand from groups of vehicles

Ride-hailing operators have unique data and insights on driving patterns for the most highly utilized passenger vehicles. Tools are available on the Uber platform that assist drivers in finding the optimal times and places to charge their vehicles. The data from the collective group of vehicles on the Uber platform provides enough granularity on a large and growing number of BEVs that could be used to offer some guarantee of charger demand, which would make the business case more attractive for charging operators to open new facilities.

This collection of vehicles on the Uber platform also has the potential to better inform cities of the optimal positions for charging hubs. Governments already have defined areas which are particularly underserved in terms of transit provision, and Uber could guarantee some energy demand in these areas, particularly as there is already significant overlap between these underserved areas and areas of high demand from drivers on the platform.

Metrics to monitor

Public fast charging infrastructure, similar to overnight charging, needs to increase in availability and affordability relative to petrol. While access to overnight charging provides more cost savings for BEV drivers, the increase in DC charging alleviates range anxiety and limits the lost earning that could occur when ride-hailing drivers and other working drivers are charging during prime service hours. Therefore, to ensure DC fast charging is improving, it is important to monitor deployment in relation to overnight charging. It will also be vital to monitor how prices of DC fast charging evolve as the deployment of charging stations increases.

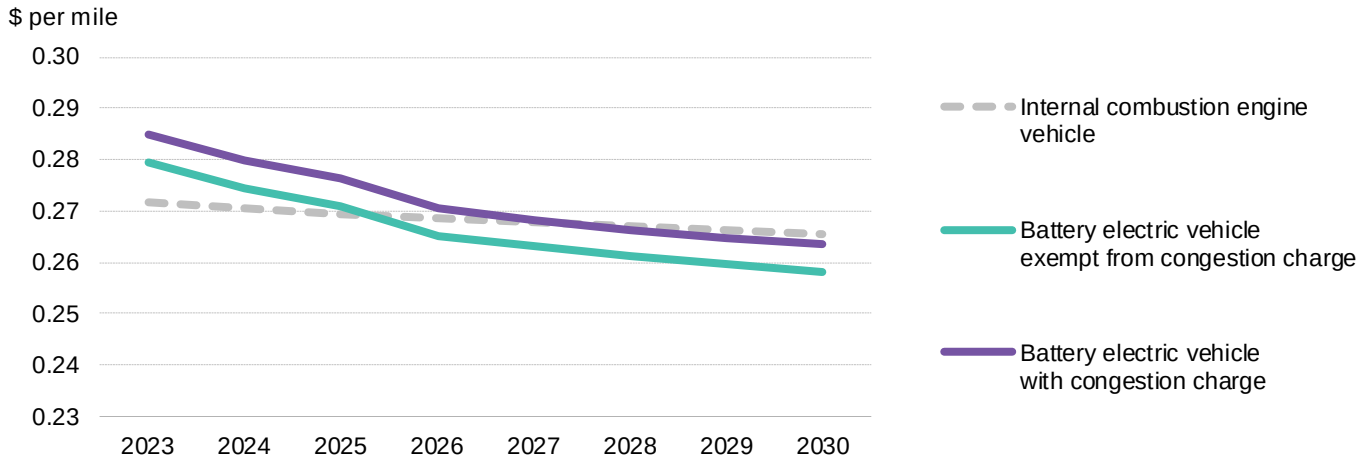
- **Average DC cost per kilometer relative to petrol:** In most markets across Europe, DC charging prices per kilometer driven are now similar to the cost of fueling a vehicle with petrol. A good metric to aim for is DC charging which is, on average, 10% cheaper per kilometer than petrol.

Challenge 4: Ensure opportunities to incentivize BEV uptake are factored into urban policymaking

There are mechanisms in place across Europe's cities which seek to increase public access to micromobility, public transit, or simply make walking and cycling more pleasant for consumers in the densest urban areas. Policy initiatives like restricted vehicle access zones and carpool or bus lanes, are valuable and, in many cases, have been effective. In the near-to-medium term, it is feasible to include allowances for electric ride-hailing and other high utilization vehicles within the scope of these initiatives to accelerate the decarbonization of the transport sector. This needs to be used carefully however, as there is risk of public backlash.

There is strong evidence that policies including congestion charges with BEV exemptions and low and ultra-low emission zones have been useful in improving urban air quality and that exemptions for ride-hailing drivers that use BEVs have been highly effective in improving the economic incentives to switch to a BEV.

Figure 16: Expected total cost of ownership for ride-hailing in London



Source: BloombergNEF

Suggested urban access solution 1: Emphasize the upsides of restricted vehicle access zones, that allow for preferred pricing and access for BEVs over ICE vehicles in the early years, to improve public acceptance and spur BEV adoption

There are clear benefits to restricted vehicle access zones and they provide a potent tool for vehicle electrification. However, they have often not received the buy-in of the general public. When bringing the public on board with these policies, the focus should be on the economic opportunities that are being created. For instance, retail in urban areas can benefit from increased pedestrian flow, and there are more opportunities for providers of shared transport and delivery services. Balanced solutions can turn ride-hailing and commercial drivers into advocates for these policies, which will sustain their effectiveness.

In addition, it is important that these policies are applied consistently and for a significant amount of time. Longer-term policies, or at the very least policies with clearly defined timelines, give drivers that switch to BEVs enough time with the policy to pay back the investment in their vehicles.

An initiative that has been effective in markets such as Oslo, Woverhampton and other European regions is to allow BEVs access to bus lanes, providing the incentive of allowing BEV drivers to travel more quickly. In regions where there are carpool lanes, a similar initiative can be applied. There are drawbacks to these policies, particularly once there is a high volume of BEVs on the road. Allowing BEVs access to priority lanes also requires careful monitoring of the traffic flow impact and a plan to scale back access as vehicle volumes grow. This should be viewed as a temporary solution to help catalyze a market.

Suggested urban access solution 2: Use access or preferred pricing for priority lanes and parking to incentivize BEV adoption in nascent markets

Bus lane or other restricted lane access allowed for BEVs could be considered as a near-term measure for cities that currently have a low BEV penetration. This measure is not suitable for all regions as, at a high volume, the increased traffic flow from a large number of BEVs would inhibit the movement of buses and other intended users of the priority lanes. However, up to a threshold of 10-15% BEV adoption, this measure can be feasible. Another guideline to ensure that bus lanes do not become overcrowded could be to allow electric private hire vehicles in the many cities where taxis (regardless of emissions type) already enjoy the privilege of bus lane access.

Metrics to monitor

With a wide variety of mobility-related urban access policies in discussion or implementation, it is difficult to measure if the maximum benefit of vehicle electrification is being achieved. However, viewing a trend of activity could give an indication if progress is being made, and if the general public is embracing such measures.

- **Count of new urban access policies with differentiation for BEVs:** Tallying up the number of urban access initiatives that are launched in this area will be a signal of momentum. BEVs do not need to be exempt from the charges applied to other vehicles or provided with the full level of preferential treatment that vehicles like buses receive. In many cases, some net benefit for BEV drivers will be enough to have an impact.

Summary Recommendations

The four challenge areas for improving the adoption of battery electric vehicles (BEVs) among ride-hailing drivers will require multiple mechanisms that are tailored to each country and city. The initiatives that have the potential for high impact, while still being achievable, are summarized at a high-level below.

Challenge 1: Increase the supply of more affordable BEVs suitable for ride-hailing

There are too few high quality BEVs that are suitable for on-demand mobility services

- Policymakers and automakers need to hold firm to industry decarbonization commitments, ICE vehicle phase-outs and model launch plans
- Provide information, advice and guidance for drivers on the capabilities and benefits of the current BEV supply

Challenge 2: Reduce the costs of transitioning to BEVs relative to ICE vehicles

The price of purchasing, leasing or renting a BEV is too high relative to an ICE vehicle

- As upfront purchase incentives for BEVs are phased down across Europe, incentives for high-mileage drivers should be prioritized
- Tie subsidies and taxes to vehicle performance, usage, battery health and other key vehicle metrics such as vehicle size and carbon footprint
- Stimulate the supply of used BEVs with corporate electrification targets and mandates that increase vehicle turnover

Challenge 3: Lower the cost of charging for BEVs, particularly for drivers without access to domestic charging

Charging BEVs could be cheaper, particularly for drivers without easy access to home charging.

- Make public overnight charging more affordable and readily available with wider off-peak electricity access, adjustments to the value added tax code, and “right to plug” initiatives
- Arrange streamlined tender and build processes, that suit both public and private partners, to speed public EV charging deployments
- Drive down DC fast charging costs by bundling power demand from groups of vehicles

Challenge 4: Ensure opportunities to incentivize BEV uptake are factored into urban policymaking

Opportunities to include vehicle electrification incentives in other urban policy initiatives are being missed

- Emphasize the upsides of restricted vehicle access zones, that allow for preferred pricing and access for BEVs over ICE vehicles in the early years, to improve public acceptance and spur BEV adoption
- Use access or preferred pricing for priority lanes and parking to incentivize BEV adoption in nascent markets

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