



newmotion

A Member of the Shell Group

EV Driver Survey Report 2020

Content

Introduction 3

EV ownership and usage 4

Cities versus suburbs
Work versus private
Car models

Scaling to the masses 7

Cost savings as the main driver
People stick with electric driving
Sufficient battery range for everyday use
Upcoming charge point shortage expected

Charge points & charge cards 12

Drivers keep their charge points close
Charge point convenience
A handful of charge cards
EV drivers demand price transparency

Managing your fleet and infrastructure 21

Company vehicles go electric
Social environment as an influencer

New Rituals 25

Parking in own driveway
Less on-the-go charging as expected

Smart charging in a sustainable future 29

Faster charging, better charge point availability and using a single charge card
Full battery not required
The future of smart charging

Methodology 35

Introduction

Electric driving is the undisputed future of mobility. The industry is currently at the crossroad of mobility and the energy transition as electric driving has become more popular and is upscaling into its next phase: mass adoption.

And – as this report shows us – this is not without reason. Current electric vehicle (EV) drivers are very enthusiastic about their switch to an electric vehicle. Most respondents of our NewMotion EV Drivers Survey expect that they will stick to driving an electric vehicle (86 percent) and nine out of ten would recommend an EV to others. Four out of five feel proud to drive an EV.

But there is still much to undertake in order to welcome the next wave of EV drivers. Almost half of our respondents worry about the availability of charge points in the future. In addition, 46 percent of the surveyed drivers mention that an increase in the availability of public charge points is the one thing they would like to see improve and 37 percent of this group even thinks that this is the most important driver for mass EV adoption. We need smart charging to accommodate the next wave of EV drivers. 69 percent of the EV drivers indicate to be willing to use smart charging, while only 11 percent are not.

The NewMotion EV Drivers Survey also exposes multiple charge card issues. The EV driver currently carries around 2-3 charge cards on average, and 15 percent of the respondents have 5 cards or more. Meanwhile, 41 percent of respondents indicate that the use of a single charge card would greatly improve their experience.

EV drivers are looking for convenience and according to our research, ease of use is the most important driver for using charge point offerings. EV drivers should be able to charge where they park: at home and at work. Smart charging and full service solutions will address the desired ease of use for EV drivers.

At NewMotion, we want to lower barriers for EV driving and the only way to do so is by making prices more transparent and consistent to eliminate any surprises afterwards. As a company, we promote roaming collaborations with all providers. We believe in interoperability: the creation of an open and transparent network where every party uses each other's services. One single charge card, coupled with transparent prices, are important to upscale EVs to a broader audience.

An openly accessible public charging network provides EV drivers with the ease of charging their EV anywhere, which will then in return lead to a faster adoption of EVs in general. We need to make e-mobility more accessible and we need to address the associated challenges together. Only then we can live up to the promising future of electric driving.



Sytse Zuidema,
CEO at NewMotion

1

EV ownership and usage



1 EV ownership and usage

As the general shift towards EV driving is rapidly accelerating, there is increasingly more to say about the characteristics of EV drivers. For example about how they acquire their electric vehicle, where they live and what kind of car they drive.

Cities versus suburbs

Cities, towns and rural areas: EVs can be found everywhere. Most EV drivers live in the suburbs and in towns. 44 percent of the EV Driver Survey respondents would describe their home location as suburban. 37 percent indicate to live in a city, while 19 percent describe their home location as rural.

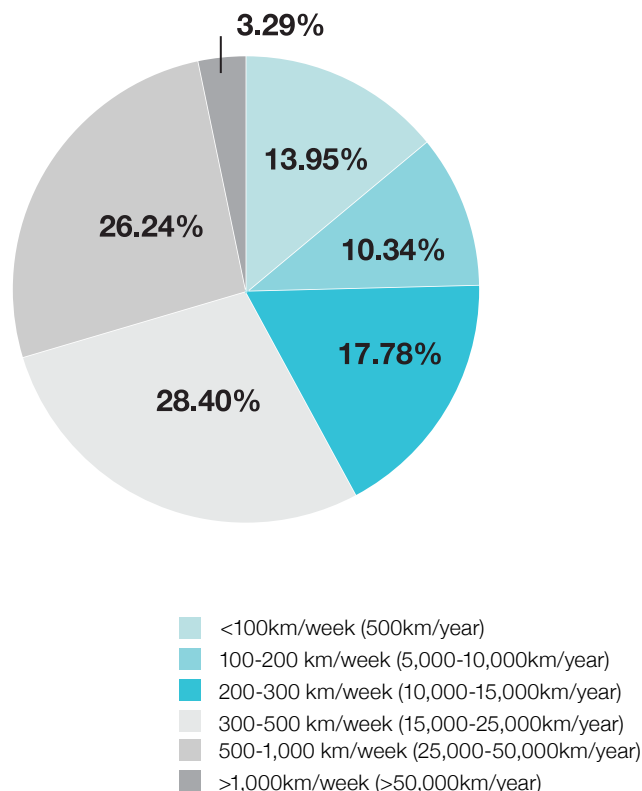
The typical EV driver has a private parking space for their car, according to the EV Drivers Survey. Most drivers (80 percent) park their EVs on a private driveway or garage. 11 percent park their car publicly on the street and 8 percent will use a dedicated parking spot in a garage or in a car park. Only 1 percent use a shared parking spot in a garage.

Most of the respondents use their EVs for 15.000 – 25.000 km/year (28 percent). A quarter (26 percent) of the survey respondents use their vehicle around 25.000-50.000 km/year while 18 percent drive their electric car about 10.000-15.000 km/year. Finally, a quarter (24 percent) drive less than 10.000 km/year.

Work versus private

In the Netherlands an electric vehicle is hardly purchased privately only by 22 percent. In other countries such as Germany (78 percent), the United Kingdom (UK, 85 percent) and France (88 percent), EVs are mostly acquired privately. This is related to financial incentives such as purchase subsidies for companies in the Netherlands.

How many kilometers do you drive per week (or per year)



1 EV ownership and usage











Car models

Among EV drivers the battery electric vehicle (BEV) is the most common car type. More than two thirds of the respondents (66 percent) drive this type of battery powered car. A quarter (24 percent) have a plug-in hybrid (PHEV).

Most respondents have fully switched to electric: less than half (45 percent) say they still have a petrol or diesel second car and 40 percent say they have no second car at all. 15 percent of respondents even have a second EV. 85 percent of the time, second cars are used privately (not for work), whereas 15 percent of respondents use their second car for business purposes.

The most popular car brand from respondents is the Tesla Model S, followed by the Renault Zoe and Tesla Model 3.

Top 10 car models

| | | |
|---|----------------------------------|------------|
|  | Tesla Model S | 13% |
|  | Renault ZOE | 11% |
|  | Tesla Model 3 | 8% |
|  | Nissan Leaf | 8% |
|  | Mitsubishi Outlander PHEV | 6% |
|  | BMW i3 | 6% |
|  | Hyundai IONIQ Electric | 4% |
|  | Tesla Model X | 3% |
|  | Volkswagen e-Golf 2017 | 2% |
|  | Volkswagen Passat GTE | 2% |



2

Scaling to the masses



2 Scaling to the masses

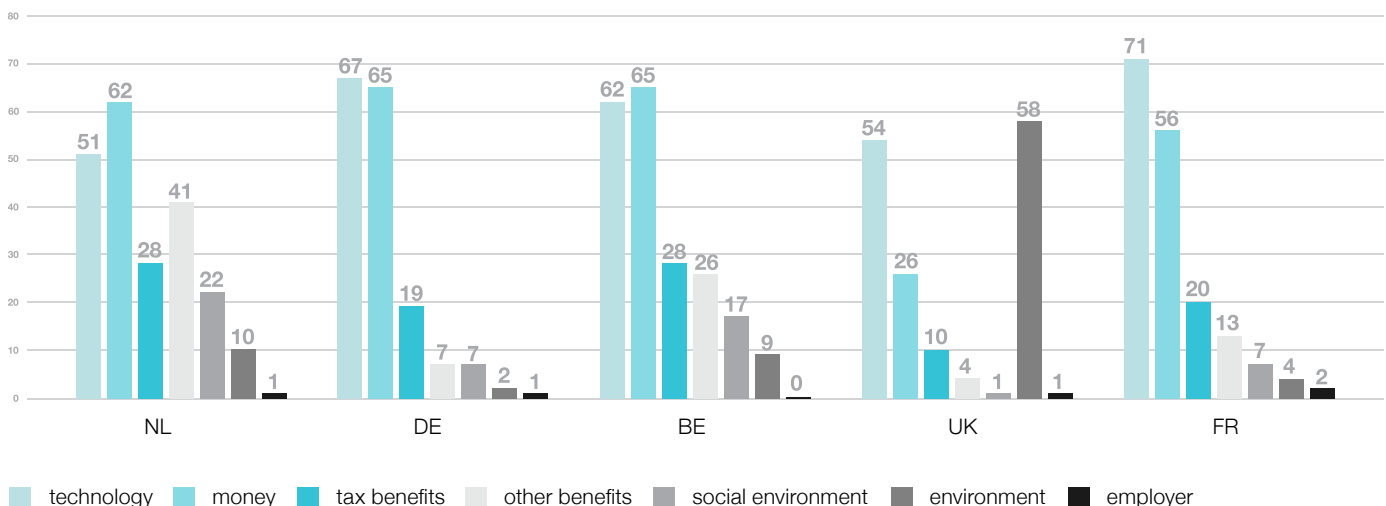
At NewMotion, we believe smart charging solutions are key to successfully scale EVs to a mainstream audience. NewMotion continues to investigate the changing and evolving charging needs of consumers, as well as driving behavior, to successfully scale EV accessibility from early adopters to early majority.

Cost savings as the main driver

Saving money is one of the most commonly mentioned reasons to switch to an electric vehicle. 61 percent of EV drivers say they drive an EV to save money. However, this benefit is very closely followed by the driving experience and technology of EVs (58 percent). Other main reasons for driving an EV include the corresponding secondary benefits (25 percent) such as free parking or the use of bus lanes) and also the lower taxation (23 percent). The percentage of EV drivers choosing to drive electric in order to contribute to a better environment is remarkably low (10 percent).

Compared to other countries, financial reasons are much less important in the UK, while environmental reasons are much more important. In the Netherlands and Belgium, the influence of one's social environment is surprisingly large.

Reasons for adopting an EV



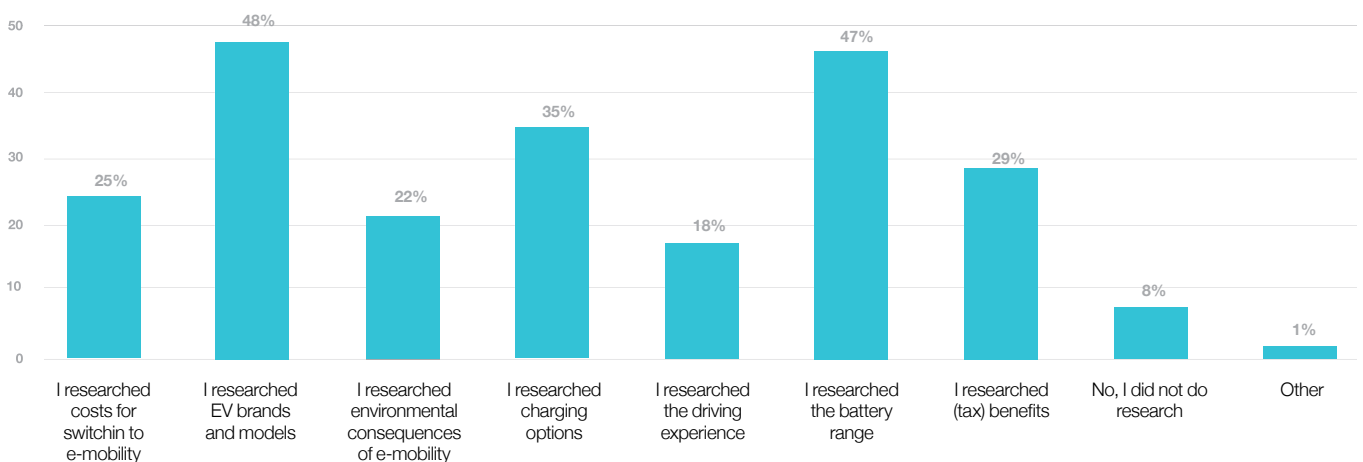
2 Scaling to the masses

People stick with electric driving

EV drivers can be considered to be very enthusiastic about their switch to EV. Most people (86 percent) believe their next car will be an electric vehicle as well. Only 2 percent would switch back to a conventional (fossil fuel powered) car next. Also, nine out of 10 people would recommend an electric vehicle to others, while only 3 percent indicate they would not recommend owning an EV to others.

On average, EV drivers do lots of research into driving electric before purchasing an EV. 92 percent of EV drivers say they do at least some specific research before their purchase. Almost half (48 percent) of the EV drivers researched EV brands and models, while 47 percent indicated they conducted research into the battery range. After car models and battery range, the third most important research topic is around the charging options (35 percent).

Did you conduct research into electric driving before purchasing your EV?



Sufficient battery range for everyday use

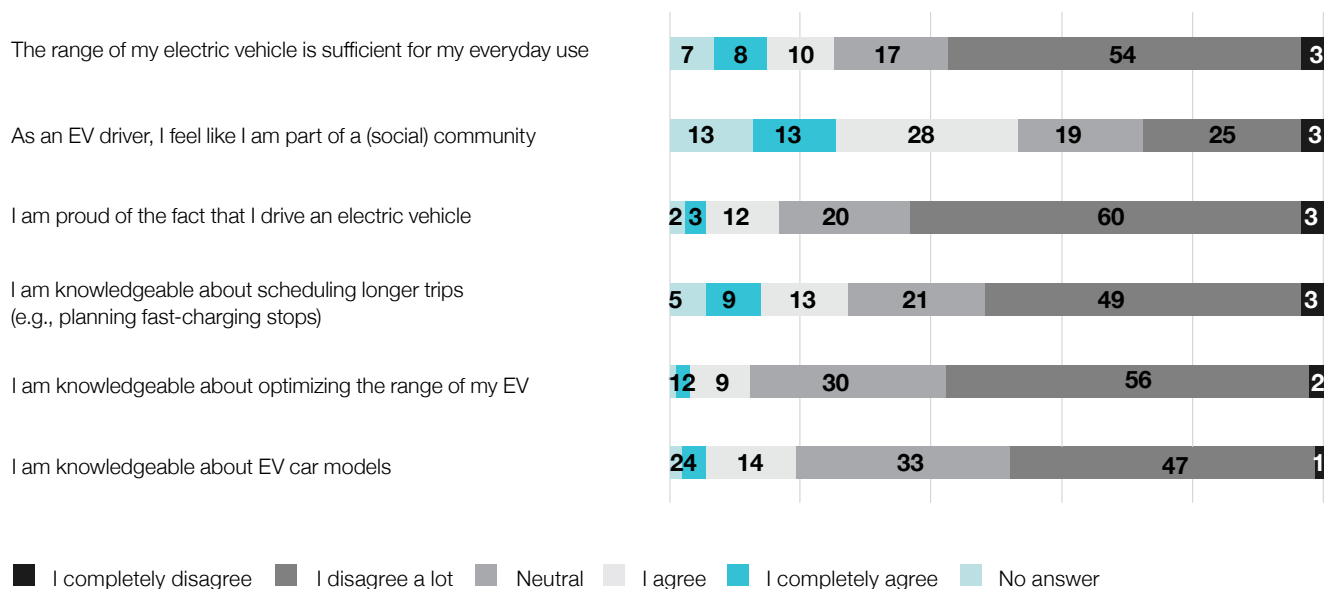
Where battery range is the second most important research area before purchasing an electric vehicle, current EV drivers agree about the sufficiency of the battery range for everyday use. Almost three quarters (72 percent) say the range of their electric vehicle is more than sufficient, while just 15 percent have their doubts about battery range. On average, participants indicated that the range of electric vehicles is sufficient for their everyday use: the average rate for battery range sufficiency is 4.49 on a 5-point scale. In Belgium and the Netherlands, this is slightly lower compared to Germany and the UK.

2 Scaling to the masses

EV drivers feel they are very knowledgeable about optimising their battery range. 86 percent of the EV drivers do know how to optimise their range while their level of knowledge about car models is 80 percent.

Most EV-drivers are very proud of the fact they drive an electric vehicle (80 percent). Participants from the UK are most proud to drive an EV, followed by Belgium and Germany. Some even indicated that they feel they are part of a community as an EV driver (44 percent).

To what degree do you recognize yourself in the following statements?



We are happy EV drivers show more trust in their battery range, as we know this is one of the most important topics in their purchase decision. It's good to see people have a good experience when it comes to their battery range. Based on charging data, we know the average commute only uses about 20 percent of the battery capacity. This is why charging at home and at work are the most convenient and least costly options.

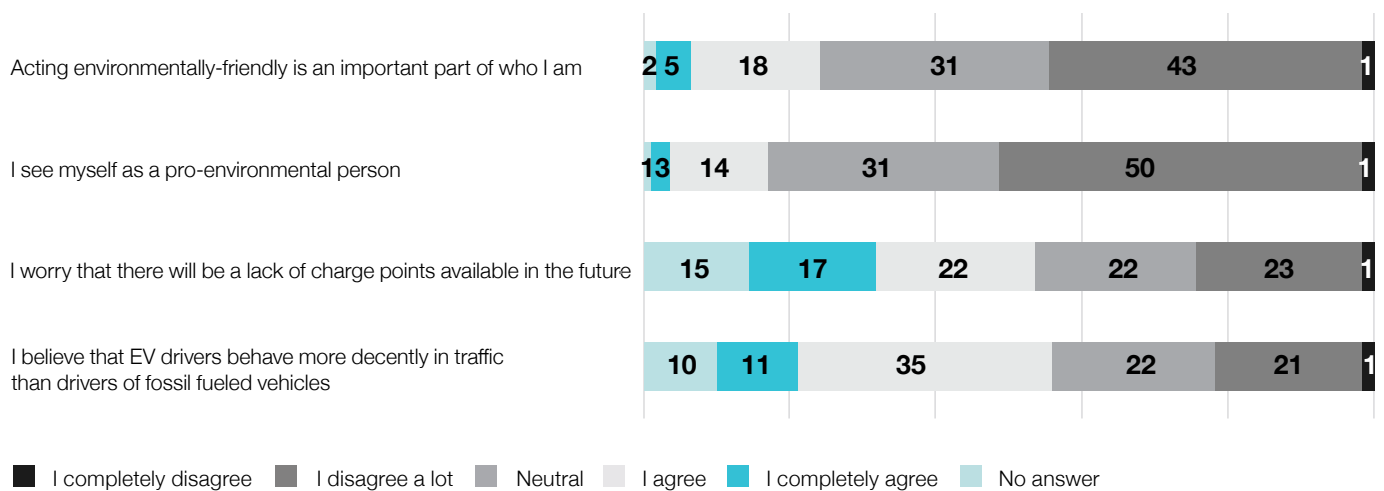
2 Scaling to the masses

Upcoming charge point shortage

EV drivers believe electric driving will rapidly be the norm for the majority of people. 60 percent of EV drivers expect 'full electric' to be the most dominant fuel type in 2030. 14 percent expect 'hydrogen' to be the most dominant full type in the future, while 13 percent have high hopes for hybrid. Another 12 percent expect fossil fuel to remain the most dominant fuel type.

This expected mass switch to EV also initiates concerns about available charge points in the future. Almost half of the respondents say they worry about a future lack of charge points as demand for them increases, while a third (32 percent) don't think this will become a big problem.

To what degree do you recognize yourself in the following statements?



3

Charge points & charge cards



3 Charge points and charge cards

Scaling to the masses means not only increasing the amount of smart charge points, but doing that in an easy, accessible and reliable way for drivers.

Drivers keep their charge points close

A striking 77 percent of drivers have a charge point at home while more than half of the respondents (55 percent) have a charge point available at work. From the respondents who do not have a charge point at home, 53 percent say they also do not have one available at work.

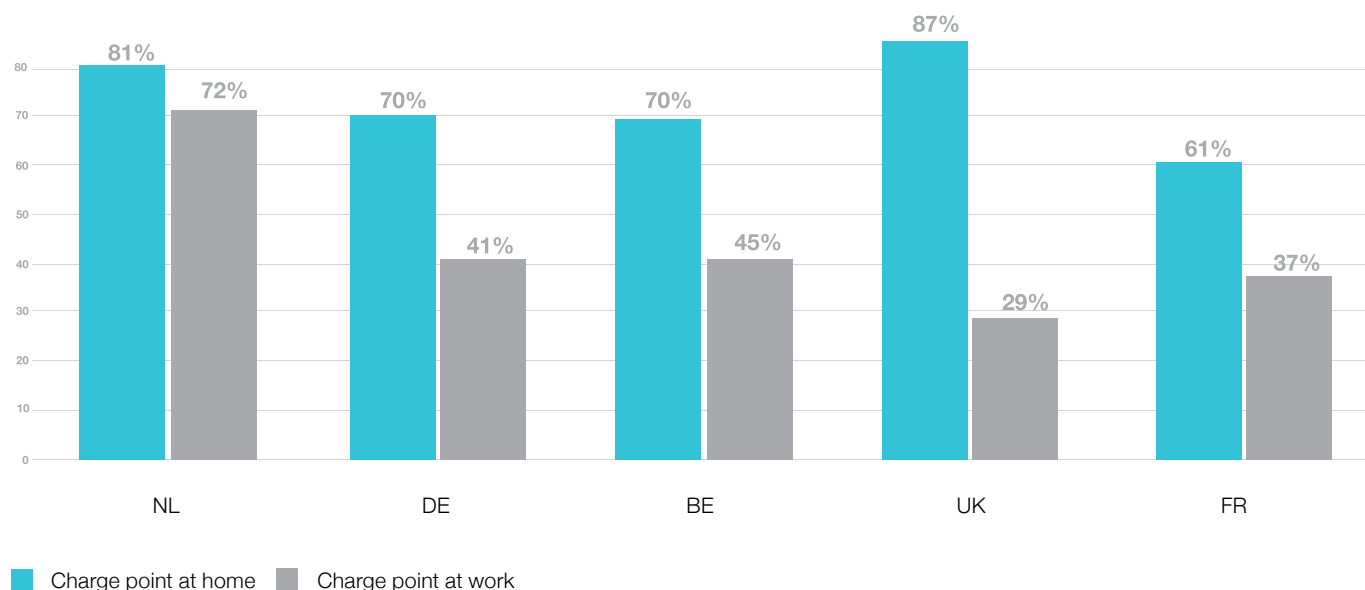
A discouraging 61 percent of the people without a charge point at home would use a standard socket to charge an EV at home, while 30 percent simply prefer to charge at work or at public locations.

The amount of people using a standard socket to charge their car is alarming. Not only because of a lower charging speed, the use of a socket is also accompanied with safety issues such as rain mixed with sockets, or an overused electricity network in the street.



3 Charge points and charge cards

Percentage of people who have a charge point at home or at work

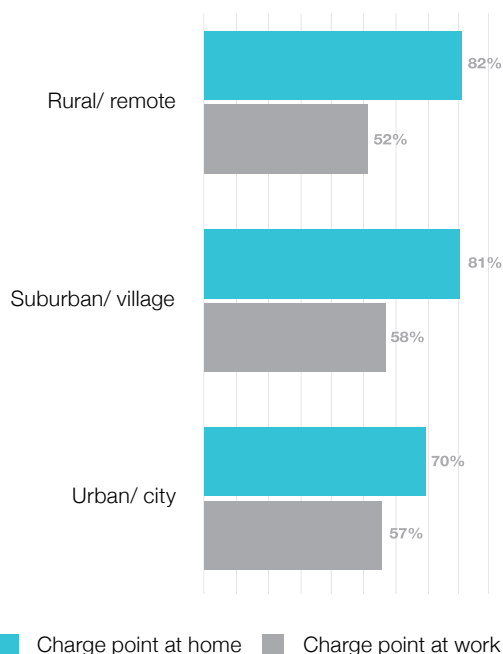


Home and workplace charging

In the Netherlands, a charge point at work is quite common: 72 percent of the respondents say they have a charge point at work. The chance you'll find a charge point at your office in the UK or Germany is significantly lower: only 29 percent in the case of British respondents and 41 percent of the German respondents have a charging solution for their EV at work. The use of a charge point at home is slightly higher in the UK compared with other countries.

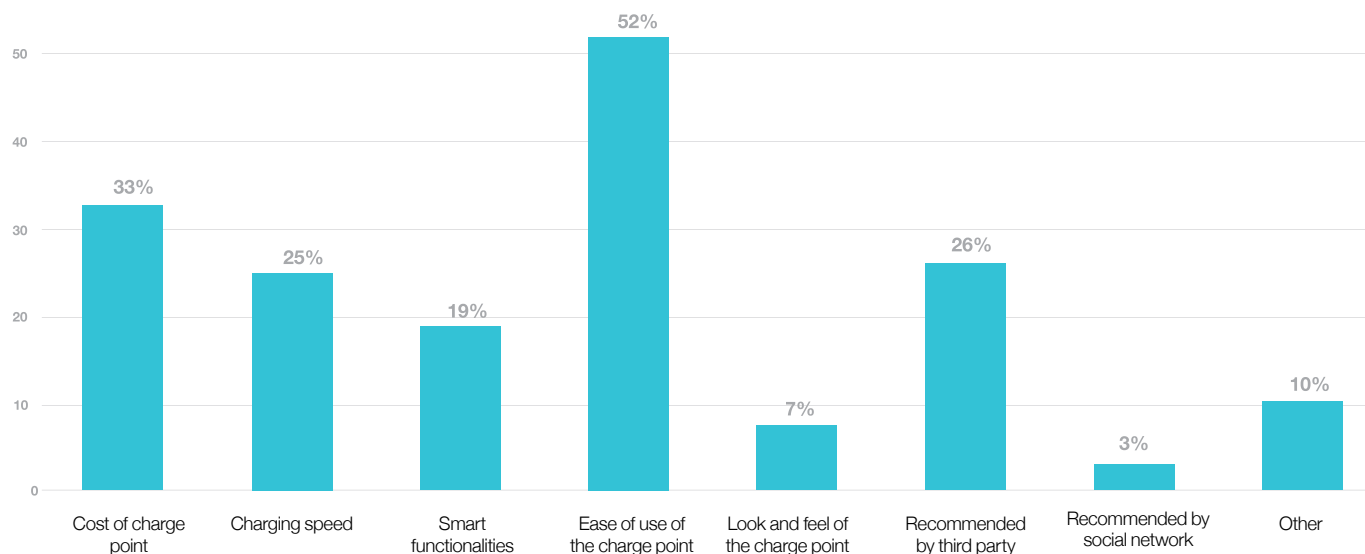
People in urban areas are less likely to have a charge point at home, while people in rural areas are less likely to have a charge point at work.

Percentage of the people that have charge point at home or at work per rural or (sub)urban area



3 Charge points and charge cards

Why did you choose the specific charge point you own?



Charge point convenience

Ease of use is clearly top of mind when it comes to charge points. For those who own a charge point, they clarify ease of use as being most important when choosing their solution, with more than half (52 percent) citing this as their main purchasing driver. A third (33 percent) say the price of the charge point is important, while a quarter (26 percent) says that a recommendation from a third party such as a lease company, a car dealer or employer, as most influential to their decision.

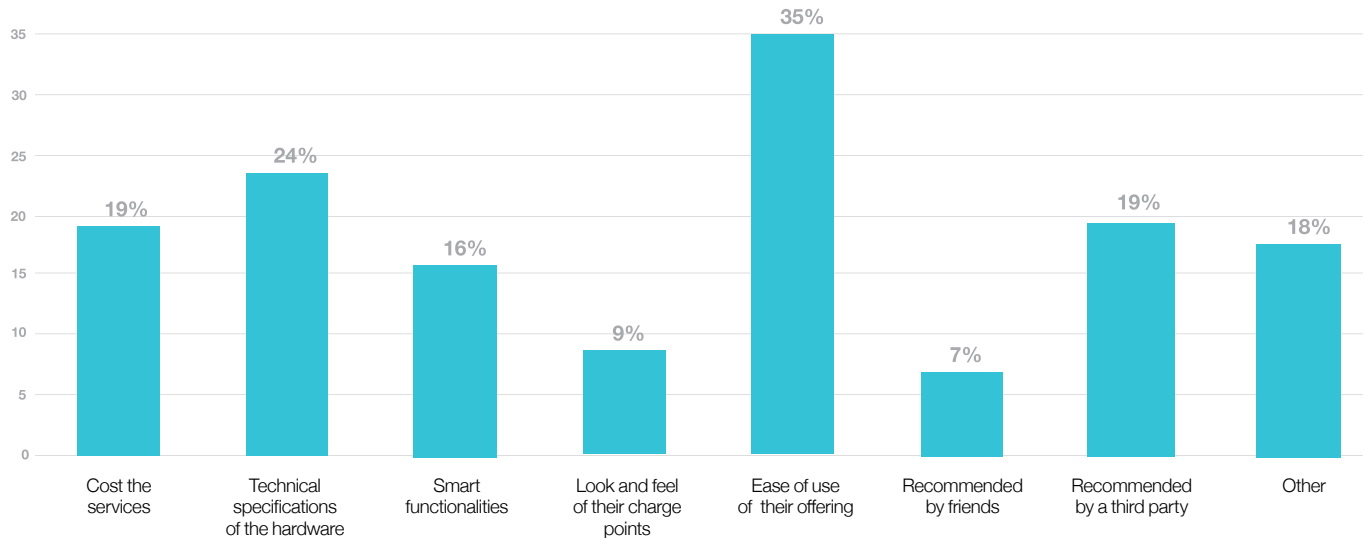
Also, when it comes to charge point providers, convenience is key. The ease of use is mentioned most often (35 percent) as the main decision driver for respondents' preferred charge point provider, while a quarter of the respondents (24 percent) say that technical specifications of the hardware is an important factor towards their choice.

35%

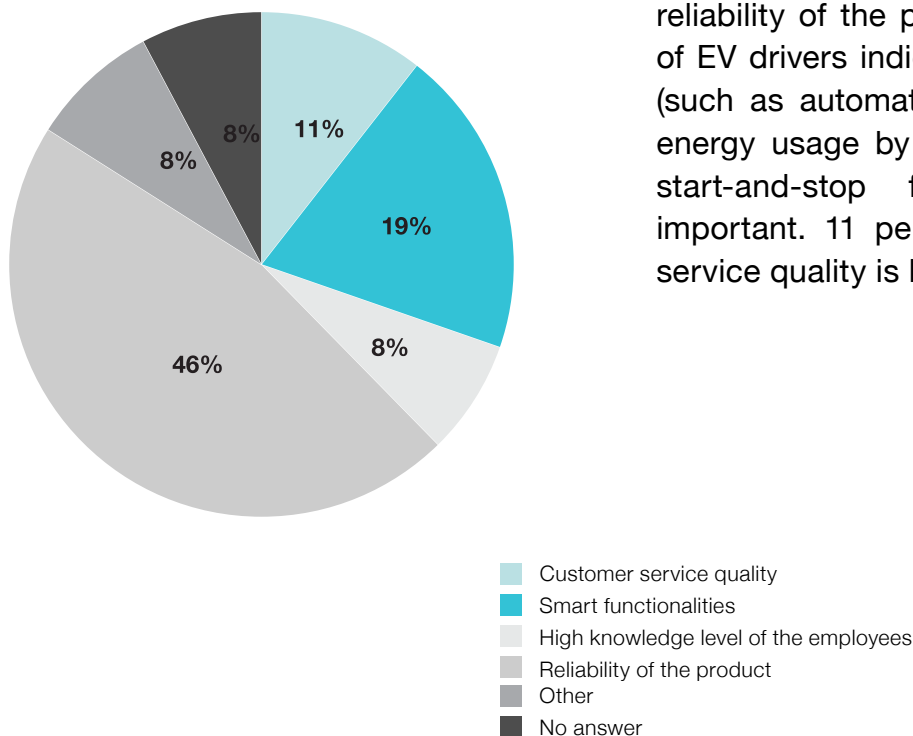
of the drivers say ease of use is the main driver for choosing a charge point provider

3 Charge points and charge cards

What are the main reasons for having chosen your charge point provider?



What do you value most in your charge point provider?



Respondents are clear about what they value most in their charge point provider. 46 percent of respondents mention reliability of the product, while 19 percent of EV drivers indicate smart functionalities (such as automatic reimbursement of the energy usage by the employer or remote start-and-stop functionality) as most important. 11 percent feel that customer service quality is key.

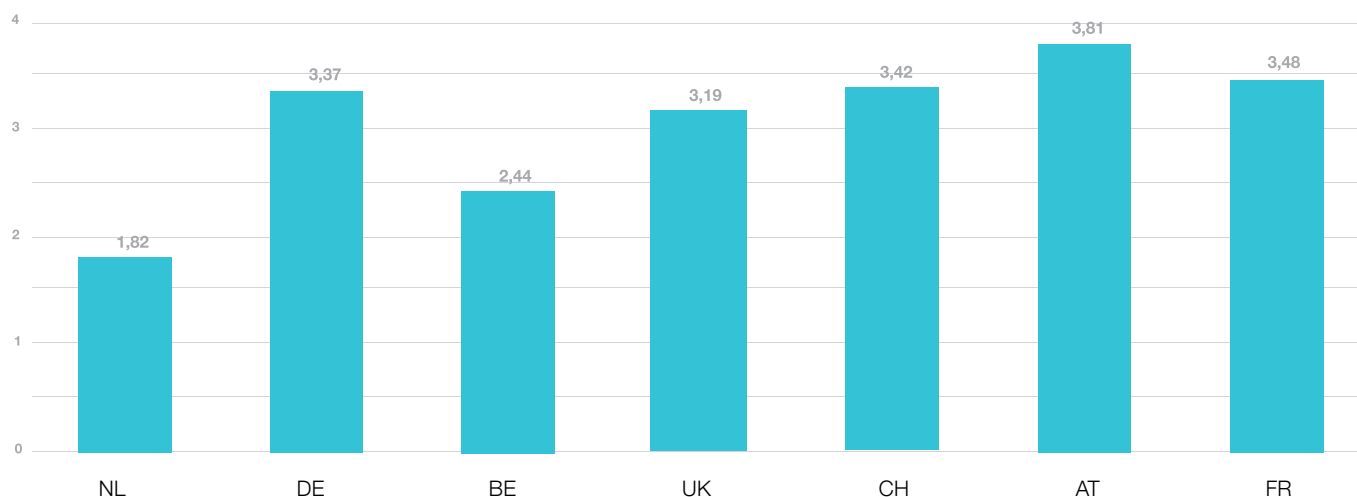
3 Charge points and charge cards

A handful of charge cards

Although many EV drivers (37 percent) own just one charging card, a lot of EV drivers admit to needing multiple charge cards. A striking 45 percent say they own 2-4 charge cards while 15 percent requires 5 or more charge cards. The average amount of charge cards that EV drivers own is 2,5.

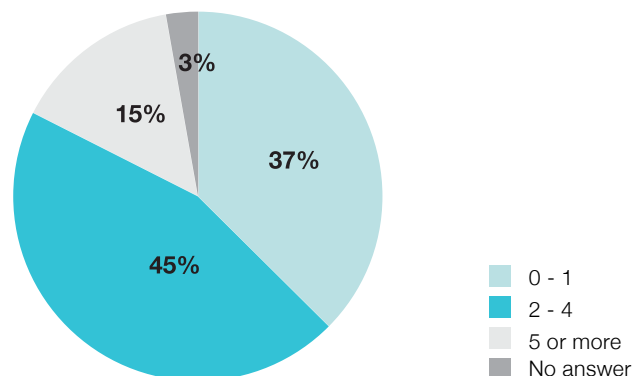
The average number of charge cards per EV driver is highest in Austria (3,81), followed by France (3,48) and Czech Republic (3,42). Also in Germany (3,37) and the United Kingdom (3,19) drivers feel the need for multiple charge cards, while the situation in Belgium (2,44) and the Netherlands (1,82) is slightly better. The relatively low amount of charge cards per EV driver in the Netherlands is most likely because most charge points are interoperable and because of the high volume of charge points, which is the highest in Europe (Source: European Alternative Fuels Observatory, December 2019).

Amount of charge cards



How many charge cards do you own?

Charging prices (41 percent) and network coverage (38 percent) are mentioned most often as the reason to use one charge card more than another.



As a company we promote collaborations in roaming with all providers. We believe in interoperability: the creation of an open network where every party uses each other's services, with just a single charge card. It provides all EV drivers, independent from their mobility service provider, with the comfort to charge their electric vehicle anywhere and is therefore an essential building block to realize faster adoption of electric vehicles in general. It simply makes e-mobility more accessible as everyone profits from a more accessible charging network with one single charge card.

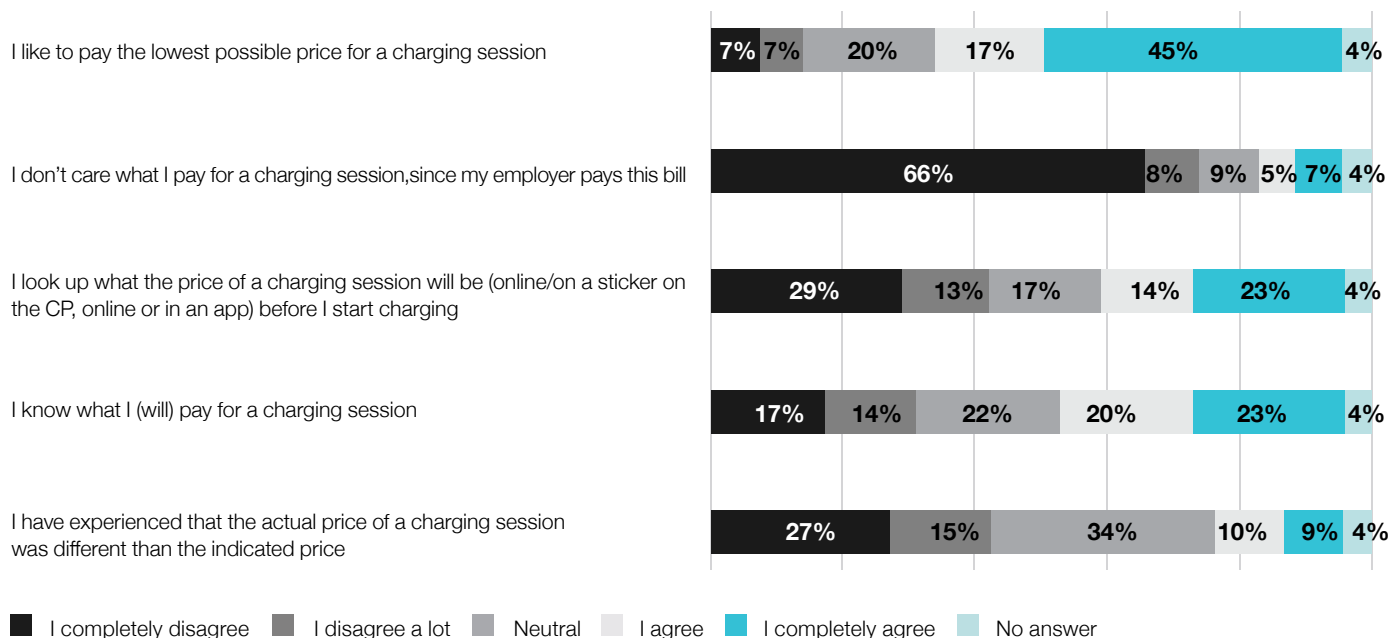


3 Charge points and charge cards

EV drivers demand price transparency

The price of charging is an important topic amongst EV drivers. 43 percent of EV drivers say they know what they will pay for a charging session before starting the session. 37 percent say they will specifically look up the price of a session before they start charging. Two out of five respondents say they've had at least one instance where the actual price of a charging session turned out to be different than a price shown beforehand at the charge point.

Which pricing statements apply most to your situation?

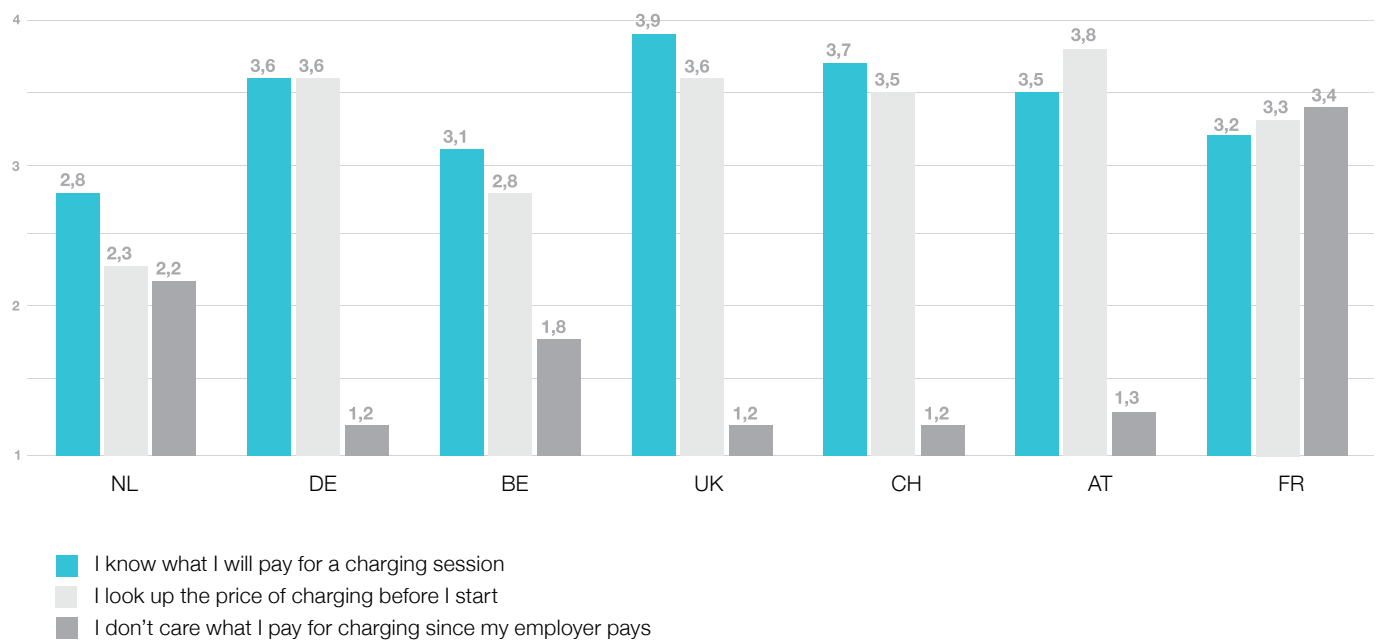


We see that the price of charging is a very important topic to EV drivers, as it should be. We want to lower the barriers for EV driving, and the only way to do so is by making prices transparent, consistent and without any surprises after a charging session. We believe this is an important issue to address for the entire industry.

3 Charge points and charge cards

EV drivers in the Netherlands are significantly less likely to know what they will pay for a charging session than in all other countries. Dutch EV drivers are also less likely to look up the price before starting a charging session. British EV drivers were the most likely to know what to pay for a charging session (3,8 on a 5-point scale), while EV drivers in Austria will carry out the most price research in advance.

Pricing related statements



Managing your EV infrastructure



Email

Password

Log in >



Change sessions and kWh usage over time



Charge location usag



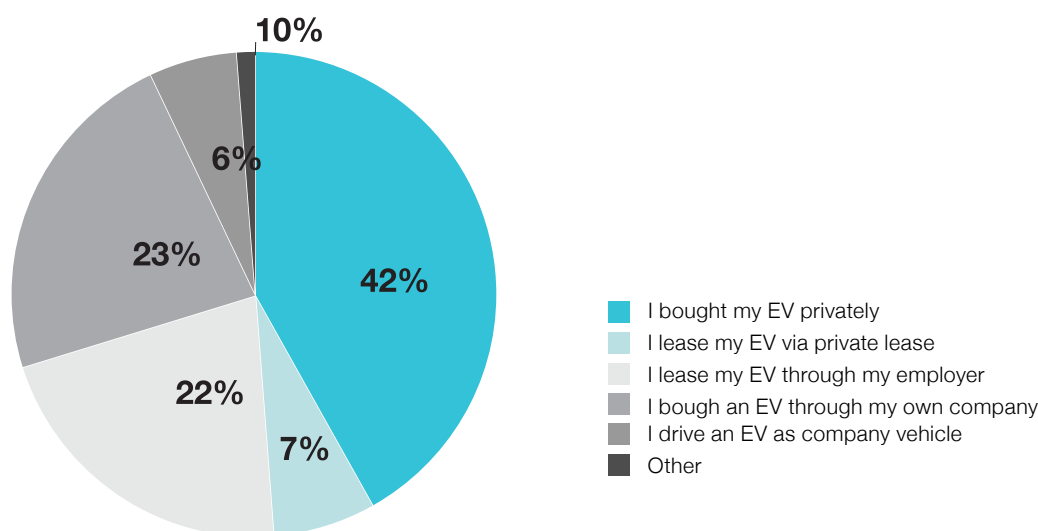
4 Managing your EV infrastructure

NewMotion makes it easy to manage EV fleet charging and an EV charging infrastructure. Smart charging helps to reduce costs and optimise efficiency. Companies face new challenges and needs when switching towards the management of EV charging infrastructure. Efficient management of this charging infrastructure can lead to an overall reduction in total costs of ownership.

Company vehicles go electric

A large share of electric vehicles are bought or leased via companies. A striking half (50 percent) of the EV drivers acquired their current electric car via their business; either leased via their employer, bought via their own company (generally SMEs) or driven as company vehicle. The other 49 percent bought or leased their car privately.

How was your current EV acquired?

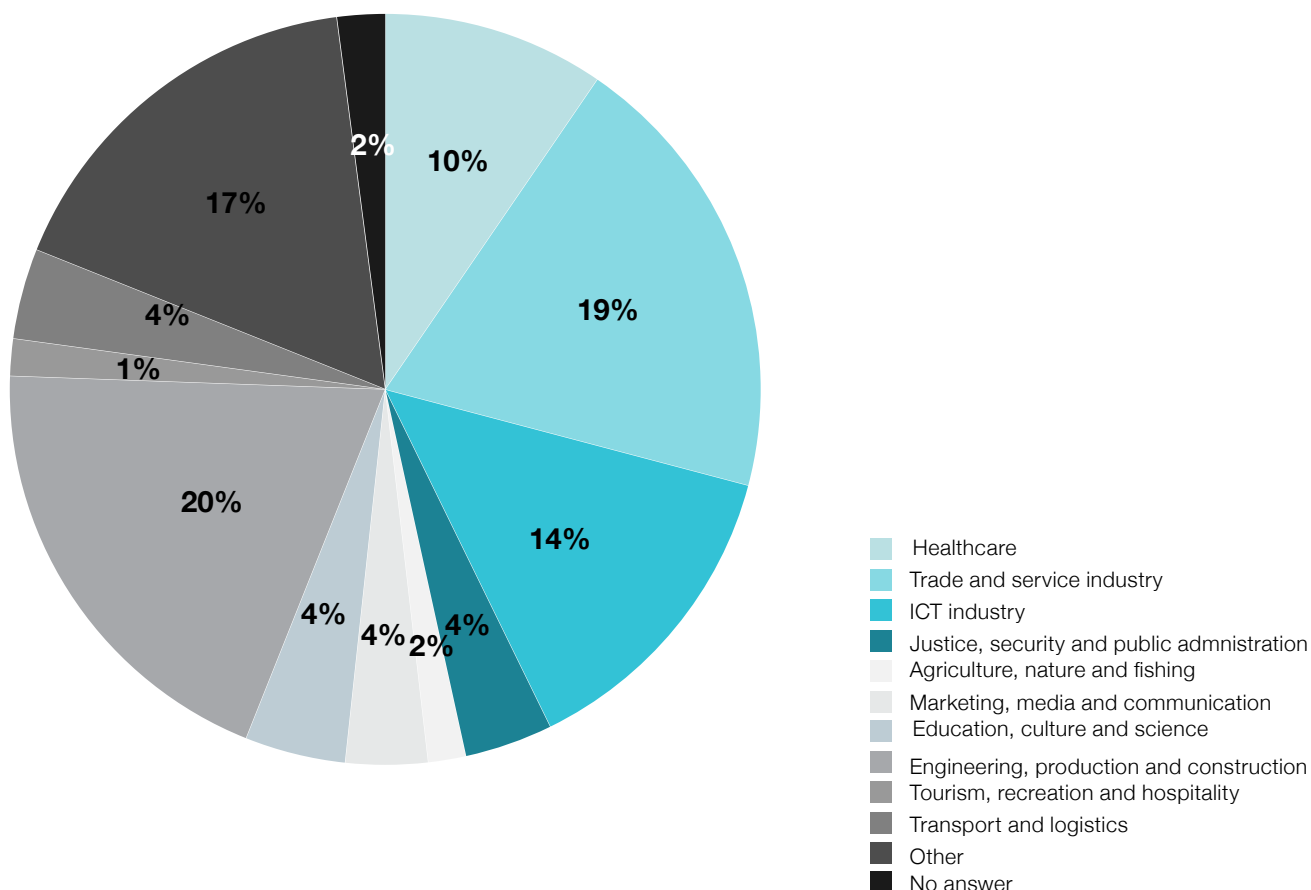


Increasingly more companies believe it's important to offer the best mobility solutions while also reducing their carbon footprint. Where employers already know the total cost of ownership (TCO) of a petrol fleet, there is more to learn about the TCO of EV fleets. NewMotion gives insights and controls to reduce EV charging costs and minimise the TCO of EV fleets.

4 Managing your EV infrastructure

Most EV drivers are currently active in engineering, production and construction (20 percent), trade and service industry (19 percent) and ICT industry (14 percent).

In which sector are you currently professionally active?



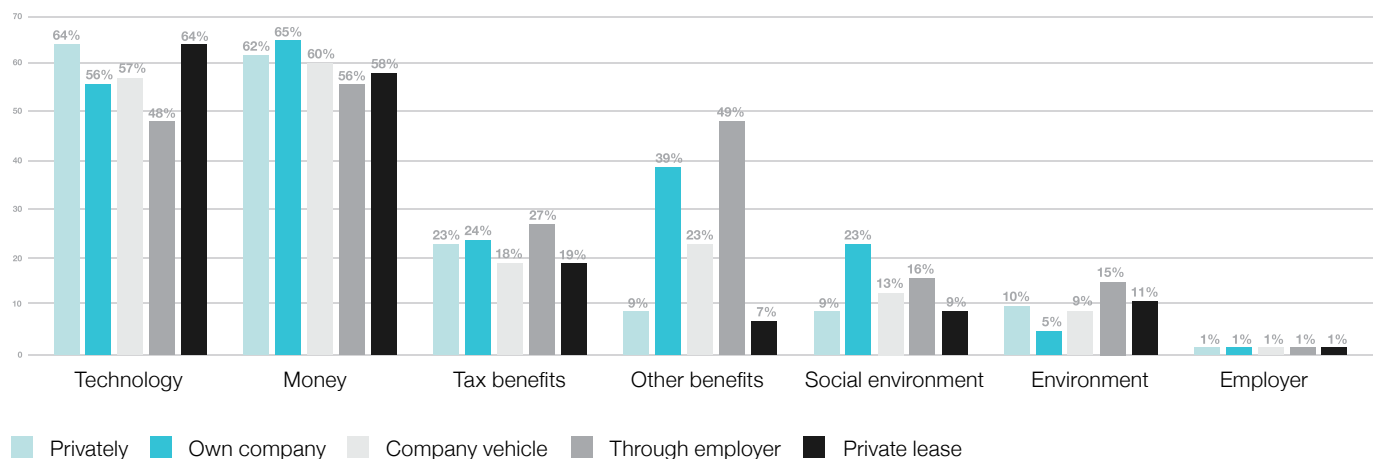
At NewMotion, we ease the transition to an EV fleet by analytics solutions for fleet charging behavior. Based on those analytics, companies can make decisions to increase efficiency. For example to install more charge points, offer at home charging solutions or create an EV company policy.

4 Managing your EV infrastructure

Social environment as an influencer

There are some differences between company and private users when it comes to the main reasons for getting an electric vehicle. EV drivers who acquire their car via an employer do not mention technology as the main incentive to go electric, compared to other drivers. The environment is relatively more important for these drivers than for other drivers. While the environment itself is not key reason to choose for driving electric. People who drive an EV via their own company mention their social environment as an influencer relatively often. The many secondary benefits of driving EVs are mainly of importance for people who own a company or got their electric vehicle via their employer. The reasons behind EV adoption clearly differs for employees as the social and environmental incentives are relatively more important to this group, in comparison with private users.

What is the main reason for driving an EV



64%

**of private EV owners think
technology is the main reason
for driving an EV**

5

New Rituals



5 New rituals

Based on ten years of charging data, NewMotion knows that people tend to charge where they park. Businesses and end users demand ease of use from their charging solutions, as this makes it easier to seamlessly fit EVs into our everyday lives.

Although most EV drivers experience some change in their driving behavior, for example they accelerate faster (45 percent) or drive as efficiently as possible (52 percent). Four out of five (80 percent) of the respondents say shorter range does not equate to shorter driving trips.

Did you change your driving behaviour since you started driving electrically?

I didn't change anything in my driving behavior.

I stopped using my car for road trips to a holiday destination abroad.

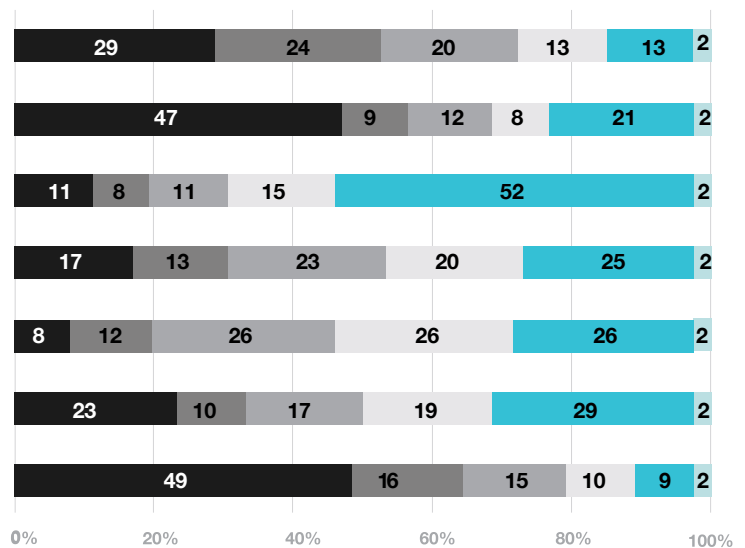
I hardly go to a fuel station anymore.

I accelerate faster.

I drive as efficient as possible (lower speed and acceleration).

I divide longer trips with more breaks due to the driving range.

The trips are shorter due to the driving range.



■ I completely disagree ■ I disagree a lot ■ Neutral ■ I agree ■ I completely agree ■ No answer

The biggest behavioral change is that EV drivers are less likely to go to a fuel station anymore and more likely to drive efficiently following the adoption of an electric vehicle. However, remarkably a faster acceleration is still mentioned as one of the biggest behavioral changes.

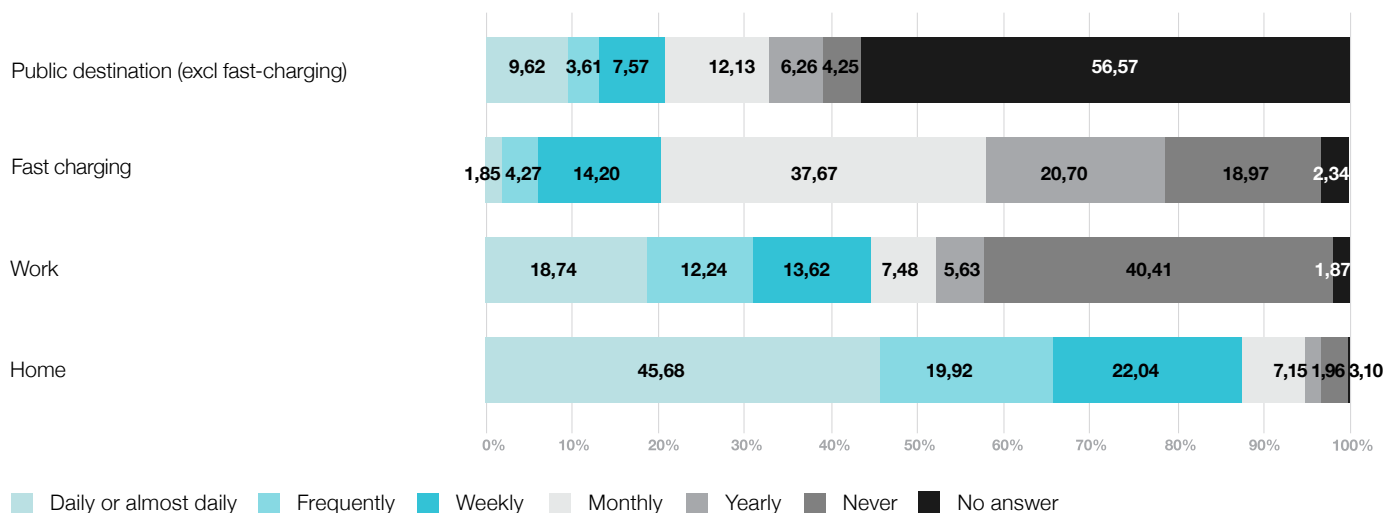
5 New rituals

Parking in own driveway

Almost half (46 percent) of EV drivers charge their car at home daily. Another 20 percent will charge their vehicle at home on a weekly basis, while 5 percent say they will barely ever charge their car at home (yearly or never). Work is frequently used as a charging location too. One in five (19 percent) respondents use a charge point at work daily, while 12 percent charge at work three or four times a week. However, 2 out of 5 respondents (40 percent) never charge their vehicle at work.

Home and work are far more popular charging options than charging on-the-go. One in ten respondents will use public charging destinations such as retail stores or restaurants on a daily basis. A charge card or token is the main payment method at public charging sessions: 80 percent. 8 percent pay via ad-hoc charging (via a credit card or payment link), while 36 percent of the respondents say their public charging sessions are free.

Please indicate per charging location how often you charge there



When charging in the evening or overnight, most EV drivers use a private charging option at home (84 percent). 9 percent use a shared or public charge point close to home, while only 5 percent have no option (or need) to charge their car overnight. 3 percent of respondents leave their car to charge at work.

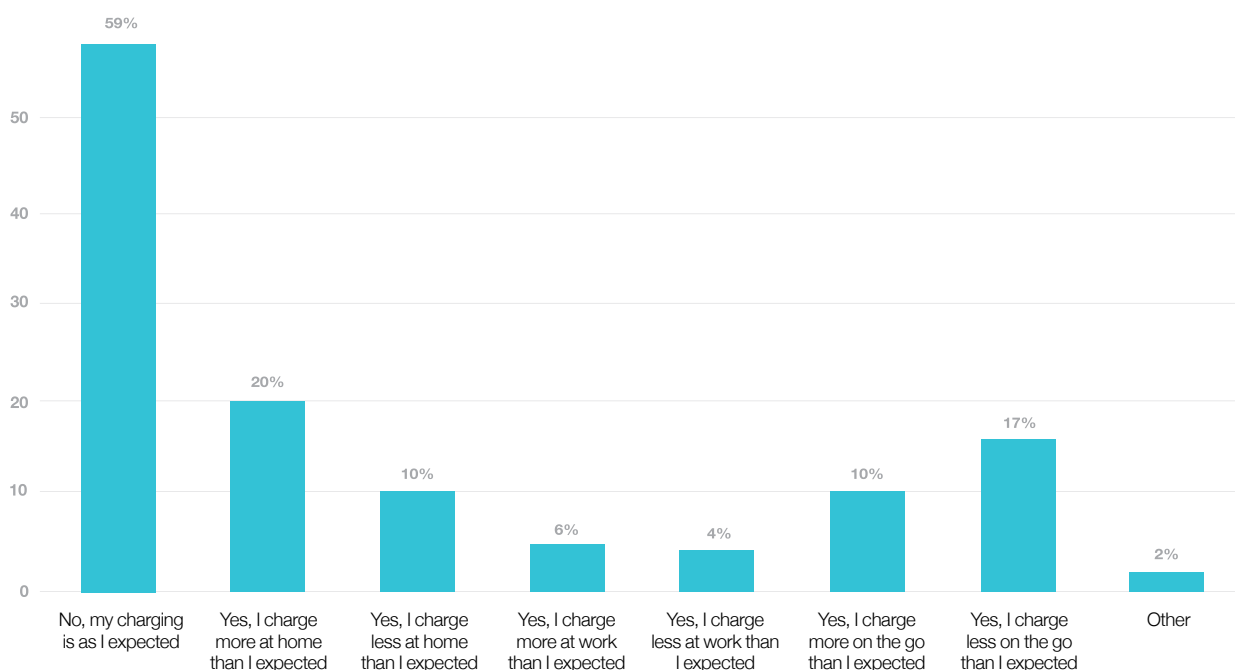
84%

**use a private charging
solution at home to charge
in the evening or overnight**

Less on-the-go charging as expected

A large share of EV drivers are not surprised by their own charging behavior. 59 percent of the respondents indicate their charging patterns are as expected. However, one in five respondents charge more at home than initially expected, while 17 percent do not charge on-the-go as much as they thought they did.

Does your charging behaviour differs from what you expected when switching to an EV?



6

Smart charging for a sustainable future



6 Smart charging for sustainable future

The importance of using renewable energy resources is increasing, while e-mobility will increase the overall energy demand. There will be a higher need for flexibility. Higher than ever. Smart charging is turning the EV into a flexible energy asset.

EV drivers are certain: electric driving is the future. 60 percent of the respondents predict that full electric will be the most dominant fuel type in their country in 2030. 14 percent says hydrogen will be largely adopted and 13 percent think that hybrid will be the most important fuel type. Only 12 percent believe that fossil fuels will remain the most dominant fuel type.

This perfectly fits into the focus on the sustainable future that most EV drivers have. 81 percent of respondents see themselves as 'pro-environmental'; 74 percent go further to say that acting environmentally friendly is an important part of who they are.

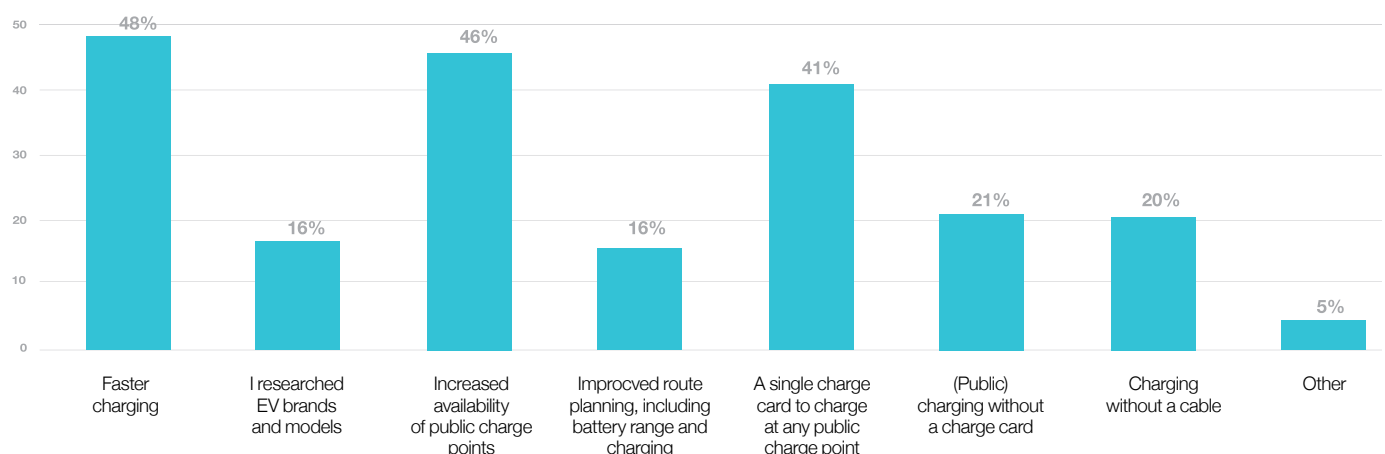
60%

predict that by 2030 full electric will be the dominant fuel type

Faster charging, better charge point availability and using a single charge card

However, EV drivers are very clear about what will improve their charging experience most profoundly. Faster charging (48 percent), increased availability of charge points (46 percent) and a single charge card for any public charge point (41 percent) are the most important improvements for a better charging experience.

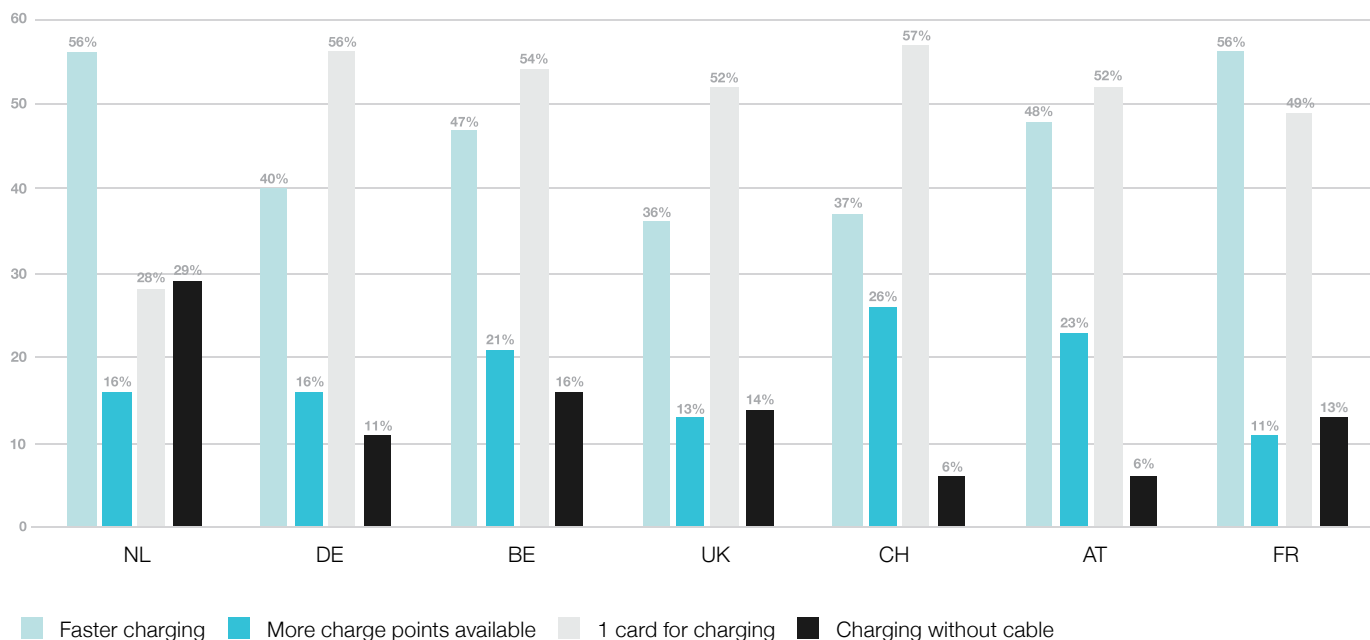
What would improve your EV charging experience most profoundly?



6 Smart charging for sustainable future

In the Netherlands, fast charging would be a more important improvement than in other countries. In Germany, UK and France the availability of charge points is considered to be more important. In almost all countries the switch to one single card for a seamless public charging experience is the most pressing matter to improve, except for the Netherlands. This is probably because of the high amount of roaming in the Netherlands.

What would improve your charging experience the most?

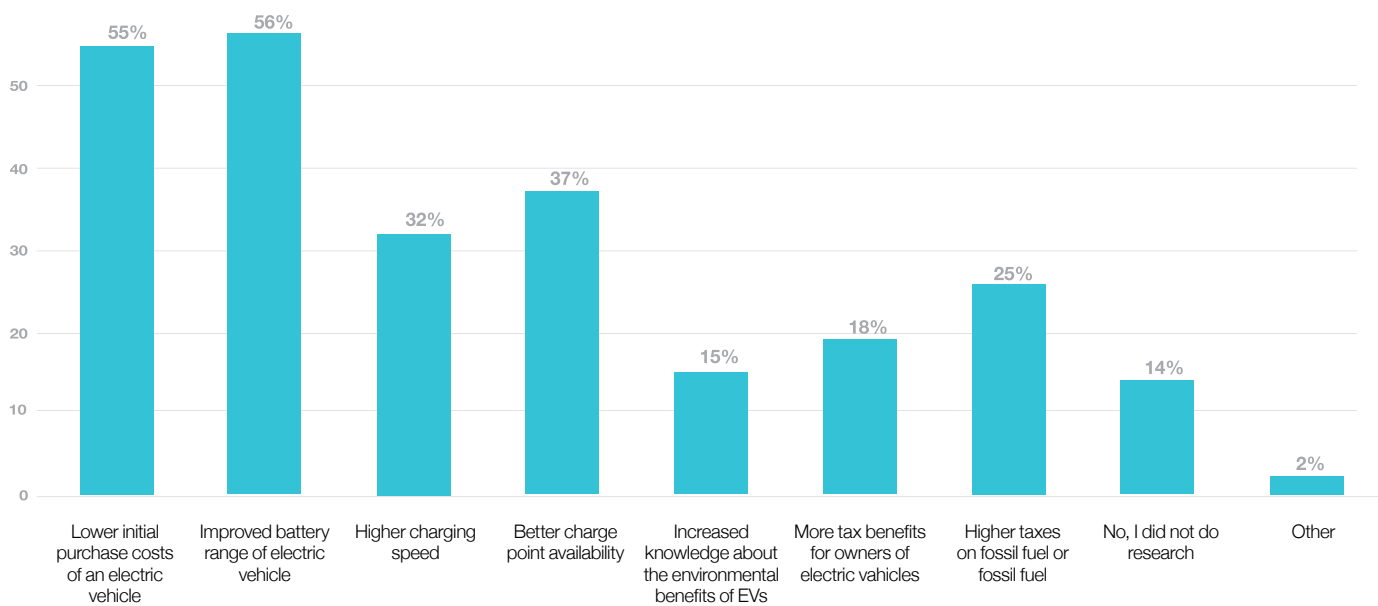


The Netherlands
has the highest charge point density of Europe

6 Smart charging for sustainable future

For an even bigger mass adoption of electric vehicles, the improvement of EV battery ranges is considered to be the most important driver (56 percent), even though the participants indicate their range is sufficient for everyday use. Followed by lower initial purchase costs of an electric vehicle (55 percent) and better charge point availability (37 percent).

What do you consider the most important drivers for the mass adoption of EVs?



6 Smart charging for sustainable future

Full battery not required

Not all EV drivers require a fully charged battery within their vehicle when they leave work. EV drivers trust their battery range: a third of drivers believe their battery should be 30 – 50 percent full when they leave work. 21 percent say their battery should be 60 – 80 percent full and another 21 percent do want their battery to be (almost) full when they leave work.

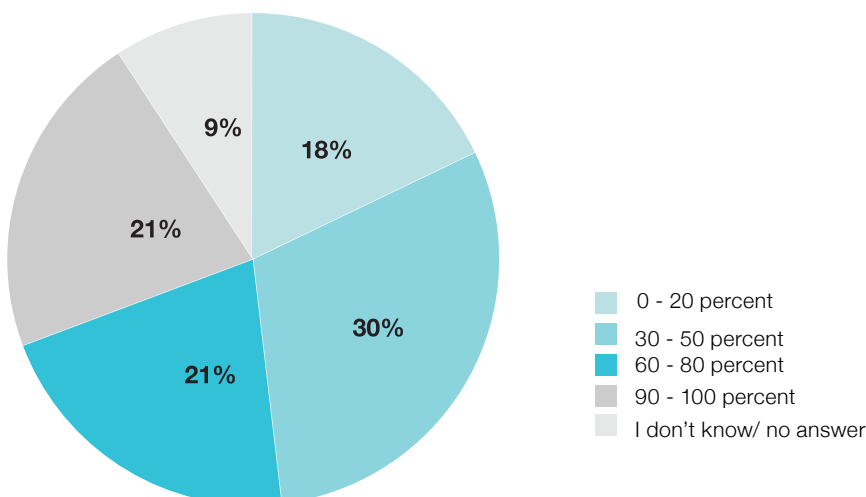
Confidence in the battery of electric vehicles can be explained by the fact that an average daily commute costs about 20 percent of the battery. As many people have charge points at work and/or at home, they don't have to be afraid of a limited battery range.



20%

**of the battery is used for
an average daily commute**

**How much do you want your battery to be charged
at least when you leave work?**



6 Smart charging for sustainable future

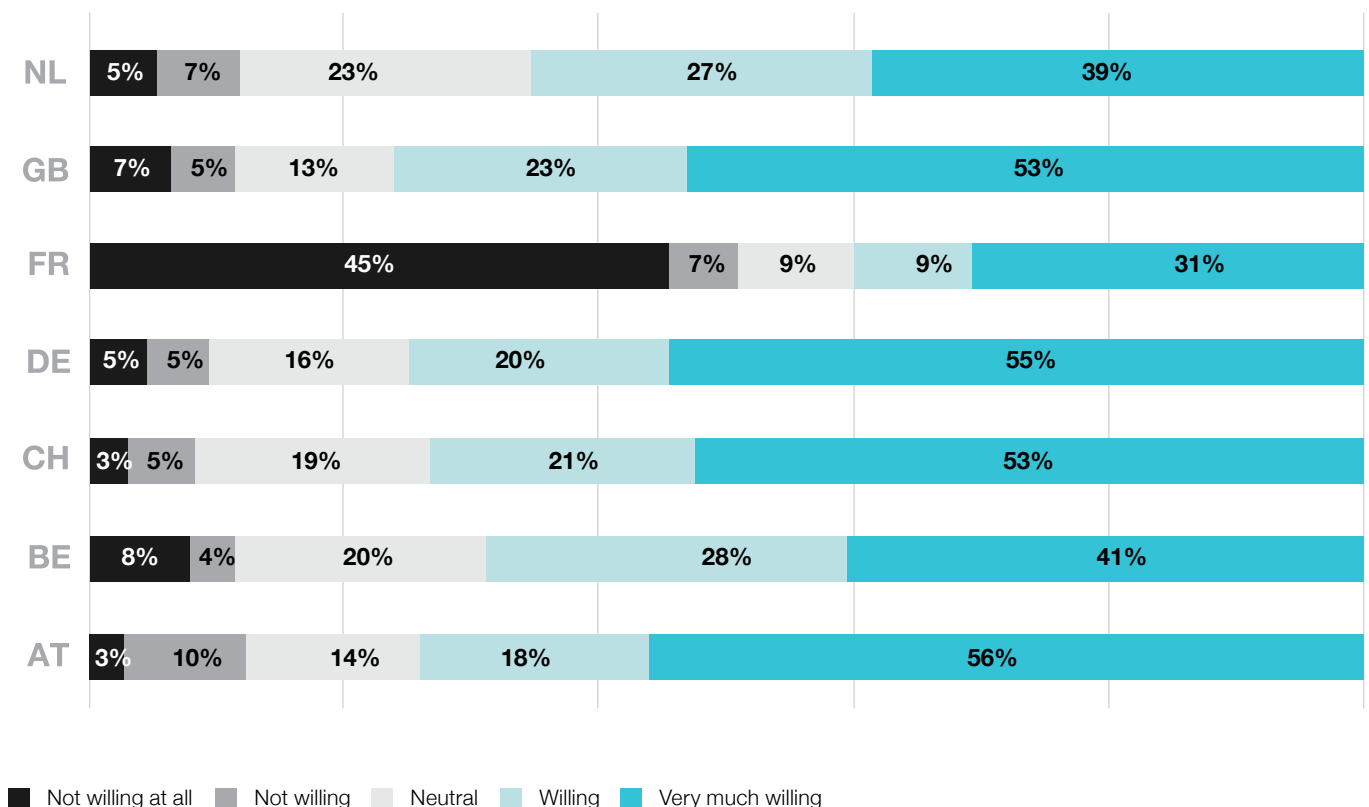
The future of smart charging

Smart charging can offer a solution for the fluctuating supply of solar and wind energy by smoothing out peaks in supply and demand. For example with apps or software that enable delayed charging, slower charging and also with V2X technology. With V2X, electricity can be fed back into the electricity grid, but also into private power grids like offices or private homes.

Using these sort of smart charging solutions might mean that upon plugging in, cars don't immediately charge at full speed for the total duration of the charging session.

EV drivers are not only confident about the future of smart charging, they are actually ready and willing to use this technology. 69 percent of the EV drivers are willing to use smart charging, while only 11 percent are not. The desire to use smart charging offerings is especially strong in the United Kingdom (76 percent) and Germany (75 percent) and is surprisingly low in France (40 percent).

I'm willing to use smart charging



Methodology

The NewMotion EV Drivers Survey 2020 is based on an online questionnaire on electric driving. In total 5493 participants started to fill out the questionnaire of which 4492 filled out at least 80% of the questionnaire. For this survey, NewMotion used the 4492 participants who filled out at least 80% of the questionnaire for the analysis.

EV drivers from all over Europe

In total 50% of the participants were from the Netherlands, 32% from Germany, 6% from Belgium, 5% from the UK, the remaining 7% was from other European countries. The data collection took place between 7 and 31 December, 2019. For the analysis of the EV Driver Survey Report 2020 NewMotion collaborated with researchers of the Rijksuniversiteit Groningen and with Omnicom PR Group Netherlands.



© 2020

www.newmotion.com

The New Motion BV
Rigakade 20
1013 BC Amsterdam
The Netherlands