

Qualitative research with electric vehicle drivers to understand their needs and experience of the current user journey

Consumers' role in decarbonisation



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Introduction

Introduction

As the GB energy regulator, Ofgem want to actively support the transition to net zero¹, as set out in Ofgem's Decarbonisation action plan². The Climate Change Committee³ estimates that 62% of the actions required to achieve net zero greenhouse gas emissions by 2050 will require some form of consumer behaviour change.

Ofgem regularly undertakes consumer research to understand the priorities, views and experiences of a wide range of consumers. In October 2020, we undertook a number of remote research interviews with electric vehicle drivers from across Great Britain to understand their needs and experiences.

This research is part of our broader work to understand how Ofgem can enable the behaviour changes needed by consumers to support the transition to net zero greenhouse gas emissions by 2050. The insight is informing Ofgem's work preparing Networks for electric vehicles.

¹ <https://www.gov.uk/government/news/uk-becomes-first-major-economy-to-pass-net-zero-emissions-law>

² <https://www.ofgem.gov.uk/publications-and-updates/ofgem-s-decarbonisation-action-plan>

³ <https://www.theccc.org.uk>

Executive summary

Tracing the user journey from undertaking initial research over purchasing to charging an electric vehicle, we heard from participants about the many hurdles they had to overcome, and what would need to be in place for them to have a smooth electric vehicle user experience.

Pain points they described include the amount of information they had to digest when engaging with this new technology, or unexpected costs associated with installing a home charge point.

Many hurdles relate to the public charging experience, which is significantly different in Scotland to the rest of Britain.⁴ Participants highlighted some of the challenges that come with having multiple different charge point operators, such as differences in how to use and pay for them.

⁴ In Scotland, non-motorway charge points are operated by ChargePlace Scotland, a public charging network.

Executive summary

Of particular interest to Ofgem is how purchasing an electric vehicle influences consumers' wider energy usage in the home. Participants' accounts varied from adopting a time-of-use tariff and charging in line with it to save on bills, to participants being unaware of smart charging and not making any changes to their energy use.

In total, we have identified **29 user needs**, which are set out from slide 33. Fulfilling these needs falls on no single organisation but will require a whole industry effort.

User-centred policy making

User-centred policy making is an approach that puts users' needs at the heart of our thinking. It helps policy makers to really give thought to how their policy ideas will affect people, by involving users in different steps of the policy process, for example by involving users in research, identifying problems and in generating ideas to improve things. This approach was successfully piloted in 2019 by Ofgem. See [here](#) for a write up of the case study including advice for others looking to use this approach.

Our research was a 'discovery' phase of research, where we looked to understand the current situation for electric vehicle drivers, what they need, and what they are trying to achieve. By first understanding what the problems are, we are able to identify which of these Ofgem are best placed to focus on, while also sharing the insight with other government departments where actions fall within their remit.

How to read this research report

This report is divided into two main sections.

Part one: is about what the research objectives were, and how we went about looking to understand these.

Part two: summarises the key actionable insights we gained from qualitative research interviews with electric vehicle users. This includes pain points with their existing user journey, their user needs, and our next steps.

This report is for: energy sector organisations and policy makers involved in energy and transport. This may also be of interest to individuals who use electric vehicles, or are thinking of getting one.

Part one:

About this research

Section summary

This section covers the wider consumer research that this piece is part of. It then explains the research objectives, research method we used, our sampling approach, and how to interpret the research.

Given Ofgem's role in facilitating decarbonisation, we seek to understand the role consumers can play in moving to a net zero energy system, the challenges this brings, and how Ofgem can support consumers on that journey.

Consumers' role in decarbonisation

As set out in our [open letter](#) in September 2020, Ofgem have evolved our consumer engagement work to focus on exploring and understanding the role of consumers in decarbonising the energy system.

The [insight](#) from our initial research into consumer attitudes towards decarbonisation identified a number of actual and perceived barriers that may impede behaviour change at the pace that is needed.

Following a broad discovery phase looking at the various ways in which changes in consumers' energy behaviour can contribute to net zero, we decided to conduct a deep dive into smart charging of electric vehicles.⁵

To inform what Ofgem can do to support or enable consumers in this area, we first needed to understand current lived experiences. We undertook a number of qualitative research interviews with electric vehicle drivers to understand their needs, goals and how their experience has been so far.

⁵ Smart charging is defined as shifting the time of day when an electric vehicle charges, or modulating the rate of charge at different times, in response to signals.

Research objectives

The purpose of this research was to:

- Build our understanding of EV users' current experiences with their electric vehicle
- Identify any pain-points or barriers with the current customer journey
- Understand their needs and goals, so that any next steps we take work for them.

While acknowledging that not all elements of the electric vehicles experience are within Ofgem's remit, we deliberately set out to understand the wider end-to-end journey including all the stages from purchase to how people with electric vehicles use energy in their home.

When looking to solve a problem for users, in this case electric vehicle drivers, we need to be mindful of their wider end-to-end experience.

Research questions

Our research questions were intentionally broad to capture rich insight on electric vehicle drivers; what is important to them, what their priorities are and what, if, any, their biggest barriers are.

The research questions covered seven areas:

- What was their situation that led to getting an electric vehicle?
- What was their choice of electric vehicle product?
- How did they make their decision? Why?
- How was their purchase experience? Why?
- What is their experience of using an electric vehicle? Why?
- Has getting an electric vehicle made them do anything differently with energy in their home? Why?
- What are their future plans?

Research methodology

1:1 qualitative interviews were conducted by Ofgem with 29 participants. Due to the pandemic and requirements to socially distance, interviews were conducted by video call.

A recruiter was used to identify and recruit a broad demographic of electric vehicle drivers from across Great Britain willing to take part in research.

Interviews were carried out over a two week period, in late September and early October 2020.

We used qualitative 1:1 interviews to identify the 'why' and the 'how' on any potential barriers, as well as user needs. This research method best fit our discovery work, which was looking to understand how things are currently and why.

Research methodology

Working with recruiters, we carried out interviews with a wide range of electric vehicle drivers:

- From across Britain; rural and urban, England and Scotland, with some participants from Wales and Jersey.
- From different careers; from CEOs to taxi drivers, day workers to night workers and people now enjoying their retirement.
- Equal split across standard demographics such as gender and age range. Those with families of different ages and those without.
- Different choice of car; electric vehicles and hybrids, those that charge at home and those that charge publicly. Those that own outright and those that don't.

How to interpret this research

The purpose of this research was to build our understanding of the needs and experiences of current EV drivers.

Given the qualitative nature and focus of this research, the sample was not intended to be representative of all EV users, nor does it attempt to provide any quantification of the issues. Findings are based on self-reported behaviours and experiences.

It is also worth noting that uptake of electric vehicles are still largely by early adopters, although this is growing. The insights generated through this research may differ for drivers who take up EVs or hybrid vehicles in the future.

Part two:

Research findings

Section summary

This section covers the insight from our research. Firstly, it sets out the high level user journeys of getting an electric vehicle, based on what participants told us.

We then mapped the pain points onto the relevant stages of the journey. Again, this is based on what participants told us.

Through this research, we identified 29 user needs that electric vehicle drivers have. When addressing the pain points, or looking to support behaviour change, whatever is put in place must meet these needs in order to be effective.

Electric vehicle (EV) user journeys

This section sets out the typical 'journey' participants described, from thinking about getting an electric car to using it.

Public charging is notably different between England and Scotland. Page 25 has further insight on these differences, and the differing experience of them reported by drivers taking part in this research.

Participants of this research told us about a number of barriers and pain points that affect the different steps of this journey, which are covered from page 21.

Electric vehicle (EV) user journeys

Motivations & research

Participants generally stated financial reasons as their main motivation for getting an electric vehicle. Information largely has to be researched, with the YouTube show *Fully Charged* often being cited.

Journeys

All participants said they don't use their electric car for long journeys, due to worries about range.

Click to add text

Charging at home

Not all participants were able to charge from home. Participants that home charge, tended to leave their car plugged in overnight, but start their charge in the evening when they get in. This differs for those working nights.

Buying an electric vehicle

Participants typically gave a lot of thought before buying. Range and price were the most common factors in what car they got. For those looking to charge their vehicle at home, dealers typically put them in contact for a charge point seller.

Charging publicly

Participants reported a very different experience depending on their location. There is a greater variety of charge point operators and processes in GB outside of Scotland, with participants reporting a number of barriers due to this.

Energy use at home

Some participants reported being on a time-of-use tariff. But for others, getting an electric vehicle hadn't made them think or do anything differently with how and when they use electricity in their home.

Biggest pain points for users

The research identified that participants encountered a number of pain points (problems experienced) when getting their vehicle, and still encounter these when using it.

This next section sets out these pain points. Anonymised quotes are included so that these barriers are also represented in the words they were articulated in.



"I didn't realise there were different cable types. I thought it was like petrol pumps one size fits all."



"There's a ridiculous amount of apps and networks and cards."



"I get used to it but it was very stressful at the beginning."

Biggest pain points for users



Motivations & research

How participants said they went about making their decision to get an electric vehicle

"My fear when buying it was not having enough chargers around so I'd have wanted to know more about that."



"The information is there but there is an information overload trying to work it out."



"We got a free installation of a charger, but we had to pay £250 for the wiring to be redone in the house."

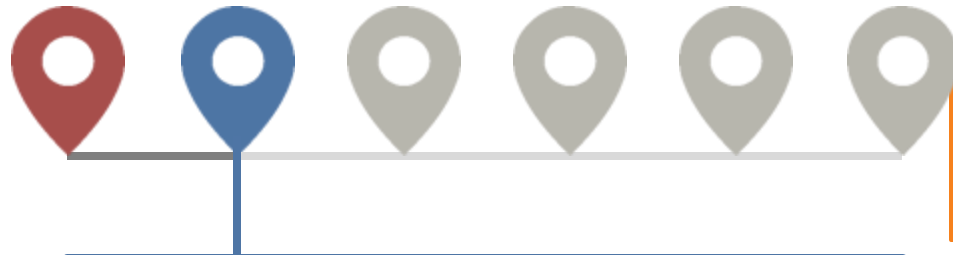


Range anxiety and lack of public charge point infrastructure is a worry for most participants when deciding to move to an electric vehicle or not.

People had to carry out their own research on electric vehicles, had to know where to look and what to search for.

Not all costs are clear upfront, e.g. rewiring in the home to be able to install a home charge point.

Biggest pain points for users



Buying electric vehicle

What participants told us about their experience of getting their electric vehicle, e.g. purchase experience

"They left out the need for the charger at purchase."



Not made clear what essential items need to be purchased separately.

"I had them come out to sort it out then they wanted another survey by which time the pod went up by £200."



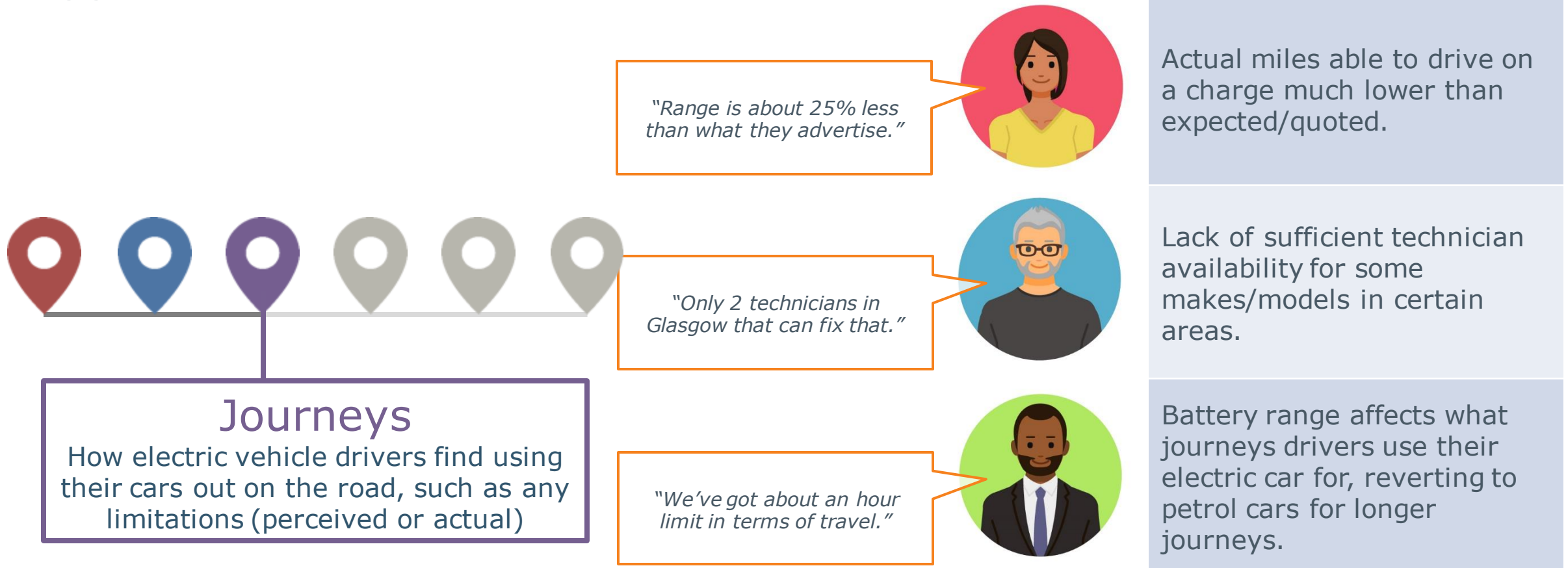
Lack of transparency around the full costs of running an electric vehicle.

"Dealership was utterly useless, they did not want to sell us a car."



Mixed perceptions on dealerships being knowledgeable of/interested in electric vehicles.

Biggest pain points for users



Public charging in England and Scotland





"I'd say I have 10-15 apps on my phone for that and RFID cards for some of these."

"There are certain areas where public charging is good but then why can't it be like that everywhere?"



"We pay £20 a year and you can charge anywhere in Scotland."

Participants highlighted very different experiences of public charging, depending on if this was in England or Scotland.

	
<ul style="list-style-type: none"> • Single operator – ChargePlace Scotland • Most are free to use at point of use • An RFID card (to use all charge points) costs £20 p/year. No cost beyond this to charge. 	<ul style="list-style-type: none"> • Multiple operators, requiring their own 'thing' to use, e.g. individual app, RFID card, website • Prices vary • While some newer charge points do allow contactless payment, older ones require actions before you can use them.

Biggest pain points for users



Charging publicly
When charging their vehicle in a public place, what were the most common barriers participants voiced?

"In Oxford there are only 2 chargers in the whole of the big city."



"It got to the point where your purse is just full of all these cards you might never use."



"You're very reliant on your phone."



Infrastructure of public charge points still being developed.

Not all public charge points can be accessed at point of need – e.g. some require pre-registering to be issued a physical card to use.

Charge points can be reliant on an internet connection to be able to use – e.g. website or app on your mobile phone.

Biggest pain points for users



Charging publicly
When charging their vehicle in a public place, what were the most common barriers participants voiced?

"I had to wait until 6 in the morning waiting for it to charge. After that experience I'm hesitant to use it."



"I didn't realise there were different cable types I thought it was like petrol pumps one size fits all."



"It is a bit annoying, that someone else unplugs your car and plugs theirs in."



Participants reported it can be a challenge to find a working public charge point.

That they are not universally compatible. They don't work with all makes and models.

And that the behaviour of other electric vehicle drivers sometimes delayed their journey.

Biggest pain points for users



Charging publicly
When charging their vehicle in a public place, what were the most common barriers participants voiced?

"It's really complicated to work out the pricing structures on the public ones."



It is difficult to understand the difference in price between the various charge point operators.

"I don't understand why I can't just use my credit card like I do in the shops."



Paying for your charge works differently to paying for petrol. In many instances it requires setting something up beforehand.

"Glasgow points are hard to access as taxis are always in them."



With more electric vehicles on the road, public charge points are busier.

Biggest pain points for users



Charging at home

For those participants who charged their electric vehicle at home, what were the barriers they experienced?

"In the meantime of getting my house setup for a charge point the price went up, we're talking £600."



Some participants experienced unplanned and rising costs for charge point installation.

"We didn't find out about the different types of chargers until we got the car. So we had a mad 'what's going on?'"



Interoperability. Not all home charge points work with all models of cars.

"I wanted to understand how it could integrate with my solar panels but they just wanted to bung it in."



Some participants perceived a lack of awareness by installers for more bespoke charge point set-ups.

Biggest pain points for users

"But my wife and kids don't care, if they need their clothes they'll put on the tumble dryer."



Benefitting fully from time-of-use tariffs require behavioural change from all household members






Energy use at home

Has getting an electric car made participants do anything differently with their home energy?




For those participants that charged their electric vehicle at home, we explored if this had made them do anything differently with how they manage their electricity use at home.

Very few pain points were reported by participants. However it is important to note that most participants hadn't made any changes to how they use their electricity at home. The next 2 pages cover further insight on energy in the home.

Energy use in the home

	Insight	Implication
	Most said they charge their car as soon as they get in. There is a reassurance need to be able to see that the car has started charging.	This means the charge is more likely to start when electricity demand is at its highest, so it is less likely to have been generated from a renewable source. The reassurance need will have to be met also when looking for people to charge their car 'off-peak' when demand is lower.
	Participants often hadn't heard of and were unfamiliar with the concept of smart charging.	People may not necessarily need to know how smart charging works in detail, but if smart charging is to increase, we need to be mindful of avoiding jargon, and articulating what it is and its benefits.
	Some participants had moved to a time-of-use tariff (costing less when electricity is used at a time when there is low demand).	People with an electric vehicle that they charge at home will be among those who benefit most from this type of tariff, given their increased electricity use. In order to make an informed choice, electric vehicle users first need to be made aware about these tariffs, how they could align their charging sessions with the tariff, and the benefits of it.

Energy use in the home

	Insight	Implication
	For those that have changed when they charge their car, this isn't a behaviour change their whole household has adopted for all their energy use.	This needs to be taken into account when considering behaviour changes that will support achieving net zero. Suppliers may also wish to consider this when designing EV tariffs.
	However, the majority told us getting an electric vehicle hadn't changed what they look for in an energy deal, or how they use their energy.	It cannot be assumed that because a consumer has taken up an electric vehicle, that they will also have adopted other actions and changes associated with energy.
	All compare the cost of charging their car to the cost of filling up a tank of petrol.	It is important to understand the value proposition if encouraging uptake of time-of-use tariffs or charging at different times. For example, with significant savings already achieved on fuel costs, the financial benefit alone of charging when electricity is cheaper may not be enough.

User needs

User needs are the needs that someone using a service, or affected by a policy, has. These needs must be satisfied for the user to get a good outcome.

By understanding user needs, we are able to build or design the right thing. Which means the service is more likely to be used, and used in the way it is intended. It also means we are more likely to achieve our policy intent.

While Ofgem may not be best placed to meet every one of the pain points and associated user needs identified from this work, publishing the full list adds value by highlighting them and saving the need to repeat this research.

More information on user needs can be found at <https://www.gov.uk/service-manual/user-research/start-by-learning-user-needs>.

User needs: **Before I get my electric vehicle**

As someone who is thinking of getting an electric vehicle...







"We got a free installation of a charger, but we had to pay £250 for the wiring to be redone in the house."

	<p>...I need a trusted source of information, so that I can make an informed decision.</p>		<p>...I need to know all the costs involved, so that I can make an informed decision about what set-up is right for me.</p>
	<p>...I need to know what the actual driving range for a charge is, so that I can make an informed decision about which EV/battery size is right for me.</p>		<p>...I need to know what charge points are available and how I can access them, so that I know what additional things I need to get to use them.</p>
	<p>...I need to know what financial support is available to me and how to access it, so that I know what I can get for my budget.</p>		<p>...I need to know who the right people are to talk to for my circumstances, so that I can get the right products for me, e.g. charge my car through my solar panels</p>

User needs: **When driving my electric vehicle**

As an electric vehicle driver...







"That's one thing that is frustrating with electric cars in this country. There isn't just one app to use."

	<p>...I need to complete my journey with minimal hassle, so that I can get to where I'm going.</p>		<p>...charging publicly, I need the way different charge points work to be similar, so that I use them.</p>
	<p>...going on a long journey, I need to know there'll be charge points available for me, so that I'm not stranded.</p>		<p>...charging publicly, I need the charge point to be in a suitable place, so that I feel safe.</p>
	<p>...charging publicly, I need to be able to charge my car when I need to, so that I'm not stranded.</p>		<p>...charging publicly, I need to know I'm paying a fair price for charging my car, so that I know I'm not being ripped off.</p>

User needs: **When driving my electric vehicle**

As an electric vehicle driver...

"It makes me just not take my car for long trips."

	<p>...who is unable to charge at home, I need public charge points to be located in a convenient place for me, so that I can charge my car when I need to.</p>		<p>...I need to be confident that using my electric car won't make my journey take too long, otherwise I'll use my petrol car.</p>
	<p>...who needs to charge publicly, I need clear information on how to use the charge point, so that I can charge my car.</p>		<p>...I need to know who to go to when things go wrong, so they can resolve my issue quickly.</p>
	<p>...who uses my car to schedule when I charge, I need to easily change from my scheduled time when I charge publicly, so that I can charge my car without hassle.</p>		<p>...who is having a problem with a public charge point (e.g. cable is stuck), I need the charge point operator to resolve my problem quickly, so that I can continue my journey.</p>

User needs: **When driving my electric vehicle**







As an electric vehicle driver...



...I need good technician availability in my area, so they can fix my car quickly at a fair price.

User needs: When charging my electric vehicle



As an electric vehicle driver...

	...I need to charge my car when it works for me, so that my car is ready to use when I need it.		...I need to know my car will have enough charge, so that I can use it in an emergency.
	...charging at home, I need to charge at a time that works for me, so that I am not inconvenienced.		...charging at home, I need the process to be easy, so that I can charge my car.
	...charging at home, I need to charge when I am comfortable charging, so that I'm not worried about it.		...who gets a smart charger, I need setting this up to be easy, so I can charge smartly and save money.

User needs: When charging my electric vehicle

As an electric vehicle driver...

"Worried that I may need a different cable. This one is only for the Nissan Leaf or the Mitsubishi."

	<p>...who smart charges, I need this to be reliable, so that I can get the financial benefit of charging when it's cheapest.</p>		<p>...charging at home, I need to avoid having to change my charge point when I get a new car, so that I avoid hassle and additional costs.</p>
	<p>...charging at home, I need the reassurance my car will be charged, so I can use it when I need to</p>		<p>...who could benefit from being on a time-of-use-tariff, I need to know how much better off I'd be, so I can make an informed decision about my energy.</p>

Ofgem is the Office of Gas and Electricity Markets. We are a non-ministerial government department and an independent National Regulatory Authority, recognised by EU Directives. Our role is to protect consumers now and in the future by working to deliver a greener, fairer energy system.

We do this by:

- working with Government, industry and consumer groups to deliver a net zero economy at the lowest cost to consumers.
- stamping out sharp and bad practice, ensuring fair treatment for all consumers, especially the vulnerable.
- enabling competition and innovation, which drives down prices and results in new products and services for consumers.