RiDC

Research report into accessibility the

Electric vehicle home charging

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energy saving trust

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About RiDC

RiDC is the leading expert in inclusive research involving disabled consumers. We are an independent, national charity with over 50 years of experience in consumer research and insight in this specialist area.

It's the only type of research we do.

We are run by, and for, people with a personal experience of disability.

We always start from the perspective of disabled and older consumers.

By working with disabled and older people, listening to their needs and reflecting on their experiences, we make sure nobody is excluded, and the insights we gather are grounded in real life.

RiDC was one of the first organisations to establish a UK panel of disabled and older consumers. Our panel includes over 3,300 people and is the most extensive pan-disability panel in the UK.

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Background

This research study is part of a broader RiDC research programme investigating whether disabled and older consumers can easily access and use low carbon energy products and services. The research programme - **Enabling Inclusive Innovation and Sustainable Choice** is funded by the Energy Savings Trust under the Energy Redress Scheme Round 11 (Innovation). The programme is being led by RiDC and delivered in partnership with Energy Systems Catapult (Living Lab).

This research, investigating the accessibility of EV home charging equipment, follows earlier research work by RiDC into the accessibility of public electric vehicle charging points, funded by Motability. This identified significant accessibility failings of both equipment and supporting infrastructure[1].

1 https://www.ridc.org.uk/transport/going-electric

Executive summary

This research investigates the needs and experiences of disabled motorists when choosing and installing home charging equipment for plug-in electric vehicles (EVs).

This research comprised three main elements:

- Desk research
- Pre-installation user workshop
- Post-installation user workshop

The research outputs are twofold, a research report and consumer guidance, both published on the RiDC website (ww.ridc.org.uk). A stakeholder workshop has been organised for Autumn 2022 to maximise the impact of our findings and help make change happen.

Main findings

Five key takeaways can be drawn from the research

1. There was a lack of awareness amongst installers of the specific access needs of some disabled motorists, including identifying appropriate EV charger models and the best positioning. This can result in the need for remedial work or sub-optimal installation location and subsequent access difficulties during use.
2. Disabled motorists participating in the research experienced difficulty in identifying suitable equipment, installers and comparing prices. Many information websites were confusing and difficult to access.
3. Participants felt they would have benefited from a pre-installation visit to discuss their particular needs, rather than the installer relying on photos, online or phone questions.
4. Some installers relied overly on carers' input, without speaking directly to the disabled motorist / vehicle owner.

5. Clear standards and codes of practice are required to ensure that both the product and installation are accessible and meet the needs of all motorists, including those with disabilities and older people.

Main recommendations

1. Installers and equipment suppliers' code of practice and staff training should specifically consider and address the needs of disabled and older users. This should include identifying any special requirements around usage, placement of the charger, interaction with customers' mobility and access needs and equipment, as well as changing needs and carer support.
2. More detailed consumer information and guidance should be made available to assist disabled motorists when choosing and installing home EV charging equipment to ensure it suits their particular needs.
3. All providers of consumer information should ensure their websites and accompanying Apps at least meet basic accessibility standards (Web Content Accessibility Guidelines (WCAG) 2.1. AA)
4. Installers should offer pre-installation customer visits.
5. The BSI should build requirements around best practice in installation of accessible home charging units into the new BSI standard that has been developed for public EV charging (BSi PAS 1899:2022)
6. More research is needed to follow up on the (UX) user experience of disabled motorists. The number of disabled EV users is currently relatively small, with early adopters. Similarly, the home EV charging market is relatively new.

Methodology

The research followed a typical customer journey from finding out what was available and suitable for people interested in buying an electric vehicle home charging point, through to the installation and running of the equipment. We were particularly interested in the accessibility of finding information about charging points, as well as the potential impact that buying, installing, and running home charging points might have on disabled people.

Desk research into electric vehicle home charging equipment and what support or incentives were offered to encourage uptake was undertaken between December 2021 and January 2022. This work helped inform two online workshops held with disabled people recruited from the RiDC panel[2], one in February 2022 and the other in May 2022. These online workshops were split between the two stages of getting a charging point namely, pre-installation and post installation.

The findings from both workshops were analysed separately and together to see if concerns voiced in the pre-installation workshops were echoed by the real-life experiences of people in the post-installation workshop who had gone through the process of buying and installing home charging equipment. All names used in this report are pseudonyms.

Workshop 1. Pre-Installation

Aim

This workshop sought to explore what would need to be considered before purchasing and installing an electric vehicle home charger that would best suit users' access and energy needs.

2 Over 3,300 disabled and older people across the UK http://www.ridc.org.uk/our-panel

The aim of this workshop was to help consumers with different access needs make informed choices about what electric vehicle home charging device to purchase and where to appropriately install it in their homes.

Participants

Three panel members with a variety of mobility, hearing and cognitive impairments participated in the workshop. They were all selected for having an electric vehicle or plug-in hybrid but not a charging device installed in their home. All three of the participants, however, expressed that they had considered or would consider getting a charging device in the near or distant future. Detail of their impairment can be found in Appendix 1. Participant details

Preparation for the workshop

Prior to and in preparation for the workshop, participants were asked to think about and do some online research into what electric vehicle home charger could best support their access and energy needs.

Participants were instructed to specifically think about where they would install an electric vehicle home charger in their home and the type of charger they would need (i.e., in terms of charging speed, type of cable, whether they would like it to be smart etc…). They were then asked to shop around for EV home chargers online using any websites or sources they wished as well as the EV charger and energy tariff price comparison website 'RightCharge'[3].

Online workshop

The online workshop was conducted over Zoom on the 17th of May and lasted approximately 90 minutes. It was recorded for later analysis and

3 Popular independent comparison website for electric vehicle home charging solutions: https://rightcharge.co.uk/

transcribed using Otter.ai. Participants were paid £50 pounds as a thank you for taking part.

The focus group was split into two sessions, each lasting approximately 30 minutes with a ten-minute comfort break in between. A topic guide which included questions and prompts was developed to guide the discussion and explore the following topics:

> **Session 1 (type of charger and where to install it)** – each participant was asked where they would expect to install an EV charger in their home in terms of ease of access. They were also asked to describe the type of charger that would support their circumstances, access, and energy needs. To enable them to do this, they were asked to think about its charging speed; whether they would want it to be smart or not; the type of cable; interface and any additional features they might want it to have.
>
> **Session 2 (shopping around for a charger and arranging installation)** – participants were asked about their experience of shopping around for an EV charger online prior to the workshop e.g., what sources they found helpful or unhelpful, if they had any difficulty accessing or understanding general and/or suppliers' information and what guidance or support wasn't available which they would have liked to have had. They were also asked what their main concerns would be in terms of arranging the installation and the actual process, as well as what the installer would need to consider with regard to their access needs.

One researcher led the workshop, whilst another researcher took notes in the background on a Miro board, which was later used to support analysis of the workshop outputs.

Workshop 2. Post-Installation

Aim

The aim of this workshop was to collect the lived experiences of disabled people who have gone through the purchasing and installation of electric vehicle home charging equipment.

We wanted the participants to share with each other their equipment's installation, and operational experiences. This provided a variety of different perspectives which when viewed with the benefit of hindsight, enabled us to probe the group to critically reflect on the choices they made.

Participants

The workshop was attended by six panel members with a variety of mobility, hearing, and cognitive disabilities. They were all chosen for having an electric vehicle charging unit installed in their home. A table of both disability and equipment can be found in Appendix 1. Participant details.

Preparation for the workshop

Prior to the online workshop we asked the participants to send to us photos or video of their home charging arrangement. We also asked them to think about the placement of the charging unit, any modification they might have made to the charging area, and the best and worst features of their set-up. We collected 21 images and three video clips.

Online workshop

A Topic Guide was developed to support the structure of the workshop and to ensure various points of interest were discussed using prompts. It also ensured the administrative necessities were acted on such as, consent forms understood and signed, expense forms processed, and permissions given for recording the session.

The online workshop, which used Zoom with audio-captions enabled, was recorded for later analysis, and transcribed by Otter.ai. It was delivered on the afternoon of the 24th of February and lasted for 90 minutes, spanning two working sessions of 30 minutes with a ten-minute comfort break between sessions. All participants received a £50 'thank you' payment for attending the workshop.

Session one (collecting experiences) – each participant was invited to describe their home charger to the group and to point out any modifications, workarounds, assistance needed, and the best and worst features. Prompts were given about any role for carers, the use of apps, and whether there were any unforeseen difficulties after the installation.

Session two (reflecting on each other's experiences) – in the light of the experiences voiced from other people in session one, each participant took turns to answer prompts about if they were to purchase a home charger again.

- Would they do anything different or change anything about their existing installation?
- What made them choose their current supplier and if they thought about their future needs when making that choice?
- What advice would they give to a close friend with similar needs?
- Were there any hidden costs with their installation?

One researcher used the Topic Guide to facilitate the workshop whilst another researcher, who was introduced to the group, was in the background taking notes onto a Miro board which was used to support analysis after the event.

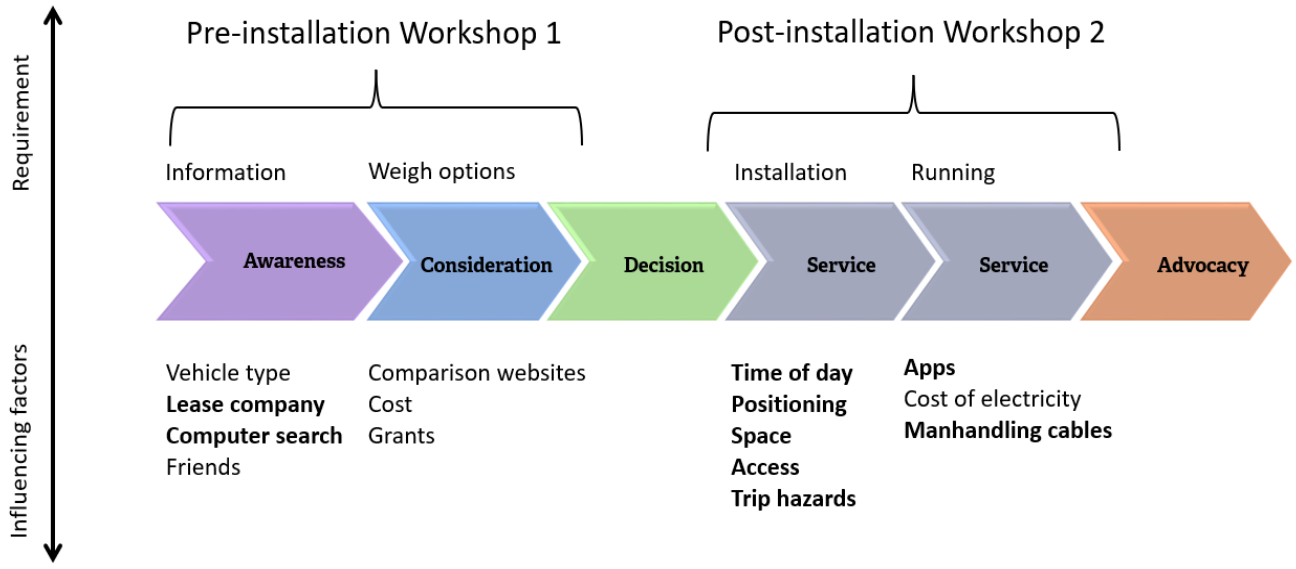
Results

In this section we have combined the results from both workshops together and highlighted where in the customer journey critical touch points exist. We used these touch points to further understand the participants' context and to explore the impact of choices made. Improvements are suggested in the 'Discussion' section at the end of this report.

The Customer Journey

The diagram in Figure 1 shows a typical customer journey for choosing and running electric home charging equipment. The influencing factors listed in bold underneath the stages of a typical customer journey identify areas of particular concern to people with disabilities.

Figure 1 Customer Journey when choosing electric vehicle home charging solution



Information

Participants in workshop one reported feeling confused about where to go for information and overwhelmed by the number of sources available. Many also found it difficult to understand information due to the technical terms and jargon used.

"It's a minefield" _Tom, Mobility

"For many people - when they get bombarded with too much technical information it can be overwhelming – an idiot's guide is needed" _Jerry, Mobility, Cognitive

Participants felt that before they could research and compare EV home chargers online, they needed guidance on the type of charger that would best suit their car, home, access, and energy needs. Important features to consider included charging speed, tethered (secured to the charger at one end) or untethered (not secured at either end) cable, smart charging, fuse protection and a protective lock etc...

"I think you need to know what you're looking for, the more you look, the more information you understand and the more you know what it is you should be looking for, so it gets easier as you go along" _Matt, Mobility, Hearing, Cognitive

"People have huge problems finding information because they don't know what it is they're looking for...Making sure it meets your needs, it matches the car are the most important things and making sure you make the right choice" _Jerry, Mobility, Cognitive

Some of the participants found that the guides available on RightCharge's website, which listed and clearly explained these features, were particularly helpful at informing them about which types of chargers they should look for and compare online.

"[RightCharge] had a very good FAQ section which was helpful in letting me know what it is I should look for and give me the ammo to search for things myself" _Jerry, Mobility, Cognitive

Several, however, noted an absence of guidance about what to be mindful of when finding a certified installer and undergoing installation.

"Guidance on finding a trustworthy installer...it's trying to find who the installers are [that's difficult], seeing if I can get a review website that tells me what the installers are like" _Jerry, Mobility, Cognitive

"You should be made aware of any certificates they may have to ensure they aren't cowboys" _Matt, Mobility, Hearing, Cognitive

Weigh options

All participants in workshop one indicated that they lease their electric vehicle through the Motability scheme. Despite being able to get a home charger at no extra cost through the scheme (if you have a pure electric vehicle and not a plug-in hybrid), having to pay to re-install it or get a new one in a new property was a deterrent for many.

"When you get one grant from Motability, you don't get another. If I buy my own charger, I get my own control" _Jerry, Mobility & Cognitive

One participant in workshop 2 (Kate) reported that Motability had directed her to the EV charging manufacturer, BP Pulse when she was looking to get a charger independently and not through the scheme.

"I contacted Motability, that my car was due for renewal, it was going to be my first time trying an electric car and they directed me to BP pulse" Kate, Mobility (Wheelchair user)

"I think Motability have a contract with BP so don't recommend other manufacturers" _Josh, Mobility & Cognitive

Participants found the comparison website 'RightCharge' useful in terms of discovering certain charger manufacturers and comparing prices. However, they found that the chargers presented to them were limited and often expensive. Whilst it required more time and effort, this prompted some to research chargers on individual manufacturers' websites instead.

"I found the prices were quite high [on RightCharge]. There were other places where you could look for individual makers, boxes etc... look up the charger and scroll through the various sorts. You did have to dig a bit for the information you need" _Matt, Mobility, Hearing & Cognitive

One participant (Jerry), however, noted that some manufacturers' websites provided very little information about the installation.

"The manufacturer in this case Hyundai was as useless as a chocolate teapot. They said they'd install the charger but there was no accompanying information. They said they would get back to me in 7-10 days but haven't" _Jerry, Mobility & Cognitive

Installation

In terms of arranging installation, one participant in workshop one (Jerry) mentioned that he would need to seek approval from the council to install one in his property. However, it was unclear where he needed to go to obtain the necessary documents to seek approval.

"I'd have to get council approval, then their electrician has to approve it, but my council said if I email them the electrical safety certificate we don't care where you put it, but I had to go find that out,

who to speak to, again going through the chain of command" _Jerry, Mobility & Cognitive

Participants in both workshops acknowledged that installation was when issues were most likely to arise and therefore, considered this to be the most important stage of the process and where support could be most needed. Those in workshop one expressed a lot of distrust in installers, believing that they could fail to consider their access needs and be faced with unexpected additional charges.

"You need to be able to say I want my box here please, because I have access issues, therefore, this is what I need. I can't believe any fitter would say 'oh no we're going to stick it over here' and not double check with you beforehand...I want someone who talks and listens to me..."

"I've heard of people having to take floorboards up and drill holes in the wall, and it ends up costing more to put the cable in than the box itself" _Matt, Mobility, Hearing & Cognitive

Many stressed the importance of preparation, i.e. knowing exactly what questions to ask the installer and what to be mindful of to ensure that the installation is done to best support the user's access needs.

"An idiot's guide with a list of questions to ask and run through with the installer" _Tom, Mobility

In most cases, obtaining a quote had to be done by completing an online form. These online forms typically require the customer to take, upload and send pictures of electricity units and different locations around their homes. Some participants found this challenging or were not able to do this due to their physical or dexterity impairments.

"They told me send photos of your electric box, pictures of your house...I had to get people to help me do this" _Kate, Mobility (Wheelchair user)

When the participants in workshop two were asked to describe their home-installation experiences, four of the six reported positively, citing the quickness and simplicity of the process. One participant (Suzanne) said they had moved to a property which already had an electric vehicle charger installed. Another (Emma), however, said she experienced problems with the placement of the 'box' which after installation failed to work properly and needed fixing.

"We have a sloping driveway, and another campervan parked in the driveway, so sometimes reaching from where the port is over to the vehicle can be a bit of a stretch" _Emma, Cognition & Dexterity

Positioning

Participants in workshop one expected to be understood and listened to by the installer throughout the installation process to ensure that the charger would be positioned at the right height for them and within easy reach. They felt it was particularly important for installers to be aware of their current access constraints. Further to this, consideration should be made as to possible future decline of their capabilities due to the nature of some disabilities.

I hope it would be fitted to my height. I'm assuming the company will ask you, and future proof it for you...I would hope the installer would have some disability or access awareness training" _Matt, Mobility

"It would be nice if installers would consider disabled folk, but you just have to look at the public chargers to see that disabled people don't get considered enough" _Jerry, Mobility & Cognitive

When participants in workshop two were asked "in light of listening to other people's experiences" if they would do anything different, Kate said

she would have preferred the positioning to be more accessible to her needs. It should be noted that the installation engineer only talked to Kate's carer about where to place the box and asked them (the carer) to provide pictures of the driveway.

"I wasn't given a great choice about where it could go, which I get around as I have a full-time carer but if you see in the corner of the picture the white bonnet of my car, well that's at the end of a concrete drive and there's a bit of a drop, and I can't get to it as I'm in a wheelchair, so I can't charge the car myself, which isn't a convenience as I have someone who can do it for me but I don't know what I'd do if I didn't have a carer...

I never spoke to them once, not even on the phone, they asked my carer to take the photos ... but probably think in the future if I was left here without a carer I would go back to a petrol car, because I could put fuel in it easier than charge[ing] at home. Who could I get to go put charge in my car? Whereas I go to the petrol station and get it put in for me" _Kate, Mobility, Wheelchair user

Although one participant said their engineer asked them where they wanted the charging unit to be placed, most felt the position of the home charging unit was chosen by the engineer for the ease of installation and to minimise cost, rather than being positioned to the needs of the user. This was often being dictated by the closeness to the mains distribution box, associated cable routing, and building obstructions.

"It seems the installation engineer has either done the installation to suit himself, or to keep the cost to a minimum, and not given a thought to the needs of the consumer" _ Ronan, Hearing

Security

One participant (Kate) in workshop two was concerned about possible abuse from other people in her neighbourhood and being singled out for having an electric vehicle. She felt that having a fully visible charge point would draw attention to this and sought to hide this by modifying her installation and having a cabinet built around the charge point. See Figure 2 and Figure 3

Figure 2: Cabinet closed

Figure 3: Cabinet built around charger

"We get kids who can be a nuisance, they took some of my flower pots outside my house once, and I was worried they'd want to play with the electric bit" _Kate, Mobility, Wheelchair user

Fear of the home charger being used or abused by neighbours was also echoed by most participants in workshop one.

"I live in a fairly rough area so I'd be more concerned someone would damage it for the sake of it" _Jerry Mobility & Cognitive

"My main worry would be someone damaging it. If someone damages it, is it going to blow everything in the house?" _Tom, Mobility

Overall, this suggests that there could be a lack of discussion between the suppliers and home occupants about what security measures are available to prevent use or abuse of home chargers by members of the public.

Running Cables

When asked to report on their experiences of using the equipment once installed, our participants in workshop two were largely satisfied. When pressed, four of the six participants (Kate, Dominique, Suzanne, and Josh) all talked about the need to avoid trip hazards with the cable. The need to run the cable to the vehicle to minimise any potential trip hazards or to stow the cable when not in use was seen as an important part of safely operating the equipment. See Error! Reference source not found., Error! Reference source not found., Error! Reference source not found.

Figure 4: Tethered cable stowed

Figure 5: Cable routeed

Figure 6: Cable under paving stone

> I have to bear in mind it can't be laid willy-nilly as someone could trip and injure themselves, I laid it by the side of the door as far as it could go and I'm careful to go round the back just in case" _Dominique, Older,

This important necessity of cable management and routing can be problematic for people with reduced mobility and/or strength. Consequently, discussions about access and physical manipulation of cables should occur before installation.

Charging throughout the year

Another consideration highlighted by participants in both workshops was the need to consider the environment at different times of the year. Slip and trip hazards are typically heightened during cold winter nights where slippery surfaces and poor lighting and visibility can lead to increased risk.

> "If you're soaking wet and carrying a cable, it's a logistical nightmare in a wheelchair" _Matt, Mobility

> "The other problem is at night when it's dark, I need some sort of flashing unit at the end of the charger itself or otherwise have one on the car, it's quite difficult to find it at night and where to insert it... it doesn't need to be bright just something to guide you

> **to the charging unit so you don't have to fiddle about especially when it's raining and I could trip and injure myself " _Dominique, Older**

Apps

Whilst being able to remotely operate the charger using an app was considered particularly beneficial for those with mobility impairments who might struggle to access the charger (due to its positioning and/or height), participants were concerned about how user-friendly these apps are and how compatible they would be with their assistive technologies.

> **"At the moment there are a lot of problems with apps and working them...you'd hope these are teething problems as they are useful" _Tom, Mobility**

Discussion

Information

In some cases, participants reported difficulty understanding information about EV home charge points due to the complex and technical nature of terminology used, suggesting that simpler and more consistent information needs to be provided across suppliers' websites.

Additionally, participants needed advice on the type of charger that would best support their access and energy needs before they could search for and compare options online. Advice on the type of cabling (i.e. tethered or untethered) that would best accommodate their needs (especially those with limited mobility and dexterity) was considered particularly important. There was also a lack of awareness amongst participants of additional safety features that would benefit them, such as having a lock (to prevent neighbours from using or vandalising it) or earthing rod (for fuse protection). This suggests that all leasing companies and suppliers should provide clear guidance which lists and describes the benefits of these features to help disabled consumers make informed choices about which type of charger they should look for.

Participants also felt that there was a lack of guidance when searching for a qualified and trustworthy installer. In addition, whilst the onus should be on the installer, many participants felt that they needed guidance on what sorts of questions to ask the installer to ensure that the installation would be done with their access needs in mind.

All digital information should adhere to WCAG2.1AA standards to ensure the information is accessible to as many people and assistive technologies as possible. Further to this, information should follow Plain English guidelines to make it as clear and concise as possible.

Installation

The installation of EV home charging equipment could have a significant impact on its day-to-day use by disabled people, particularly those who have restricted mobility and/or limited strength. Consideration needs to be taken about the positioning of the charging unit and its relationship to the vehicle input socket. This will dictate the length and track of the cable run from the charge point to the vehicle and will have an impact on potential trip hazards and access difficulties.

Further to this, participants expressed concern that their access needs would not be discussed at the point of installation, the very point at which solutions to the positioning of equipment need to take these into account.

Prior to installation, most suppliers require customers to take and upload pictures of different locations in and around their home to help them provide a quote. Some of our participants reported difficulty doing this which could lead them to request quotes only from the limited number of suppliers that offer in-person evaluations. This points towards the need for leasing companies, installers and equipment suppliers to offer disabled customers in-person evaluations whenever possible.

Overall, our findings strongly support the need for disabled users to be present and consulted by the installer at the point of installation and for installers to be made aware of access constraints and to consider the possible declining nature of users' disabilities as well as their future needs when installing a charger in their home.

To reassure users and ensure that the charger is positioned to be accessible to their needs, installers should:

- Ensure that the time of installation is arranged at a time convenient for the disabled user - so they are present at the point of installation
- Provide the disabled user with documentation showing they are an authorised installer
- Consider the space surrounding the charging unit (including whether it can be accessed safely with mobility aid(s))

- Consider and address potential trip and slip safety hazards
- Ensure that the charger is placed somewhere where it is visible with sufficient lighting
- Ensure that the charger is positioned at the right height and within easy reach for the user

Achieving change

A key strategic priority for RiDC is to ensure that disabled people can make sustainable choices and easily access and use low carbon products and services. This is the research objective of our over-arching research programme **'Enabling Inclusive Innovation and Sustainable Choice'** in which this research study into EV home charging sits.

Electric Vehicles are a more sustainable choice over petrol and diesel cars. This research has indicated that disabled motorists are facing a number of potential challenges to accessing and installing home chargers to suit their needs. It should be remembered that there are over a million disabled motorists [4] in the UK and many millions more older motorists for whom many of the same difficulties are likely to be encountered.

This research has identified the challenges encountered by our research participants and provided some recommendations for potential solutions.

To further support and achieve change we will be sharing and discussing our research findings widely with key stakeholders and through mainstream, trade and social media. We will also be promoting online consumer information, based on our research findings and published at www.ridc.org.uk. This aims to ensure that disabled motorists can make informed choices about choosing and installing EV home charging equipment.

Finally, we will be convening a stakeholder workshop event in Autumn 2022 to develop action plans to help deliver the necessary changes.

[4] 1.2 Million vehicles in disabled tax class, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1019477/transport-disability-and-accessibility-statistics-england-2020.pdf

Key stakeholder groups

It is important to note that there is a huge number and range of private, public and consumer stakeholders involved in the delivery of electric home chargers within the UK. These include:

- Home charge point manufacturers and installers (e.g. Wallbox Pulsar Plus; My Energi Zappi; Ohme Home Pro)
- Energy providers (e.g. Octopus; E.ON; UKPN)
- Home charger information and comparison websites (e.g RightCharge.co.uk; Plugandcharge.co.uk)
- Trade associations and bodies (e.g Beama.org.uk; REAL (Renewable assurance Ltd); EVCC, NFDA)
- Government legislators & policy makers (e.g Office for Zero Emission Vehicles)
- UK and International Standards bodies (e.g. BSI and ISO)
- Consumer groups representing the interests of and/or advising motorists. (e.g. Which?; Disabled Motorists UK; Driving Mobility)
- Specialist disability motoring schemes (e.g. Motability Scheme)
- Consumer information providers (e.g. Which; Energy Savings Trust)
- Landlords and property freeholders (public and private)

Future actions

Below we summarise our broad recommendations for action based on our research findings and identify the stakeholder(s) best placed to deliver. These will be discussed, refined, and expanded into targeted action plans at the stakeholder workshop event.

- Codes of practices and staff training for EV home installation to specifically consider and address the needs of disabled and older users. (Trade bodies & installers)
- Offer pre-installation customer visits. (Installers and trade bodies)
- Provide more detailed consumer information and guidance on home EV charging choices and checklists on what to consider

(Government; consumer and motoring organisations; comparison websites and EV home charging industry)

- Ensure consumer websites meet basic accessibility standards minimum Web Content Accessibility Guidelines (WCAG) 2.1 AA (all stakeholders)
- Build requirements around best practice in installation of accessible home charging units into the new BSI standard that has been developed for public EV charging (BSi PAS 1899:2022)
- Encourage further research on the (UX) user experience of disabled motorists as the EV home charging market develops. The number of disabled EV users is currently relatively small, with early adopters. Similarly, the home EV charging market is relatively new. (EV home charger manufacturers, research bodies and government)

Appendix 1. Participant details

Table 1: Participant impairment details

Group 1	Number	Details
Mobility	3	Spinal muscular atrophy, Fibromyalgia, degenerative disc disease
Hearing	1	Hard of Hearing
Cognition	2	Aspergers, anxiety, dyspraxia

Group 2	Number	Details
Mobility	3	Stroke, Spinal cord damage, Late onset Ataxia
Age	2	Stroke, frailties associated with aging, Memory
Cognition	3	Tourette's Syndrome Autism, ADHD, Developmental Coordination Disorder

Table 2: Assistive technology and help

Group	Assistance given
1	3 * Wheelchair users + use of sticks/crutches
2	3 * Wheelchair users, 1 * WAV owner (with ramp), 1 * Carer, 1 * assistance dog

Table 3 Charging unit details (group 2)

Equipment	Details
Rolec * 2	7 Kw, 1 * tethered 7 Kw, 1 * untethered
PodPoint * 1	7Kw, 1 * tethered
BP Pulse * 3	7Kw, 1 * tethered 7 KW, 2 * untethered

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