

Individual Response Number 16

I've been an EV owner for the last 3 1/2 years and work as a [✂]. As such, I feel I'm well placed to have knowledge on both themes you are focusing on.

Theme 1:

There are three main areas of concern that need to be addressed within this theme - on-route charging, destination charging and home charging.

On-route charging is charging your vehicle on the way to your destination because it does not have sufficient stored energy to reach the destination, or there is no means to charge at the destination in order to return to your point of origin. This type of charging should aim to be not just as quick and convenient as filling up with a tank of fuel, but more so, to provide an attractive proposition to potential buyers. Ultra-rapid charging times of 5-10mins are possible with 800V charging architectures currently in development by automotive OEMs, however the UK charging infrastructure is likely unable to provide this amount of power this quickly for the foreseeable future. Faster roll-out of ultra-high capacity chargers needs to be encouraged, perhaps through grants or R&D funding pots, otherwise OEMs will have no reason to bring this to market in the UK, slowing adoption.

Away from motorway service stations, on-route charging is now dominated by two main players in BP Pulse and Shell Recharge/NewMotion. They are spending huge sums of money on putting in the necessary infrastructure to eventually provide 350kW ultra-rapid charging capability at a large number of sites in the UK, but this level of investment is starting to make it almost impossible for smaller companies to compete. This also gives Shell and BP, two companies that have built their respective empires on fossil fuels, the ability to manipulate fuel prices for cleaner vehicles, which begs the question about conflicting interests in this sector if they have the ability to make plug in vehicles more or less financially attractive on a whim. The government must put in place measures to prevent unfair pricing practices, such as a pence per kWh price cap, that ensures EVs remain more attractive in terms of running costs to the consumer.

On the motorway services, I am not one to name and shame normally, but Ecotricity have had a devastating impact on most first time buyers and magazine journalists first impressions of public charging through unreliability, difficulty of payment and poor customer service. [✂]The contracts they have been awarded meaning it is difficult for other providers to give competition must be reviewed urgently. In stark contrast, Tesla have managed to slowly expand their private network at motorway services to, in most cases, dozens of extremely reliable, fast and easy to use chargers at every site they are located.

Destination charging typically takes place in car parks where the vehicle can be parked for a few hours at a time or workplaces where the car will be there all day. At the moment this is done through single phase 7kW charging and sometimes three phase 11-22kW charging depending on the supply to the site - this is usually sufficient. The issue is with car parks either not having enough charging points,

those charging points not working, or with ICE cars parking in charging bays. The solutions could be to encourage private carpark owners to install charging points in as many spaces as possible through tax incentives, discourage ICE car drivers from parking in EV bays through similar measures as are used with disabled bays, and to enforce fines on companies who fail to maintain their charging network within a certain time limit.

At home charging, many consumers charge via a 3 pin plug because, despite the subsidies, charging point installation is still costly to the tune of several hundreds of pounds. A solutions here may be to work with energy companies to offer free smart chargers that the energy company can control to manage the grid effectively as demand ramps up.

Whilst this is appropriate for people with off-street parking, I myself had to rely on charging at work when I lived in a flat whilst owning an EV. Charging my car from lamp posts is an obvious step to take to solve this problem, however some assigned parking spaces do not have lamp posts nearby. This presents a problem that is not easily solved, but perhaps there is an opportunity to fund research into this via specific targeted research and R&D grants.

Theme 2:

The barriers to EV adoption in terms of the charging network are similar to those described above. Prices must be lower than a conventional ICE car to fuel to keep the coat of ownership as an attractive prospect. Charging points must be reliable, plentiful and as fast as necessary for the situation (on-route, destination or home).

In terms of charging tariffs, in general, electricity costs are so cheap compared to fuel that only the most expensive rates (Ionity and similar) require consideration before choosing a network. Placing a price cap on them would help reduce the risk of this becoming a problem. The greatest issue when choosing a charging network is reliability and knowing you will be able to top up simply when you arrive. I will actively avoid using motorway services and Ecotricity for this reason.

The final issue to address in this area is the difficulty in signing up for and paying for charging sessions. A concerted effort to have a cashless payment system that do not require users to sign up their personal and payment details to a third party to use their charging points must be enforced. I personally have 13 different charging point payment apps on my phone, 5 different RFID cards to activate charging points, and several of them are both unreliable and not user friendly. Contactless card payments should be a minimum requirement to remove a barrier to access on all charging points that require payment. Ideally, payment should be made wireless via the car with charging points automatically taking payment at an advertised rate depending on how much charge the consumer selects they want. That system needs a holistic approach with OEMs and charging point suppliers all involved in development of the various standards and procedures involved. Government could help this effort by setting up a consortium to lead these discussions and set targets on time frame for development.

Thank you for reading my comments on the charging network. If you need any other information I am happy to provide more input if required.

Individual Response Number 17

I'd like to give a view on the current CMA electric vehicle charging study.

For context I have [redacted] leased a Jaguar IPace on a three year deal. I have a home charger and due to Covid related travel restrictions we've never needed to charge away from home. However, we live in [redacted] but have family in [redacted] so will need to use public charging when allowed to travel again.

Ease/fairness of use

Firstly there is a complex mix of charging options, some with simple pay per kWh pricing using a debit/credit card, some where you need to get a special card or dongle to use that company's chargers and some where you need an account or app set up. Sometimes there is a subscription model where a monthly fee is payable in return for a lower rate.

Compare this with the existing petrol station business model, where aside from some low value loyalty cards, everyone pays the same per litre at a given petrol station. I don't need to set up an account online with Shell/Esso/Tescos etc just so I can use their forecourts and I certainly can't get a massively cheaper rate for doing so.

I don't want to need to do homework before undertaking a long journey to ensure I have all the right accounts or contactless cards for any charging company I come across. I just want to be able to pull in and charge without a second thought as to what companies charging station I have arrived at. I want simple pay as you go pricing using a normal debit or credit card without being concerned that the car next to me is paying 40% less because they've signed up for an account or have downloaded an app. Loyalty cards should only give a small benefit for example 1-2% at most.

Pricing

Secondly, the prices seem very high, typically 35p/kWh, much higher than the 10-20p/kWh rates payable for home charging. I believe proposed rates for the newer 100kW chargers are even higher. I accept that must be a premium for public charging and due to the high power involved the upfront cost must be substantial but I would expect this to fall significantly over time. Once installed the ongoing maintenance costs of the high power cables is low.

Exclusivity

I object to seeing a nearly empty row of Tesla chargers that only Tesla can use. I get that they got a jump on the market by getting in early but it's definitely anti-competitive. To make another petrol station comparison you don't see pumps reserved for Fords at the Shell garage.

Electric vehicle manufacture is a distinct market from electric vehicle charging and I feel like in the long term these arms of the company should be split. If Tesla wants to remain in the charging market then it should open their chargers to all electric vehicles with the same pricing available to all.

Thanks for the opportunity to give my views.

Individual Response Number 18

Just done 620 mile return journey from [redacted] and then 380 mile return journey [redacted].

Have had my Jaguar iPace for 2 years now.

Ionity [redacted] and Ionity [redacted] Services two points out of action at both. Third point required repeated rebooting with phone support. Bang and smell of burning from my car - back to dealer for new charging port after AA call out.

Instavolt [redacted] Retail Park wonderful. Instavolt [redacted] Village also tap, plug in, select CCS and go.

Return trip via [redacted] Services two out of action, third on free vend but slow - car said 13 hours to charge. Ionity are supposed to be one of the market leaders.

Spent 45 minutes in pouring rain from one Ionity point to another whilst on phone support. Then said charging finished and had added zero.

ChargePoint at [redacted] in [redacted] took three reboots with phone support. Same point with a loan EV also took three phones and reboots to start to charge.

[redacted]

Individual Response Number 19

Invitation to comment

Box 1

1. The EV charging sector is developing in a haphazard manner that is also confusing in terms of customer useage. For example each supplier may require an account to be set up prior to purchase of energy. This may require an App on a phone with attendant password linked to a credit/debit card. Purchase of electricity should be as simple as buying diesel/petrol. i.e. arrive on forecourt, plug in, present debit/credit card in a contactless manner, car connect and receives charge.

2. There is very limited completion of main routes. It is a question of grab what you can when a charging point is available on the route to ones destination.

3. Signage is needed, much as traditional fuels are signed with prices. Location is important and should be properly lit, covered for protection, not as an afterthought around the back of petrol station/hotel /toilets etc. Perdonal safety of customers should be considered when locating charge points.

4. Cost

5. Parts of the UK are a desert in respect of charge points so journey planning is a must. I must shortly attend a funeral some 250 miles away and due to current restrictions will need to travel home the same day. Uncertainty re operational chargers on route will probably mean I will use a second car that is diesel for peace of mind to ensure I arrive on time.

6. ?

7. Public support is needed where there are no opportunities for driveway charging. So lamp post charging, pop up chargers will all be needed. Local authority car parks must also host chargers.

8. 8?

9. Local authorities can play a big role in offering public charging and thus the uptake in electric vehicles. A mixture of chargers are required i.e. 50/100kW for fast charging and 11/22kW for longer term charging through the day and overnight. This could be cash neutral or positive for the authority being funded by the supplier.

10. ?

Box 2

1. Two things are barriers to switching. Cost of the car and probably most important range anxiety. I have been used to filling a tank with diesel and driving 450 miles before needing a refill.

2. ?

3. At present charge points are chosen as to what is available on or near the route to the destination. If there is a choice, then what the simplest method to connect.

4. Charging tariffs are mind numbingly complex and difficult to compute. Regular commuters/travellers on a particular route will find this easier.

5. Consumers who charge 80% of the time at home with occasional forays to distant relatives or holidays find challenges in coming to terms with making the jump to EVs and negotiating the myriad of charging points.

6. There are apps such as ZapMap that help.

7. ?

8. ?

9. There needs to be a rapid expansion geographically in charging points to keep pace with the quickly increasing sale of EVs. I am a private individual and a recent convert to EVs. Most journeys are local i.e <200miles round trip. The comments expressed are my own and I do not represent any organisation.

Individual Response Number 20

Dear Sir or Madam,

I am an EV-owning member of the public, do not represent a group of any kind, and may therefore not qualify to comment formally on your EV Charging Market Study. However, it is a matter that I feel strong about – as, I suspect, do most EV owners. My comments may or may not be of some use.

Some background [X]. The Motor Industry would have that I am a 'classic' case of a consumer being 'better off' with a new diesel car rather than a new EV – but I assume the Government would not agree. If more people like myself are to be encouraged into EVs then I feel my comments are worth taking on board.

The first thing to say is that EV charging at the Motorway Service Areas is a shambles. It has been so for some time and remains so despite continued promises of imminent improvement. I have discussed this with several dozen other EV drivers and every one (of the non-Tesla) EV drivers I have spoken to has all agreed that, with the notable exception of a couple of new Ionity charging stations, they all drive off the Motorway into the countryside to find a reliable charger. This makes a nonsense of traffic flow and planning.

The keys problems seem to be lack of competition and (potentially related) the lack of investment in replacement as well as new kit.

Frankly, in my opinion things have got so bad that the Government needs to step in to ensure competition.

The ongoing upgrading of existing chargers and the installation of new chargers is worth dwelling on. The pace of EV development, including the ability of new models to charge more and more quickly, risks outpacing the speed of the chargers in the vast majority of the network. You could say "Hard Luck", but this in turn risks putting potential new EV owners off. They read about what is technically possible and are not encouraged that chargers in their area are 'grinding along' taking say an hour to recharge the car they are thinking of buying – when they know the same car could be recharged in half the time at a more modern unit. This is clearly a major investment issue that needs not to be overlooked.

As for the installation of new chargers where at the moment there are none, existing provision is driven by commercial profit and, therefore, chargers are placed in areas of major population or on routes linking major populations. The far South West and much of Wales are, for example, areas where rapid chargers are currently scarce. The Government needs to think about a comprehensive network covering the whole of the British Isles and how either to incentivise this development or how and where Government is going to step in. In some instances there may not be the option of shelving this issue onto the shoulders of others.

There is also the 'lesser' issue of different, and often complicated, payment methods. After a while EV owners get used to working around this, but potential new recruits are definitely being put off taking up EV ownership when they hear about this

problem. In practice, I now find the chief ongoing difficulty is an over reliance on apps. They invariably don't work in even semi-rural areas. Standard Debit/Credit card payment would undoubtedly be easiest for everyone.

Finally, I can also see that one of the key issues for the uptake of EV ownership is going to be on-street charging opportunities for those who cannot home-charge on a driveway. The only way I can see this being addressed in any comprehensive way is via a dedicated line on the Council Rates – which we all pay irrespective of whether we are EV owners or not, or whether we have home charging (as I do) or not. This will undoubtedly cause an uproar but I for one, would accept that approach.

If you have stuck with me this long – thank you. I wish you well with the Consultation.

Individual Response Number 21

I have been driving evs since 2016, and have driven across many different parts of the country in a [🔗] Nissan Leaf. As such I have a broad experience of ev driving in a lower range car. These are how I see things going forward.

1) Rapid chargepoints are needed every thirty miles or so regardless of population density.

2) installed chargepoints are often inappropriate to the areas needs in terms of;

a) obscure network requiring another app

b) expensive for a slow/fast chargepoint so virtually doesn't get used

c) location means it is often vandalised

and d) they are then not maintained.

Also the provision at times is woefully inadequate. An example is the [🔗] swimming pool car park in [🔗]

Another issue is the serious imbalance in funding across the country. Milton Keynes has way in excess of rapid chargepoints. Towns and cities need fast type 2 chargers, rapids are for long journeys. Obviously there needs to be guidelines on how funding is used.

In terms of provision hotels such as Travelodge need multiple slow chargepoints. Then customers can wake up with a full battery and the strain on the grid is minimal.

Supermarkets and park and ride car parks could do with banks of fast type 2. And possibly a provision to allow residents to park overnight and charge in areas where people don't have driveways to park and charge on.

Motorways and main routes need regular rapid and ultra rapid chargepoints.

Provision needs to be even in terms of chademo and ccs. Note that the government should encourage chademo as it allows v2g which helps with grid balancing.

Subscription models should be allowed but there has to be a real incentive. BP pulse have recently put their prices up substantially for 150kw speed while failing to provide much for people who only want 50kw. Apart from anything else it's got to be better to have six times 50kw than two times 150kw. Especially since cars than can take higher rapid charging quickly slow down the rate anyway. A good model is the Instavolt [🔗]. It has load sharing on the rapids.

As for pricing. If a rapid loses communication with Ecotricity drivers aren't left stranded as they go to free vend. This needs to be a requirement otherwise you get more breakdown call outs, increased likelihood of cars running out on main roads. But I think you can leave it the market. Gridserve has recently announced 24p/kWh. With over hundred locations planned the other providers will have to cut prices or people will just not use them.

Hope this helps.

Individual Response Number 22

As an electric vehicle owner and user I find that the biggest frustration in recharging away from home is the lack of a simple standard way of paying for a recharge. I have to have multiple Apps on my phone that I use to communicate with each different charge point and I also carry a pre-paid card for the Charge Your Car network.

There is a glaring need for a common payment system. This could be in the form of an RFID card or a standard App that all charge point owners accept. Or even a Debit Card acceptor.

Perhaps a suitable model to examine is that of concessionary payments for travel that was developed by the ITSO consortium. This is essentially a software packet that any operator of Ticketing terminals can build into their terminals to enable a holder of a concessionary card to get free travel anywhere from Bognor to Blackpool. Each Bus operator can have their own charging or concession system installed in their Ticket machines but they also recognise an ITSO standard card when presented and process it accordingly.

I hope that this is a useful comment.

Individual Response Number 23

I own a [🔪] which is a 100% electric vehicle and wish to comment on your study.

The car is great to drive however the charging infrastructure is difficult to navigate.

Some rapid chargers - eg Osprey and Instavolt accept contactless payment and are easy to use. However some of these chargers are at pubs and may be closed at the present time and don't always operate 24 hours. Knowing which chargers are open isn't easy.

There are rapid chargers which need an app or a RFID card - eg Electric Highway and Genie Point. This makes the charging experience confusing. This will be a barrier for those who are not technical.

Fast chargers are more confusing as they do not use contactless. Pod point are easy to use with their app but Polar/Charge Your Car, one company - BP Chargemaster - has 2 separate networks and apps - you need to have a credit balance before activating their charger.

Ringling customer support varies. Alpha Power did not pick up. BP chargemaster picked up after 20 mins. Some companies do not offer 24 hr customer support eg Electric Highway.

I would like to see a system whereby an EV owner connects to a charger and to be automatically billed or have every charger accept contactless payment. The costs need to be clearly displayed. The charging process across all networks need to be similar. There are more companies entering the market with their own app - just adds to the confusion.

Many thanks for undertaking this study,

Individual Response Number 24

As an EV driver I would like:

- Clear guidance on where EV chargers are located and type of connections – things like ZAPmap are good, but could be better
- Confidence that the charge point I am aiming for is operational – this is not always clear or current on the site – area for improvement
- When charge points are decommissioned, temporarily or permanently – they must be updated in all mapping tools immediately – area for improvement
- Not keen on having to sign up to various cards/schemes, etc. to be able to charge vehicle

[✂] street lamp charge point providers. This is a marvellous approach. But has struggled with DNO obstructive approach. It has also been difficult to progress if certain providers or councils limit the make/model available in a geography. Worst still if the authority (Scotland) offer free energy – impossible to commercially compete with free energy!

regards

Individual Response Number 25

I am the user of a battery electric car.

I have the use of a charge point at my office/home and that works seamlessly.

However, when I travel more than 100 miles from my office/home, it is necessary to recharge the car at a public charging point. I have not found this to be a relaxing or satisfactory process. The problems that I have encountered are: -

1 there simply are not enough charging points available. I regularly have to travel to Axminster in Devon and there are no public charging points available in that town. The nearest fast charging point is at Chard, which is 10 miles away. There are charging points in Lyme Regis, 15 miles away, but from the graffiti endorsed on them it is obvious that nobody has been able to make them work. There are charging points in the car park at Tesco at Seaton, 10 miles away, but they only charge at 7kW and the time allowed in the car park is limited to 2 hours so that the amount of charge obtainable is very little. Remote charging stations need to be at least 50kW to be of practical use (even at that capacity it takes 90 minutes to re-charge my car).

2 despite the fact, as I understand it, that the law was changed in 2019 such that all charging points must facilitate simply plugging the car in and using contactless card payment, I have not yet found a public charging point anywhere that provides this facility. The charging points that are available all adopt separate procedures requiring downloading an application to a smart phone, signing up to the system, waiting for confirmation that the system can be used (quite frequently 48 hours) the pre-payment of money into the account and then activating the charging point. This is completely useless if you are away from your home charging station, in need of a charge immediately and have not previously signed on to the procedure required by the charging point. It is crucially important that this chaos is quickly resolved such that all charging points become user-friendly failing which any effort of government to persuade more motorists to change their cars to battery electric vehicles will be wasted because the remote charging systems are unsatisfactory.

3 all the charging points seem to be reliant upon a mobile phone signal enabling the charging point to communicate with the smart phone being used by the customer and, presumably, the administration centre of the charging company. If the mobile phone signal is poor then communication is not made and the charging station becomes inoperative.

4 the cost of using remote charging stations varies dramatically. Whereas my home/office charging point costs approximately 12p/kWh (less when charge is being received from the p.v. panels), I have seen some remote charging stations that charge upwards of 50p/kWh. I fully understand that the amount charged at remote charging stations must be commercially acceptable to the company's that install them, but the impression that I have obtained is that some companies grossly overcharged, particularly in areas where the charging points are few and far between. There should be a regulation stating a reasonable price that must not be exceeded by the companies concerned.

I hope that the CMA in its exercise to scrutinise the electric vehicle charging market will take account of my comments.

Individual Response Number 26

I am the driver of a battery electric vehicle. I usually charge at home and it is sufficient for most journeys, but I do sometimes travel further and need to make use of public chargers.

The main concern currently is reliability of chargers. You can plan a journey in advance but one faulty charger can make a big difference – you have to factor in at least two, and preferably three, alternative charging points. I think this is sometimes because the charger is unable to connect to the host controller and the actual charging facility is still functional, but cannot be used. If chargers were permitted to fallback to off-line payment, or required to default to freevend in this circumstance, then this would at least enable cars to charge and would potentially provide an incentive for companies to fix faulty units or resolve comms issues more quickly?

Having to use an app for payment, and a different one for each network, is a major pain, especially when the facility is used infrequently and pre-payment is required. Some form of cross-acceptance should be mandated, and the facility to pay by contactless. The apps require mobile connectivity to operate, so a good mobile data service should be mandatory for any installation. The connectivity at some chargers is dire.

When pulling up to a facility with several chargers, it is not always clear which chargers support which services. A type-2 connector has a maximum charge rate significantly lower than a CCS connector, but only one of the devices might support CCS. Often the only way to tell is to park, and then inspect the units in turn, before moving the car to the best charger. Clear signage of connector type and maximum charge rates per device should be standardised and mandated. Pricing per unit should also be clearly displayed so as to be visible without leaving the vehicle.

Some chargers are mounted on pavements at the end of lay-bys. However, the cables are the absolute minimum length. If the vehicle has a side-mounted charger, often the only way to use the charger is to park the wrong way in the lay-by facing oncoming traffic, which makes parking and leaving extremely dangerous. Where cables are installed on the charger, they should be long enough to support both front-end and side-mounted vehicle charge points, including both nearside and offside mounted points. If street chargers are to be installed to allow for the cases where home charging is unavailable, then the cables should be able to reach more than one parking space to maximise use.

Many supermarkets and other facilities are installing charge points. However, these are often near the entrance and are taken by internal combustion engine vehicles (ICEd), or EVs that are not actually charging. These spaces should be enforced in the same way as disabled and parent/child parking spaces, or should be located in less 'desirable' parts of the car park. I'm not sure how it could be enforced, but perhaps some way of prioritising charging for BEVs over Hybrids could be devised? A hybrid can still be driven without charge; a BEV cannot.

There are many home charge points that are idle during the day. There is an informal scheme on Zap-map that allows such points to be used but payment for use is 'on trust' and only by Paypal. Perhaps JustPark and similar services should be encouraged to add EV charging as an option included in their driveway rental schemes? Payment could be based on time rather than actual charge taken to avoid the need for the charge points to have a remote enable/disable feature and provision of detailed charge reporting?

Personally I would question the use of traditional forecourts for charging purposes. These are designed to get people in and out as quickly as possible, and often have two or three cars 'stacked' in a lane. This isn't practical for EV charging and a completely different layout is required. I would also question the use of high voltage connections in the vicinity of highly flammable vapour. When charging, you want access to toilet facilities and perhaps somewhere to get a drink, have a snack, and take a break for 20-30 minutes, preferably away from the car. Motorway service stations are better equipped for this, but local petrol stations are not.

Individual Response Number 27

MARKET STUDY ON ELECTRIC VEHICLE CHARGING

These comments are made from the following viewpoints

- a. a) As a consumer
- b. b) As an engineer with relevant experience in [✂]
- c. c) As a volunteer for 10 years with a charity providing a service for [✂] people.

The existing market for vehicle fuel

My opening comments concern the existing market for fuel for petrol and diesel engine light vehicles. This market is very open and competitive, with the following features relating to the ability of vehicle owners to purchase fuel at any retail supplier.

- Fuel is very widely available in most areas from multiple outlets
- No contract is necessary with a supplier
- Fuel supplies are not linked to the vehicle manufacturer
- The pump nozzle and fuel tank entry are internationally standardised
- No charge is made for accessing a pump
- There is a competitive market based on fuel price
- Prices are very clearly advertised allowing drivers to make a choice based on price between any conveniently place retailer, before entering the premises

The market for electric vehicle charging should be structured so as to achieve similar outcomes.

Clause numbers referenced below relate to the clauses in the Invitation to Comment.

CHARGING INFRASTRUCTURE

Chargepoints

13(a) says that currently 80% of charging is done at home and it is anticipated that this will continue. However, **17** says that around 40-50% of homes across the UK do not have access to off-street parking, and clearly charging at home will not be possible for these.

If people living in such homes are not to be disadvantaged in terms of access to this market, and become purchasers of electric vehicles to replace the petrol or diesel vehicles which they currently own or would buy in the future, the 80% home charging proportion will significantly reduce over time. It is essential that they are not disadvantaged, so adequate public charging provision must be provided. This issue is especially pertinent, given the revised 2030 date for the end of new petrol and diesel light vehicle sales.

With regard to **13**, a note says that charging at home using a standard 3-pin socket (13 Amp) may give rise to safety concerns and be more costly. There is no safety issue if the system to which it is connected complies with appropriate electrical regulations and the socket is not exposed to the weather. In the current state of the EV chargepoint market it is possible that the tariff per kWh for domestic premises will be lower than that at chargepoints. Variable domestic electricity tariffs through the day or an off-peak rate for EV charging may be beneficial for this market, and help to spread demand.

Clause **17** goes on to say that on-street charging may be the most likely immediate option. It also says that deployment of on-street EV chargepoints faces a number of

difficulties, including costs for providers to install and practical constraints in space and capacity to meet likely demand. There are many difficulties not mentioned here, which are set out in detail in Appendix A to these comments.

On-street charging is not an acceptable general solution. If attempts are made to install large numbers of such chargepoints, there will be very significant problems. Legal liability issues may well arise with respect to cables.

Clause 16 states that significant expansion of the chargepoint network is necessary, but comments on the difficulty of prediction. The issue here is the number of publicly accessible retail connection points (on the basis that a retail chargepoint location can have a number of connection points), and there are various factors to be taken into account. A useful approach is to use as a comparator the existing number of retail petrol/diesel pumps N .

- Unless there are significant changes in Government transport policy or a major price barrier, it can be assumed that the demand for private transport will not fall from today's level and average annual mileage will not reduce.
- Range per charge for EVs is increasing, and the latest models can typically travel half the distance that their predecessor petrol/diesel equivalents could travel on a full tank. In practice not every driver fully fills their tank every time, but nevertheless this factor could suggest say a 60% increase in refuelling events with the change to fully electric. Thus $1.6 N$.
- Against this, it might be estimated that say 40% of the events involve privately owned charging facilities, either home or work. Thus $0.6 N$ public connection points.

This coarse but useful approach suggests that the number of public retail connection points ultimately required could be in the order of $1.6 \times 0.6 N = 0.96 N$.

Note: These factors can readily be adjusted by anyone with better statistics than are available to the author of these comments. However, the website www.statista.com states that there were 8385 petrol stations in the UK in 2019. If an average of 8 nozzles per station is assumed, that indicates 67,080 petrol/diesel connection points. If that figure is used as N above, it suggests 64,396 public retail EV connection points will be required.

It is suggested in 18 that there may be fewer chargepoints in rural or remote areas, which may cause problems for EV users who live in or travel to these areas. This is the current situation with petrol stations, the only difference being that petrol/diesel vehicles have a longer range than current EVs. There are factors which may improve access to fuel in rural areas for EVs compared with current situation:

- Rural homes are more likely to have off street parking where private charging can be used.
- The capital and operational costs of chargepoints in rural areas may be significantly lower than for petrol stations.
- Hotels, Inns, farm shop or convenience store car parks, public car parks etc in rural areas can be suitable sites for a variety of operators to install chargepoints

Key players in the sector

At least one of the providers mentioned in 21, Tesla, restricts many of its chargepoints to owners of Tesla vehicles. This is an undesirable approach, wasteful of resources and an anti-competitive situation; it could be prevented by regulation.

It is surprising that this section makes no mention of the potential for existing petrol station operators to become key players. As the change from petrol and diesel to

electric vehicles takes place these operators will have a commercial imperative over time to move in stages from supplying liquid fuel to vehicle charging and re-purposing their sites accordingly. Such a phased change would have advantages in avoiding disruption in the commercial and employment position of existing operators and in providing familiarity to consumers.

Many petrol stations are part of large supermarket sites, and many more have on-site convenience stores, some with small cafeteria facilities. This makes them very suitable for vehicle charging, particularly with rapid chargers, as customers can shop or snack whilst the charging takes place. The oil companies are of course becoming involved in this market, mainly by the acquisition of recently established charging companies.

The operators of petrol stations already have the culture of supplying vehicle fuel in an unrestricted and competitive way, and it is very desirable that this culture should be applied to vehicle charging. Such operators may begin to make this change in response to demand, but consideration should be given to incentivising them to do this in advance of demand, to help create confidence in the potential purchaser market for electric vehicles.

Note: A recent press item shows a new charging forecourt opened by Gridserve, which can serve up to 36 vehicles with enough power within 20 minutes to provide 200 miles of travel. The forecourt has the familiar feel of a filling station. Gridserve's CEO says he hopes to update the traditional petrol station model for a net zero carbon facility giving drivers confidence to replace fossil fuel powered cars with electric versions.

Regulatory Developments

In **33** it is stated that all new-build homes will be required to have smart chargepoints. This should not apply to those new build houses which do not have off-street parking.

Relevant Work

The need for consumers to understand pricing is mentioned in **35**. The basic unit of energy on which this should be based is the kWh. The capacity of vehicle batteries should be given in kWh; this is clear in the information for some vehicles, less so for others and for many not stated at all. Typical capacities where given appear to range upwards from 30 kWh. Regulation should require battery capacity and energy prices to be quoted in kWh units, and vehicle energy consumption to be given as miles/kWh. This would provide consistency and a degree of familiarity.

Note: Some manufacturers give battery capacity in Ampere-hours. This criterion is used to indicate the size of 12v batteries which power auxiliaries in petrol and diesel engine vehicles. It is not a measure of stored energy and is not a suitable way to describe EV battery capacity.

It is important that consumers have adequate price information to enable them to make a choice between chargepoints. Access via a mobile phone App will be the obvious way to provide this to most consumers, which is beginning to happen. The information should be standardised, with a map for a selected geographical area showing chargepoint location, type of connection available, connection charge if any and current cost per kWh. Energy costs are likely to vary by time of day, so the App should show current cost in real time. To provide clarity in price comparison for consumers, it may be desirable for prices from all suppliers to be updated at the same time, say on the hour, which is a regulatory matter.

Whilst this approach will serve the majority of consumers, there will be a small and probably decreasing number who are not technologically enabled. For this reason, it

is desirable that at least the larger chargepoint stations, which more closely resemble petrol stations, have large signs indicating the price, electronically updated as with the Apps. Such establishments, particularly where there is a shop on the site, are more likely to have a staff member present who can assist customers if necessary.

Appendix A: On-street EV Chargepoints

There are some critical issues to be considered in relation to the provision of on-street chargepoints. The obstruction of the Highway (which includes the footway, commonly known as the “pavement”), is in England and Wales covered by various sections of the Highways Act 1980 (as amended), and allows the Highway Authority to take action to have obstructions removed. The Act also covers situations where persons other than Councils may be granted permission to install things, on, in or over the highway for various defined purposes. One defined purpose is the production of income, which presumably covers chargepoints.

It should be noted that a Highway includes the footway, as mentioned above, and the carriageway, commonly known as the “road”.

Location

It is possible for Highway Authorities, under the legislation, to permit the placing of free-standing bollards or cabinets as chargepoints, or to agree that connection points may be integrated with street furniture such as street lamps, subject to conditions. However, a Council may not give such permission unless they have the consent of frontagers. In many situations this consent is unlikely to be given. In some situations, the frontagers will be residents or other establishments with no off-street parking, in some cases paying for a permit to park outside their homes. Obtaining consent is even less likely in these circumstances.

This raises a further important issue. Is it envisaged that Councils will restrict parking at the connection points except for those using the facility? Highways Act Section 115E deals with the permission and consents to place the connection points, but there is no obvious sub-clause which authorises the Council to control parking in such a way to accompany the placing. Even if it did, many frontagers would inevitably object.

In one of the pictures above, the relevant section of carriageway appears to be marked “RESTRICTED”, presumably to prevent the parking of vehicles other than those recharging. Parking restrictions are covered by the Road Traffic Regulation Act 1984 Part IV. It is not clear which clause in Part IV gives a power to restrict parking on a section of the carriageway for the benefit of chargepoint operators and their customers.

Without controls on parking, on-street chargepoints may not be economically viable.

Cables

Cables as shown in the pictures above, running along or across the footway, can be considered hazardous. They are in particular trip hazards. They are hazardous to all pedestrians, but particularly hazardous to visually disabled people. Councils would normally not permit such cables to be laying on the footway and/or carriageway for these reasons. Where they are found, action for their removal would normally be taken, possibly under Highways Act Section 149(2).

Note: As long as there is adequate footway width remaining, permitted bollards or cabinets would not be an obstruction or a hazard if located in a position where street furniture can reasonably be expected. In this situation, visually disabled people

would detect their presence, either using a cane or one of the electronic detection aids now becoming available.

In the case of cables connecting EVs with connection points, the following comments are relevant:

- If a Council found a cable running from a house to an EV owned by a resident, they could and should take action.
- The Council may by licence permit a chargepoint operator to install connection points on the footway, subject to conditions including the operator accepting some liability.
- The licence cannot include the cable, as it is not owned by or under the control of chargepoint operator.
- It is not feasible to licence the EV owner to use a portable cable to be laid on the footway in a particular location or at multiple unknown locations.

In the case of an injury accident to someone tripping over the cable, who would be liable? Probably not the chargepoint operator, as the cable is not under their control. Possibly the EV owner as owner of the cable, but would the vehicle insurer accept this? More likely the Council for permitting an obstruction (facilitating it in fact by permitting the connection point).

On street charging should not be permitted, for the various reasons set out above.

The detailed comments in this document have not been directly linked to the two themes and specific key questions in section 51 of the consultation document.

However, the issues in the comments are clearly defined, although in some cases responding across a number of questions.

Individual Response Number 28

Dear Chairman and Chief Executive:

Responding to the Competition and Markets Authority's electric vehicle charging market study: As more people start to use electric vehicles (EVs) it's critical that government and regulators make that switch as easy as possible for people. Right now the process can feel intimidatingly complex, it shouldn't be this way.

Charging an EV should be simple to do. It should be easy to understand all the options available, how much you're paying and whether you're getting good value. And there needs to be good consumer protections to give people confidence and to help them fix problems when they go wrong.

Individual Response Number 29

Dear Sirs

I read with interest the article in today's Telegraph about electric vehicles. I have owned a Hyundai [X] for just over 2 years. It has a range of between [X] and to date have not had to do more than a 2 hundred mile round trip. I once attempted a rapid charge at [X] services (just to test it out) and it did not work. I am [X] and not particularly technically savvy. I am therefore reluctant to attempt any long journeys. I have used the charging outlets at some Tesco and McDonalds (POD Points) which are free to use but as they are generally only 7kW are not practical for long journeys.

There are several companies offering charging but unless you are registered with them they are not useable. Is there any reason why one cannot just use a credit/debit card as one would at a normal service station?

Yours Faithfully,

Individual Response Number 30

Dear sir/madam

I understand from the Guardian newspaper that you are investigating how to help people in this country purchase new electric vehicles in order to help the environment.

This is all good, but it's the range which is still the big problem.

One of the major issues is range anxiety and you want to increase charging stations to help with this.

I think the problem goes far deeper. We purchased an electric car EV recently. We told them we do a [✂] trip and we needed to do it every week and we didnt want to charge up on the journey. They told [✂] Nissan Leaf was a suitable car which would do 168 miles, and if we drove it carefully we could get 200.

That was the clincher. We asked if we could test drive the route but they said no.

As soon as we bought the car, we were very disappointed because we had to drive below 60mph more like 50 mph, without heat and lights even in warm weather, to be able to do the journey. Driving without heat is very unsafe and at 50mph it is dangerous because trucks overtake and cut in Infront. All the official figures seem to give the 168 range and this is very misleading.

I think it is a scam

There are many complaints from people wanting to be green, but who have become very disappointed on the forums like facebook.

To my mind this is somewhat like the emission scandal.

I would love you to investigate and sort out the issue before anyone else gets disappointed

Is there anything we can do, the dealer refuses to say they have miss- sold, and it has now done over the 30 days consumer protection date?

Individual Response Number 31

I am replying to your paper and invitation to comment, dated 2 December 2020. I have no expertise on competition, but I have been an electric car owner for a few years and confine my replies to theme 2. I prefer anonymity if any of this is published.

1. Chargepoints. This is a very unsatisfactory situation. There are not enough. You may arrive at one and find it occupied by another car for hours (I had to leave my own car plugged in at Heathrow for five days while away on a journey because there was no way it could be unplugged and moved, so the chargepoint was blocked for all that time.) I have at least 4 apps on my phone relating to different charge point providers, and this is unacceptable. When arriving at a chargepoint the last thing one wants to do is try to discover, often in poor lighting, which is the provider and whether a special card is required, or even if that charger will fit my Nissan. The instructions on the chargepoint are often incomprehensible, and illegible at night. There has to be uniformity with all providers coming together. Imagine if every petrol station had different size pumps and payment requirements!
2. Challenges. Obviously range, finding chargepoints
3. Which chargepoint services. One has no option but to join every scheme one can find because you don't know as you travel which provider's chargepoints you will need. There is no real competition, one has to pay whatever.
4. One can compare with some difficulty but again you have to sign up to every single one you can.
5. If you do not have a driveway or garage at home for charging, driving an EV is too difficult. You can't leave cables trailing across the pavement.
6. The only thing that would help would be bringing all providers of chargepoints together under one service, one app. Advance notice on an app that the next chargepoint is already occupied would help.
7. I don't know
8. One uniform service would be better than comparison. Comparison is only theoretical because you have to take whatever chargepoint is there when you need it.
9. Uniformity!