

Driving and accelerating the adoption of electric vehicles in the UK

Final report

A research project conducted by the Behavioural Insights Team and Transport Research Laboratory on behalf of the Department for Transport and the Office for Low Emission Vehicles

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July 2020

This report has been produced by the Behavioural Insights Team and the Transport Research Laboratory under contract with the Department for Transport. Any views expressed in it are not necessarily those of the Department for Transport.

Table of Contents

1. Executive summary.....	3
2. Introduction	12
3. Research objectives.....	14
4. Overview of approach	18
5. Discussion & conclusion	21
Objective 1 - I am aware of EVs, my knowledge is accurate & I perceive them as viable	21
Objective 2 - I can afford an EV, and I perceive it as good value for money	24
Objective 3 - The charging infrastructure and experience is adequate for my needs.....	29
Objective 4 - The vehicle functionality and experience is adequate for my needs	33
Objective 5 – I want one – it is desirable, and I can imagine myself using / owning one	36
General conclusions	38
6. Catalogue of shortlisted ideas	42
Objective 1.....	43
Objective 2.....	57
Objective 3:.....	115
Objective 4:.....	154
Objective 5:.....	182
Appendix A - Robust evaluation of behavioural policy interventions	194
Appendix B – Phase 3 research activities.....	202
Online survey with private consumers.....	202
Focus groups with private consumers.....	210
Telephone interviews with commercial fleets	213
Appendix C – Phase 3 survey questionnaire	220

1. Executive summary

Background and objectives

In 2018, transport accounted for 28% of all greenhouse gas (GHG) emissions in the UK; more than any other sector on its own. The large-scale adoption of EVs is therefore a key pillar of the government's efforts to create a carbon neutral economy by 2050 and the government's consultation proposes for all new cars and vans to be zero emission by 2035 or earlier.

The Department for Transport's (DfT) Social and Behavioural Research Team and the Office for Low Emission Vehicles (OLEV) commissioned the Behavioural Insights Team (BIT) and the Transport Research Laboratory (TRL) to develop, research, and present a range of comprehensive policy measures that could address the main barriers and harness the right motivations to accelerate the adoption of electric vehicles (EVs) in the UK. The focus of this work was on passenger cars and other light-duty vehicles, among private and commercial buyers, including public sector procurement.

A behavioural approach

We have applied a behavioural lens to our analysis throughout this research, which means that the ideas were developed and appraised with human behaviour and behavioural insights at their centre. Having reviewed previous research on the individual barriers and motivations to EV adoption, we developed a five-step model illustrating the customer journey to adoption of EVs – shown below in Fig. 1.

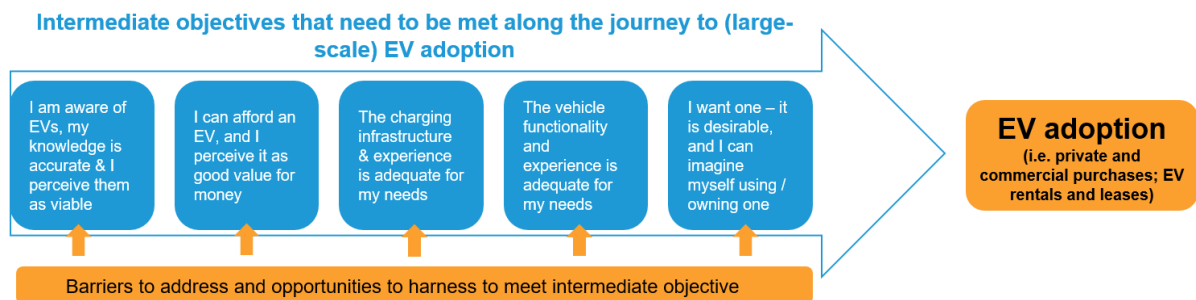


Figure 1: Intermediate objectives on the journey to EV uptake

There are five intermediate objectives that need to be met along the journey to EV adoption. Each of these objectives corresponds to a cluster of important barriers and motivators which influence EV adoption. These barriers are well documented in the research literature. They are:

- ❖ **Awareness & knowledge:** An important initial step is to ensure consumers and fleets have adequate awareness and knowledge of EVs; this includes how the technology works and what that means for functionality, how and where to charge, what models are available, where to find them, what the costs are, and where to find more information.
- ❖ **Financial factors:** Financial factors have a substantial impact on EV adoption; these include purchase price, running costs (and Total Cost of Ownership, TCO), the availability of financial incentives, and vehicle depreciation. There are also important cognitive dimensions to cost perception, including our tendency to focus on the high upfront costs of EVs, and to discount the benefits of lower running costs.
- ❖ **Charging infrastructure:** Availability of and access to charging infrastructure is a critical barrier to adoption. Clearly, for consumers to adopt an EV they need to be able to charge it. [Evidence](#) suggests that it is most important to have 1) access to charging at or very near to

home, followed by; 2) access to charging at work, and then lastly; 3) availability of nationwide public charging infrastructure to enable long journeys. Both *actual* and *perceived* charging availability are key to EV adoption, noting that consumers may over-weight the importance of on-the-go charging (as we are accustomed to refuelling in this way), despite being likely to complete the majority of charging at home.

- ❖ **Vehicle attributes:** 'Range anxiety', long charging times, long-term battery performance, and other concerns related to novelty and inexperience with EVs and their characteristics are among the main barriers to uptake. The limited range of battery electric vehicles (BEVs), in particular, is one of the most commonly raised concerns amongst prospective buyers.
- ❖ **Consumer attitudes:** The development of positive attitudes towards EVs is an important component which can drive purchasing behaviour. This includes symbolic attitudes - those which relate to the symbolic meaning and value of a vehicle; affective attitudes – those which relate to the emotions and feelings evoked by owning and using a vehicle; and instrumental attitudes – those which relate to the general practical or functional attributes of a vehicle.

Our main hypothesis is that a holistic approach to policy making is necessary to achieve large-scale EV adoption. This means that all of these five objectives need to be met. We have concluded this research by highlighting a set of 23 ideas with the highest potential for addressing these objectives and driving EV adoption thereafter.

Overview of the project

The project was divided into three phases, the output from each superseding the previous. In Phase 1 we focused on generating policy and intervention ideas. In Phase 2 we sought feedback on our ideas from expert stakeholders in industry, the public sector, consumer bodies and academia and subsequently shortlisted 65 of the ideas. In Phase 3, we tested a subset (35) of the 65 shortlisted ideas with individual consumers (using an online survey and focus groups) and commercial organisations who operate vehicle fleets (using telephone interviews). This report is the final deliverable, which provides an overview of the approach throughout the whole project but focuses on the findings from Phase 3 and our final conclusions about the **potential impact**, the **likely support** for the idea by consumers, and the extent to which the idea is **ready for implementation**. The main output from this work is a catalogue of the 65 shortlisted ideas (Section 6 of this report), as well as our key recommendations (Section 5 of this report).

None of the ideas developed during the course of this project, including final recommendations, reflect government policy. All content herein should be interpreted as the recommendations of BIT and TRL based on our research and expert judgement. Further scrutiny and deliberation should be applied to the final set of recommendations, including deliberations on affordability, value for money, resource, legal and political feasibility. Wherever possible, the impact of individual ideas on the respective underlying objective should be evaluated in the field, and we highlight some potential next steps within the full catalogue of ideas (Section 6).

Key findings and discussion

A holistic approach, addressing all of the five intermediate objectives is key to encouraging the large-scale adoption of EVs. We recognise that the likely impact of different ideas is wide ranging and some ideas clearly outperform others in terms of their direct impact on EV adoption. But highest individual impact isn't the only metric to consider. Ideas with a low perceived impact may be considered worthwhile, particularly where readiness and feasibility is high or cost is low.

Generally speaking, there was wide ranging support among the public and industry for these ideas, but on average ‘carrots’ were preferred over ‘sticks’. We also found that the *perceived* cost of EVs and *perceived* availability of charging infrastructure is as important as the *actual* cost of EVs and availability of charging infrastructure. While the actual cost of EVs and the adequacy of the charging infrastructure are critical factors, behavioral science advocates that where perceptions are worse than reality, it may make sense to focus on improving those perceptions before investing considerable funds into improving reality. The range of ideas recommended within each of the objectives therefore responds to both of these – *perceived* and *actual* – barriers by applying a behavioural lens to the available policy tools.

Within each of the five intermediate objectives we have grouped ideas into different types of intervention. We list these below and discuss individual ideas with the highest potential per objective and type of intervention. Where individual idea numbers (#) are included, these reference the full catalogue of ideas in Section 6.

Figure 2 below summarises our final recommendations, spanning the 23 policy ideas which, if implemented in combination, would go a long way to addressing all five of the key objectives identified within the customer journey to EV adoption.

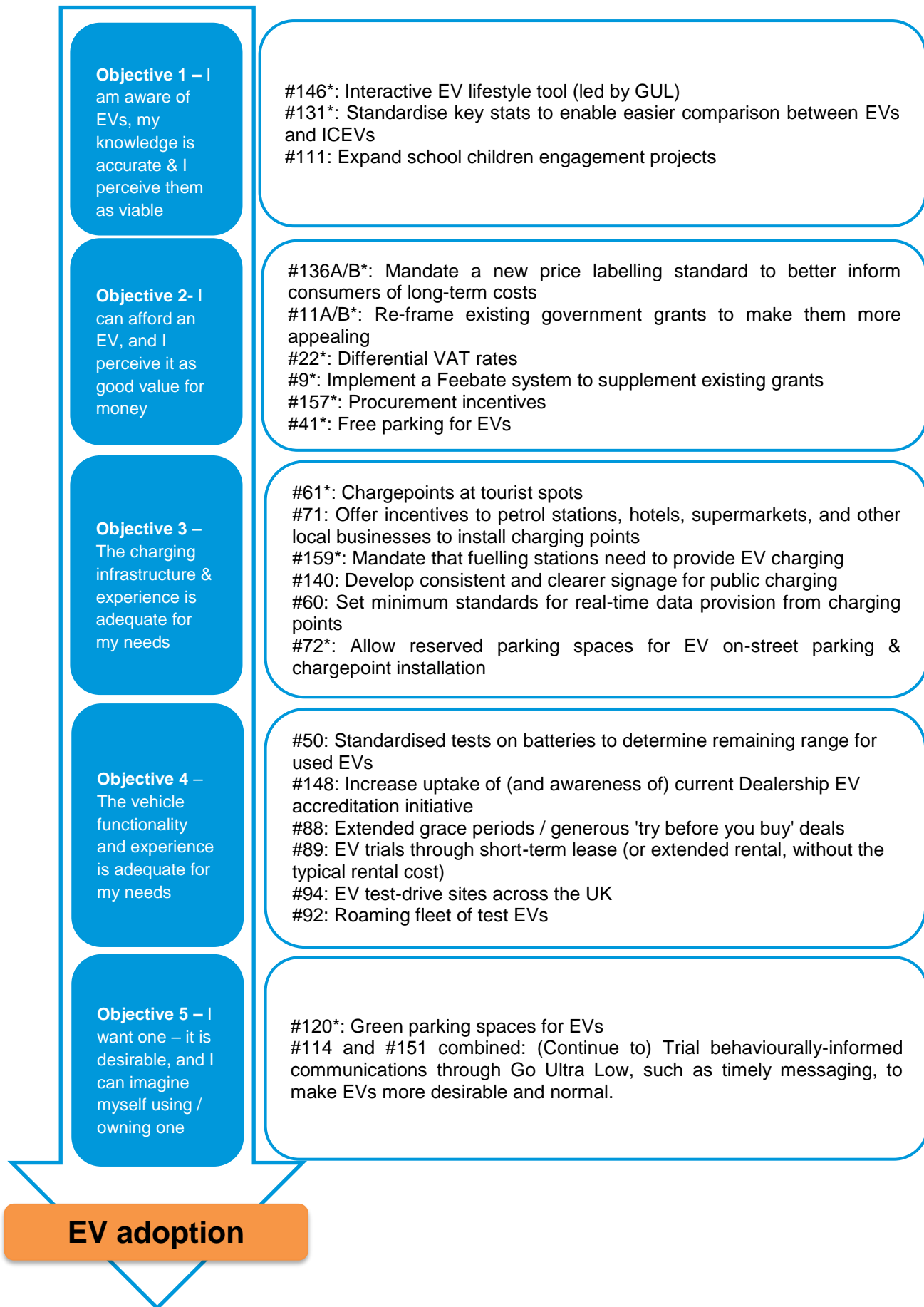


Figure 2 Overview of ideas with highest potential for each intermediate objective on the journey to EV

Objective 1 – I am aware of EVs, my knowledge is accurate & I perceive them as viable

Six policy ideas were shortlisted which can address this objective. These are grouped into three types of intervention:

- ❖ **Personalise information:** We are generally less likely to engage with information that we cannot relate to. We've been driving internal combustion engine vehicles (ICEVs) for decades, so many of us don't have a good intuition about the significance and relevance of electric range and charge time, for instance. Personalising that information to individuals' circumstances and explaining what the switch to an EV would mean for their daily driving can go a long way to engaging those who currently cannot relate to information about EVs, or who discount it as irrelevant. For example idea #146 suggests an interactive EV lifestyle tool, in the form of a website where drivers can input information about their daily driving habits like commuting time or mileage, has high potential to achieve this.
- ❖ **Make comparisons between EVs and ICEVs easy:** For a number of years to come, ICEVs will be the baseline most of us will use to compare EVs to. Making the comparison between ICEVs and EVs on key metrics (e.g. idea #131 'Standardise key stats to enable easier comparison between EVs and ICEVs' by standardising key metrics and units like performance, running costs, durability (e.g. battery life) and range) should be as easy and as accurate as possible, both to familiarise consumers with EVs and to help buyers make more informed decisions, using terms and concepts they understand.
- ❖ **Identify the most effective messengers & touchpoints:** Often the messenger is as important as the content of the message they deliver. As noted in idea #111 ('Expand school children engagement projects') school children can be an effective messenger in this instance. Not only are children future drivers and consumers but they are also influential messengers to their parents. Expanding existing school engagement projects is therefore a quick and affordable way of raising awareness.

Taken together, the most important theme of the ideas in objective 1 is to help consumers understand what it means to own and drive an EV by overcoming poor intuitions about our individual driving needs, vehicle characteristics and general misconceptions around EVs.

Objective 2 – I can afford an EV, and I perceive it as good value for money

We have shortlisted twenty-two ideas that address these real and perceived financial barriers. These were grouped into four types of intervention:

- ❖ **Effective communication about 'real' costs:** In the car market (and indeed across all markets), many consumers will make their purchasing decisions mostly based on the upfront cost of the vehicle, while disproportionately discounting future costs including running/fuel costs, taxes over the vehicle's lifetime, insurance, and so on. The challenge in the case of EVs is that many of their financial benefits are realised over its lifetime rather than at the point of purchase. Idea #136 therefore proposes to mandate a new price labelling standard to better inform consumers of these long term cost savings, and support more accurate 'lifetime cost' comparisons between ICEVs and EVs. We note that the [new environmental labels](#) are a good step in that direction as they clearly lay out different types of running costs. Idea #11 suggests reframing the existing EV grant to highlight the lifetime savings, specifically by telling consumers how much the grant is worth in terms of savings on fuel. Both ideas help consumers realise the premium likely to be required to acquire an EV is less than they may have assumed, which may help tip the balance.

- ❖ **Make EVs more affordable and prioritise upfront incentives:** Providing some form of financial support to make it easier to afford an EV is one of the most effective and popular levers policy-makers can adopt. The highest rated ideas in this category are differential VAT rates for EVs and non-EVs (#22) and a feebate system based on emissions (or powertrain) (#9). Both ideas would cost ICEV drivers and benefit EV drivers in very similar ways. In our survey we framed this as a discount to VAT rates for EVs, and as a feebate system which imposed a fee on ICEVs and a discount to EVs – as such, unsurprisingly, the VAT option was more popular, though in reality either option could be tailored to provide identical penalties/rewards for the two powertrains and therefore are likely to have a similar impact. Feebates, however, provide a more flexible policy tool and may be easier to implement.
- ❖ **Create demand through market design:** Government should consider redesigning its procurement system to favour fleets with EVs. This would send a positive signal to the market, incentivising fleets to invest in EVs and reassuring manufacturers about future demand. Government can leverage its own procurement system to reduce the risk to suppliers of ramping up EV production by sufficient and stable demand for those EVs (#157 'Procurement incentives'). EV uptake among fleets is important in accelerating the large-scale adoption of EVs, in terms of absolute numbers but also as a quick way to filter electric vehicles down to the second-hand market.
- ❖ **Make EVs more appealing through recurring incentives:** Owning and driving a car involves many recurring costs over its lifetime. Repurposing some of these to benefit EV owners can provide an additional incentive. For example, making public parking free of charge for EVs (#41) is one type of recurring incentive which could have a positive impact at least over the short and medium term as long as the opportunity costs to local authorities don't exceed the benefits to EV drivers. However we note that these types of incentive were not always popular among consumers, perceived to benefit the already well-off. They may also be less effective than front-loaded incentives which impact the cost of purchase.

Taken together, these interventions make it easier to afford an EV at the point of sale and over its lifetime, redesign market incentives to boost demand, and improve consumers' understanding about the 'real' cost of EVs, thereby correcting possible misperceptions regarding value for money.

Objective 3 – The charging infrastructure and experience is adequate for my needs

Eighteen policy ideas were shortlisted which can address this objective. The ideas are grouped into three types of intervention:

- ❖ **Expand public charging infrastructure in key locations:** It is important to recognise that both actual and perceived adequacy of the charging infrastructure are crucial to achieve this objective. It is not enough to just aim for the former when many drivers still perceive the infrastructure to be inadequate and therefore decide to opt for an ICEV instead of an EV. Idea #61 recommends installing chargepoints at tourist spots to provide assurances that charging is possible even at remote locations. Combining that with either idea #71 offering incentives to petrol stations, hotels, supermarkets, and other local businesses to install charging points' or with idea #159, which mandates fuelling stations to provide chargepoints, could be very effective at addressing both the actual and perceived inadequacy of the charging infrastructure. In particular ideas #71 and #159 aim to provide a dense network of chargepoints to drive consumer confidence in being able to easily charge their vehicle wherever they are and even over longer distances (responding to prevalent concerns such as range anxiety). In particular, mandating petrol stations to install chargepoints, may provide a perceived level of security (because they are ubiquitous, familiar and easy to find) that other locations.

- ❖ **Improve public charging information transparency & accuracy:** The two ideas selected here are recommended to be implemented alongside one another. Firstly idea #140 is focused on developing consistent and clear signage for public charging, to ensure that consumers can easily identify and find public charging infrastructure, and improve perceptions about their prevalence. The second idea, #60 is about setting minimum standards for real-time data provision from chargepoints. This would improve charging experience by ensuring real-time information on chargepoint status could be remotely accessible from third-party applications such as Google Maps or Waze reducing the likelihood of navigating to a chargepoint they are unable to use.
- ❖ **Provide charging solutions for those without off-street home parking:** One of the big challenges as more people want to adopt EVs will be to provide enough charging solutions to those living in flats or other types of accommodation without off-street parking. Idea #72 proposes the provision of reserved parking spaces for EV on-street parking and chargepoint installation. This would allow EV buyers to get a chargepoint installed on the kerb-side outside their home and a reserved parking space, to ensure they could always access their chargepoint. However we note that none of the ideas under this category scored highly on feasibility or consumer popularity, and thus further thought is needed to address this increasingly critical barrier.

Taken together these types of intervention address the main barriers associated with charging infrastructure provision such as an actual lack of availability of suitable chargepoints, and a perceived lack of infrastructure, or poor perceptions about chargepoint reliability.

Objective 4 – The vehicle functionality and experience is adequate for my needs

A total of ten ideas were shortlisted in this objective; these can be grouped into the following types of intervention:

- ❖ **Deliver accredited services and standardised training:** Idea #50 promotes the creation of standardised tests on battery health in used EVs, to improve confidence in the second-hand market. Though our consumer research did not identify this idea as especially appealing, prior research does show widespread concern about long-term battery performance, which is likely to become a major issue when the second hand market grows. Acknowledging that salespeople and dealerships have significant influence over consumer choice, idea #148 proposes to encourage the wider uptake of the National Franchised Dealers Association's government-endorsed dealership accreditation programme to increase public trust in dealers and the quality of information they provide to consumers
- ❖ **Reduce long-term commitment anxiety:** Given EVs are a relatively new technology, and many potential buyers are hesitant and not wishing to commit too soon, assurances against 'buyers' remorse' could be powerful incentives, particularly in the short term. We suggest implementing either of two measures: Idea #88 proposes standardised extended no-fee cancellation periods for EV lease and PCP deals, enabling consumers to 'try before they buy', or idea #89 which proposes short-term leasing options for EVs whereby consumers could sign-up to a 2-3 month lease or rental for a monthly fee, without paying the typically high costs of car rental. This would enable them to gain real-world experience of using an EV without needing to sign-up to a long-term finance deal. Both of these ideas are considered to have high impact but low readiness levels because protections for the industry would need to be developed against the risk of turning over 'nearly new' vehicles after a short period of time with reduced residual value.

- ❖ **Increase awareness and knowledge of EV capabilities:** The final type of intervention aims to increase awareness and knowledge of EV capabilities. The ideas with the highest potential suggest doing so by increasing the prevalence of test driving, which is [evidenced](#) to be one effective way of reducing range anxiety and helping to familiarise drivers with the new technology. Idea #94 proposes to set up independent EV test-drive sites across the UK which would be manufacturer-agnostic. Idea #95 offers an alternative to fixed test drive sites by setting up a roaming fleet of test EVs which would be loaned to organisations as a live trial. In this way, a relatively small fleet of vehicles could be exposed to a large number of potential buyers, at a relatively low cost. Idea #95 directly targets businesses and so this has a particular benefit for commercial fleets but readiness of idea #94 is considered to be higher because a model for implementation already exists with the Milton Keynes EV Experience Centre.

EV functionality covers factors related to the utility of the vehicle. The critical issue which has a substantial influence on adoption is range anxiety, but other factors such as long charging times, vehicle model choice, long-term battery performance, size and payload also have an influence. The ideas selected here have good potential for addressing these barriers and ensuring consumers have confidence in the functionality of EVs, and that EVs will be suitable for their needs.

Objective 5 – I want one – it is desirable and I can imagine myself using/ owning one

We have shortlisted seven ideas for Objective 5. The most promising of these fall under one common theme:

- ❖ **Increase the visibility of EVs and charging infrastructure to help normalise them in society:** Idea #120 proposes a solution for increasing the visibility of EV charging and parking spaces by standardising that they should all be painted green. This harnesses the ‘green’ environmentally-friendly image of EVs and should help to increase salience of EV charging infrastructure for both EV-drivers and non-EV drivers. This is a similar idea to current government plans to explore the use of green number plates on EVs. Secondly, ideas #114 and #151 (these have been merged) are a broad recommendation to develop and trial a set of communication campaigns - informed by best practice from behavioural science - that can help make EVs more desirable. There are many strategies to explore, and we recommend this includes:
 - Information highlighting the prevalence or increasing popularity of the desirable behaviour, e.g. the increasing prevalence of EV ownership;
 - Harnessing usual motivating characteristics such as safety, reliability, driving enjoyment, or performance/ acceleration; and
 - Harnessing ‘timely moments’ when people are most receptive to be prompted to change their behaviour. For transport behaviours moving home, starting a new job, getting your driver’s license are all such ‘timely moments’.

Conclusions

In conclusion, there is a broad range of interventions which policymakers can use to have a positive impact on EV adoption, and on associated intermediate objectives identified within our 5-step customer journey to EV adoption. The individual ideas with the highest potential, outlined above, address a number of sub-themes in each objective. In some cases these ideas can/ should be combined for higher impact. In other cases, ideas are ‘substitutes’ for one another, as highlighted in the summary tables within Section 5.

The implications of COVID-19 for the conclusions in this report

The research underpinning this report was concluded before the outbreak of COVID-19 across the globe and in the UK. The pandemic has impacted and will continue to directly and indirectly impact the way people travel, and economic activity as a whole, including vehicle purchases. Among wider measures to fuel the economy, accelerating the adoption of EVs is still an important element of wider efforts to reach the net zero goal by 2050.

We maintain that the most effective way of achieving this is to adopt a holistic approach by addressing all of the objectives along the five-step customer journey to EV adoption in this report rather than focusing on individual high impact ideas such as a feebate system or the expansion of the public charging infrastructure. That said, we do recognise that the impact and importance of some objectives may have shifted as a result of the consequences of COVID-19. For example, ideas that address financial barriers (objective 2) may be even more important now than they were previously, as many individuals and firms are facing greater financial difficulties than they were previously. We also note that the reset after COVID-19 when people return to their offices may present a timely moment to promote EVs as some may be looking to buy a car to avoid having to take public transport. It is important that EVs represent a viable and competitive alternative for that group.

However, a holistic and balanced approach with measures addressing all five objectives is necessary to accelerate the adoption of EVs in the UK, also after COVID-19.

2. Introduction

Transport contributes over 27% of all greenhouse gas (GHG) emissions in the UK; more than any other sector on its [own](#). Passenger cars and light-duty vehicles together account for about 20% of GHG emissions, and HGVs contribute about 5%. Decarbonisation of passenger cars, light-duty vehicles and HGVs are particularly important for the UK's efforts to meet net zero emissions targets by 2050.

Large-scale adoption of electric vehicles (EVs) is a key component of this effort; the government is consulting on all new cars and vans to be effectively zero emissions by 2035, or earlier. Significant positive market developments are being realised. Despite COVID-19 impacting the end of Quarter 1 2020, data from the European Automobile Manufacturers Association ([ACEA](#)) show that pure electric vehicle sales were up 204% compared to the same period in 2019 and plug-in hybrid sales have increased 59%. Despite positive growth however, considerable progress is still required to reach the level of mass-market adoption needed to meet our climate change obligation. EVs also represent an even smaller fraction of total car sales, with sales of second-hand petrol and diesel vehicles still far outstripping sales of EVs. This will in part be due to low supply; there are limited options for prospective second-hand EV purchasers currently. Improving sales of new EVs, particularly by commercial fleets, will help to accelerate the flow-down of EVs into the second-hand market too. The relatively low uptake of EVs is due to a number of financial, practical and psychological barriers. To achieve the government's goals, EVs need to be affordable, convenient, functional and aspirational.

The Department for Transport's (DfT) Social and Behavioural Research Team and the Office for Low Emission Vehicles (OLEV) therefore commissioned the Behavioural Insights Team (BIT) and TRL (the Transport Research Laboratory) to develop, research, and present a range of comprehensive policy measures that address the main barriers and harness the right motivations to accelerate the adoption of EVs in the UK – with a focus on passenger cars and light-duty vehicles (specifically battery electric vehicles, plug-in hybrid battery electric vehicles and range-extended electric vehicles). Hydrogen vehicles are not currently widely available to the mass-market and are therefore out of scope for this particular project. It is nevertheless still considered a potentially important technology for reaching future low emission targets in transport. This market growth ambition extends to both private and commercial buyers as well as the public sector.

The project was delivered in three phases:

- In Phase 1, we focused on idea generation. We reviewed previous research on the barriers and motivations to EV adoption and undertook structured brainstorming exercises – informed by behavioural science in their setup - to generate a long list of about 160 policy and intervention ideas that address individual barriers and motivations.
- In Phase 2, we sought feedback on our ideas from expert stakeholders across a wide range of sectors. Subsequently, the individual ideas were ranked on various metrics such as impact on EV adoption as well as financial, practical and political feasibility. The initial list of ~160 ideas was reduced to a shortlist of 65 ideas.
- In Phase 3, we 'tested' a subset of the shortlisted ideas with private consumers (using an online survey and focus groups) and commercial organisations who operate vehicle fleets (using telephone interviews). Using the insights gained from these activities, along with those from the earlier phases of work, we assessed each idea in the initial shortlist in order to draw conclusions about the potential impact, the likely support for the idea by consumers, and the extent to which the idea is ready for implementation. The main output from this work is a catalogue of ideas, including our key recommendations, which policy-makers can draw on to inform design and implementation of interventions to increase EV adoption.

This Report:

This report represents the final output of the project, summarising the work undertaken across all phases, and detailing the key findings and recommendations.

- ❖ **Section 2** outlines a series of intermediate behavioural and attitudinal objectives that need to be addressed to achieve the overall objective of increased EV adoption. These intermediate outcomes are captured in a five-step model which illustrates the customer journey to adoption. We also summarise a consumer segmentation model which was used to assess potential impacts of ideas against specific segments of the private car buyer market.
- ❖ **Section 3** outlines our approach to shortlisting, testing and scoring the ideas.
- ❖ **Section 4** contains a discussion of the ideas with the highest potential which can be implemented to meet the five objectives and presents the overall conclusions and lessons from the project.
- ❖ **Section 5** presents a catalogue of shortlisted ideas; 65 ideas are presented which span the five intermediate objectives. For each idea, we have summarised and assessed key information with regard to the likely impact, support and readiness of the idea.
- ❖ **Appendix A** provides a step by step guide to robust policy evaluation and summarises key evaluation methodologies.
- ❖ **Appendix B** outlines the methodology of all Phase 3 research activities in more detail
- ❖ **Appendix C** contains the questionnaire we used in the online survey

None of the ideas developed during the course of this project, including final recommendations, reflect government policy. All content herein should be interpreted as the recommendations of BIT and TRL based on our research and expert judgement. Further scrutiny and deliberation should be applied to the final set of recommendations, including deliberations on affordability, value for money, resource, legal and political feasibility. Wherever possible, the impact of individual ideas on the respective underlying objective should be evaluated in the field, and we highlight some potential next steps within the full catalogue of ideas (Section 5).

3. Research objectives

The ultimate aim of the project was to develop ideas for government policy to increase the uptake of new and second hand electric vehicles by private consumers and commercial fleets (including home-based, depot-based and public sector fleets).

In Phase 1 and 2 of this project we outlined a number of intermediate objectives that need to be addressed to achieve the overall objective of increased EV adoption. These intermediate outcomes are captured in a five-step model which illustrates the customer journey to adoption – shown below:

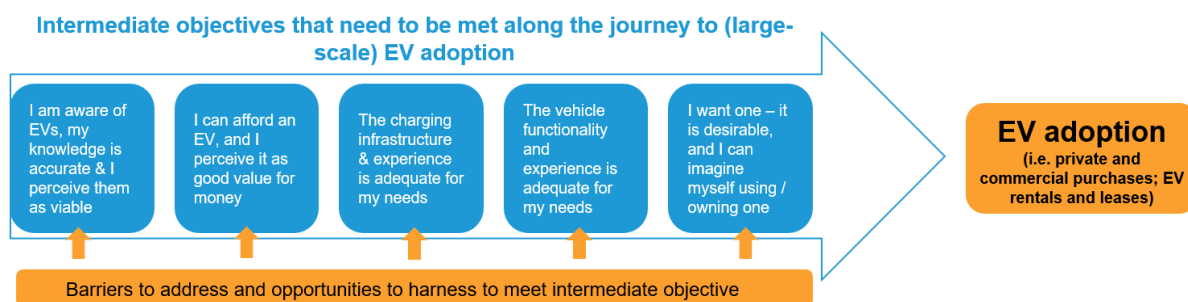


Figure 3: Intermediate objectives on the journey to EV uptake

Each of the intermediate objectives corresponds to a key category of barriers and motivators which influence EV adoption. These barriers are well documented in the research literature, including in previous work by TRL and BIT and the DfT’s [Transport and transport technology public attitudes tracker](#). They are:

❖ Awareness & knowledge

An important initial step is to ensure consumers and fleets have adequate awareness and knowledge of EVs; this includes how the technology works and what that means for functionality, how and where to charge, what models are available, where to find them, what the costs are, and where to find more information. Without any awareness, consumers will not choose an EV over a conventional petrol or diesel vehicle, and without accurate knowledge, consumers will be unable to make an informed and optimal choice and may be less likely to adopt an EV due to relying on outdated pre-conceptions of EVs and their limitations. This relates to all other barriers listed below, since *perceptions* (of costs, of charging infrastructure etc.) matter more than reality. Addressing this barrier is therefore a prerequisite for adoption. That said, improving awareness and knowledge is not sufficient on its own to ensure adoption.

❖ Financial factors

Financial factors have a substantial impact on EV adoption; these include purchase price, running costs (and Total Cost of Ownership, TCO), the availability of financial incentives, and vehicle depreciation. The high purchase price of EVs is one of the most commonly cited barriers to adoption. Evidence suggests that financial incentives which reduce the upfront purchase price are effective for increasing EV adoption. EVs can offer reduced running costs over their Internal Combustion Engine Vehicle (ICEV) counterparts, predominantly through lower electricity costs per mile of travel compared with equivalent prices for petrol and diesel, but also through reduced servicing and maintenance requirements and lower vehicle taxes. These savings can serve as a motivator for adoption, however evidence suggests that most consumers fail to consider the TCO when making purchasing decisions, and are instead more heavily influenced by upfront purchase premiums. Concerns over perceived higher depreciation rates

with EVs compared with ICEVs may also be a barrier, although such concerns should be appeased as the market develops.

❖ **Charging infrastructure**

Availability of and access to charging infrastructure is a critical barrier to adoption. Clearly, for consumers to adopt an EV they need to be able to charge it. Evidence from [trials](#) and the DfT's [public attitudes tracker](#) suggests that it is most important to have 1) access to charging at or very near to home, followed by; 2) access to charging at work, and then lastly; 3) availability of nationwide public charging infrastructure to enable long journeys. However the relative importance of these for any individual will likely depend on the use-case of the vehicle. For instance, single-car households may place greater emphasis than multi-car households with an ICEV on nationwide charging, since they would lack a second car for occasional longer trips. In this case, less frequent usage of a given charging location does not necessarily translate to reduced importance – it might still be critical to the purchase decision.

Access to charging at work and in public locations is particularly important for BEV adoption, but less so for PHEV adoption, because PHEV drivers are able to draw on the internal combustion engine to extend their travel beyond those journeys which are local to home. Both actual and perceived availability of public charging infrastructure are key; sufficient numbers of chargepoints must be provided to ensure EV consumers can charge where and when they need, and their location, availability and reliability must be sufficiently clear to members of the public so as to support consumer confidence.

❖ **Vehicle attributes**

'Range anxiety', long charging times and other concerns related to novelty and inexperience with EVs and their characteristics are among the main barriers to uptake. The limited range of BEVs, in particular, is one of the most commonly raised concerns amongst prospective buyers. [Evidence](#) shows that likelihood to adopt a BEV increases with increasing electric range; minimum thresholds of 200 miles are likely needed to appeal to more than half of the market, and 300 miles is likely to be sufficient to appeal to a substantial majority. Likelihood to adopt a PHEV also increases with increasing electric range. As technological developments bring longer range vehicles to market for affordable prices, range anxiety is likely to reduce. Again, perceptions about range needs are also key. Therefore, whilst longer range models are still in development, interventions which help consumers better understand their actual real-world range needs may help to alleviate concerns for some segments of the market.

❖ **Consumer attitudes**

The development of positive attitudes towards EVs is an important component which can drive purchasing behaviour. Experience with an EV can impact attitudes, and likelihood to adopt. This includes symbolic attitudes - those which relate to the symbolic meaning and value of a vehicle; affective attitudes – those which relate to the emotions and feelings evoked by owning and using a vehicle; and instrumental attitudes – those which relate to the general practical or functional attributes of a vehicle. Attitudes will naturally vary between market segments. For instance, those who sympathise with environmental concerns are more likely to appreciate the 'green' symbolic value of EVs, whilst others might value the smooth performance and quick acceleration.

It is important to acknowledge that the market is not homogenous and instead there are nuances which must be considered when considering propensity to adopt. For example, previous consumer research has shown that private consumers can be separated into distinct segments which characterise their vehicle purchasing behaviours ([Anable, Kinnear, Hutchins, Delmonte & Skippon, 2011](#); [Skippon,](#)

[Kinnear, Lloyd & Stannard, 2016](#)). The attributes of five segments of the private consumer market, defined in this earlier work, are summarised in Table 1.

Table 1: Attributes of private car consumer segments; each segment accounted for approximately 20% of the sample in the original segmentation

Attribute / Segment	Cost-conscious greens	Pragmatists	Unmet needs	Uninterested rejecters	Car-loving rejecters
Age	Young	Youngest	Youngest	Oldest	Oldest
Gender	50/50 male/female	50/50 male/female	High male predominance	Slight male predominance	High male predominance
Income	Medium	Low	High	Low	High
Employment	Low (50%)	High (70%)	High (70%)	Low (50%)	High (70%)
Car ownership history and attitudes to driving	Own one car Do not link cars to status Do not particularly like cars or driving 10% spend >£20k on new cars	Own one car Strongly link cars to status Do not particularly like cars or driving 10% spend >£20k on new cars	Own two or more cars Link cars to status Like cars and driving 25% spend >£20k on new cars	Own one car Do not link cars to status Do not particularly like cars or driving 10% spend >£20k on new cars	Own one or two cars Link cars to status Very much like cars and driving 40% spend >£20k on new cars
Typical car journey patterns	Average annual mileage Infrequent long trips	Average annual mileage Frequent long trips Predominantly urban driving	High annual mileage Frequent long trips	Lowest annual mileage Infrequent long trips	Highest annual mileage Frequent long trips
Attitudes towards new technology	Not interested	Interested	Interested	Not at all interested	Interested in new cars, but not that interested in new technology generally
Attitudes towards the environment	Greenest – deeply believes in impact of individual actions	Neutral – feels moral obligation to reduce emissions, but not a priority	Positive	Negative	Least green
Attitudes towards fuel use and running costs	High willingness to pay for running cost savings	Relatively high willingness to pay for running cost savings	Relatively high willingness to pay for running cost savings	Do not see benefits in changing fuel from oil to electricity	Do not see benefits in changing fuel from oil to electricity
Attitudes towards EVs	Positive	Negative	Positive	Negative	Most negative

As a result of varied attitudes, motivations, circumstances and needs of consumers, the influence of each of the barriers on the likelihood to adopt an EV will differ between individual consumers. It also follows that different policy ideas are likely to have a varied impact on different segments of the market. By considering how policies may interact with the specific attitudes and characteristics of the different consumer segments, we can make judgements about the likely impact of each idea on increasing adoption across the whole private consumer market. Therefore, where relevant, an assessment of the likely impact of certain policy ideas on different segments has been included in the Discussion section (Section 5) of this report.

Ultimately, a holistic approach to policy making whereby all five of the intermediate objectives are met is recommended. This report discuss a range of ideas which can be selected to achieve this outcome.

4. Overview of approach

In Phase 2 we shortlisted a total of 65 ideas which span the five objectives. In Phase 3 we undertook research with private consumers and commercial fleets to gather detailed feedback on 35 of the ideas. We chose not to test ideas with less potential and those for which we had already received a lot of feedback from stakeholders in Phase 2. We also excluded some ideas where self-reported impact was unlikely to adequately capture the implicit behavioural mechanism through which we would expect the intervention to achieve impact, meaning that at face value the mechanism may appear to be less impactful than empirical evidence would suggest. Phase 3 research activities included:

- ❖ Conducting an online survey with 2,756 members of the public to measure the perceived impact of and support for each idea
- ❖ Conducting focus groups with 22 members of the public to gather qualitative insight on the reasons behind consumers' perceived impact and support for each idea
- ❖ Conducting telephone interviews with 5 commercial organisations who operate a vehicle fleet to gather qualitative insight on perceived impact and support from businesses. We tested ideas targeted solely at businesses and those that would impact both the public and businesses.

A full explanation of the methodology employed for these three activities can be found in Appendix B.

These research activities, together with activities undertaken in Phase 2, provided a range of data sources for each idea. We have synthesised these data sources to inform an overall assessment of each idea.

Each idea was assessed in terms of its potential impact on achieving a given objective related to EV uptake, the likely level of support for the idea from private consumers and/or businesses, and the extent to which the idea is ready for implementation. These 'impact, 'support' and readiness' metrics have been expressed using a traffic light system whereby:

- ❖ **Red** indicates low impact / support / readiness
- ❖ **Amber** indicates moderate impact / support / readiness
- ❖ **Green** indicates high impact / support / readiness



Low



Moderate



High

It is important to note that the ratings we attributed to the ideas are a reflection of our subjective interpretation of the feedback we collected and our own expert judgement. The ratings should be considered relative to each other within each objective.

Impact - we define impact as the extent to which the intermediate objective is addressed, rather than impact on the end goal of EV adoption. To infer the ultimate impact of the idea on EV adoption, an assessment of the relative importance of the five objectives is required, which would require further research outside the scope of this project. In any case, we suggest that all five objectives need to be addressed to some extent to achieve a large-scale adoption of EVs, as previously noted.

To judge the potential impact of an idea, we considered a number of points:

- ❖ How 'directly' does the idea, e.g. uptake of a service, address a barrier? For example, what is the impact of test-driving an EV on range anxiety?
- ❖ How much of the market would an idea impact?
- ❖ Are there critical pathways (e.g. penetrating fleets to boost second-hand markets), which can lead to higher indirect impact?
- ❖ Does modest impact now mean modest impact in future (and vice versa)? For example, a policy might address a barrier which will become critical but isn't slowing uptake right now. Free parking for EVs may work the opposite way, it may be effective now but become less feasible and effective the more EVs there are on the streets.

Support – by support we mean the extent to which consumers and businesses are likely to be supportive of a given policy idea being implemented. This is an inherently subjective metric which will vary considerably between individuals and organisations depending on their circumstances and backgrounds; the data collected in Phase 3 on 'support' are therefore crucial to enable an assessment against this metric. As such, we chose not to rate ideas on support that were not tested in Phase 3 since we had no relevant data available to inform the judgement.

Readiness – this is all about how 'ready' the idea is to be implemented in its current form. The ideas were not directly scrutinised for 'readiness' in the Phase 3 testing, but this metric is included to reflect our view on the extent to which the idea is ready to be implemented (also considering work that OLEV and DfT are already undertaking), and how confident we are in our judgements of the idea on impact and support, or whether we think further work and research is required to confirm our ratings.

To judge the readiness of an idea, we considered a number of points:

- ❖ How much further work would need to be done to get this policy off the ground?
- ❖ Is similar work underway within government or industry? Could it build off existing programmes?
- ❖ Does it rely on partnerships, for example, with industry or local authorities? How diffuse is responsibility?
- ❖ What policy tools and levers are needed for implementation (e.g. primary legislation, departmental responsibility, etc.)?
- ❖ How ready for the policy is the market and the population? Should it be implemented now, or would it be more useful and critical in 5 / 10 years' time?

Further information on the approach taken to assess each idea and assign traffic light rating can be found in the Appendix B of this report.

For each idea, the outcome of this assessment – including traffic light ratings - is detailed in full in Section 6, which provides a catalogue of all ideas grouped by each of the five objectives. Where available, this catalogue also summarises the results from the Phase 3 research activities. Section 5 of this report focuses on 23 ideas which have been selected as those with the highest potential, and draws together the overall conclusions from the work.

When considering the findings reported in the following sections it is important to acknowledge the limitations of the research. For example, using self-reported measures of intended behaviour for impact evaluations of behavioural outcomes is only a proxy measure; that is, the results can only be considered an approximation of the actual behaviour that could be expected. This is because our stated behavioural intentions do not necessarily equate to our actual behaviour. In this instance, we felt it was justified to use self-reported measures because the data were used to inform a wider discussion (based on multiple data sources and insights) of the ideas, with the ultimate goal of

prioritising a shorter list of ideas with the highest potential for consideration for further research and development. Self-reported measures are also limited in that the questions and idea descriptions used in our survey were required to be simple; this meant that single framings of ideas were required and questions could not easily explore the nuances of particular ideas. The qualitative research activities (focus groups and telephone interviews with businesses) helped to mitigate this to some extent, by enabling deeper discussion and reflection on the ideas, which aided interpretation of the survey findings and the forming of overall conclusions.

Each idea listed in this report has an ID number (#XXX). These numbers originate from an initial longlist of ideas which was developed in Phase 1 of the research. The numbers are no longer sequential, since individual ideas have been further refined, combined, and removed from the longlist as the project has progressed. Nevertheless, we have retained the original numbering in this document as a means of keeping the audit trail intact. Readers of this report can otherwise ignore the numbers.

5. Discussion & conclusion

The following section summarises the key findings and the ideas with the highest potential, for each objective. At the end of this section we discuss cross-cutting conclusions looking at the behavioural underpinnings of our recommendations.

The tables throughout this section provide an overview of the shortlisted ideas (per objective), their ratings, and what ‘type of intervention’ they belong to. Those ideas with an asterisk where those tested in Phase 3. The ideas highlighted in **blue** are the ideas with the highest potential, which have been judged to strike the best balance between impact, support and readiness, whilst collectively addressing a breadth of key barriers within a given objective. These are therefore the ideas which we recommend are prioritised for further consideration, though many ideas are worthy of further research and/or trialing, and some are substitutable, bringing different advantages and limitations. To that end, the ‘pairings & alternatives’ column highlights which ideas complement each other well and which should be considered substitutes to one another.

Objective 1 - I am aware of EVs, my knowledge is accurate & I perceive them as viable

Objective 1 is about achieving large-scale awareness and accurate knowledge of EVs. Six policy ideas were shortlisted which can address this objective. These are grouped into three types of intervention:

- ❖ Personalise information
- ❖ Make comparisons between EVs and ICEVs easy
- ❖ Identify the most effective messengers & touchpoints.

Taken together, these types of intervention address barriers including information overload, the hassle of having to make computations to compare metrics of different powertrains, lack of consumer engagement, and low salience or relevance of available information.

Type of intervention	Pairings & alternatives	Idea	Impact	Support	Readiness
Personalise information		#146*: Interactive EV lifestyle tool (led by GUL)	M	H	H
Make comparison between EVs and ICEVs easy	131 OR 131 & 143	#131*: Standardise key stats to enable easier comparison between EVs and ICEVs	H	H	M
		#143: Require dealers to add plug-in alternatives ICEV sales sheets	M	-	L
Identify the most effective messengers and touchpoints		#111: Expand school children engagement projects	L	-	H
		#118*: National EV day or National zero emission day	M	L	M

		#144: Car comparison websites to have a dedicated EV section of the site	L	-	H
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We have identified three ‘types of interventions’ to address this objective:

Personalising information about vehicles: Some drivers might not engage with information about EVs adequately because they can’t relate to it, or because generic information does not reflect their particular needs. We’ve been driving ICEVs for decades, so many of us don’t have a good intuition about the significance and relevance of range and charge time for instance. Personalising that information to individuals’ circumstances and explaining what the switch to an EV would mean for their daily driving can go a long way to engaging those who currently cannot relate to, or discount as irrelevant, information about EVs. Specifically, idea #146 suggests an interactive EV lifestyle tool, in the form of a website where drivers can input information about their daily driving habits like commuting time or mileage, and typical out-of-work trips. Based on that information the tool will suggest EVs that best suit their needs.

The “Pragmatist” and “Unmet needs” segments are most interested in new technology, and motivated towards greener lifestyles, and therefore are perhaps more likely to engage with an online tool like this compared with other segments.

Making comparisons between ICEVs and EVs easier: Driving ICEVs has been the norm for decades. It’s natural, therefore, that ICEVs are the baseline most of us will use to compare EVs to. Making the comparison between ICEVs and EVs on key metrics like performance, running costs, durability (e.g. battery life) and range should be as easy and as accurate as possible, both to familiarise consumers with EVs and to help buyers make more informed decisions, using terms and concepts they understand. Idea #131 (‘standardising key stats to enable easier comparison between EVs and ICEVs’) are communicated suggests standardising the way key metrics are communicated (e.g. by standardising the units in which metrics like performance, runnings costs etc. are presented) to make sure that an accurate comparison can be easily made between similar models of ICEV and EV. Over time, this will help UK drivers become increasingly familiar with EVs, and enable accurate judgement of what vehicle best fits their needs.

A more interventionist idea, #143, suggests that dealers are required to display plug-in alternatives by adding them to ICEV specifications to alert potential buyers of EV substitutes. Evidence from the wider behavioural sciences (e.g. from public health messaging) suggests that information provision and prompts delivered at the point of decision or during the decision journey are more effective than efforts to raise background awareness or understanding, and so presenting these EV alternatives to those who are considering to purchase a car, could be powerful, albeit requires bolder government intervention on consumer decisions. Idea #143 can be implemented in combination with #131, since such prompts may use the standardised metrics, but is not a direct substitute for #131.

Both ideas have potential to have greater impact for the “Car-loving rejectors” and “Unmet needs” segments of the market (see ‘Research objectives’ section for explanation of the segments), since these types of consumers have greater enthusiasm for cars generally, and so may benefit from easier comparisons between EVs and ICEVs.

Identifying the most effective messengers and touchpoints: Evidence shows that picking the right messengers and the right moments to communicate important information is often just as important for capturing people’s attention as getting the message itself right. That is also true for raising awareness about EVs. As noted in idea #111 (‘Expand school children engagement projects’) school children can

be an effective messenger in this instance. Not only are children future drivers and consumers but they are also influential messengers to their parents. Expanding already existing school engagement projects is therefore a quick and affordable way of raising awareness. This said, reach of such programmes will be limited, since scaling across many schools is costly, and not everyone has children. In contrast, national campaigns and events, such as a national EV day (#118), may reach more people and can provide a platform from which to promote or deliver a number of related activities and initiatives (such as test drives, or 1-day ICEV bans in participating towns and cities). Creating dedicated EV sections on car comparison websites is less salient and less widely noticed as a national EV day but it's specifically targeting those looking to buy a car (if they search online and if they click on the dedicated EV section).

From all of the ideas under objective 1, which aims to address issues around awareness and knowledge of EVs, the most important theme is to help consumers understand the implications of switching to EVs by making the technology familiar, and the comparison between ICEVs and EVs easier. A key part of this is overcoming poor intuitions about our driving needs, and negative preconceptions that may exacerbate risk-averse, 'stick to what works' attitudes. While raising awareness and accurate knowledge of EVs is paramount to enable people to buy the right car for themselves and to promote large-scale adoption, it is insufficient on its own.

Objective 2 - I can afford an EV, and I perceive it as good value for money

Objective 2 focuses on addressing the upfront cost barrier associated with EVs and helping consumers better understand the value for money they can offer. We have shortlisted twenty-two ideas that address these barriers. These were grouped into four types of intervention:

- ❖ Effective communication about ‘real’ costs
- ❖ Make EVs more affordable and prioritise upfront incentives
- ❖ Create demand through market design
- ❖ Make EVs more appealing through recurring incentives.

Taken together, these interventions make it easier to afford an EV at the point of sale and over its lifetime, redesign market incentives to boost demand, and improve consumers’ understanding about the ‘real’ cost of EVs, thereby correcting possible misperceptions regarding value for money.

Type of intervention	Pairings & alternatives	Idea	Impact	Support	Readiness
Effective communication about ‘real’ costs		#136A/B*: Mandate a new price labelling standard to better inform consumers of long-term costs	M	H	H
		#11A/B*: Re-frame existing government grants to make them more appealing	M	H	H
		#155 & #138: Expand on existing government marketing and communication campaigns targeted at private and commercial consumers based on segmentation and empirical data	M	-	H
		#87: Continue and improve emphasising savings on clean air zones and congestion charges	L	-	H
Make EVs more affordable & prioritise upfront incentives	22 OR 9	#22*: Differential VAT rates	H	H	L
		#9*: Implement a Feebate system to supplement existing grants	H	L	M
		#12*: Government grant as cash-back	M	L	M
		#161*: Scrappage scheme	M	H	M

Type of intervention	Pairings & alternatives	Idea	Impact	Support	Readiness
		#5*: Green credit for EVs	M	L	M
		#21*: EV-to-work scheme (new cars)	H	M	M
		#163*: EV-to-work scheme for used EVs	M	M	M
		#16*: Scaled grants for fleet owners (more generous the more of them you buy)	M	H	L
	15 & 14 OR 27	#15: Larger grants for first X number of EV purchases	H	-	L
		#14: Put deadlines on grant applications	M	-	M
		#27*: Collective purchase agreements	M	M	L
Boost demand through market design		#157*: Procurement incentives	M	H	M
		#156*: Mandate fleet ZEV targets	H	M	L
		#109*: Mandate the disclosure of vehicle emissions by delivery firms and other large fleet operators and thereby incentivise EV adoption	M	M	M
Make EVs more appealing through recurring incentives		#41*: Free parking for EVs	M	H	M
	162 OR 45	#162* Higher rates of annual vehicle tax for high-polluting vehicles	L	M	M
		#45*: Increased fuel duty	M	L	M
		#44*: Reduced insurance premiums	L	M	H

Making EVs affordable and perceived as good value for money is one of the most important objectives policy-makers need to work towards to achieve rapid large-scale adoption. There are a number of levers that should be pulled simultaneously:

Effectively communicating the 'real cost' of EVs: In the car market, many consumers will make their purchasing decisions mostly based on the upfront cost of the vehicle, while discounting future costs including running/fuel costs, taxes over the vehicle's lifetime, insurance, and so on. This focus on the present is a common cognitive bias and well-documented in the behavioural literature ([Laibson, 1997](#);

[BIT, 2014](#)). The challenge in the case of EVs is that many of their financial benefits are incurred over its lifetime rather than at the point of purchase. Idea #136 therefore proposes to mandate a new price labelling standard to better inform consumers of these long term costs, and support more accurate 'lifetime cost' comparisons between ICEVs and EVs. This would not only make EVs seem more favourable, but would support consumers to make more informed decisions, regardless of their final choice, and is therefore a low-risk policy to pursue. Note also, that EVs are not necessarily cheaper than ICEVs over their lifetime (this depends on the mileage driven), but even where consumers come to realise the premium paid for an EV is less than they'd assumed, this may tip the balance for some consumers who would prefer an EV for other reasons. We note that the [new environmental labels](#) are a good step in that direction as they clearly lay out estimated expenses for the different types of running costs, yet the consumer is still required to add these up to be able to work out a cars' total lifetime costs. Idea #136 proposes to make that calculation on behalf of the consumer.

The "Cost-conscious greens" segment place particular value on running cost savings, and so clear communication about these benefits is likely to have a positive impact for this group. In addition, "Pragmatists" and "Uninterested Rejectors" typically have lower income on average, so cost savings may be appealing to these groups as well.

We tested two versions of a new price labelling standard (#136). Version A advocated a label design which advertises vehicles in terms of their total lifetime cost or where sold on lease, as the total monthly cost, including capital repayment and running costs. This would be a generic estimate based on average mileage and fuel costs, unless there was scope to tailor this to individual consumers. Version B proposes that labels display pence-per-mile estimates for all vehicles, since this is generically appropriate for both ICEVs and EVs, providing a common metric that highlights the significant cost saving of running an EV. As noted above, the rationale was to reframe information in a way that enables consumers to overcome their bias towards the upfront cost and put greater emphasis on the 'real costs' of the vehicles over their lifetime. We didn't find a significant difference between versions A and B in our preliminary research (see Section 3), though both have promise, and we recommend further testing to identify which version of the label and framing of the information is most effective and feasible.

In addition to new labelling standards (#136), we also recommend reframing the way the current EV grant is advertised (#11). In our research we tested a 'free fuel' framing and found that highlighting to people how much the grant is worth in terms of the free fuel they'd be getting for that money, was perceived to be more impactful and more supported by participants in our online survey compared to the existing standard grant. This is likely to be because the distance you could drive in an EV for the value of the grant is significant (~120,000 miles, for £3,500 of electricity. We also note that since March 11th, 2020 the grant is £3,000 – this change came in after the research with consumers took place). For many people this would equate to free fuel for the entire ownership of the car. Given the high position in public consciousness that 'fuel costs' have, this is a very salient and appealing framing. We have also proposed a range of other framings under idea #11 in the catalogue of ideas that should equally be considered for further testing.

Overall, both ideas #136 and #11 are low cost compared to any additional monetary aid and help other more costly interventions (like the grant itself) to maximise their impact. Both ideas are also great examples of how important it is to be aware of common behavioural and cognitive biases that influence the way the public perceives information to be able to design policies in a way that allows them to reach their full potential for impact.

In addition to ideas #136 and #11, which we highlight as being most promising, we present a number of other ideas focussed on targeting and tailoring communications to highlight recurring savings, such as from access to charging clean-air zones – which may become more prevalent in the future.

Helping people afford the upfront cost: Providing some form of financial support to make it easier to afford an EV is one of the most effective and most popular lever policy-makers can adopt. The shortlisted ideas in this category highlight the many forms financial aid and incentive design can take. Many of the ideas are about restructuring the existing grant, for example through turning it into a time-limited offer through the use of deadlines (#14 'Put deadlines on grant applications'), or by distributing a finite budget for grants on a first-come-first serve basis for both individuals (#15 'Larger grants for first X number of EV purchases') and fleets (#16 'Scaled grants for fleet owners (more generous the more of them you buy)'). Other examples would be to repurpose the grant as a cash-back option (#12) on the hypothesis that a windfall might be more appealing than a discount on the vehicle, or as a scrappage scheme to target it towards removing the most-polluting vehicles from the roads (#161), though we recognise that scrappage schemes may not be the most effective from a value for money perspective .

For instance, with respect to idea #14, creating a sense of urgency and the notion of the grant as a limited resource, may help accelerate the uptake of EVs. These principles are referred to as 'scarcity effects' in the behavioural literature. However, a common concern with these ideas among the public is they have the potential to exacerbate income inequalities. Some surprising findings also emerged in the Phase 3 research – for instance idea #12 (cashback) was less popular than expected, in part because respondents recognised that it may promote irresponsible spending/borrowing. This highlights that there are, unavoidably, some limitations in measuring the 'impact' of these policy ideas through surveys, and further research is required with many of these ideas to fully explore their potential to drive EV adoption.

Other ideas within this category experiment with novel, additional incentives to the grant, to materially reduce the (upfront) cost of buying an EV. These include ideas #21 ('EV-to-work scheme for new cars') and #163 ('EV-to-work scheme for used EVs'), both versions of an 'EV to work scheme' allowing employees to purchase an EV from their pre-tax salary – this would approximately represent a 30-50% saving and so would likely have a very large impact, though the cost to government could well be prohibitive.

The most effective way for additional government funding may be to create differential VAT rates depending on a vehicle's powertrain (#22) or to introduce a feebate system in similar fashion (#9). Both ideas would cost ICEV drivers and benefit EV drivers in very similar ways. In our survey we framed this as a discount to VAT rates for EVs, and as a feebate system which imposed a fee on ICEVs and a discount to EVs – as such, unsurprisingly, the VAT option was more popular, though in reality either option could be tailored to provide identical penalties/rewards for the two powertrains and therefore likely to have a similar impact. Feebates, however, are likely to provide a more flexible policy tool. Both feebates and VAT changes also offer the opportunity to incentivise innovation among vehicle manufacturers of ICEVs too. By creating 'threshold effects' where discounts or penalties kick-in at certain emissions standards, manufacturers can be motivated to manufacture vehicles which just fall into the next-best category, to avoid the higher tax band and thus avoid losing market share. Continually shifting the standards over time, but always just within reach of ambitious innovation, drives continued improvements.

Fundamentally, we recommend these types of incentives and disincentives levied on upfront costs (i.e. feebates, grants, and VAT changes) are preferable to those levied on recurring costs (such as changes to vehicle tax or fuel duty) because a.) they are better aligned with the behavioural science, since we focus more on these upfront costs; b.) they are less regressive, since they only impact new sales, and not the running costs of existing vehicles, and c.) there is more scope for upfront incentives to be larger than recurring incentives, given how politically infeasible it would be to (say) radically increase fuel duty or vehicle tax to the same magnitude as an EV grant scheme. That said, a small increase to fuel duty could help fund a larger upfront incentive.

Boost demand through market design: Fleets play a central role in accelerating the large-scale adoption of EVs. Not only do they account for many vehicles in absolute terms, they also are quick to filter down to the second-hand private consumer market helping to increase availability of cheaper EVs. The government has already put in place generous grants to help fleet operators switch to EVs. Still, many have not yet made the switch, due to a lack of market pressure among other reasons. Government can leverage its own procurement system to reduce the risk to suppliers of ramping up EV production by ensuring sufficient and stable demand for those EVs (#157 'Procurement incentives'). It will also act as a symbolic demonstration that government is committed to electrifying transport in the UK, and that the targets are here to stay.

Harness and repurpose recurring incentives to benefit EV owners: Finally, driving a car involves many recurring costs over its lifetime. Repurposing some of these to benefit EV owners can provide an additional incentive. For example, making public parking free of charge for EVs (#41) is one type of recurring incentive which could have a positive impact. It also acts as a reminder and signals to the public what the 'socially-desirable choice' is. This is one of the better examples of a modest, recurring incentive, because it may be more salient to those who haven't yet bought an EV than, say, a small discount/ reduction in annual insurance premiums (idea #44). This is particularly true if free parking spaces are painted green or otherwise made salient to ICEV drivers (idea # 120, under Objective 5). We do however recognise that the benefits need to be traded off with the potential loss in revenue for local authorities, as well as local authorities' other objectives (e.g. reducing congestion levels in urban centres). There are equity considerations to take into account too, as early EV adopters are likely to be wealthier, which may cause resentment towards EV owners.

Overall, all four categories of intervention within this objective are important levers in making EVs more affordable. That said we believe the first two categories - effective communication of 'real costs' and helping people with the higher upfront costs – are among the most important factors to accelerate the adoption of new EVs among the public. Salient government commitment to future purchases can help to increase the share of EVs among fleets and in the medium term to help create a viable second hand market for EVs - which in turn will help those with lower incomes afford one. Implementing recurring incentives can help financially whilst also having symbolic value.

Objective 3 - The charging infrastructure and experience is adequate for my needs

Objective 3 focuses on ensuring adequate provision of charging infrastructure and improving consumers' confidence in that infrastructure. Eighteen policy ideas were shortlisted which can address this barrier. These are grouped into four types of intervention:

- ❖ Expand public charging infrastructure in key locations
- ❖ Improve public charging information transparency & accuracy
- ❖ Provide charging solutions for those without off-street home parking
- ❖ Facilitate home chargepoint installation

Taken together these types of intervention address the main barriers associated with charging infrastructure provision such as an actual lack of availability of suitable chargepoints, and a perceived lack of infrastructure, or poor perceptions about chargepoint reliability. Of all of the ideas for this objective, six have been prioritised for recommendation.

Type of intervention	Pairings & alternatives	Idea	Impact	Support	Readiness
Expand public charging infrastructure in key locations	61 & 71	#61*: Chargepoints at tourist spots	M	H	L
	OR				
	61 & 159	#71: Offer incentives to petrol stations, hotels, supermarkets, and other local businesses to install charging points	H	-	H
		#159*: Mandate that fuelling stations need to provide EV charging	H	H	M
Improve public charging information transparency & accuracy	140 & 60	#140: Develop consistent and clearer signage for public charging	M	-	M
	70 & 69	#60: Set minimum standards for real-time data provision from charging points	M	-	H
		#141: Using VMS to communicate chargepoint location and status on the SRN	M	-	M
		#70: Regulator to set penalties for chargepoint operators based on chargepoint performance	M	-	M
		#69: Chargepoint reliability indicators	M	-	M

Type of intervention	Pairings & alternatives	Idea	Impact	Support	Readiness
		#65: Make charging time more appealing	L	-	L
		#77: Build on current initiatives and make EV chargepoints more noticeable by having art design competitions	L	-	H
		#153: Expand on existing initiatives using a trusted messenger to update beliefs about inadequacy of infrastructure	L	-	H
Provide charging solutions for those without off-street home parking	72 OR 79	#72*: Allow reserved parking spaces for EV on-street parking & chargepoint installation	M	M	L
	OR 75	#79*: Priority public parking and charging for those without off-street parking at home	M	M	L
		#75*: Incentivise collective EV purchases with conditioned government investment	L	M	L
		#62*: Enhanced workplace charging scheme	M	M	L
Facilitate home chargepoint installation	78 & 150 & 82	#78: Include chargepoints in EPC label for properties	L	-	H
		#150*: Home mover bundle deals to promote chargepoint installation	M	M	L
		#82: Landlord regulations to simplify chargepoint installation for tenants	M	-	L

Expanding public charging infrastructure in key locations: Three ideas have been highlighted which aim to expand public charging infrastructure in key locations. Idea #71 and #159 represent potential alternative means to increase charging infrastructure in high use areas. Idea #71 offers incentives to petrol stations, hotels, supermarkets, and other local businesses to install charging points, whereas idea #159 takes an alternative approach by mandating that existing fuel stations must provide charging infrastructure alongside fuel pumps. A dense network of charging stations is likely to have a particular benefit to high-mileage drivers who are more likely to need to charge away from home than those who typically undertake short distance return journeys which can be easily covered by a single charge of the battery. These ideas may therefore have greatest impact on the 'Unmet needs' and 'Car-

loving rejector' segments since they typically have higher annual mileage than other segments. That said, a dense network of chargepoints is likely to have a considerable positive effect on consumer confidence generally, and therefore high impact ratings have been assigned for both idea #71 and #159. Drivers are knowledgeable about existing fuel infrastructure hence setting equally familiar chargepoint availability is easily understandable and can provide reassurance.

Idea #61 focuses on improving chargepoint provision at tourist spots, such as seaside and rural locations, to which consumers may travel long distances from their home, particularly on weekends or during holidays. This would combine well with idea #71 and #159 (incentivising and mandating public chargepoint infrastructure), as when applied together improvements in both high and low use areas could be realised. The impact of idea #61 is expected to be lower than #71 and #159 since the reach will be smaller, however it would help to alleviate concerns about driving an EV long-distances to more rural or remote places which represents an important barrier. It is expected to have greater impact on 'Pragmatists', 'Car-loving rejectors' and 'Unmet needs' segments because these types of consumers tend to do more frequent long trips than the other segments.

A common theme implicit in these recommendations is that it is worth considering which charging locations provide best 'bang for buck' in terms of improving attitudes towards the charging network – and this is not necessarily the same locations where charge points would be most used. For instance, rural charging locations may be used less often, but their absence represents a critical barrier to anyone who might take a longer drive into a rural part of the UK, even once a year. Similarly, installing charge points at petrol stations may have an outsized impact on attitudes relative to other locations, because they are salient, and perhaps symbolic in the transition to EVs. There may be a degree of security in always knowing that petrol stations have charge points: they are perceived as ubiquitous, are always easy to find, and it is likely to be a stronger public communications campaign to say 'all petrol stations now have EV charging' than '8,300 new locations have EV charging'. We therefore encourage policy makers to think beyond sheer quantity of charge point installations, and more about the psychological / attitudinal implications of different roll-out strategies.

Improve public charging information transparency & accuracy: The second set of ideas we have highlighted in the shortlist focus on improving the transparency and accuracy of public charging information. The two ideas selected here are expected to have a moderate impact on their own, but would combine well to make a powerful policy intervention. Firstly idea #140 is focused on developing consistent and clear signage for public charging, to ensure that consumers can easily identify and find public charging infrastructure, and improve perceptions about the prevalence of public chargepoints. The second idea, #60, is about setting minimum standards for real-time data provision from charging points. This would improve charging experience for EV drivers by ensuring real-time information on chargepoint status could be remotely accessible from third-party applications such as Google Maps or Waze. This would also enable consumers to identify whether a chargepoint was working, occupied, faulty or offline before making a journey, reducing the likelihood of consumers arriving at a chargepoint and finding they are unable to charge - a common complaint among current EV drivers. Government is currently taking forward work to consider how best to ensure EV drivers have the information they need with a policy proposal to be presented to industry in the forthcoming consumer experience consultation. Improved service and reliability from public chargepoints will be indirectly beneficial through avoiding social diffusion of negative experiences from EV owners to non-EV owners and increasing positive messages. Both of these ideas are likely to have greater impact for Pragmatists, Unmet Needs, Uninterested Rejectors and Car-loving rejectors because they will be less tolerant of an imperfect system than Cost-conscious greens who are more environmentally motivated.

Provide charging solutions for those without off-street parking: The final idea highlighted under this objective is an intervention to provide charging solutions for those without off-street home parking. Idea #72 proposed the provision of reserved parking spaces for EV on-street parking and chargepoint

installation. This would allow EV buyers to get a chargepoint installed on the kerb-side outside their home and a reserved parking space, to ensure they could always access their chargepoint. Whilst this could be a successful approach for addressing charging barriers for those without off-street parking (and getting a private parking space could be a strong additional incentive to buy an EV) the feedback received during Phase 3 testing suggests that in practice this idea has substantial challenges. Perceived impact and support were lower than average in the survey, and feedback from the focus group was mixed. Feasibility issues and potential negative consequences for parking availability and green spaces (i.e. public parks, recreation grounds, etc) were common concerns which were raised. In Phase 2 expert stakeholder engagement, local authorities also expressed concerns about the viability of implementation, since resident parking in urban areas is a highly contentious issue due to insufficient parking space for the number of vehicles on the road – although that would make EVs all the more attractive for residents without off-street parking. Despite these issues and the lower than average impact and support ratings, we have highlighted this idea because it is clear that lack of at-home charging solutions is a critical barrier which needs to be addressed in order to enable adoption by the large proportion of consumers who do not have off-street parking. This will become even more critical as EVs reach higher rates of market penetration. We therefore recommend that further research should be done (see Section 3) to develop a more viable policy solution for this problem.

The final type of intervention included in this objective is **'Facilitate home chargepoint installation'**. The ideas included within this sub-category have not been selected as ideas with the highest potential because, at least for consumers who have access to off-street parking at home, installing a home chargepoint is not considered to be one of the most critical barriers limiting adoption of EVs today. An inability to charge at home is a more critical barrier for those without off-street parking at home, and interventions which aim to remove this barrier are covered in the sub-category of 'Provide charging solutions for those without off-street parking' – discussed above.

Objective 4 - The vehicle functionality and experience is adequate for my needs

This objective aims to reduce consumer concerns about the functionality of EVs being inadequate for their needs. EV functionality covers factors related to the utility of the vehicle. The critical issue which has a substantial influence on adoption is range anxiety, but other factors such as long charging times, vehicle model choice, long-term battery performance, size and payload will also have an influence. These factors also impact commercial operators who will have varied but specific functional needs for vehicles in their fleets.

A total of ten ideas were shortlisted in this objective. They can be grouped into the following types of intervention:

- ❖ Deliver accredited services and standardised training
- ❖ Reduce long-term commitment anxiety
- ❖ Increase awareness and knowledge of EV capabilities

Type of intervention	Pairings & alternatives	Idea	Impact	Support	Readiness
Deliver accredited services and standardised training	N/A	#50: Standardised tests on batteries to determine remaining range for used EVs	M	H	L
		#148: Increase uptake of (and awareness of) current Dealership EV accreditation initiative	M	M	H
		#149: Introduce standardised training for lease companies	M	H	L
Reduce long-term commitment anxiety	88 OR 89	#88: Extended grace periods / generous 'try before you buy' deals	H	H	L
		#89: EV trials through short-term lease (or extended rental, without the typical rental cost)	M	H	L
Increase awareness and knowledge of EV capabilities	94 OR 92 OR 90	#94: EV test-drive sites across the UK	M	H	M
		#92: Roaming fleet of test EVs	M	M	M
		#90: Shopping centre test drives	L	M	M

Type of intervention	Pairings & alternatives	Idea	Impact	Support	Readiness
		#108: EVs promoted for car rental when booking flights	L	-	H
	N/A	#95: Telematics service to provide journey need assessments	M	H	M

Deliver accredited services & standardised training: Idea #50 promotes the creation of standardised tests on battery health in used EVs, to improve confidence in the second-hand market. Though our consumer research did not identify this idea as especially appealing, prior research has shown that barriers to adoption include concerns about long-term battery performance ([Kinneer, Anable, Delmonte, Taylor & Skippon, 2017](#); [Graham-Rowe et al., 2012](#)). Such concerns could become more prevalent when the second hand market grows, even if actual performance of batteries over time is good. As with many of the policy proposals made in this report, the details matter, and our research revealed a degree of distrust in ‘official’ figures and information from vehicle manufacturers and dealerships. In the case of standardised battery tests, benefits may be realised by addressing consumers’ confidence by demonstrating validity and reliability in the figures.

We also believe there is value in encouraging wider uptake of the National Franchised Dealers Association’s government-endorsed dealership accreditation programme (idea #148) to increase public trust in dealers and improve the experience and quality of information provided to consumers when shopping for vehicles in dealerships. This acknowledges that salespeople and dealerships have significant influence over consumers’ decisions, and thus are key routes to influence. Again, however, distrust is a barrier, and so it will be important to ensure the programme is perceived as credible.

Reduce long-term commitment anxiety: Two further ideas were highlighted in this objective which focus on reducing anxiety associated with making a long-term commitment when switching to EVs. Many other consumer markets provide mechanisms to offer assurance against ‘buyers’ remorse’, including ‘no win no fee’ arrangements, generous returns policies, and money-back guarantees. These are widely adopted by retailers and evidence suggests they are effective at reducing anxiety, increasing sales, whilst avoiding large numbers of consumers who actually use the returns policy. Given EVs are a relatively new technology, and many potential buyers are hesitant and not wishing to commit too soon, we believe a similar mechanism is important for this market.

Idea #88 proposes to implement standardised extended no-fee cancellation periods for EV lease and PCP deals, enabling consumers to ‘try before they buy’. In the survey and focus group, participants generally reported that they would be likely to make use of this kind of initiative. Experience with EVs can have a significant positive impact on attitudes particularly with regard to vehicle performance and driving enjoyment.

An alternative option to idea #88 is to implement short-term leasing options for EVs (idea #89) whereby consumers could sign-up to a 2-3 month lease or rental for a monthly fee, without paying the typically high costs of car rental. This would enable them to gain realistic real-world experience of using an EV without needing to sign-up to a long-term finance deal. Lower impact may be expected for this idea, as a smaller than average share of participants in the survey indicated they would be likely to make use of short-term lease deals – though there are various ways of designing and communicating this offer which may make it more appealing. As with #88, greatest impact is expected for consumers who are tempted to adopt an EV but have a few minor concerns which are holding them back.

An important consideration for both #88 and #89 is how to mitigate the risk of creating a fleet of 'nearly new' vehicles which are returned following the grace period / short-term lease and consequently have reduced residual values. In addition, solutions need to be considered for how to provide charging infrastructure for consumers alongside the short-term use of the vehicle, and how to handle heavy use of the vehicles during the trial period. This latter point is particularly relevant for commercial fleets where heavy use is most likely. For these reasons, both idea #88 and #89 are considered to have a low readiness level.

Increase awareness and knowledge of EV capabilities: The last two ideas we have highlighted in this objective are idea #94 and #92. Idea #94 proposes to set-up independent EV test-drive sites across the UK which would be manufacturer-agnostic, so as to offer an alternative to dealerships. We expect this idea to have an equal impact on the different segments of the private consumer market, however since in practice only a select number of EV test drive sites could be created, the reach of this scheme would be limited. An overall moderate impact is expected. Idea #92 offers an alternative to fixed test drive sites by setting up a roaming fleet of test EVs which would be loaned to organisations as a live trial. In this way, a relatively small fleet of vehicles could be exposed to a large number of potential buyers, at a relatively low cost (on the assumption that favourable partnerships could be formed with manufacturers, and the vehicles sold after a period in rotation).

Both of these ideas have potential benefits for both private consumers and commercial fleets. Idea #92 directly targets businesses and so this has a particular benefit for commercial fleets. There is also a benefit for private consumer adoption, since employees of the businesses which take part would gain experience with using EVs, which may influence their private purchasing decisions. On the other hand, the reach of the initiative is also limited by definition to consumers who are in employment. The practicalities of delivering this service should also not be underestimated; solutions for storage, transport, and maintenance of the roaming fleet of EVs need to be developed before this can be implemented. Conversely, a model exists for idea #94 in the form of Milton Keynes EV Experience Centre, and so readiness is considered to be higher in this case.

Objective 5 – I want one – it is desirable, and I can imagine myself using / owning one

We have shortlisted seven ideas for Objective 5, which is focussed on increasing the desirability and appeal of EVs. The seven ideas are all varied in their approach and as such there are no direct substitutes in this category where two or more ideas offer different options for achieving similar effects. The ideas can be summarised into two broad types of intervention:

- ❖ Interventions which increase visibility of EVs and charging infrastructure to help normalise them in society, and;
- ❖ Interventions which implement incentives to increase the appeal of EVs.

Type of intervention	Pairings & alternatives	Idea	Impact	Support	Readiness
Increase visibility of EVs and charging infrastructure to help normalise them in society	N/A	#120*: Green parking spaces for EVs	H	H	H
		#114 and #151 combined: (Continue to) Trial behaviourally-informed communications through Go Ultra Low, such as timely messaging, to make EVs more desirable and normal	H	-	M
		#112: Concerted push to increase product placement in mainstream media, inc. TV shows and video games	H	-	M
		#116: Smart signage at entry points to clean-air zones, highlighting the number of EVs which have entered (toll free)	M		L
		#122: Salient indication that you're inside an EV	L	-	H
Implement incentives to increase appeal of EVs	N/A	#33*: Discounted personalised number plates	L	L	H
		#128: Enter users into a lottery every time they choose an EV through partnering organisations (rental companies, Uber, etc.)	M	-	M

Increase visibility of EVs & the charging infrastructure to help normalise the idea: We have highlighted two ideas as most promising within this objective, both of which come under this category of intervention, although the second idea also lends itself to increasing the *appeal* of EVs (which is the second category of interventions in this objective). Idea #120 proposes a solution for increasing the visibility of EV charging and parking spaces by standardising that they should all be painted green. This harnesses the 'green' environmentally-friendly image of EVs and should help to increase salience of

EV charging infrastructure for both EV-drivers and non-EV drivers. The data from the survey suggested strong support for this idea amongst consumers; a significantly higher than average share of survey participants were somewhat or very supportive of this idea. Most participants in the focus groups also reported that they felt green parking spaces would help to draw attention to EVs and charging infrastructure. In addition, we expect high impact relative to its cost and implementation feasibility, in agreement with expert stakeholders who were consulted in Phase 2 of this work, as it is a simple solution which should be effective at widely raising awareness of EVs and improving perceptions about the availability of charging infrastructure. The impact of the idea is unlikely to be greater for any one segment of the private consumer market, and instead should serve to raise awareness more generally. Whilst there are financial and logistical implications to consider before this can be implemented, we considered the idea to have a high level of readiness.

Our second highlighted proposal (#114 and #151, merged) is a broad recommendation to develop and trial a set of communication campaigns informed by best practice from behavioural science. There are many strategies to explore, and we recommend this include:

- ❖ Using the power of social norms by communicating the increasing number of people who are adopting EVs, or the increasing proportions of new EV sales (rather than absolute numbers – which are still quite small). Similarly, communicate the increasing number of charging points.
- ❖ Promote EVs by emphasising their similarities to and improvements over conventional vehicles rather than their differences, to remove perceptions that they are niche vehicles only suitable to selected consumers. This could include harnessing usual motivators for vehicle purchase, such as high safety ratings, reliability, driving enjoyment, or high performance / acceleration.
- ❖ Harnessing timely moments to change attitudes and behaviours, such as using targeted messaging campaigns through estate agents to reach consumers who are in the process of moving home or targeting new employees, new drivers, or those who have recently had a failed MOT.

Given the basis of these approaches is grounded in evidence from behavioural science, we expect impact to be high. However, each campaign would need to be consumer tested and evaluated against its individual objective, as impacts may vary greatly between market segments and the precise messaging used. This approach is well suited to testing, for example running online randomised controlled experiments to compare different messaging.

Implement incentives to increase appeal of EVs: Two ideas are presented under this sub-heading , although neither are ideas we have highlighted as having highest potential due to providing a less compelling balance of likely impact, public support and readiness. The first is to restrict personalised number plates to EV owners. Whilst this offers an interesting opportunity to associate high-status individuals with EV ownership, it did not receive strong support (perhaps because few people surveyed would themselves be interested in personalised number plates). The final idea is to reward EV use during rentals or taxi bookings, by entering users into a lottery, which would provide appealing, larger prizes, at very low average value (and thus relatively low running costs). Whilst we feel this idea does have merit, government's role is less clear, and success would likely depend on a large commercial organisation (such as Uber) choosing to pursue something similar on their platform.

General conclusions

In conclusion, the research shows there are a broad range of interventions which policymakers can use to have a positive impact on EV adoption, and on associated intermediate objectives identified within our 5-step customer journey towards EV adoption.

To achieve large-scale adoption of EVs, most, if not all, of the five objectives on the trajectory to EV adoption need to be met. To do that, it's necessary to implement multiple interventions simultaneously. The top rated ideas address a number of sub-themes in each objective. In some cases these ideas represent potential combinations which can / should be combined together. In other cases, ideas are 'substitutes' to one another, as highlighted in the summary tables within this section.

Overall, support from industry, members of the public and commercial fleets has broadly been very high, although generally 'carrots' are greatly preferred over 'sticks'. This is not to say, of course, that positive incentives would necessarily be more impactful than penalties.

Individual impact of ideas is important but not the only factor

Overall, the anticipated impact of the ideas is wide ranging. Ideas tackling the upfront cost barrier (e.g. #9 feebates) as well as those addressing the perceived inadequacy of the charging infrastructure (e.g. #61 chargepoints at tourist spots or #159 mandating chargepoints at fuelling stations) will probably have the highest impact if implemented as an individual idea. But highest impact isn't the only metric to consider. Ideas with a low perceived impact can be considered worthwhile, particularly where readiness/feasibility is high or cost is low. For example, expanding existing school engagement projects (#118) or painting parking spots with an EV chargepoint green (#120). It is also important to understand the interaction of impacts between ideas which are complementary, and the impacts of ideas on different market segments.

Interventions which target a broad range of private and commercial consumers are likely to have the greatest overall impacts; these are also likely to elicit the greatest support since they are less likely to be perceived as unfair or imbalanced, particularly if they contain a generous incentive. For example, differential VAT or feebates (#22 or #9), expanding the public charging infrastructure at petrol stations (#159) and tourist destinations (#61) or providing better and more effective information standards to enable comparisons between EVs and ICEVs (#131 and #136), which is to some extent achieved by the [new environmental label](#).

Perceived cost and charging infrastructure is as important as *actual* cost and charging infrastructure

While the *actual* cost of EVs and *actual* adequacy of the charging infrastructure are undeniably critical to promote EV uptake, behavioural science advocates that paying attention to the way the public *perceives* their situation, i.e. in this case the *perceived* cost of EVs and the *perceived* availability of charging, is incredibly important. Where perceptions are significantly worse than reality, it may make sense to focus on improving those perceptions before sinking too much cost into improving reality. This means, policies solely based on observational or modelled data (such as income or traffic and geographical data used to assess the optimum level for a grant or the location and frequency of chargepoints, for example) are unlikely to reach their full potential unless they are designed to maximise subjective value and subjective convenience of infrastructure.

For example, as noted in the discussion under objectives 2, we believe there are various ways existing grants can be modified to improve their appeal without requiring new money, such as by framing them as free fuel, or offering cashback deals.

The comparison of feebates (idea #9) to differential VAT rates (idea #22) is another good example of how framing and perceptions matter. The overall cost to government may end up being very similar across both ideas, and indeed either could be designed to mimic the other, but framing the VAT idea as a discount, and the feebate idea as a combination of a fee and a rebate, led to overwhelmingly more public support for feebates in our survey compared to the idea of differential VAT rates. Before introducing any policy such as this, it would be necessary not only to undertake economic analysis to understand the impacts of such incentives on purchasing behaviour, but also the impacts of different framings on public support.

When it comes to the charging infrastructure, the ideas with the highest potential also attempt to address both actual and perceived adequacy and availability. As discussed under objective 3, some chargepoint locations will have a bigger impact on perceptions, and they may not be the same locations that would be most used. For example, while there is an actual need for more public chargepoints, especially to enable long distance journeys, in reality most charging will happen overnight at people's homes or at workplaces rather than en route (e.g. at fuelling stations). However many consumers, most of whom are not yet experienced with EVs, will continue to over-estimate the importance of the public charging network due to a natural assumption that they will use an EV in much the same way as they currently fuel their ICEV. Therefore, ideas such as #159 (mandating chargepoints at petrol stations) and #71 (incentivising supermarkets, petrol stations or local businesses to install chargepoints) deliberately focus on alleviating concerns about en route charging. This may be necessary in the near term to address this perceived barrier. Once the UK public is more familiar with EVs, and market penetration is much greater, it is likely that lack of at-home charging for those without off-street parking will become a much more severe *actual* barrier.

Behavioural interventions can help to overcome misperceptions

Behavioural science can help correct these misperceptions through effective communication and other interventions that harness the right levers. Introducing clear and standardised signage for the public charging network (idea #140), for example, will increase the visibility of the rate of progress and help create a heightened sense of awareness. In similar fashion, painting EV parking spaces green also taps into our heightened awareness of novel and salient visuals as well as our desire to comply with trends we *perceive* to be emerging around us – as in this case, the increasing frequency of EVs and of public chargepoints.

Much of the behavioural literature has been documenting the importance of identifying the most effective messengers, touchpoints and the right timing to communicate information to people. Ideas #111 (school engagement projects), as well as ideas #114 & #151 (trailing timely communication to make EVs normal and desirable) capture these principles.

Test-driving EVs (ideas #94 – test drive centres across the country) or extending grace periods (idea #88) are popular interventions as they directly address fears associated with range anxiety and the uncertainty related to using a new, unknown technology. Experience with EVs is known to influence perceptions; in particular, instrumental attitudes about vehicle performance and driving enjoyment tend to improve once consumers have had a chance to drive an EV. This is a lesson that could apply to any large-scale societal/technological shift, where status-quo bias, risk-aversion and loss aversion tend to skew us towards the familiar and the known, and dampen the rate of uptake.

Personalisation of information and choices is another behavioural lever that can make a difference to whether or not we adhere to information provided to us. Using telematics data (idea #159) as well as the EV lifestyle tool (idea #146) make use of that principle.

Further, making decisions and behaviour as easy as possible is arguably one of the best-evidenced and most widely used behavioural insights. Small hassle factors in everyday life and decision-making processes can have a disproportionate effect on our choices and behaviours. Removing any of these 'frictions' when providing information can ensure consumers take into account the right level of detail and pay attention to what's important. Mandating new price labelling standards to reflect the total cost of ownership (idea #136A, B or any of the other suggestions under #136) makes it easier for consumers to account for the vehicles' lifetime costs rather than just the upfront price tag – a common behaviour whereby we focus on the present costs and benefits while discounting any future implications. Idea #131, standardising key stats between ICEVs and EVs, has a similar aim of making the direct comparison between the two types of vehicle as easy as possible.

Finally, we note that almost all policy interventions considered during the project involve some element of coordination / collaboration between government and industry, so establishing and maintaining good working relationships and pursuing common goals is key for success. We recommend conducting further scrutinising and trialling of the ideas with the highest potential ideas in each objective – and indeed all ideas considered for implementation – to understand their potential for impact, as well as conducting feasibility and scoping studies to consider if further prioritising is necessary. Section 6 outlines specific next steps and recommended research for each of the 65 shortlisted ideas. Many of our 'research next steps' recommendations in Section 6 are about impact and process evaluation of the ideas. Appendix A provides an overview of the most common robust evaluation techniques.

We highlight the ideas with the highest potential for each of the five objectives in Fig. 4 below. Those ideas marked with an asterisk (*) were tested in Phase 3.

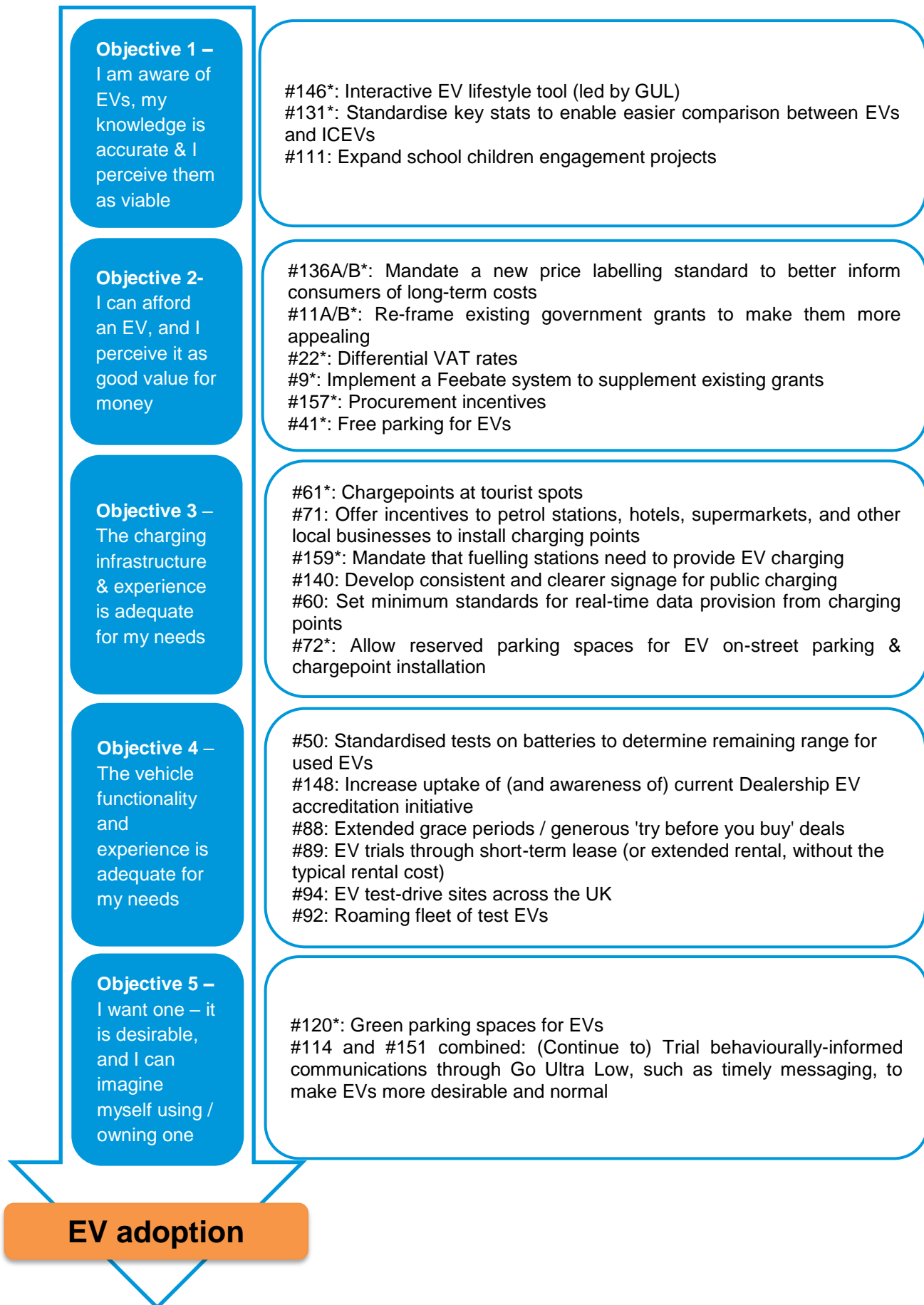


Figure 4 Overview of ideas with highest potential for each intermediate objective on the journey to EV

6. Catalogue of shortlisted ideas

This section provides a summary of key information for each idea, including a description of each idea, the key findings from Phase 3 (where available), overall conclusions (spanning across all phases) and recommendations for next steps.

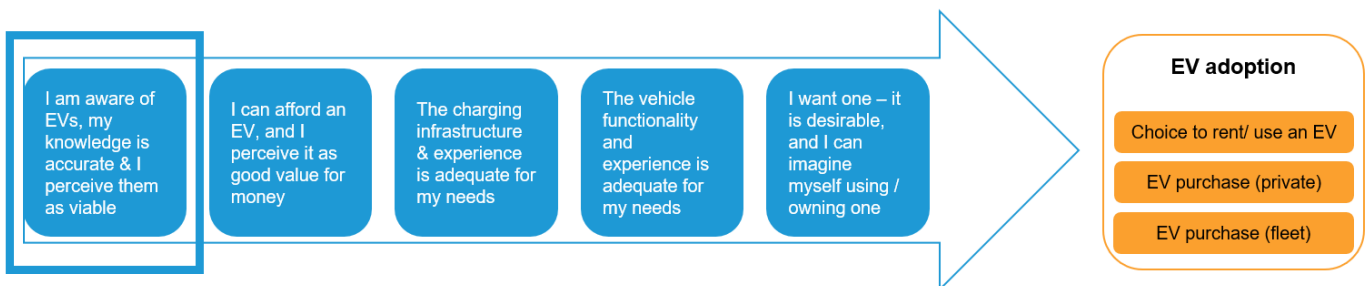
How to read this section:

- Those ideas with a **green tickmark** are the ones with the highest potential as discussed in Section 5.
- The 'impact' and 'support' bar charts each represent the share of participants who rated an idea 'positively', i.e. as Very or Somewhat likely/supportive (a 4 or a 5 on a 5-point Likert scale).
- For **support** the scale was the same for each idea meaning the average net positive is the average across all 35 tested ideas.
- For **impact**, we used three different scales, which means the average net positive describes the average proportion of 'positive' ratings across ideas with the same scale. For graphs that compare two versions of the same idea, the dotted lines representing the average net positives are relevant for both versions of that idea.
- **N for this idea**: Number of participants who rated the idea
- **Avg. net positive**: The average proportion of participants who rated ideas with the same scale 'positively', where 'positively' refers to the top half of each respective 5-point Likert scale, i.e. point 4 or 5 each time. Note, that the average net positive ratings do not refer to the average score of ideas per objective 1-5. Instead they refer to the average score among all ideas that used the same scale across all objectives.
- We ran significance tests to compare the results between versions A and B of the same idea ,i.e for idea #136 and idea #11.
- For some ideas we looked at subgroups. When reporting subgroup analysis, we present the average scores (ranging from 1 to 5) for the different subgroups being compared. An overview of our sample and the respective subgroups can be found in Appendix B. No significance testing was done between subgroups.

A detailed description of the different scales used for each idea in the survey can be found in the Appendix B.

Objective 1

“I am aware of EVs, my knowledge is accurate & I perceive them as viable”



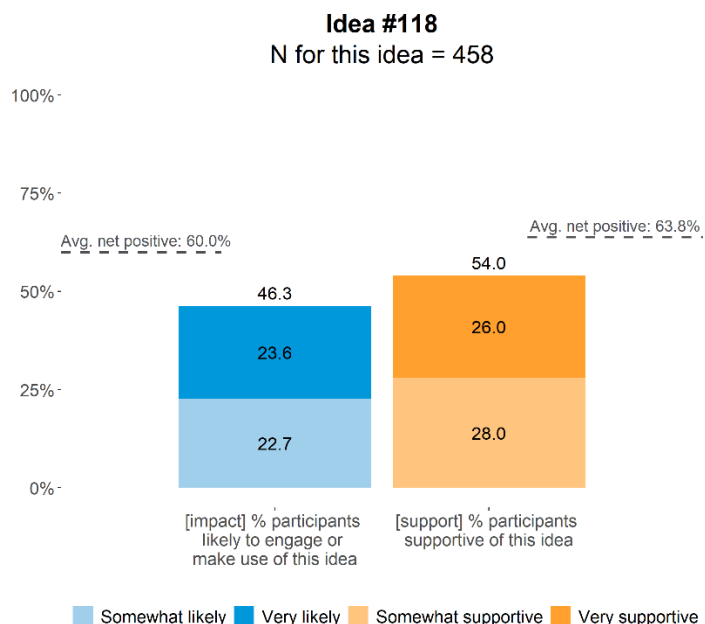
#118: National EV day or National zero emission day

Host an annual national event through which EVs are celebrated. It could include a ban on ICEVs in city and town centres for the day, or just focus on offering free test drives in town and city centres on the day, holding exhibits, media engagement, product releases, or getting spokespeople to communicate the benefits of EVs.

Rationale: To raise awareness of EVs, increase the public's familiarity with the technology and emphasise the positive aspects of the future of transport.

Private consumer feedback

Survey description: "Imagine there was a 'national zero-emissions day', an annual event to celebrate environmentally-friendly technology like electric vehicles. On that day you would find free test drives in city centres, exhibits or speaking events on electric cars and the future of transport. On that day, petrol and diesel vehicles may be banned from entering city centres."



Key findings from online survey

1. **Impact:** 46.3% of participants indicated they were somewhat or very likely to attend a national EV day - that's below the average self-reported attendance/ uptake rate of 60.0% across ideas.
2. **Support:** 54.0% of participants were somewhat or very supportive of this a national EV day - that's below the average support rate of 63.8% across all ideas.
3. **Subgroups:** Those aged over 55 and those who don't currently own a car were less supportive of the idea and rated its impact lower than other subgroups.

Key findings from focus groups

1. Overall support for the idea was mixed; some were somewhat supportive and others somewhat unsupportive. None of the participants were strongly in favour or strongly against the idea. These results match what we found in the survey.
2. In general participants were not in favour of banning ICEVs from town/city centres because it was felt this would unfairly disadvantage some parts of society, such as those with impaired mobility, those without access to public transport, and those who can't afford an EV.
3. Enthusiasm for the idea was generally low, and most participants felt they would be unlikely to make a special trip to attend exhibits/events as part of a national day.

Conclusion and recommendations



Impact: Moderate. Despite the lower-than-average survey results we remain confident that a national EV day would help to raise awareness and knowledge about EVs (since it would not be necessary to proactively engage, in order to have one's awareness raised). The extent to which people will engage with such an event will depend on how easily they can get to a local event or a test driving centre and how appealing the events will be to them. Participation in some features will also be limited, though media coverage may reach a large audience, and even those who are not actively interested would have some increased exposure to EVs.



Support: Low. Though more than half of survey participants were supportive of the idea, this is low relative to other ideas, and focus group attendees were fairly ambivalent. In particular, participants didn't like the idea of banning ICEVs for the day. This aspect of the idea might have biased their overall views on both support and impact. Ultimately, relatively few people are actively against this idea, and it would be low-risk if the ICE ban element is removed (or the decision for this is left to local authorities).



Readiness: Moderate. While significant planning would be required to implement this, overall the core of the idea seems clearly defined and low risk. Some more research would be required to test support of the idea without an ICEV ban.

Conclusion

We think it's worth considering this idea in the early years of the transition to raise awareness, signal the desirability of low vehicle emissions and update people's perceptions and knowledge of EVs more generally – albeit without the ICEV ban given the low levels of public support. In that form, it seems low risk and therefore worth pursuing. It can also be scaled up or down in ambition to suit budgetary, logistical and political constraints.

Research next steps

Given this idea is low-risk, further testing would not be essential, though it may be wise to gauge support of the idea without the temporary ICEV ban. More research could also be done to identify the optimal location for test-drive centres, or whether there are ways of leveraging existing infrastructure and events to minimise cost. Simple pre-post consumer testing could be used to evaluate the impact of the events on consumer awareness and understanding, to validate whether the event is worth repeating year-on-year.



#146: Interactive EV lifestyle tool (led by Go Ultra Low - GUL)

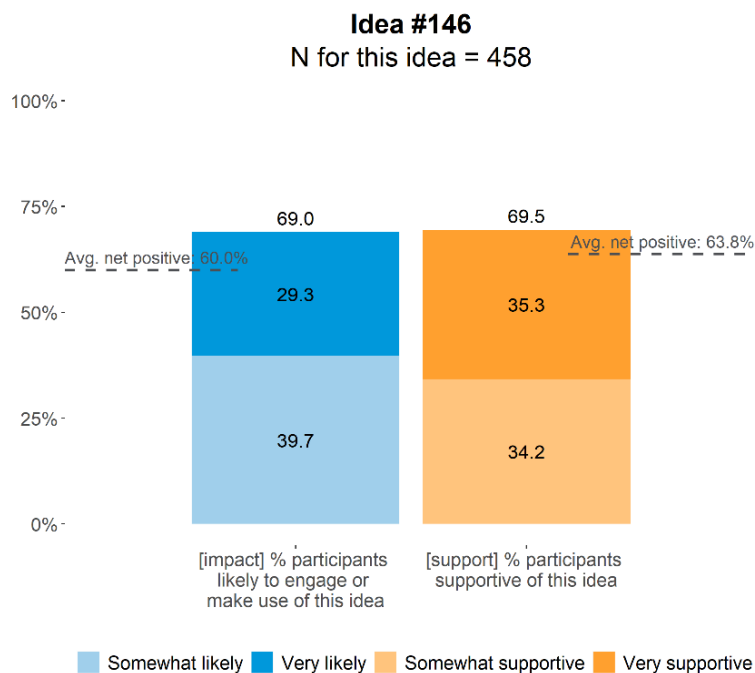
An additional feature to the existing government-owned online tool for consumers that identifies what type of EV would be suitable for their circumstances and needs. The tool promotes information relevant to the individual. The new feature would involve consumers inputting their annual commuting mileage, and then this would output running cost estimates and long-term cost savings estimates over their current vehicle or a new, comparable ICEV. The tool would also link to other information on available grants, home charge point installations, etc.

Since the idea was first developed, GUL have taken forward a similar approach already.

Rationale: Provides a mechanism for engagement with individual consumers, to promote relevant advice, and increase awareness and knowledge.

Private consumer feedback

Survey description: Imagine there was an online tool (in the form of a questionnaire) for consumers like you that identifies what type of electric vehicle could be a good fit for you. The tool might ask you about things like your annual commuting mileage and, based on the data you provide, it could help you understand the yearly running costs (i.e. charging costs) of an electric vehicle compared to a petrol or diesel vehicle. The tool might also be able to estimate how long it would take you to make up for the higher upfront costs of an electric vehicle through your annual savings on fuel.



Key findings from online survey

1. **Impact:** 69.0% of participants indicated they were somewhat or very likely to use an EV lifestyle tool - that's substantively higher than the average self-reported participation/ uptake rates of 60.0% across other relevant ideas.
2. **Support:** 69.5% of participants were somewhat or very supportive of the idea of a digital EV lifestyle tool - that's higher than average support rate of 63.8% across all ideas.
3. **Subgroups:** There aren't any notable differences in response to this idea by subgroup.

Key findings from focus groups

1. There was strong support for this idea. All participants said they would be likely to use a tool that assessed what type of EV would be best for them and gave them information on costs and savings (most saying they were 'very likely' to do so).
2. Participants thought that it would inform their decision about whether to buy an EV, and help them choose between EV models. Indeed, some participants had already constructed their own spreadsheet 'tool' that made these comparisons/calculations. Some thought it would help challenge perceptions that EVs were not affordable or cost-effective.

Conclusion and recommendations



Impact: Moderate. Both the survey and the focus groups show that there is strong interest and appetite for using such a tool. We therefore expect the impact on awareness and knowledge on EVs to be high, albeit only among those who follow-through on their interest, and use the tool. Hence, we have scored this similarly to the National EV Day (idea #118) which scored lower in the survey, but benefits from having greater outreach and exposure.



Support: High. Support for this tool is high. In fact, participants seem to welcome and expect this type of guidance from government if policy around ICEVs becomes more restrictive.



Readiness: High. GUL has laid some of the groundwork already. More research may need to be done on what type of data users should be asked to input into the tool, and how its output can be tailored and reliable. It needs to be data that users can easily and accurately recall and that they are willing to provide as well. For example, there is likely to be trade-off between asking users to provide their home and work addresses (easier to recall and will be more accurate) from which the tool can then calculate their annual commuting mileage vs. asking users about their annual commuting mileage directly (less accurate but also less sensitive data).

Conclusion

We recommend implementing this additional feature to tool with a third party, given its combination of relatively low-cost, high-feasibility, and high levels of public support and interest in using it. Regardless of the ultimate impact on EV sales, it will help consumers make more informed decisions.

Research next steps

A prototype of the tool can be tested in an online experiment to measure its impact on consumer understanding and confidence of decision-making. When in use, different features of the tool can be tested through A/B test to continue to optimise the design. Separate behavioural research may be undertaken to maximise traffic to the tool among car buyers.



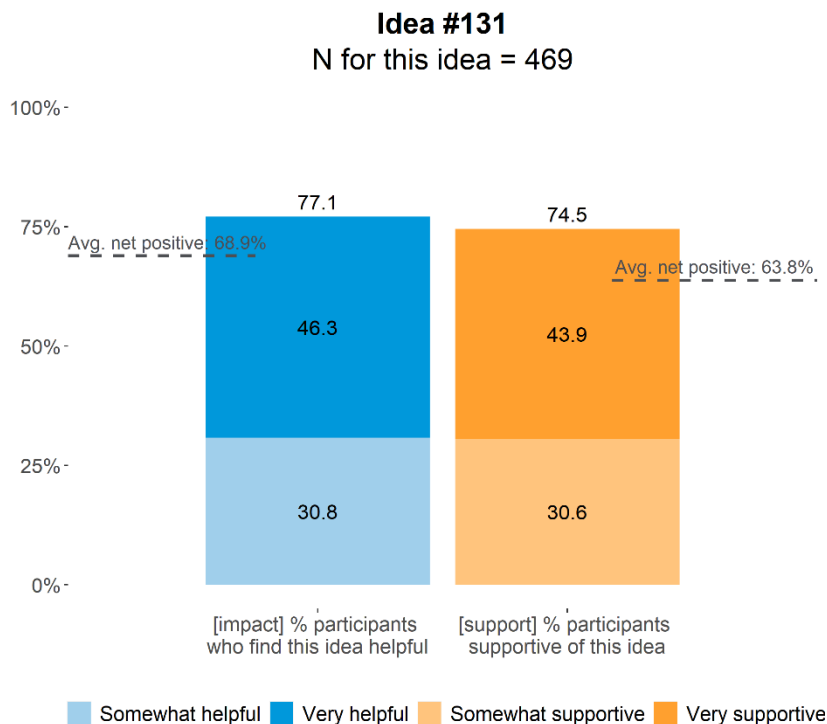
#131: Standardise key stats to enable easier comparison between EVs and ICEVs

Standardise the way key metrics across EVs and ICEVs are presented at the point of sale to help consumers compare models and navigate the market. For example, key stats could be related to efficiency / running cost (e.g. lifetime cost price labels, see also idea #136), vehicle performance and features. This would help consumers decide between ICEVs and EVs, and could be used to provide tailored advice on which EVs are suitable for their needs, based on their preferred ICEV model. This could also be linked to the EV lifestyle tool – idea # 146).

Rationale: Increase awareness and understanding of vehicle models and how they compare to traditional ICEVs. In particular, to help address preconceptions about cost, range and suitability of vehicles. Encourage consumers to make comparisons, consider options they might not have previously considered, and make better informed choices.

Private consumer feedback

Survey description: Imagine car dealerships were required to publish information, for the whole range of vehicles they sell, that makes it easier to compare electric vehicles to petrol and diesel cars on a range of important factors such as fuel efficiency, running costs, vehicle performance, and vehicle features.



Key findings from online survey

1. **Impact:** 77.1% of participants would find standardised key stats comparing EVs to ICEVs somewhat or very helpful - that's substantively higher than the average rate of 54.5% across other ideas measured on helpfulness.
2. **Support:** 74.5% of participants were somewhat or very supportive of the idea of standardised key stats - that's substantively higher than average support rate of 63.8% across all ideas.
3. Almost half of the respondents said they found the idea 'very' helpful (46.3%) and were 'very' supportive (43.9%).
4. **Subgroups:** Indicative findings show that participants who expressed one of the following 'attitudes' to EVs were more likely to rate this idea positively on both impact and support.
 - a. I have heard of electric vehicles but won't consider buying one
 - b. I have thought about buying an electric vehicle, but have decided not to at this stage
 - c. I haven't thought about buying an electric vehicle but I would consider it

Key findings from focus groups

1. Participants in the group raised a distrust of manufacturer and dealership figures, but generally thought that some sort of standardised information would be helpful and should be available.
2. Most participants were supportive of the idea despite distrust, citing that vehicle purchase decisions should be informed by facts so consumers know what they are buying.

Conclusion and recommendations



Impact: High. This is one of the best performing ideas in the survey in terms of impact (albeit measured on helpfulness, rather than stated impact on purchasing intentions). Participants generally thought standardising key metrics would be helpful and aid their decision. The strong survey results suggest that difficulties in comparing EVs to ICEVs is a common barrier, and is likely to reinforce the status quo bias (sticking to what you know).



Support: High. Support is also generally high although some participants in the focus groups voiced their distrust in manufacturers. It might therefore be advisable for government to be taking the lead on developing these standardised metrics as a more trusted and objective source of information compared to manufacturers.



Readiness: Moderate. While the core of the idea and its purpose are clear, there is work to be done on ascertaining which metrics should be included, how to make them comparable, and how to set averages or baselines (e.g. standard annual mileage, electricity costs) in a way which is useful and accurate. The extent to which these figures are perceived as relevant and accurate to someone's situation, will influence the level of impact these metrics have on that person's decision. We note that these questions will also need to be answered for some other ideas, such as TCO price labelling (idea #136).

Conclusion

Creating effective units of comparison is complex, we therefore recommend engaging in further conversation with manufacturers, academics and other experts who can shed light on how feasible it is to standardise these metrics in a way that still makes them relevant to individual consumers (in addition to the information conveyed on the fuel economy and the [new environmental labels](#)). There is a trade-off to be made between feasibility (which might dictate 'one size fits all') and impact (which would benefit from tailoring).

Research next steps

The first steps are to develop the metrics in formats which are comparable, and to ensure these are the right metrics through consumer testing on usefulness and impact on decision-making. Subsequently, online randomised controlled experimentation would be well suited to optimise the design and presentation of the metrics to maximise their impact on consumer understanding. Impacts on actual sales (or intention to purchase / hypothetical choice) could also be measured, albeit noting that the goal of this objective is to enable more informed choices – not *necessarily* increased likelihood to buy an EV for all consumers.



#111: Expand school children engagement projects

Expand on existing engagement projects undertaken with school children to further raise awareness about EVs. This should include promotion of environmental benefits, health benefits and pedestrian safety.

Rationale: Improving understanding in children to inform parents and raise awareness

Conclusion and recommendations



Impact: Low. Engagement with these projects could be quite high among participating schools and children. However, from a feasibility standpoint, coverage of such initiatives can only be partial. Moreover, the impact of these events on the awareness and engagement of the car-buying adult population is indirect, and therefore more modest. The events might therefore be worthwhile, but only if low cost, as we would expect quite modest impacts.

Support: N/A



Readiness: High. GUL has conducted a number of school engagement projects already and could expand on these by increasing their capacity to roll them out further. Continuous evaluation could allow GUL to improve the programmes each time.

Conclusion

As it's quick and fairly straightforward to build on existing programmes of work, in the short term these projects should be continued and could be expanded on. However, across the car-buying adult population, we would expect modest impacts. In the medium term, that decision on how worthwhile these programmes are, should be informed by rigorous evaluation of their actual impact.

Research next steps

There is an implicit theory of change in these initiatives: raised awareness of young children will either a.) lead to those children being more likely to buy an EV when older, and/or b.) lead to them sharing their knowledge, enthusiasm and values with their parents. The impact of the programmes along this journey can be evaluated, for instance measuring the impact of a school engagement project on parents' awareness, and intention to purchase, through a randomised controlled trial (clustered by school). This impact evaluation should be used to inform a cost-benefit analysis to ascertain whether these programmes are worth their cost.

#144: Car comparison websites to have a dedicated EV section of the site

Commonly used car-focused price-comparison website, could dedicate a clearly labelled section on their website to EVs. This could become a dedicated resource for consumers to use when looking for used EVs, which mirrors and works with rather than rivals most popular car listing site(s). To avoid EVs being seen as 'other' by segregating them, potentially use the EV page as the default landing page. Moreover, the site should not segregate ICEVs and EVs to the extent that users cannot make comparisons between models of each type. We have assessed the impact of this change for Autotrader, as the leading online dealership who OLEV have already worked on their dedicated EV section.

Rationale: This would send a clear signal about EVs being suitable for the mainstream, and help users make comparisons and source reliable information from a familiar and trusted resource.

Conclusion and recommendations



Impact: Low. While we believe this is a low-cost change that would be worthwhile, and while Autotrader is a widely used platform, the EV section would need to be made very salient (or become the default landing page) for site users to see it. Many visitors would also not be motivated to fully explore the page. Moreover, many people do not visit autotrader.com. As such, we would realistically expect this idea to have very modest impacts across the population. Impact would potentially be higher if more online dealerships implemented this idea.

Support: N/A



Readiness: High. This idea doesn't require additional research or significant development. It requires conversation with online dealerships and approval for implementation.

Conclusion

This is a low-impact but simple and feasible idea worth pursuing by all car-focused comparison sites.

Research next steps

Online experiments could be run to test the most effective way to present, list and cluster the information, e.g. whether a separate EV tab would get more clicks compared to an EV filter in the search function, compared to making 'EVs-only' the landing page. Though we do not judge this to be a major risk, it would also be prudent to test whether the benefits from the increased salience of EVs in a dedicated and prominent section, are undermined by presenting EVs as 'other' and distinct.

#143: Require dealers to add plug-in alternatives to ICEV sales sheets

Require dealers to use a standardised system to display plug-in alternatives on ICEVs sales sheets to inform consumers of the possible low emission alternatives and the associated savings (e.g. on running costs) if they chose an EV instead of the ICE vehicle they are looking at.

Rationale: This would simplify information for consumers and enable them to make easier comparisons between ICEVs and EVs at the point of sale. Proactively presenting EV options to consumers who are looking at ICEVs is also a much stronger provision of information.

Recognised risks: Some consumers might find it intrusive or overly interventionist, since it could be construed as an active push from government, with the information not being something the consumer has sought. It will also be necessary to navigate state aid and competition laws if specific EV makes and models are presented as alternatives, though this could be limited to presenting EV alternatives from the same brand, where available.

Conclusion and recommendations



Impact: Moderate. The impact on awareness and knowledge around EVs could be significant especially if the information is provided in a standardised and easy-to-understand format. The novelty of the amended sales sheet would make this information salient. The impact on actual sales has the potential to be considerable but will depend on how relevant the plug-in alternative is to the individual consumers' needs, and how favourable the comparison is (e.g. on lifetime cost) – care would need to be taken to present realistic substitutes. The salesperson will also have to take on an active role in promoting that information and the plug-in alternative.

Support: N/A



Readiness: Low. Most dealerships focus on one or a few brands, which might mean that there won't be relevant plug-in alternatives available at that same dealership for each ICEV model. The incentives of the dealership should be aligned with the information on the sales sheet otherwise we risk them downplaying or failing to provide that information. There are also key questions on the suitable level of government intervention.

Conclusion

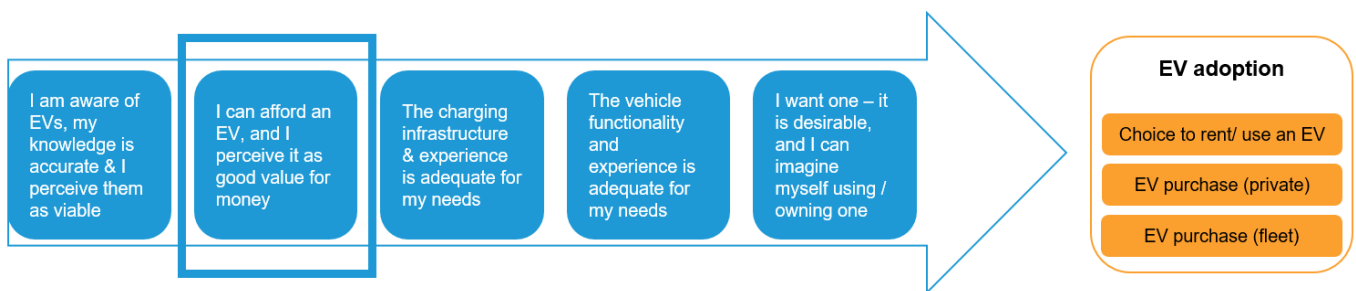
In theory this could be a strong (albeit interventionist) way of nudging would-be buyers of ICEVs to consider EV alternatives. However, there are significant implementation challenges, and coverage would not be complete as viable substitutes only exist for some models of ICEV. Further research and policy development will be needed.

Research next steps

More qualitative research with manufacturers, dealerships and consumers is required to understand what information could go onto these sales sheets in a standardised way. A feasibility study to test the legal implications, and feasibility of implementation is also required, ensuring any solution which is feasible doesn't dilute the essence of the intervention. If the policy is fundamentally feasible, an online experiment can help to identify the most effective way of formatting and displaying that information, and finally a randomised controlled trial (RCT) in the field (in collaboration with multiple dealerships) could measure the impact of these new sales sheets on proportion of zero emission vehicles sold.

Objective 2

“I can afford an EV, and I perceive it as good value for money.”





#136A/B: Mandate a new price labelling standard to better inform consumers of long-term costs

Mandate a new price labelling standard explicitly referring to the long-term, total costs of ownership (TCO) of a vehicle. For instance, a mandate may stipulate a label design which advertises all new vehicles in terms of their lifetime cost, or where sold on lease, as the total monthly cost, including capital repayment and running costs. Various formats are possible and suited to consumer testing. These two ideas propose two different framings:

- Version A - displaying 'TCO' estimates based on standardised average usage (or where possible tailored to consumers use-case)
- Version B - displaying pence-per-mile estimates.

Further framings to be tested could include developing MPG-equivalent ratings for EVs.

We also note that since this idea has first been developed, a new environmental label has been put in place, which spells out the various running costs explicitly. It would be interesting to compare the impact of this label to the framings suggested in versions A and B above.

Rationale: This would improve understanding of the financial benefits of EV ownership. Even if EVs do not work out cheaper for everyone (e.g. low-mileage drivers), their long-term savings may at least bring them closer to ICEV costs, which may be enough to 'tip the balance' in favour of EVs for some consumers.

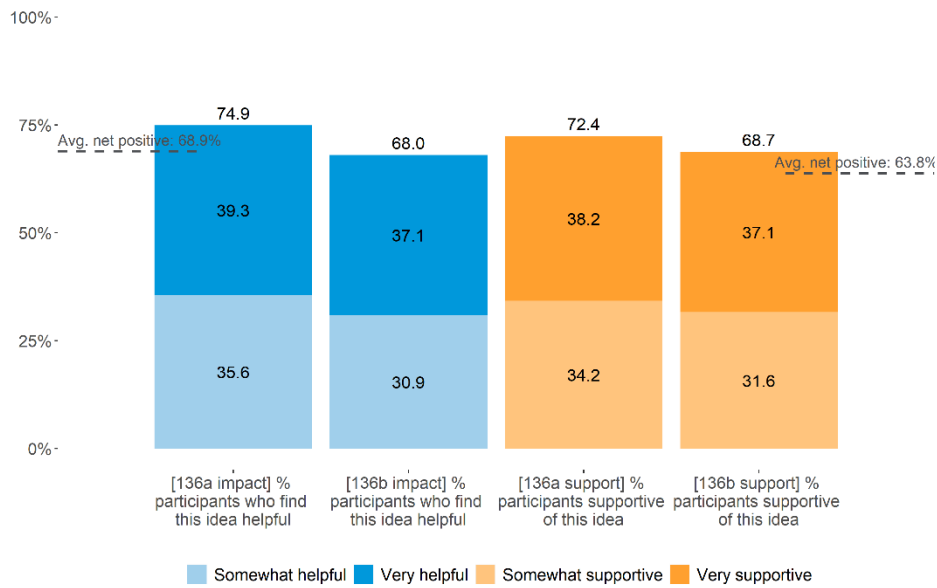
Private consumer feedback

Survey description:

(Version A) "Imagine a new law requires car dealers to display an estimate for the lifetime costs of the vehicle (the upfront price plus all fuel and running costs)."

(Version B) "Imagine a new law requires car dealers to advertise the 'pence per mile' cost of driving for all vehicles."

Idea #136: framing (a) vs framing (b)
 N for idea 136a [simple TCO figure] = 450
 N for idea 136b [pence per mile] = 469



Key findings from online survey

- Impact:** 74.9% of respondents indicated they would find a TCO labelling system somewhat or very helpful. This is higher than the 68.9% average across all policy ideas tested for perceived usefulness.
- Impact:** 68.0% of respondents rated the ‘pence per mile’ framing positively, which is lower than the 74.9% of respondents who did so for the TCO format, though this difference is not statistically significant.
- Support:** 72.4% of respondents indicated they would be supportive or very supportive of introducing a TCO form of label. This is higher than the average of 63.8% supportive across all policy ideas tested.
- Support:** The TCO format of the label received stronger support than the alternative design of pence per mile (72.4% vs 68.7%), though this difference is not statistically significant.
- Subgroups:** There aren’t any notable differences between subgroups other than the general trends across all ideas.

Key findings from focus groups

- Labelling which provides clear information on lifetime costs (TCO) was perceived as very helpful by most participants, and as a result overall support for the idea was quite high.
- However, concerns over mistrust in information provided by manufacturers and dealers will need to be managed. Some suggested external verification of figures would be needed to give them confidence in accuracy.
- Applicability of ‘average’ lifetime costs for individual consumers also needs to be considered in implementation.
- Most participants also felt that it would be helpful to have ‘pence per mile’ cost information when choosing a new vehicle.

Conclusion and recommendations



Impact: Moderate. Upfront cost is a major barrier, and in part this is borne from a present-biased perception of costs, as we discount long-term savings and focus on the price tag. With cost being such a strong determinant of vehicle choice, helping people recognise the long-term savings associated with EVs has the potential for substantive impact. This will be particularly true for those with high annual mileage (for whom running costs are more significant). All of this said, this intervention is relatively light touch, and is not doing anything to actually reduce the cost of EVs, which is why the impact will be moderate rather than high, compared to other ideas within this category.



Support: High. This policy idea is non-contentious and simply makes it easier for consumers to make an informed decision. This is reflected in the high level of support in the survey and focus groups.



Readiness: High. This policy idea is relatively easy to implement and could be adopted soon. Whilst there are a number of technical and bureaucratic processes to navigate (including optimising design of the label and information, ensuring this information is meaningful to a wide range of buyers with different annual mileage, and passing legislation if the label is to be mandated), we believe these issues can be addressed quite swiftly, relative to the overall time-scale of government targets for EV adoption.

Conclusion

We consider this idea to be very worthwhile. Its modest impact is commensurate with the relative ease of implementation. Even if it led to no appreciable shift in EV purchases, it helps consumers make more informed decisions and is therefore low-regret.

Research next steps

An Randomised Controlled Trial (RCT) could be set-up in collaboration with an online dealership or a number of physical dealerships to compare the impact of these two different labels on sales. In addition to capturing sales data, it may also be interesting to understand how useful people found this information and how well they've actually understood it through quick in-store surveys. Prior to testing in the field, online experiments measuring intentions to purchase and consumer comprehension, can be used to prototype label designs.



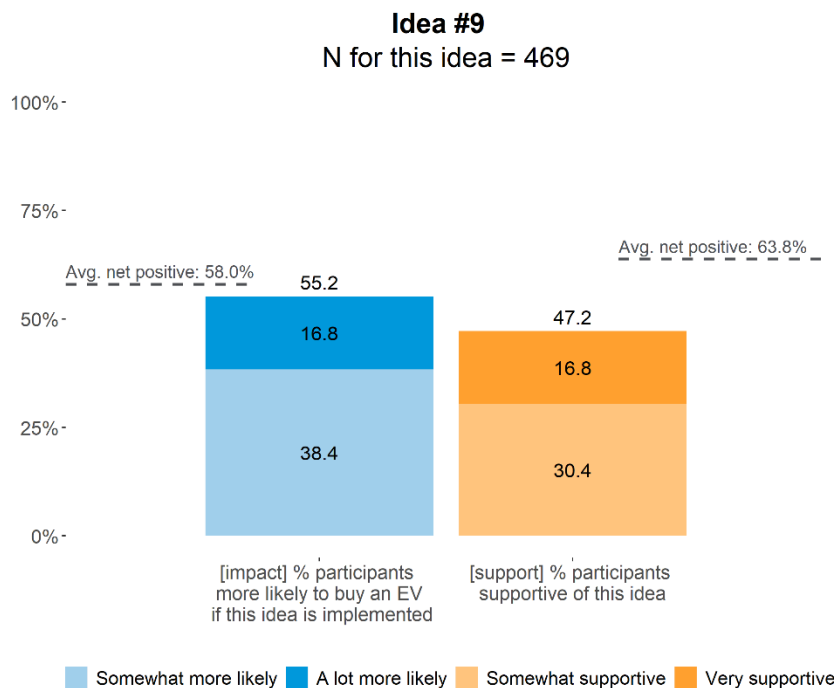
#9: Implement a Feebate system to supplement existing grants

An established system in other markets, involving a first registration tax on vehicles with high CO2 emissions or fuel consumption, the revenue from which is then used to provide a rebate to vehicles with low (or zero) emissions. Also known as 'bonus-malus' schemes, used in France and Sweden, [for example](#). In order to avoid being a regressive tax on lower-income households, who are more likely to own older, higher polluting cars, the fee would apply at point of purchase, rather than increasing liabilities on existing vehicles.

Rationale: A Feebate system could be used in the UK to supplement or replace the existing Plug-in Grants (PiGs) (offering a stronger incentive to consumers) and at the same time disincentivise purchase of ICEVs, providing both a carrot and a stick. Evidence from other markets, such as Norway, suggests that the system can be effective, although can be politically unpopular to increase taxes for ICEVs. This may be particularly effective for company car fleets, tipping the balance in favour of EVs, and helping to accelerate penetration of EVs into the second hand market.

Private consumer feedback

Survey description: "Imagine the government introduced a fee or higher tax (for example, approximating £500 - £1,500, depending on the emissions of the vehicle) on newly purchased diesel or petrol vehicles and used the revenue to subsidise electric or hybrid cars. This system would replace the current government grant applied to electric vehicles purchases."



Key findings from online survey

1. **Impact:** 55.2% of participants indicated they were somewhat or a lot more likely to consider buying an EV if a feebate system was implemented - that's just below the average response rate of 58.0%, among ideas tested for likelihood to purchase an EV.
2. **Support:** 47.2% of participants were somewhat or very supportive of introducing a feebate system. That is well below the average support rate of 63.8% across all ideas.
3. **Subgroups:** There aren't any notable differences in response to this idea by subgroup.

Key findings from focus groups

1. Participants had mixed perceptions about the impact this would have on their likelihood to adopt an EV. Overall support was also mixed.
2. Reasons for perceived low impact and low support included concerns about unfairness and displeasure with an increase in taxes.
3. Others felt it could be an effective incentive for consumers to switch to electric by reducing upfront cost barriers while also disincentivising purchase of ICEVs.

Conclusion and recommendations



Impact: High. Despite the relatively muted self-reported impact for this measure in the consumer testing, we remain confident that a feebate system (of sufficient magnitude) would be a strong incentive, given the well-evidenced importance of cost in vehicle purchase decisions. Expert stakeholders in earlier workshops also rated the idea highly.



Support: Low. Survey and focus group findings reveal this is not the most popular approach. Higher acceptance will likely depend on EVs being a truly viable alternative to all, so that the feebate does not end up punishing those who feel unable or unwilling to buy an EV - this requires policy to simultaneously address other technological and psychological barriers. One potential variation would be to (initially) apply a fee only to fleets, but the rebate across all EVs sold. It is also worth noting this idea was framed principally in terms of increasing the cost of an ICEV within the survey, so we would expect a relatively negative response.



Readiness: Moderate. Overall, we believe that this idea requires further research, in particular to navigate public and industry acceptability, but remains a strong option to shift the market. Furthermore, given this is a strong financial intervention which imposes cost on ICEV use (i.e. it's not just a positive incentive on EV use) it is important that other barriers to EV ownership are addressed before bringing it in, to avoid it being regressive or punitive to those for whom an EV is not an option. Stakeholder feedback also suggests a Feebate is a more feasible and appealing option than, say, VAT changes, which would be a less customisable and flexible system and likely be more difficult to implement.

Conclusion

A feebate would be a major policy announcement, but one which we feel has the potential for high impact if done right. By applying only to new cars it avoids being regressive, and is therefore one of the more promising incentive options. Contrary, to how it was described in the survey, a feebate system would likely not replace the plug-in grant but would be implemented as an additional incentive.

Research next steps

Public support for this idea could be continuously monitored through surveys. This may be important as support can change over time, especially as the policy is introduced and people move towards cleaner vehicles over time. The survey can also test different variations and levels of fees. This empirical data could be usefully added to economic models estimating the impact of the idea.



#11A/B: Re-frame existing government grants to make them more appealing

Existing government grants can be reframed to make them more appealing. There are various ways this can be done, including:

- 'Free fuel' (e.g. covering electricity costs for the first 120,000 miles), either just communicated as such, or potentially implemented as such (e.g. administered through a combination of charge-cards for public charging, and tariff adjustments with partnering utility providers).
- Make the grants more salient rather than automatically applying at dealer level
- Break grant into 'mental accounts': e.g. £XX discount on your new EV / £XX covers first 30,000 miles free 'fuel' / £XX covers all your maintenance etc./ Road tax is already free

In this case we tested the '**free fuel**' framing, and compared it to the current framing of the grant. Note we separately also tested a scrappage scheme idea (idea #161)

Rationale: Consumers respond differently to the way information is framed, so re-framing of existing money could be an effective way of increasing its impact for no additional cost to government. Whilst behavioural science provides some clues on which framings may be most effective, it is possible to empirically test for the most effective framing of a grant.

Private consumer feedback

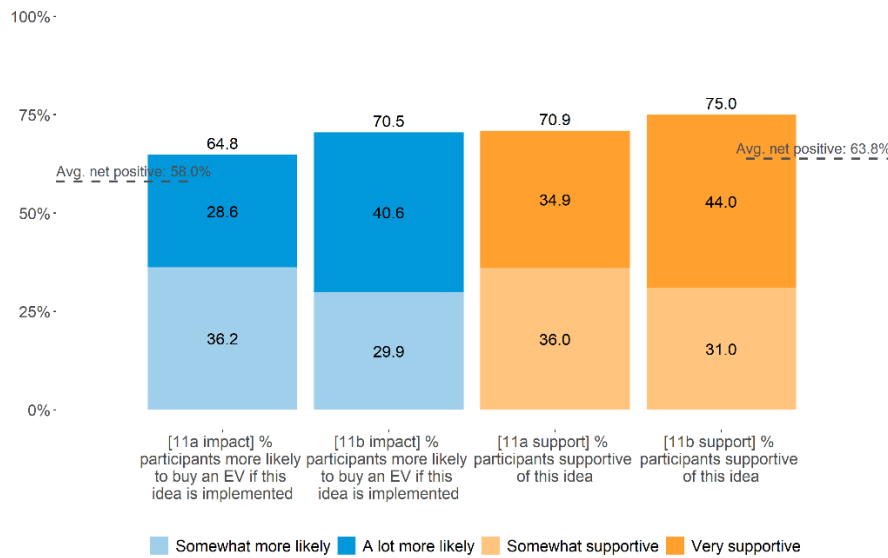
Survey description:

Grant version A (business as usual): "The government currently offers a £3,500 grant on new EV purchases. This is automatically deducted from the upfront cost of the vehicle."

Grant version B (fuel cost framing) – "Imagine the government paid for the fuel (i.e. electricity cost) used for the first 120,000 miles you drove in a new EV. This amount is approximately worth £3,500."

(Note, the grant value has been reduced to £3,000 as of March 2020, after we gauged feedback from the public)

Idea #11: framing (a) vs framing (b)
 N for idea 11a [current grant] = 461
 N for idea 11b [fuel cost framing] = 468



Key findings from online survey

- Impact:** 70.5% of participants indicated they were somewhat or a lot more likely to consider buying an EV if the government provided a grant equivalent to the first 120,000 miles of fuel (worth £3,500). This is statistically significantly higher than the 64.8% who said they would be more likely / much more likely to purchase an EV under the current grant system, implying re-framing towards free travel may be more appealing.
- Impact:** Stated impact for the fuel cost framing (idea #11b) is also markedly higher than the average of 58.0% across ideas with the same scale for measuring impact.
- Support:** 75.0% of participants were somewhat or very supportive of re-orienting the grant towards free fuel / mileage. This is statistically significantly higher than the 70.9% of participants supportive of the current system.
- Support:** Stated support for both versions of the idea is also substantially higher than the average 63.8% of people expressing support across all ideas.
- Subgroups:** There aren't any notable differences in response to this idea by subgroup.

Key findings from focus groups

- Most participants thought an incentive in the form of 'free fuel' for EVs would make them more likely to buy one and were supportive of the idea, as it was seen as a large incentive that didn't negatively impact lower income people.
- Some concerns were raised about potential adverse consequences; free fuel may incentivise higher mileage than normal. 120,000 miles was seen as a very large amount.

Conclusion and recommendations



Impact: Moderate. Re-framing the grant as 'free fuel' appears to be both popular, and significantly more appealing to prospective buyers than the existing framing of the grant as a discount. However the value is equivalent, and so we should not overestimate the impact this would have on real-world purchases: consumers' decision making is relatively sophisticated, and would be given more careful thought than respondents to this survey would have given their answers. As such, this should not be seen as a simple 'trick' to make consumers think they are getting a bigger discount. However, it does increase the salience of the saving, and convert it into something tangible and substantial. 120,000 miles of free fuel is, for most people, equivalent to never paying for fuel over their ownership of the car.

Indeed, it would even be possible to replace the grant with the offer of 'free fuel for life', where the government pays for all electricity costs associated with charging the vehicle over the lifetime of original ownership (which on average, would likely be less than £3,500 per vehicle).

The impact might depend on the precise implementation of this idea. For example, if communications used to advertise the grant simply equate the value to free fuel, impacts might be more modest than if the delivery of the grant was in some way linked to actual free fuel (such as through a government funded refuelling charge card).



Support: High. Support for this idea is high, and we believe it is relatively non-contentious. That said, simply re-framing the existing money may be seen as disingenuous by some critics. Converting the money into a refuelling charge card, or a feed-in-tariff through electricity suppliers, may seem like a more genuine offer.



Readiness: High. This framing of the grant could be used in communications material immediately. If instead developing a feed in tariff or refuelling charge card, further work will need to be undertaken to establish the logistics of implementation.

Conclusion

'Free fuel' seems more appealing than 'money off', perhaps because the mileage covered by the free fuel is surprisingly high, such that the benefit of the policy is essentially coming from consumers' unawareness of how cheap it is to fuel an EV. Using this message in communications is therefore a very worthwhile and low-cost policy, albeit with modest impact on actual sales compared to some incentives in this category of ideas. Developing an actual offer of free fuel requires much more work, but could be more powerful, and is therefore worth exploring further.

Research next steps

We believe this idea has merit and the next step should be to test it in the field to the extent possible to see if the survey results replicate in the real world.

#16: Scaled grants for fleet owners (more generous the more of them you buy)

To encourage more rapid adoption by fleets, the grant amount could be scaled so that larger discounts are offered for bulk purchases. A cap could be implemented to help manage costs.

Rationale: This may help to get the 'big players' to build a critical mass in EV adoption, in particular by addressing the current diseconomies of scale faced by some large firms: the more vehicles you have, the less likely you are to switch to EVs because charging infrastructure and logistics becomes more challenging. Encouraging these large fleets to move to EVs will also be a particularly effective boon to the second hand EV market.

Recognised risks: The cutoffs would need to take into account the level of supply feasible for vehicle manufacturers. The system would also need to be designed such that companies would not be able to artificially aggregate orders from other companies (e.g. among their supply chain). It would also be politically difficult to prioritise larger fleets, triggering some concerns over state aid and fairness.

Commercial fleets feedback

Interview description: "Imagine that the value of government grants would be increased as the number of vehicles purchased increases. For example, an organisation which decides to purchase 10 vehicles simultaneously would be provided with a higher grant per vehicle, compared with when purchasing a single vehicle."

Key findings from telephone interviews

1. Organisations on the whole were supportive of the principle of this idea
2. Incentives which help fleets to overcome the upfront cost barrier for EVs were viewed positively; organisations indicated that they would be likely to utilise this type of incentive and that it would have a positive impact on their business.
3. Applicability and usefulness of the incentive may be dependent on the type of fleet which the organisation owns however. For example, some organisations indicated that there would be limited value for company cars (since the purchasing of these vehicles is typically linked to individual employee decisions rather than batches of vehicles being centrally ordered by the fleet manager).

Conclusion and recommendations



Impact: Moderate (depending on the magnitude of the incentive). The impact will depend on the scale of the incentive offered, as large organisations can be expected to make vehicle procurement decisions with fairly clear-cut cost-benefit analyses. If generous enough (and this threshold might still be quite high at the moment) to boost purchases in a meaningful way, this could be one of the most effective ways to accelerate EVs into the second-hand market.



Support: High (but likely mixed). Support was high among the organisations interviewed. However it's worth noting that support would likely be lower among smaller organisations who would not benefit from the grant, or the general public who may feel public money should be used to support the public, rather than large commercial entities. Ensuring the benefits of the scheme trickle down to second-hand car purchases may be key to building support. Indeed, formalising this may help - for example, a quid pro quo in which fleet operators who sell the used cars are specified discounts below market rates, or by combining this with the 'EV to work scheme for used cars' (see idea #163).



Readiness: Low. This would be an expensive policy (and if it was not, then uptake would be low). It may therefore not be fiscally feasible, and would require further research to justify it - in particular, cost-benefit analysis to weigh this option against other policy ideas which might achieve similar impacts at lower costs.

Conclusion

An expensive policy idea, and one which at face value prioritises large firms over SMEs and individuals. Though the impact could be high, it would therefore need to be justified through further research and cost-benefit analysis.

Research next steps

Support and demand for this idea should be tested with commercial consumers using a large survey, covering a wider range of big and small firms. A cost-benefit analysis should also inform the pursuit of this idea over other incentive designs.

#162 Higher rates of annual vehicle tax for high-polluting vehicles

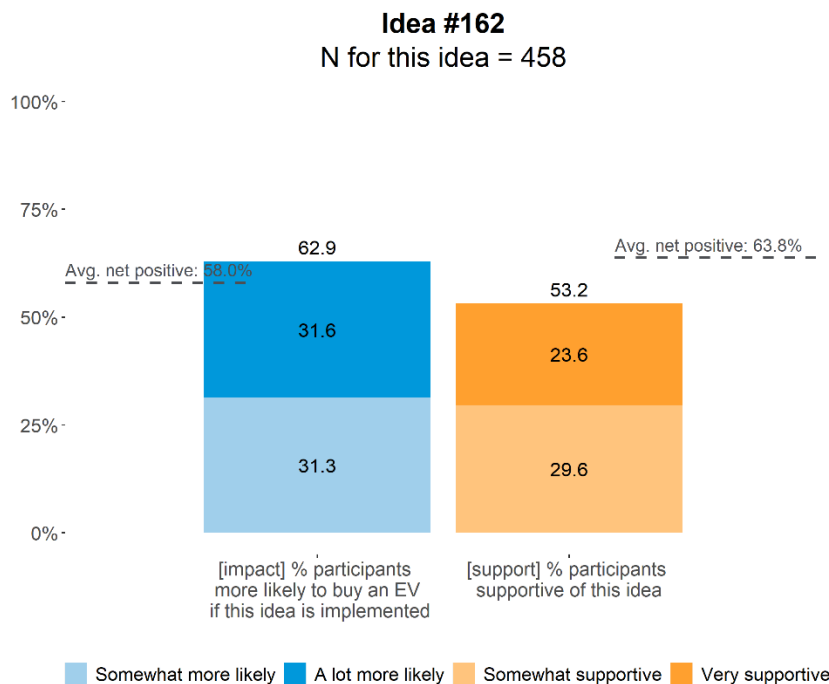
Higher rates of annual vehicle tax for high-polluting vehicles. Tested with consumers as a potential doubling (e.g. from £145 currently to £290).

Rationale: Increasing the running cost differential between EVs and more polluting cars could be a strong incentive. As a financial incentive, this works across new and second-hand purchase decisions, whereas many of the other financial incentives being considered only apply to new sales. However, given our tendency to bias towards upfront costs, increasing the running costs (i.e. annual vehicle after the first year, where it can vary depending on vehicle emissions) in this way may prove to be a less effective strategy than focussing on upfront costs (unless paired with another solution, such as Idea #136 - mandating labels which communicate long-term costs).

Recognised risk: Politically difficult, and will disadvantage low-income households who cannot afford to upgrade their vehicles

Private consumer feedback

Survey description: “Imagine government increases vehicle tax (i.e. the tax you pay on your vehicle annually) for all diesel and petrol vehicles, so that the cost of taxing these vehicles roughly doubled (e.g. from £145 currently to £290), but electric vehicles remained vehicle tax-free.”



Key findings from online survey

1. **Impact:** 62.9% of participants indicated they were somewhat or a lot more likely to consider buying an EV if vehicle tax was altered, slightly higher than the 58.0% average across ideas tested for likelihood of EV purchase.

2. **Support:** 53.2% of participants were somewhat or very supportive of introducing this policy, well below the average support rate of 63.8% across all ideas.
3. **Subgroups:** There aren't any notable differences in response to this idea by subgroup.

Key findings from focus groups

1. Support for this idea in the focus groups, as with the survey, was generally low; participants felt it was a small amount of money being offered and as such it would make no difference to their likelihood to adopt an EV.
2. Those who indicated some support for this idea generally did so with reservations about the potential negative impacts on people who own older cars due to their financial situation, and young drivers who already pay more for insurance.

Commercial fleets feedback

Key findings from telephone interviews

1. There was mixed support for this idea from commercial consumers; some organisations were strongly against the idea and others were for it.
2. A common theme in the feedback was that the policy would increase costs for businesses, which would inevitably be passed onto customers or affect profits. Some felt this would encourage a switch to EVs, but others felt that the amount of money (£145 per vehicle per year) was not large enough to have an impact.
3. Concerns were raised by some organisations regarding the idea being unfair or inappropriate where viable electric alternatives for some fleet vehicles are not currently available on the market.

Conclusion and recommendations



Impact: Low. High vehicle tax may slightly accelerate the decision to buy a new vehicle among owners of older, higher-taxed vehicles. However, for the specific example that we tested (i.e. increasing the cost from £145 to £290), the cost differential is very small relative to the overall cost of car ownership, and thus the impacts on new car sales (choosing between an EV and a new ICEV, for example) will be quite low. It is possible that in future, if tax bands are set optimally, it might be possible to incentivise the purchase of second-hand EVs over second-hand ICEVs, since at this point the vehicle tax is a greater portion of the total costs. However currently, significantly higher tax on polluting vehicles will generally penalise those least able to afford a new car. It is for these reasons that we rated impact as 'low' (compared to other ideas in this category) despite 62.9% of survey respondents suggested it would impact their decision.



Support: Moderate. Support for this idea was quite muted, in part because it is a regressive tax, and because it is not perceived to be a very effective incentive design.



Readiness: Moderate. Whilst changes to the vehicle tax bands can be made rapidly, we feel it is not the right time to implement this policy. The case for this approach may strengthen in time when readily affordable and second-hand EVs are available, at which point this approach would be somewhat less regressive.

Conclusion

A regressive, and generally unpopular approach, these downsides are not justified by its impact because it is not a particularly strong incentive. We believe similar incentives levied at the point of sale, e.g. VAT changes (idea #22) or a feebate (idea #9), can be leveraged to a stronger degree to provide stronger incentives, without such issues of unfairness.

Research next steps

More sophisticated willingness to purchase studies could be undertaken to more accurately estimate the impact, and thus make a more informed judgment of this versus other incentive designs. It would be difficult to validate such estimates using an experimental field trial, though pre-and post-implementation surveys or a regression discontinuity design (comparing vehicle sales either side of a tax threshold before and after the tax is introduced) could be feasible.



#22: Differential VAT rates

Use VAT rates to create additional incentives to buy EVs. Though presented to consumers in the consumer survey as a simple VAT discount on EVs (from 20% to 5%), this idea could also have a manufacturer-facing component: by creating 'threshold effects' (stepped VAT rates), which align with particular emissions levels across all classes of vehicle, it would be possible to incentivise ongoing, incremental product innovation among manufacturers (who would be strongly motivated to fall into the next cleaner band, and this band could be slowly moved year-on-year).

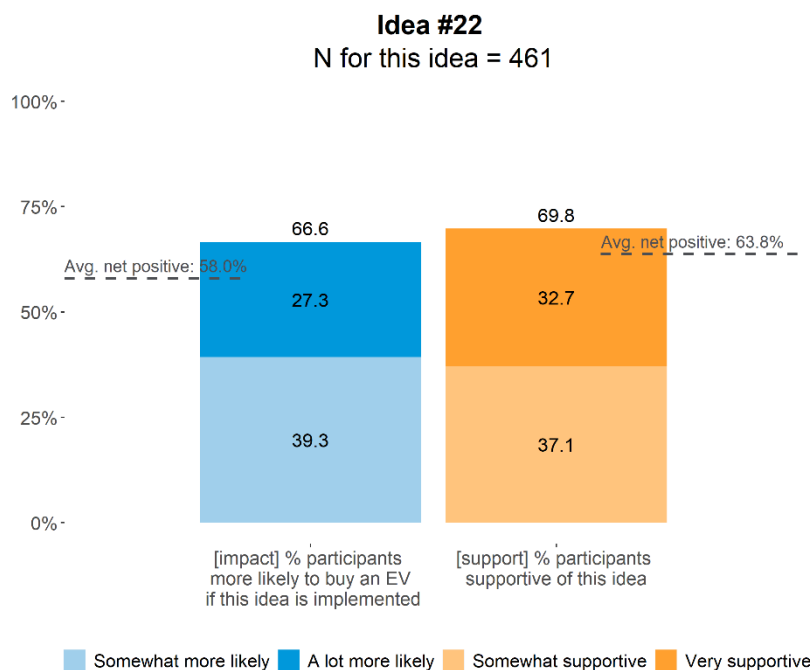
Note that this threshold approach could also apply to other incentive designs such as a feebate system.

Rationale: Addresses upfront cost barrier by making EVs cheaper at point of purchase, but if applied in a more sophisticated way across all cars, it also has the potential to drive innovation by incentivising manufacturers to reduce emissions.

Recognised risks: Once implemented, it could be hard to revert (increasing VAT on EVs would be difficult).

Private consumer feedback

Survey description: "Imagine government introduced different VAT rates on new vehicles depending upon emissions, i.e. high-polluting vehicles like diesel or less efficient petrol vehicles would have a VAT rate at the current level of 20% and low-emission vehicles like electric and hybrid vehicles would have a VAT rate of only 5% or would be exempt from VAT entirely".



Key findings from online survey

1. **Impact:** 66.6% of participants indicated they were somewhat or a lot more likely to consider buying an EV if VAT was reduced from 20% to 5%. This is substantially higher than the 58.0% average across ideas tested for likelihood of EV purchase.
2. **Support:** 69.8% of participants were somewhat or very supportive of introducing this policy, above the average support rate of 63.8% across all ideas. However, note that the survey framing was positive (worded as a discount on EVs), and so support would generally be high.
3. **Subgroups:** There aren't any notable differences in response to this idea by subgroup.

Key findings from focus groups

1. There was strong support for this idea and most participants said it would make them somewhat or a lot more likely to adopt an EV. This is because participants felt reduced VAT rates would be a big incentive and would make EVs more affordable and competitive in the market.
2. Some participants raised concerns about loss of revenue for the government leading to increased taxes elsewhere.

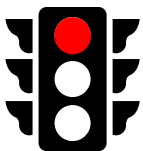
Conclusion and recommendations



Impact: High. The impact would depend on the scale of the VAT differential, but has the potential to be very high. Depending on the balance of increased vs. decreased VAT, this also has the potential to be a significant revenue raiser for government, which could then fund some of the more costly policy ideas (such as rapidly accelerated charging infrastructure).



Support: High. Support was surprisingly high - though we note that support will generally depend on whether ICEVs are subject to increases in VAT (lower support would be expected) or EVs subject to reduced VAT (higher support expected). A combination of both, with the former funding the latter, would seem sensible, and then is closely analogous to a 'feebate' (as per idea #9) albeit without necessarily ring fencing and balancing the revenues and subsidies.



Readiness: Low. It is very unlikely this idea could be implemented. There are significant logistical and legislative barriers to address in order to implement this idea. Moreover, progressing this policy sooner vs later presents some interesting trade-offs. For example, given that most new car sales are currently ICEVs, a very modest increase in VAT on ICEVs could fund a significant reduction in VAT on EVs, which could largely or entirely remove the cost barrier of EVs. However this could have the knock-on consequence of shifting sales, en-masse, to EVs, which would then undermine the source of revenue funding these discounts (or, simply hit the limits of manufacturers to supply the vehicles). Further economic analysis is therefore needed to model these outcomes and strike the best balance.

We note that the benefits could also be achieved with a feebate system, which is a more flexible instrument than VAT in its implementation but more problematic from a behavioural perspective as it is punishing those buying combustion engine

(and benefiting those who buy an EV or a hybrid) while differential VAT rates only benefit those buying an EV or a hybrid without an additional punishment to any car buyer.

Conclusion

This is a big policy option and has the potential to be very impactful but unlikely to be feasible.. The fact that this has proven much more popular with survey and interview respondents than a feebate, may simply be down to the precise framing and descriptions used, and thus we would advise further research before concluding that VAT changes are definitely superior to a feebate system in the eyes of consumers. From government's perspective, a feebate system is more flexible and easier to implement than VAT changes.

Research next steps

As with other incentive ideas, more sophisticated economic modelling and empirical willingness-to-pay studies can inform the design and magnitude of the incentive and disincentive. This can be followed by pre-post or quasi-experimental studies to validate the impact on EV sales.

#45: Increased fuel duty

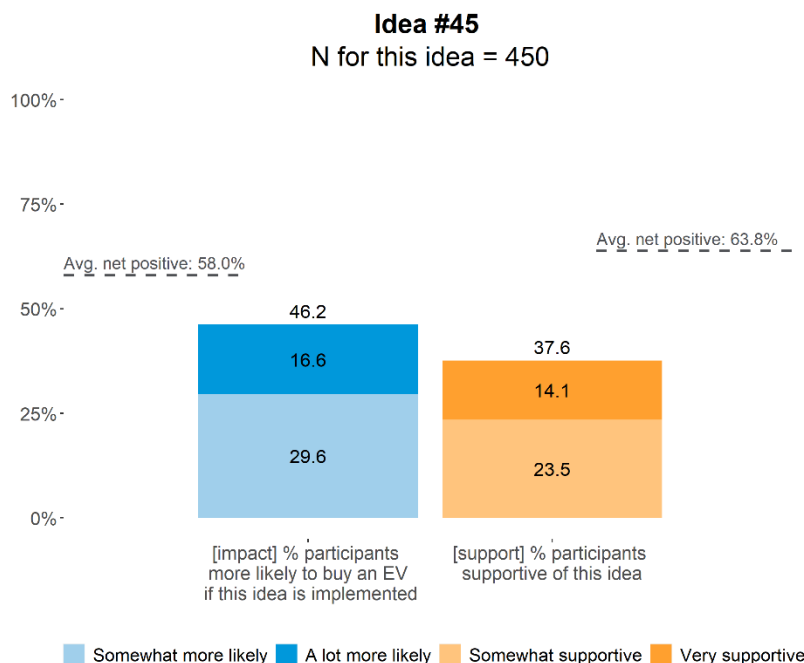
Significantly increase fuel duty. As an option, the increase could be applied with a 'tax and redistribute' model to avoid adverse redistribution impacts, where all revenue is re-distributed to all drivers (e.g. through reduced vehicle tax or other benefits).

In the consumer survey, this was presented as diesel and petrol both increasing by 5p per litre.

Rationale: strong disincentive for ICEV ownership.

Private consumer feedback

Survey description: Imagine government increased fuel duty, so that petrol and diesel were both 5p more per litre, for example.



Key findings from online survey

- Impact:** 46.2% of participants indicated they were somewhat or a lot more likely to consider buying an EV if VAT was reduced from 20% to 5%. This is substantially lower than the 58.0% average across ideas tested for likelihood of EV purchase.
- Support:** Just 37.6% of participants were somewhat or very supportive of introducing this policy, well below the average support rate of 63.8% across all ideas.
- Subgroups:** There aren't any notable differences by subgroup, though this in itself is interesting: even current EV owners, and those who intend to buy an EV as their next car, were only slightly more in favour of this idea. This shows the fairly universal unpopularity of this idea, even among those who it wouldn't penalise to such an extent – these people may still dislike the idea due to having second cars which are ICEVs, or family members who rely on an ICEV.

Key findings from focus groups

1. Most participants said they would be somewhat more likely to buy an electric vehicle if petrol and diesel were subject to an additional 5p per litre of duty.
2. However, most were also unsupportive of the idea. Some because they thought it was unfair for lower income earners who were not able to afford an electric vehicle, and some because they didn't want to have to pay more for fuel.
3. Some thought it wouldn't be noticeable as petrol prices fluctuate regularly anyway, sometimes by around 5p per litre, while others anticipated the financial impact would be very significant.

Commercial fleets feedback

Key findings from telephone interviews

1. There was a unanimous lack of support for this idea from commercial consumers
2. This was due to the increased costs for the businesses, and a perception that it would be an unfair penalty for ICEV usage when no viable alternatives were available.
3. All commercial organisations interviewed felt there would be negative impacts on their business.

Conclusion and recommendations



Impact: Moderate. Significant increases in fuel duty do bring the potential for high impact on vehicle choices. However, significant increases are unlikely to be politically acceptable. More modest changes provide more modest incentives and so are likely to bring relatively modest impacts. Moreover, increasing the long-term running costs of a vehicle are unlikely to be the best design of a disincentive from a behavioural science perspective, due to our tendency to discount the future and focus on upfront costs and savings. (Dis)incentives which apply at the point of purchase may therefore be more effective.



Support: Low. Support is very low for this idea, largely because it is regressive, and consumers feel like it is punitive to the many motorists who lack an alternative.



Readiness: Moderate. Changes to fuel duty could be brought in rapidly. However, if done too soon, before cheaper EVs (including second hand) are available, it becomes regressive. As such, significant increases in fuel duty are perhaps better seen as a secondary incentive to boost the transition to EVs, after other incentives (e.g. feebates) have had their effect over a number of years, and infrastructure, vehicle range and vehicle availability have all improved.

Conclusion

An unpopular policy, and one which is regressive if implemented too soon before lower-income consumers have viable alternatives. However, it could provide a powerful boost in future years, once the EV transition is slightly more progressed and technologies are further improved.

Research next steps

It might be useful to monitor public support for this policy on a continuous basis. Support may be low before it's introduced but it may increase once it has been introduced and people realise it isn't that bad. Similar trends in public support have been observed with other controversial policies, e.g. plastic bag charge. Moreover, public attitudes around driving and air quality may shift significantly in response to COVID-19 (noting this research was undertaken before the UK was affected).

#12: Government grant as cash-back

Repurpose some (or all) of the plug-in car grant as a voucher or lump sum cash back, transferred directly rather than discounted from the vehicle cost.

This could be combined with a number of other approaches, including:

- Delayed payments, so consumers get a lump sum of cash at the point of purchase, and pay nothing for X months.
- Separating the grant application from the purchase, so you get the lump sum of cash now (held in account, unable to be spent), which is lost if you don't buy an EV within X months. This harnesses loss aversion.
- Lifetime cost labelling standards to emphasise that even without the cashback, costs of EVs are comparable to ICEVs over long-term usage, to reinforce the point that the cashback really is 'free money'.

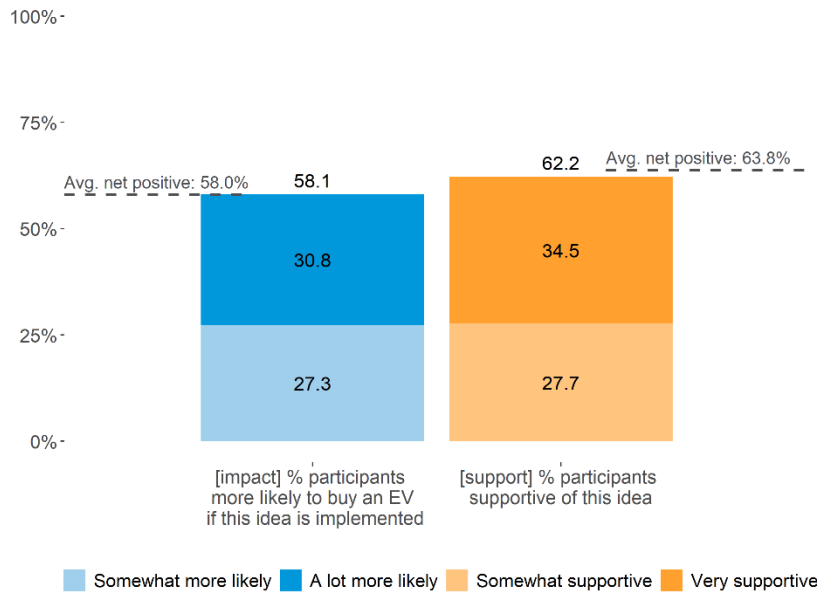
Rationale: As technology improves, the grant money is not strictly 'necessary' to address upfront cost because a.) most people buy new vehicles on credit anyway (so access to finance is not the barrier), and b.) total monthly costs (capital repayment plus running costs) are comparable (or close to comparable) between EVs and ICEVs (so long-term cost is also not the barrier, once cheaper running costs are taken into account, though this depends on annual mileage). As such, offering cash back could provide a particularly appealing incentive without undermining consumers' ability to afford the vehicle costs in the long term.

Private consumer feedback

Survey description: The government currently offers a £3,500 grant on new electric vehicle purchases. At the moment, this is automatically deducted from the upfront cost of the vehicle. Imagine this money was instead directly transferred to you when you purchase the vehicle as 'cash back' to do what you want with, even if you brought the car on credit or lease.

(Note, the grant value has been reduced to £3,000 as of March 2020, after we gauged feedback from the public).

Idea #12
N for this idea = 458



Key findings from online survey

- Impact:** 58.1% of participants indicated they were somewhat or a lot more likely to consider buying an EV if the grant was offered as cashback. This is in line with the 58.0% average across ideas tested for likelihood of EV purchase. We also note, for comparison, that the current grant framing (idea #11a) received 64.8% impact, whilst re-framing the grant as a free fuel allowance (idea #11b) received 70.5% impact – both higher than this cash back framing.
- Support:** Just 37.5% of participants were somewhat or very supportive of introducing this policy, well below the average support rate of 63.8% across all ideas.
- Subgroups:** There aren't any notable differences by subgroup though this in itself is interesting: even current EV owners, and those who intend to buy an EV as their next car, were only slightly more in favour of this idea. This shows the fairly universal unpopularity of this idea, even among those who it wouldn't penalise to such an extent (e.g. potentially because they have second cars which are ICEVs, or family members).

Key findings from focus groups

- Participants were generally indifferent or somewhat supportive of this idea. Four of the six did not think it would make any difference to their decision to adopt an electric vehicle and the other two said they would be somewhat more likely to adopt.
- One of these noted that it felt like a better idea than the grant because they thought that dealers just put the price of the cars up by the amount of the grant. However, there were still concerns among others that this scheme would similarly result in price increases.
- Some participants felt positive about the grant being awarded as a cash lump some, while other participants felt there was no benefit as they would want the money to be used to reduce the price of the car anyway.

Conclusion and recommendations



Impact: Moderate. The stated impact of this idea, from consumers, is more positive than neutral/negative, but lower than two other similar ideas: both the existing (business as usual) grant framing, and the 'free fuel' framing scored higher. This said, we must acknowledge that the consumer survey has some limitations in eliciting a measure of true impact. Our assessment of the behavioural science is that a sizeable upfront cash payment *would* be a strong incentive, particularly for those buying on credit, where the upfront cash really does provide a windfall rather than simply a small discount on future monthly payments. We also believe this has the potential to be particularly powerful if combined with other policies, such as new labelling mandates, which make clear to consumers that an EV is, over the long term, comparable in cost to an ICEV even without the grant. That is, would you rather an ICEV costing you £400 pcm including all running costs, or an EV costing you the same, but with an extra £3,500 in your pocket today? The true implications of this might not have been well understood by survey participants (given the need to provide very concise questions), but we believe this idea merits further research despite receiving average ratings in the consumer research.



Support: Low. Support from survey participants was low, and was mixed / faintly positive within the focus groups. As above, it is possible that this idea was not well communicated in this research, or that consumers were not able to envisage the impact of a generous cash-back offer on their purchasing decisions. Given the strong theoretical appeal and impact of this idea, we therefore suggest further research is undertaken before discounting it based on these survey results. That said, we do recognise some focus group feedback that it might be perceived as an encouragement to take on unnecessary debt, i.e. spending a £3,500 windfall which must be repaid through higher vehicle repayments, compared to having that money discounted from the car.



Readiness: Moderate. As a policy, requiring no new money, implementation could be relatively rapid. There are also no major practical or technological barriers against rapid implementation, beyond the logistics of distributing payments to the consumer rather than the dealership. However as noted above, further research would be required to fully understand the impacts of this policy.

Conclusion

Relatively muted results from consumers discord with our own assessment that this could be a strong policy option, considering it requires no new money. We advise further consideration and testing in the field. A cash back option scenario is one of those policy measures where we may expect stated behaviour and actual behaviour to diverge. Meaning that even though the public think and say they dislike a cash back option in theory, in practice, once that money has actually been paid out it's likely people would use the cash and in hindsight change their attitudes towards a cash back option. This mechanism, that behaviour change leads to a change in attitudes rather than the other way around, is a commonly described phenomenon in the behavioural literature.

Research next steps

Though not straightforward due to likely concerns of fairness, the impact of this idea on EV uptake could be robustly evaluated using a field RCT where a sample of dealerships randomly divided into two groups and administer either a cash-back system, or existing grant system.



#41: Free parking for EVs

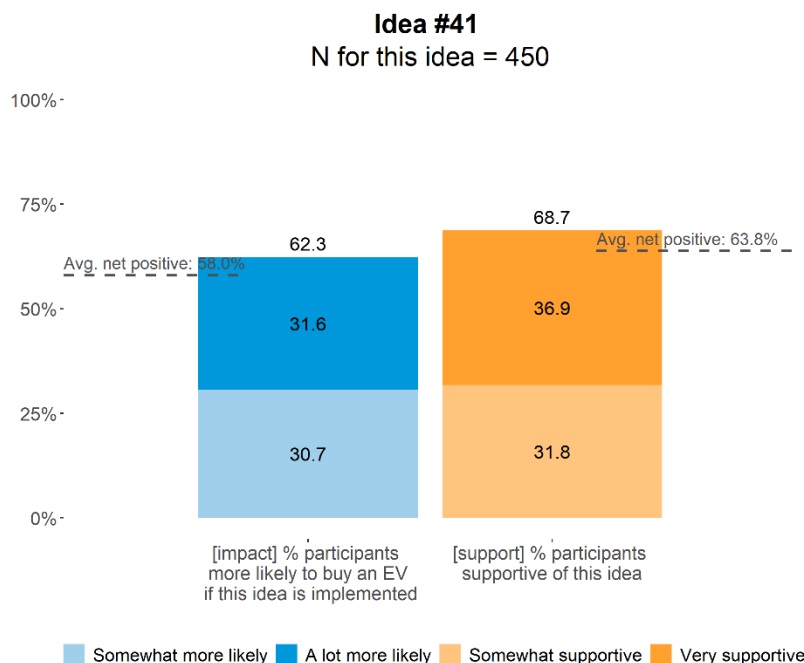
Provide free parking for EV drivers, ideally across all publicly owned car parks, giving a further financial benefit and a strong incentive for EV ownership.

Rationale: A salient and recognisable additional incentive to encourage adoption, and offset increased upfront costs

Recognised risks: Parking revenue is a key source of income for local authorities.

Private consumer feedback

Survey description: Imagine parking in public spaces (those owned by local authorities) was free for all electric vehicles.



Key findings from online survey

1. **Impact:** 62.3% of participants indicated they were somewhat or a lot more likely to consider buying an EV if they were entitled to free parking. This is slightly higher than the average across all policy ideas tested for uptake of EVs (58%).
2. **Support:** 68.7% of participants were somewhat or very supportive of introducing this policy, slightly higher than the average of 63.8% across all ideas.
3. **Subgroups:** There are no notable differences between subgroups beyond those observed across all policy ideas.

Key findings from focus groups

1. Participants generally thought that free parking would make them somewhat more likely to adopt an EV, but questioned whether the charging would also be free and whether fees for parking might be re-introduced once a critical mass of vehicles were electric.
2. Participants queried what impact this might have on parking businesses and local authorities who rely on parking revenue to fund local services.
3. Just over half of the group were very supportive, with the remainder being indifferent or unsupportive. The participant who was unsupportive said they thought that this idea only benefits people who can already afford to buy/run an EV and thought it would require “more costly infrastructure”.

Conclusion and recommendations



Impact: Moderate. As we might expect, even though support for this idea was reasonably strong, the stated impact on EV purchases was more modest (though still slightly above average). This is unsurprising given it is quite a modest financial incentive. Nonetheless, there may be other behavioural factors which amplify this policy's impact - in particular, it would be a salient benefit appreciable by all drivers every time they park (unlike, say, some financial offerings which may only become known about when someone looks into them or is actively considering a car purchase).



Support: High. This idea seems relatively non-contentious, and received high ratings in the survey. Though there will be some inevitable resistance from the fact that it most benefits those who can afford to buy an EV. Ultimately it may be wise to monitor public perceptions when rolling out such a policy. This is easy to do given the policy is well suited to piloting in certain regions.



Readiness: Moderate. The policy idea is simple, and could be implemented rapidly by some local authorities. However at a wider scale, further thought would be needed on the implications of local authority revenue and impacts on wider local authority strategies (e.g. reducing congestion).

Conclusion

This is a lower impact, but highly cost-effective and low-regret policy that is well suited to trialling in some areas to measure public response. Our main reservation, and that of local authorities, is that it promotes car use above other forms of transport. This policy may be more appropriate on some areas within local authorities than others, depending on the wider local transport plans.

Research next steps

We recommend continuously monitoring public support for this idea. To measure the impact on EV uptake, comparison between different local authorities using either propensity score matching or a

difference-in-differences setup to monitor EV registration numbers in areas with and without free parking for EVs. It would also be beneficial to identify a small number of willing vanguard authorities to trial this idea, tracking public perceptions and acceptance through implementation and use. It would also be wise to monitor traffic flow in areas where free parking is offered, since any form of free parking (even if only a minority of cars are eligible) may have the unintended consequence of increase car use.

#161: Scrappage scheme

Convert the EV grant (or create a similar fund) to operate as a true scrappage scheme, allowing it to be used for second-hand purchases too. Receipt of the fund would be conditional on buying a replacement car (registered to the same driver) that is an EV (or meets certain emissions standards).

Rationale: The grant scheme is good for people buying new EVs. However, turning it into a scrappage scheme (with certain conditions) means it will a.) be usable for people buying second hand EVs, and b.) can be used to target the older, more polluting vehicles from the road, rather than simply offsetting purchases of relatively efficient ICEVs.

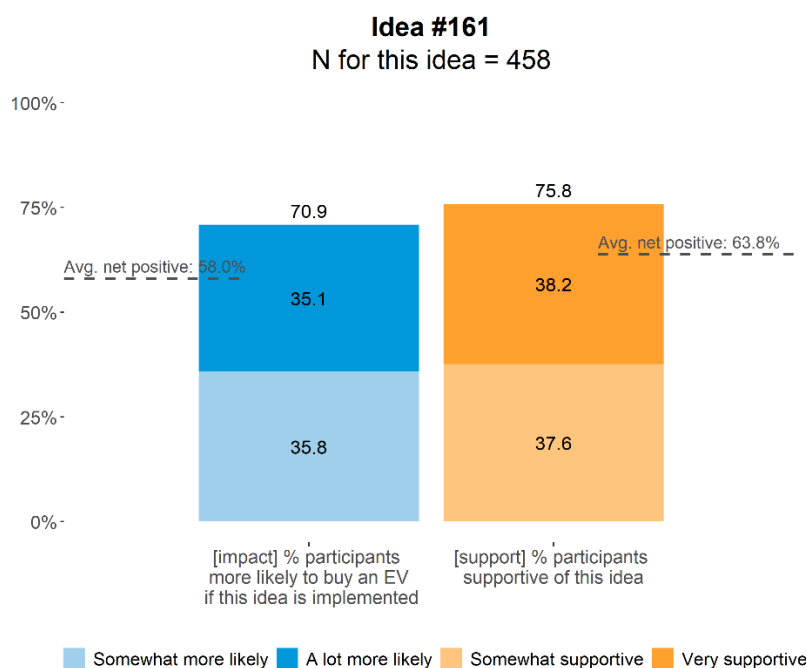
Recognised risks: There have been some problems with scrappage schemes in the past. They tend to be poor value for money (e.g. bringing forward purchases that would have happened already) and can be susceptible to gaming or fraud, though we believe a well-designed scheme can mostly avoid this.

Private consumer feedback

Survey description: The government currently offers a £3,500 grant on new electric vehicle purchases (therefore not including second hand purchases). This is automatically deducted from the upfront cost of the vehicle.

Imagine this money was now available even when buying a second hand electric vehicle, so you would receive £3,500 when you trade in your old petrol or diesel car for a second hand electric vehicle.

(We note, the grant value has been reduced to £3,000 as of March 2020, after we gauged feedback from the public).



Key findings from online survey

1. **Impact:** 70.9% of participants indicated they were somewhat or a lot more likely to consider buying if the EV grant money was converted (or available as) a scrappage scheme. This is substantially higher than the 58.0% average across ideas tested for likelihood of EV purchase. Moreover, this relatively high stated impact came mostly from an increase in those stating they would be 'much more likely' to buy an EV (rather than 'somewhat more likely').
2. **Support:** 75.8% of participants were somewhat or very supportive of introducing this policy, well above the average support rate of 63.8% across all ideas.
3. **Subgroups:** Support for this idea was slightly higher among those living with their parents. This may relate to the fact that younger buyers are more likely to rely on the second-hand market, and/or have an older and less valuable car they could scrap.

Key findings from focus groups

1. Participants were unanimous in thinking this idea would make them more likely to buy an electric vehicle, with five of the nine participants saying "a lot more likely". Eight of the nine participants were somewhat supportive or very supportive of the idea.
2. Generally participants felt this could be an effective intervention to bring new EV prices down to a more affordable level whilst also helping to push second-hand values up. Incentivising removal of older vehicles off the road was also looked on favourably.

Conclusion and recommendations



Impact: Moderate. Survey results show the impact to be very high, though we would expect more modest impacts. There are two mechanisms at play here: 1. Re-framing existing money in a manner which may be more appealing or salient, and 2. Allowing the scheme to apply to second hand vehicles. It is not clear which of these aspects is driving the high survey response, but given second-hand EV purchases are relatively few, and the money provides no additional incentive to that currently on offer, we anticipate the impact to be moderate. There may also be some disconnect between those who have a car worthy of scrapping, and those who would be in a position to buy an EV.



Support: High. Support seems to be high, potentially because it targets financial support at removing the most polluting vehicles from the road, and could be construed as being more targeted towards lower-income households who might be more likely to have a 'scrappable' vehicle (though this may not always be true in practice).



Readiness: Moderate. There are some logistical barriers to address before implementation is possible. In particular, avoiding mis-use of the policy by people buying an old car simply to scrap, or indeed the same vehicle getting awarded the grant more than once. The process of validating scrappage claims and implementing the incentive can also be complex.

Conclusion

Stated impacts and support for this idea are somewhat higher than expected. The data suggest it is worth pursuing, though further research to understand the basis of such support would be wise, and to further 'stress-test' the policy with consumers. Beyond consumer support, we also recognise the implementation risks and challenges this idea poses.

Research next steps

The impact of this idea on EV uptake could be evaluated using a pilot field RCT where a sample of dealerships (or a region of dealerships) operates the scrappage scheme, and sales are compared to a control group either as a true randomised controlled trial, or a quasi-experimental method (e.g. difference-in-differences).

#44: Reduced insurance premiums

Reduce insurance premiums for EVs.

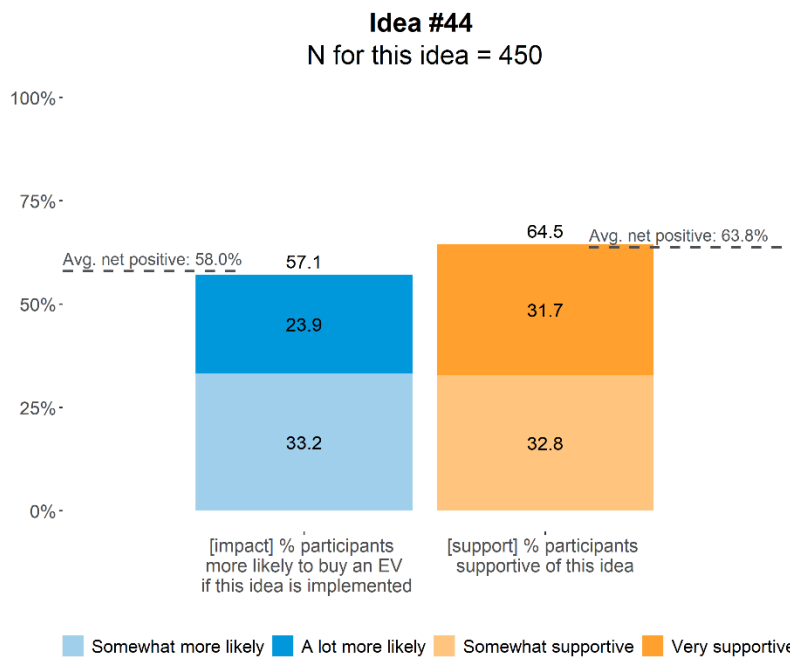
Rationale: Insurance for EVs can typically be slightly more expensive due to costly repairs if the battery is damaged, and fewer garages being able to repair them. Insurance premiums could be reduced for EVs, which would also serve as a mechanism for offsetting the higher upfront purchase costs, either by:

- Instating a market-wide re-insurance levy (similar to FloodRe) where the cost of EV insurance is levied across all vehicle insurance premiums, or
- Waiving Insurance Premium Tax, equating to around 12% of the insurance premium

Rationale: Reduces the running costs of EVs and offsets increased upfront cost.

Private consumer feedback

Survey Description: Currently, insurance for electric vehicles tends to be slightly more expensive than for petrol or diesel vehicles. Imagine government waived the insurance premium tax of 12% for electric vehicles, meaning insurance was roughly the same between electric vehicles and petrol/diesel vehicles.



Key findings from online survey

1. **Impact:** 57.1% of participants indicated they were somewhat or a lot more likely to consider buying an EV if insurance premiums were reduced. This is close to the 58.0% average across ideas, though we note that relatively few people felt they were 'much more likely to consider buying an EV', with most positive responses being 'slight'.
2. **Support:** 64.5% of participants were somewhat or very supportive of introducing this policy, close to the average support rate of 63.8% across all ideas.

3. **Subgroups:** There are no notable differences between subgroups beyond those observed across all policy ideas.

Key findings from focus groups

1. There was generally mixed feedback on this idea; the group was split as to whether they thought reduced premiums would make a difference, with slightly more in support than not.
2. Reasons for perceived low impact included that some participants felt overall running cost benefits would already be an incentive for some buyers, so insurance premiums would already have been included in their calculations and a further reduction would make no difference. Some also felt the amount of saving being offered was too small.

Commercial fleets feedback

Key findings from telephone interviews

1. Overall the idea was viewed positively, and the organisations indicated they would be supportive.
2. However, the level of impact for each organisation varied, from high impact, to no impact. This appeared to depend on the nature of the business and the way the fleet was managed / set-up. For example, one organisation stated that they self-insure their fleet vehicles, and as such this policy would have no impact for them. Others stated that reducing the insurance premium would represent a big cost saving though, and it was felt this would have a positive impact on the organisation being able to switch to EVs.

Conclusion and recommendations



Impact: Low. As an incentive, discounted insurance is relatively weak as it occurs in the future (yet we focus on upfront costs) and is a small fraction of the total ownership costs. This is not to say the policy is not worthwhile, if the cost of implementation and feasibility are good. We also believe the high fraction of 'slight' support over 'strong support' is illuminating – it wouldn't have a negative impact, but it's unlikely to be a strong motivator.



Support: Moderate. Support within the survey group was modest - as might be expected when discussing a government subsidy. However it was not overwhelmingly strong, and focus group attendees and commercial consumers similarly had mixed feelings.



Readiness: High. There are no significant barriers to adopting this policy in the near term.

Conclusion

Though there are no major drawbacks to this policy and it could be implemented with ease, it provides a relatively weak incentive, incurs some cost to the government, and benefits wealthier motorists with EVs the most. It is therefore not one we would prioritise at this stage.

Research next steps

If considered as a viable option, further consumer testing would be wise to ensure it provided government with value for money. If implemented, this policy could be evaluated using pre and post-implementation random population surveys to understand how people think and value this policy.

#109: Mandate the disclosure of vehicle emissions by delivery firms and other large fleet operators and thereby incentivise EV adoption

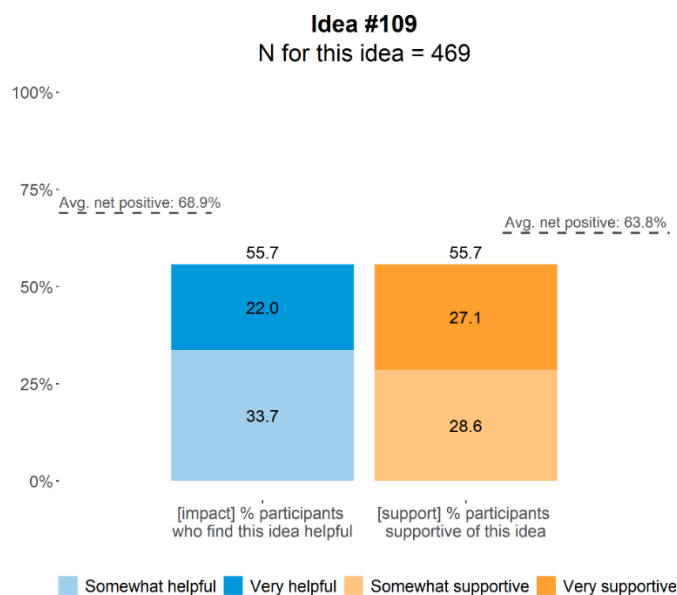
Mandate the disclosure of vehicle emissions by delivery firms and other large fleet operators and thereby incentivise EV adoption through reputational and market pressure.

To facilitate easier implementation, the mandate could be tied to carbon disclosure requirements already in place for listed companies. The new information would also influence investors, not just end-users, in both cases incentivising firms to adopt greener fleets.

Rationale: Similar to requirements to publish gender pay information among large firms, by making this information public, we de-shroud the market. To the extent that consumers and businesses employing the services of these fleet operators care about emissions and air quality, this is a mechanism to 'regulate by reputation'.

Private consumer feedback

Survey description: Imagine operators of large numbers of vehicles (e.g. food and parcel delivery companies, supermarkets that deliver) were required to publish information on their vehicles' carbon emissions. This information could enable you to compare between companies to assess their 'green credentials'.



Key findings from online survey

1. **Impact:** 55.7% of participants indicated they would find such information disclosure somewhat or very useful. This is substantially below the average of 68.9% across all policy ideas tested for usefulness.
2. **Support:** 55.7% of participants were somewhat or very supportive of introducing this policy, below the average support rate of 63.8% across all ideas.

3. **Subgroups:** There are no notable differences between subgroups beyond those observed across all policy ideas.

Key findings from focus groups

1. Support ranged from indifferent to very supportive and perceived helpfulness of the information also varied. Some participants were not at all concerned about 'green credentials' and wholly concerned with the quality and cost of service. Others thought it was a great idea and that it would inform their purchasing and patronage choices and generate competition among companies.
2. There were some concerns that it may hurt smaller companies who may not be able to match efficiencies of the larger companies. It was also noted that some larger companies, for example Amazon, don't have their own fleets so it would be difficult to include them in comparisons unless their supply chain carbon emissions were included in the calculations.

Commercial fleets feedback

Key findings from telephone interviews

1. Most organisations were generally supportive of this idea and reported that they already capture and report fleet emissions data.
2. Concerns were raised however about the practicality of implementing this for all businesses in a fair way. For example, one organisation felt that this would create an unfair penalty for them, because they felt less likely to switch to EVs currently than some of their competitors, due to the nature of their operation and lack of suitable electric models at the moment.

Conclusion and recommendations



Impact: Moderate. Though consumer interest was relatively low, the strength of this policy is that it may trigger competition in the market anyway. Even if just a small fraction of consumers or businesses switch their suppliers (delivery firms etc.), or if these suppliers perceive a threat to their reputation, this leverages market competition between suppliers to improve their environmental performance. We therefore believe it could achieve moderate impact if implemented well, though it does depend upon certain market dynamics playing out which are difficult to predict. (i.e. X% of consumers switching their choice of delivery firm, creates Y incentive for the supplier to shift their vehicle choice, but X and Y are both unknown – they may or may not be sufficient to tip the balance).



Support: Moderate. Support was relatively modest, and many people were indifferent. There were relatively few who actively disliked the idea, with the possible exception of small businesses who may be disadvantaged, and so the policy would need to be designed in such a way as to ensure fairness.



Readiness: Moderate. This puts additional reporting burdens on businesses, and so supporting systems will need to be developed to make this as frictionless as possible. There may also be an argument for rolling out this idea in a couple of years' time, once more fleet operators have started to adopt EVs, so there is greater differentiation in the market which can be leveraged. The need to provide fleet operators with sufficient warning, so they do not buy a fleet of ICEVs one year, and find themselves penalised the following year, would also delay implementation.

Conclusion

This policy's strengths lie in its ability to de-shroud a market and leverage competition between fleet operators to good effects, whilst being essentially costless for government to implement. We therefore believe it is worth exploring further.

Research next steps

The impact of this policy on consumer choice can be tested in collaboration with a large delivery company or a third-party comparison website offering various delivery choices. A/B testing can be used on the company's website to measure if information on vehicle emissions changes consumer choice on that website. This quantification of consumer switching, can be the used to estimate whether or not enough consumers would switch to make it commercially beneficial for fleet operators to buy EVs.



#157: Procurement incentives

Procurement processes, across all government departments, could award additional points for organisations who have green fleets.

Rationale: This would give organisations who adopt EVs a competitive advantage in public tenders.

Commercial fleets feedback

Description: Imagine that government procurement frameworks and other mechanisms awarded additional points to organisations who have green fleets, providing a competitive advantage in public tenders to organisations who adopt EVs.

Key findings from telephone interviews

1. There was generally a good level of support for this idea and most organisations felt that it would have an impact (except those who are not currently involved with public tenders).
2. A common concern was a need for fair implementation of the incentive, so as not to disadvantage some businesses over others as a result of their operational requirements. In particular, organisations should not be penalised for having ICEVs in their fleet where no suitable EV alternative is available on the market.

Conclusion and recommendations



Impact: Moderate. This could be a big incentive for those companies for whom government is a big client (though it depends how much weight government procurement puts on this factors). The policy will likely have ripple-effects on other companies and sectors who don't directly supply government. The idea also sends a strong signal to industry on what the 'right and desirable' behaviour is and indirectly also on what the future car markets will look like. That symbolic value plus the direct impact on government suppliers makes the overall impact of this 'moderate'.



Support: High. Support seems fairly high in the interviews. Some have however, rightly pointed out that the policy needs to be designed in a fair way so as to not disadvantage any particular businesses.



Readiness: Moderate. As pointed out in the interviews, it's important the scheme would be fair and not disadvantage any suppliers. It may be that this requires clever workarounds that take time and research to get right.

Conclusion

As well as providing a direct incentive, by changing its procurement rules this way, government would signal the importance and desirability of prioritising EVs, and that government is serious and committed to its own policies. The symbolic value of doing this, or in fact the symbolic value of not doing this could be quite far-reaching. The next step should be to figure out if there are any major implementation challenges.

Research next steps

The first step after implementation would be to measure whether the new system increases the odds that an EV-using supplier wins the tender. Pre-post measurements would likely be inadequate given the background rising level of EV adoption, though a randomised trial would be unfair – we therefore suggest a hypothetical exercise where the proposed procurement rules are applied to a number of applications to see if the procurement decision would have changed. This can be used to design the weighting of this factor in procurement decisions – since it is only worthwhile if it would lead to a change in a non-trivial number of procurement decisions. Subsequently, the impact of the policy could be inferred from supply data on the types, number and prices of offers made to government in response to these changes in procurement rules. Suppliers could also be surveyed about how they've responded to these changes and their more general attitudes towards the policy and EVs.

#5: Green credit for EVs

Provide favourable credit options to individuals and businesses for buying EVs on credit (allowing them to borrow more money if choosing to buy electric).

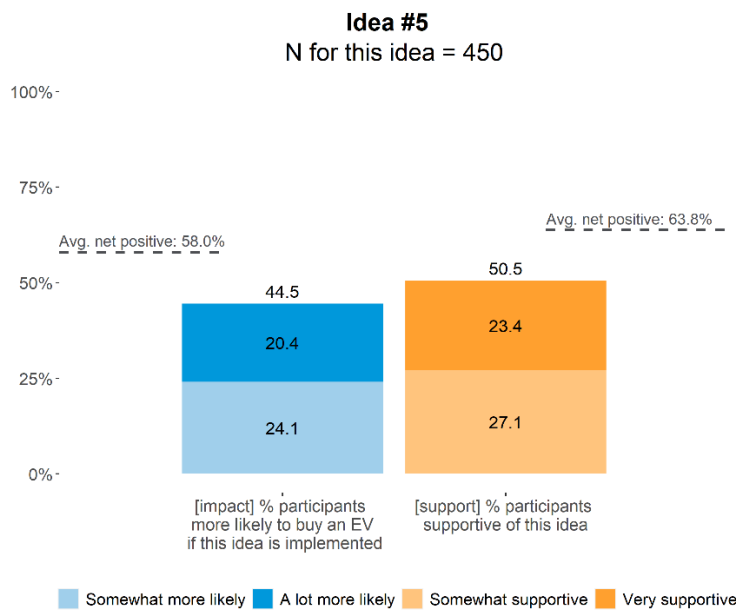
This could simply be more generous lending limits against EVs, justified by the fact that repayment costs are easier to manage due to lower running costs (analogous to 'green mortgages' through which lenders lend more against more energy efficient homes due to lower energy bills).

Alternatively, it could be a more conventional incentive, with reduced interest rates for EVs. In this case, the government's role might be to back the loan to offset the risk of reduced interest rates or more generous lending.

Rationale: Reduce the impact of upfront cost barriers

Private consumer feedback

Description: Imagine you are either leasing a car or buying a new car on credit. Now imagine you could borrow more money if you chose an electric vehicle instead of a petrol or diesel vehicle.



Key findings from online survey

- Impact:** 44.5% of participants indicated they were somewhat or a lot more likely to consider buying an EV if generous credit options were available. This is substantially lower than the 58.0% average across ideas. This relatively low level of impact was driven by a large number of people feeling indifferent, rather than negative responses.
- Support:** 50.5% of participants were somewhat or very supportive of introducing this policy, substantially below the average support rate of 63.8% across all ideas. This was also driven by high numbers of people indifferent to the idea, although there were also more people who were actively against the policy: 16.9% of respondents viewed it negatively, compared to 11.6% average across all policy ideas.

3. **Subgroups:** There are no notable differences between subgroups beyond those observed across all policy ideas.

Key findings from focus groups

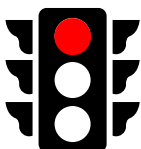
1. Just over half of participants said access to “green credit” would make them somewhat more likely to adopt an EV, albeit with caveats around the loan term and interest rates. These people cited reasons such as wanting to buy a more environmentally friendly vehicle even if it was more expensive. Others felt it would make no difference to them as credit would just spread the cost but not bring prices down.
2. Support was also mixed; those who were unsupportive expressed concerns about increasing levels of debt.

Commercial fleets feedback

Key findings from telephone interviews

1. Feedback suggested this idea may have very little (to no) impact for some commercial fleets because of the way vehicles are typically acquired by organisations (leasing or direct purchase). Access to credit was generally not an issue for most of the organisations interviewed, although one organisation did indicate that they would be interested in this type of scheme if applicable to vans and HGVs.

Conclusion and recommendations



Impact: Low. The public did not rate the potential impact of green credits highly. This idea is designed to enable those to buy an EV who want to buy one but cannot do so because of the higher upfront cost – noting that it addresses access to cash barrier, without actually reducing the cost. The idea therefore only has merit if access to finance is currently a limiting factor, which is unclear – some reports suggest credit providers’ lending calculators are not sufficiently sophisticated to differentiate between an EV being out of lending limits but a comparable ICEV being within limits. More research is needed on this point.

Other participants also had reservations about the terms and conditions of this credit, which we didn’t explain in any detail in the survey and that might have led to a fairly large share of participants feeling indifferent or unsure, which may even explain their somewhat muted support and impact rating.



Support: Low. Support seems to be fairly low. There are a few concerns about the setup of the credit and higher levels of debt but the latter would be made up for by lower running costs of the vehicle over time. The credit still doesn’t make EVs any cheaper, that is also likely to drive the muted level of support.



Readiness: Moderate. Interest and demand for this product from financial services providers is unknown but it seems to be fairly low cost and risk to put it on the market to gauge demand. Further research would be required to figure out the credit term details, e.g. how much higher would the credit be, etc.

Conclusion

Government would have a limited role to play in this but it would be worth talking to the financial industry to pitch the idea and gauge their interest.

Research next steps

A scoping study with industry should be done to explore feasibility of car credit providers to fine-tune their loans this way, and also to understand potential demand for this product in the population. In particular, this idea only has merit if credit providers are currently turning down loans for, say, a £35k EV where they would approve the loan for a comparable £30k ICEV. This should be further researched.

#21: EV-to-work scheme (new cars)

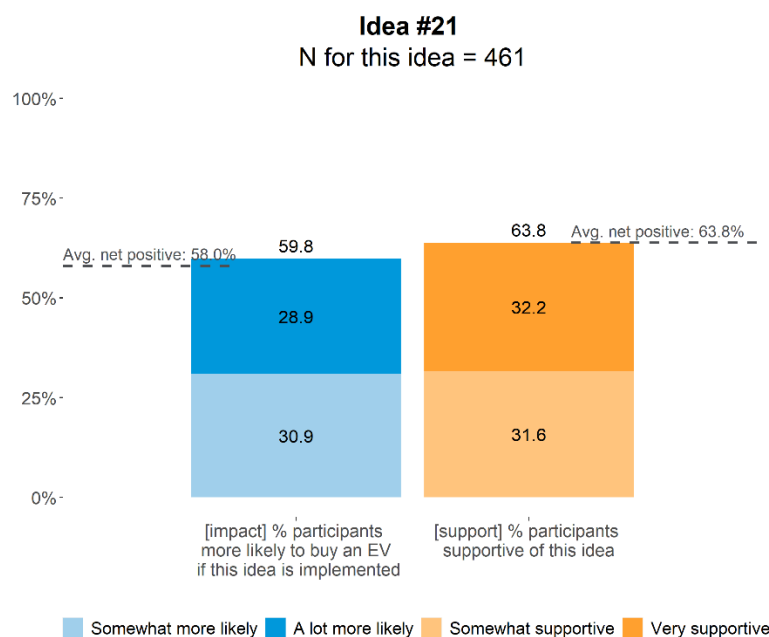
An 'EV-to-work' scheme would operate in a similar fashion to the existing cycle-to-work scheme. This allows consumers to purchase or lease EVs out of their gross salary, to encourage sustainable commuting, and provides significant benefits for the consumer in terms of income tax and NI savings.

Rationale: These savings would be substantial (30-50%), and so would likely help to address upfront cost barriers.

Recognised risks: Apart from being an extremely costly policy, there is a likelihood that it might hit manufacturers' limits in EV supply. Targeting commuters, there is also a risk that it would offset public transport use rather than offset ICEV use, though this could be mitigated, e.g. by designing it as a trade-in scheme.

Private consumer feedback

Description: Imagine you could buy an electric car using your pre-tax income, which could equate to up to roughly 30% off the car's price for lower-rate tax payers, and up to roughly 50% discount for higher-earners.



Key findings from online survey

1. **Impact:** 59.8% of participants indicated they were somewhat or a lot more likely to consider buying an EV through an EV-to work scheme. This is close to the average of 58.0% across ideas tested for likely purchase of EVs.
2. **Support:** 63.8% of participants were somewhat or very supportive of introducing this policy, aligned with the average of 63.8% across all ideas.
3. **Subgroups:** As might be expected, support and likely impact for this idea was highest among working age (25-54) respondents, and among those earning more than £30k (who would save

more on tax), though in both cases the differences to other age groups and those earning more than £30k were not large.

Key findings from focus groups

1. About half of participants said that being able to use pre-tax income to buy an electric car would make them more likely to adopt one. Those who said it wouldn't, voiced strong concerns about the scheme compounding inequality – “the more you earn, the less you pay!” One participant didn't feel that the discount would be sufficient to overcome their concerns about vehicle performance.
2. Opinions were generally divided by income level, with lower income / no income participants expressing strong dissatisfaction with the idea as it would be of less benefit to lower income earners and was seen to unfairly advantage higher income earners (who were already advantaged).
3. The group also discussed the potential for this kind of scheme to drive prices up to match the increased capacity to pay.

Conclusion and recommendations



Impact: High. The scheme would make EVs significantly cheaper and more affordable (up to 30-50%). The impact on uptake can therefore be expected to be substantial, particularly for those with higher incomes, who might be more inclined and warmed-up to the idea of buying an EV already. The average survey rating is therefore somewhat surprising but perhaps explained by the fact those who are not employed wouldn't benefit and also those with lower incomes might not consider these savings to be enough to tip them over the edge.



Support: Moderate. Like with impact, support for this idea in the survey was average, which might be explained by similar reasons as above. It really only benefits those who are currently employed and it significantly benefits those with higher incomes more, which might be unpopular as also raised in the focus groups. We note, however, that this is the same with the existing cycle to work scheme (albeit the money involved is far less).



Readiness: Moderate. Lots of technical, tax and legal details would need to be figured out before implementation is possible, perhaps most importantly the estimated cost (foregone tax revenue) to government, which might be substantial. However, similar schemes exist already, so it should be within reach to implement this on a wider scale.

Conclusion

It provides enormous financial support to many of those potential early adopters who are most likely to buy an EV – it is therefore worth considering. We are however conscious of the potentially high cost and implementation challenges.

Research next steps

A scoping and feasibility study should be done to model the potential cost to government in lost tax revenue. It may also be worth considering implementing the idea with a cap on total expenditure, which would essentially mean it's rolled out on a first-come-first-serve basis. Finally, a field trial could be developed by drawing on similar existing schemes (e.g. those provided by Octopus Energy), testing uptake under different conditions or designs of the incentive.

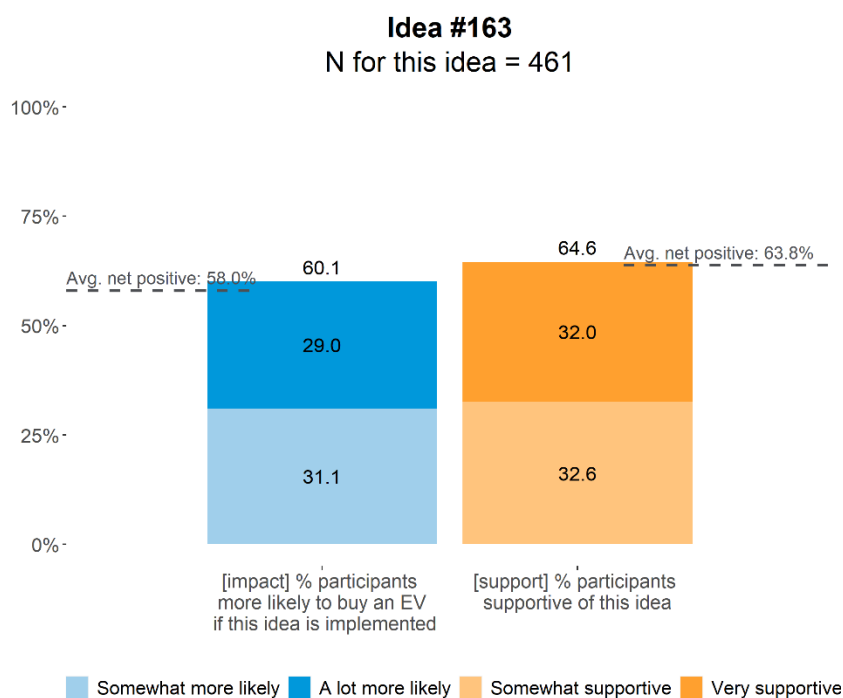
#163: EV-to-work scheme for used EVs

An 'EV to work scheme', as described above (idea #21) could be adapted to second hand purchases from company fleets. This would allow employees to buy EVs from their employer's fleet (after the vehicle has been used for 3 years), from their pre-tax income to achieve large savings. Eligibility could be broadened by allowing vehicles to be sold from one company to employees of another participating company which doesn't have its own fleet.

Rationale: Buying an EV at second hand rates, with a 30-50% discount through tax relief, would provide an extremely strong incentive. The cost to government would be less than a nation-wide EV to work scheme, since the number of vehicles and eligibility would be lower, and the absolute value of the tax-break would be lower due to the lower value of second hand purchases.

Private consumer feedback

Survey description: Imagine you worked for a company that allowed you to buy an electric car, which had previously been used as a company car, out of your pre-tax salary. This would allow you to buy it at the second-hand price, but also save 30% - 50% off this price through tax benefits.



Key findings from online survey

- Impact:** 60.1% of participants indicated they were somewhat or a lot more likely to consider buying an EV if they could buy a second-hand vehicle from pre-tax income. This is close to the average across all policy ideas tested for uptake of EVs (58%), and close to idea #21 for a conventional EV to work scheme for new vehicles.
- Support:** 64.6% of participants were somewhat or very supportive of introducing this policy, close to the average of 63.8% across all ideas, and close to that for the conventional EV to work scheme for new cars (also 63.8%).

3. **Subgroups:** As with the conventional EV to work idea, support and likely impact for this idea were slightly higher among working age (25-54) and higher income (£30k+) groups, though the differences are relatively small (and less notable than with the conventional EV work idea).

Key findings from focus groups

1. Participants were generally supportive of this idea, but had mixed views on whether it would make them more likely to adopt an EV.
2. Positive aspects raised included that it would enable costs to be spread and savings to be made.
3. The one person who thought it would make them less likely cited concerns about how the vehicle might have been driven whilst being used as a company car, and the remaining battery life. However, others thought it was a positive aspect because they would know the history of company cars. In discussion, it was suggested that the scheme should also apply to new vehicles.

Commercial fleets feedback

Key findings from telephone interviews

1. The value of the idea was understood and in general support was high, with a positive benefit perceived for employees.
2. With the exception of one organisation who does not currently offer company cars, all organisations indicated they would be very likely to engage with this type of scheme, and felt it would have a positive impact on employees and the business.

Conclusion and recommendations



Impact: Moderate. Survey participants rated this idea slightly higher on impact on EV uptake than #21, which was focused on new vehicle purchases. This might be explained by the fact that second-hand vehicles will be cheaper overall, and in combination with the tax saving therefore can make EVs accessible to a larger proportion of the population. However, we are somewhat more reserved about impact simply because for people to have access to this scheme, they need to work for a company that has a company fleet in the first place and even those would probably have to wait for those cars to be turned over before they are offered to employees.



Support: Moderate. Like with impact, support levels were slightly higher than for idea #21. Given that tax savings would now be smaller in absolute terms (though still increase with income level) might make this idea more palatable from an equality perspective.

Interestingly, commercial fleets were quite supportive of implementing this idea – which is important as they are the key partners.



Readiness: Moderate. Like with idea #21 there are quite a few legal and tax implications to consider though the overall scheme would certainly be less costly for government.

Conclusion

Idea #21 and #163 harness the same tax benefit but essentially target different groups of the population. If implemented together, impact could be very substantial, though this has to be weighed up with the potentially excessive cost.

Research next steps

As for idea #21, once legal and tax implications have been assessed, a Randomised Controlled Trial could establish the impact of this idea on the level of interest (and with a longer timescale in mind, also purchases) of EVs. The easiest way to do this may be to seek partnerships with existing providers of similar systems, e.g. Octopus Energy.

#27: Collective purchase agreements

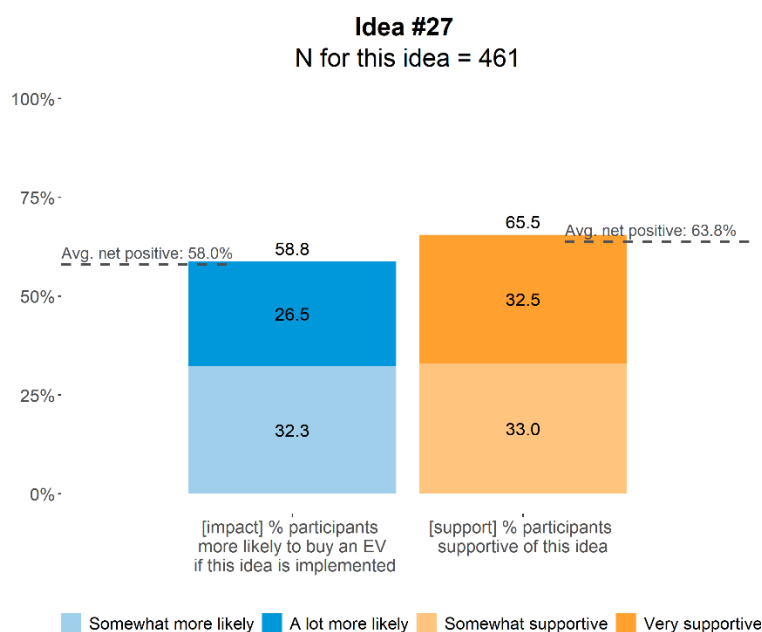
Local authorities to coordinate and support collective purchase agreements of EVs among local groups. For example, by setting up an online portal for people to submit expressions of interest, and then managing the purchase agreement with the manufacturer.

This could be supplemented with further targeted subsidies.

Rationale: Reduce impact of upfront cost barriers by securing bulk-buy discounts, and driving rapid uptake in targeted areas (e.g. cities with high air pollution)

Private consumer feedback

Survey description: Imagine your local authority helped a group of you and other people in your area to each buy an electric car by negotiating a bulk-buy discount with a manufacturer.



Key findings from online survey

1. **Impact:** 58.8% of participants indicated they were somewhat or a lot more likely to consider buying an EV if they could use a collective purchase agreement to benefit from a discount. This is close to the average across all policy ideas tested for uptake of EVs (58%).
2. **Support:** 65.5% of participants were somewhat or very supportive of introducing this policy, slightly higher than the average of 63.8% across all ideas.
3. **Subgroups:** There are no notable differences between subgroups beyond those observed across all policy ideas.

Key findings from focus groups

1. Participants were split on whether the idea would influence how likely they were to adopt an EV. Participants were either somewhat supportive or indifferent.

2. Those who said it wouldn't make a difference, or would make them less likely to adopt an EV, cited implementation issues, questions about effectiveness in reducing costs and not being "into" collective buying. Those who said they would be more likely to adopt an EV still had doubts about its practicality.
3. Concerns about implementation included whether it would really be accessible to everyone, and whether it would affect flexibility around model choice and personalisation.

Conclusion and recommendations



Impact: Moderate. The idea received an average rating on impact in the survey. People voiced some concerns about equal accessibility, and whether you'd be able to personalise your car/make/model. Trust on one's local authority seems key for this idea to work, and the ultimate impact would depend on the level of the discount achieved through bulk buying.



Support: Moderate. This idea received slightly higher than average support and as it's a voluntary scheme with no extra cost to consumers, this rating makes sense.



Readiness: Low. There are many open questions to be considered around this idea: who would lead the coordination, how would manufacturers react to this idea, would there be enough demand in one region to justify a discount? Overall readiness we think is low because it's not clear if local authorities or anybody else would actually be willing and ready to take on this coordination role.

Conclusion

We think this is an innovative approach and one which local authorities may wish to independently explore, though assistance from central government (establishing frameworks and processes) would be helpful. The impact ultimately depends on the system being frictionless, and the local authority being able to negotiate substantial discounts without limiting choice.

Research next steps

Three questions would need to be investigated upfront: would manufacturers be willing to participate in this scheme? And what discount could they offer? And is there resource in government available on a local level to coordinate this?

If implemented, the scheme can be evaluated using a difference-in-differences analysis comparing uptake in areas with the scheme to areas without the scheme.

#156: Mandate fleet ZEV targets

Regulate fleets (e.g. of a certain size and composition) to have a minimum proportion of zero emission vehicles, with targets scaled over time while phased in to avoid supply shortages or sudden expense burdens.

Rationale: Increase adoption of EVs in fleets, which will in turn feed the consumer market.

Recognised risks: If imposed with no incentives or support alongside, it could be quite a substantial financial burden on businesses. It may also require primary powers to mandate, and so feasibility will depend on political appetite. Vehicle supply may also limit mass uptake.

Note that idea #109 (mandating fleets to publish emissions or fleet information) is a much softer version of a similar approach, seeking to 'regulate by reputation' rather than by force.

Commercial fleets feedback

Key findings from telephone interviews:

1. Organisations varied in terms of their reported level of support.
2. Some were supportive of the principle, but noted that their organisation already has ambitious emissions-related targets for the fleet, and so felt a government mandate would add little further benefit to them.
3. Another organisation was supportive but concerned about ability to comply currently, due to a lack of suitable electric models for their type of fleet. One organisation was against the idea of a mandate.

Conclusion and recommendations



Impact: High. Mandating targets is one of the most powerful government levers, so it would certainly drive change in the market, especially among those fleets who could switch but don't currently have ambitions to do so. The mandate would be challenging for those that don't have a viable zero emission alternative to their current vehicles – and considering that segment of the market, change will be moderate.

In the medium term, as more ZEV fleet vehicles get phased out, it would help flood the second hand market with EVs, which is an important driver of uptake in the retail sector.



Support: Moderate. This mandate would remove the risks associated with being a first-mover and would create certainty among fleet operators as well as vehicle manufacturers of the direction and level of demand. Overall support was mixed though, questioning if such a draconian measure was necessary while others voiced concerns about not being able to meet the requirements.



Readiness: Low. Some research would need to be done to understand if a mandate is feasible for most fleets and to set the right target. Exemptions would need to be considered for those who would struggle to switch to ZEVs, and it is likely that a long notice period (of several years or more) would be needed to make this policy viable.

Conclusion

It's not clear if this idea is feasible from a vehicle supply perspective, not from a political feasibility perspective. Are enough vehicles (different types but also overall numbers) available to replace current fleets at a large scale? If so, the idea has merit and sends the right signal but questions remain if it's necessary to be this draconian or if these targets could also be achieved with clever incentives. The most feasible version of this idea may simply be to bring forward the date at which ICEV sales are banned, for fleets, by 5-10 years.

Research next steps

A feasibility study would need to be conducted, in particular to understand if supply could meet this new level of demand, and over what time period such a mandate could realistically be phased in.

#15: Larger grants for first X number of EV purchases

Increase the grant size for early adopters (up to a predetermined number) and respectively decrease the grant size after a certain number have been issued to contain costs. This is akin to marketing strategies used in 'flash sales'.

Rationale: Help create momentum in the market and harness 'scarcity bias' and 'loss aversion', which are nudging us to act on the premise that it's a limited offer - similar systems have been used in the USA with some success.

Conclusion and recommendations



Impact: High. Expert stakeholders at the workshop as well as our own judgement suggests that this idea could have a substantive impact on frontloading purchases by early adopters and those who are considering but hesitating to buy an EV. Scarcity bias and loss aversion can have a strong pull, as is often demonstrated successfully in flash sale marketing strategies like that of booking.com, e.g. 'only 2 more rooms available at this price'. In addition to these psychological drivers, the larger grant size will be an appealing incentive in itself.

Support: N/A



Readiness: Low. Considerable research would probably need to be done to establish the right level of grant sizes for early and 'late' adopters. The idea could also be quite controversial with the public, subsidising those who can more easily (and therefore earlier) buy and install a chargepoint at their home and afford an EV.

Conclusion

Impact on early adoption could be high. However, we have some concerns about the acceptability of the idea.

Research next steps

The next step should be to research public acceptability of this idea using a random sample population survey (or an online survey for a more pragmatic approach). The impact of this idea on EV uptake could be evaluated using an RCT. One group of people will be sent a prompt to visit an online platform with information about the existing grant. They can sign up through that platform. The other group is prompted to visit a similar platform, except that the grant size is now changing over time, and participants can monitor how it changes as more and more people sign up for it.

#14: Put deadlines on grant applications, or allow pre-applications

Create scarcity effects by making grants a time-limited offer. This could be achieved through a new grant scheme or a remarketing of the current grant, e.g. a phased reduction over time or messaging as a limited time opportunity.

(Variation) - separate the grant-application process from the car buying process, to allow people to prospectively apply for the grant. Being 'given' this grant, which is redeemable within a limited time window (say, 6 months) may harness loss aversion to the effect that they are more likely to go ahead with the purchase.

Rationale: We tend to over-value that which is scarce, and that which we already own (but may lose).

Conclusion and recommendations



Impact: Moderate. This idea seeks to maximise the subjective value of the existing grants, by harnessing loss aversion and scarcity bias, but the grant size doesn't actually increase. Thus the impact will be relatively modest.

Support: N/A



Readiness: Moderate. The grant size and method for distribution does not need to fundamentally change, though some further research and process would still be necessary.

Conclusion

This idea is low-cost, relatively quick to implement, and could particularly help frontload and accelerate uptake of early adopters, i.e. of those who are already considering to buy an EV. However, the potential downsides of introducing deadlines also need to be considered – that is, it might reduce the total number of applicants, since not everyone will meet the deadline.

Research next steps

The logic behind this idea – that deadlines and loss aversion boost uptake – should be further tested. This can be done with a variety of methods, and is well suited to an RCT either in the field or the lab (online).

#155 & #138: Expand on existing government marketing and communication campaigns targeted at private and commercial consumers based on segmentation and empirical data

Campaigns should continue to be more targeted, by following these steps for private consumers:

- ❖ Merging road-user segmentation with EV-user segmentation work to understand which segments most overlap (e.g. which road user segments are most likely to consider an EV soon)
- ❖ Undertake ICEV sales data analytics to build a deeper understanding of vehicle attributes valued within these market segments.
- ❖ Combining the above, identify segments which a.) have attitudinal characteristics most aligned with EV users and b.) whose preferred vehicle attributes can most readily be met by the EV market.
- ❖ Tailor and target communications accordingly.

The above should be aligned with ongoing communication efforts at GUL.

A similar process can be undertaken for commercial consumers. The key message here could focus on highlighting the loss fleet operators are incurring from the continued use of an ICEV fleet, and the benefits associated with switching to EVs. By using empirical data, businesses could be targeted proactively with personalised recommendations.

Rationale: Vehicle manufacturers themselves undertake sophisticated marketing campaigns but are not concertedly pushing EVs over their ICEVs. Government campaigns and communications can be less sophisticated by comparison. Recognising that EVs are not yet for everyone, greater efficiency (impact per marketing £ spent) can be achieved by continuing to target efforts at the most likely early adopters. Harnessing a number of behavioural insights (loss aversion, personalisation) and overcoming others (procrastination, status quo bias), this may help some private consumers and businesses, for whom EVs make sense but they haven't yet been proactive enough themselves.

Conclusion and recommendations



Impact: Moderate. For being an 'information' intervention the impact of this idea can be significant, especially if compared to the relatively small investment required. Interventions like grants or tax rebates are arguably more impactful but beyond comparison in terms of cost-effectiveness. Targeting those people most 'ready' to buy an EV with personalised information and offers, we believe can be powerful.

Support: N/A



Readiness: High. Given the existing setup and access to data and research, we rate readiness as 'high'. For example, GUL is already undertaking segmentation research as part of their upcoming 2020/21 campaign. We caution however that the difficulty with segmentation studies often is that it's not obvious how communication channels and information can be customised for each segment. In other words, segments are clustered around attitudinal variables which are most often not targetable. If the existing segmentations don't provide enough information, new segmentation studies would have to be designed.

Conclusion

This idea seems like partly underway already with Go Ultra Low - it's low-hanging fruit, not too costly, non-controversial and likely to have fair impact if done well.

Research next steps

There are two key research stages. First, undertaking and merging segmentation work to identify the target audiences, and secondly identifying the most effective marketing materials (informed by behavioural insights, social marketing, etc.) for those audiences. These Targeted marketing campaigns can then be evaluated using an RCT in the field, or piloted in an online experiment.

#87: Continue and improve emphasising savings on clean air zones and congestion charges

The increasing prevalence of (paid) clean air zones, and the added cost and complexity of driving within them in a more polluting ICEV, is a clear incentive to switch to an EV which could be leveraged more than it currently is. By highlighting the increasing number of zones in the UK, and the associated savings for EV drivers, this incentive can be made more salient. In particular, the benefit of future-proofing their purchase may be a strong incentive if it is made clear that the costs of not owning an EV are likely to increase.

Rationale: Leveraging an additional incentive for EV ownership.

Risks: Euro 6 ICEVs are currently exempt from clear air zone charges as well as EVs, so this system may need to be tweaked to increase impact.

Conclusion and recommendations



Impact: Low. While the financial and health benefits as well as the convenience of being exempt from any inner-city charges may be appealing to many people, these benefits seem relatively small in comparison to the hassle, cost and change in habits one has to take on when switching from an ICEV to an EV. They are also uncertain and in the future.

As alluded to above, currently Euro 6 ICEVs are also exempt from these charges, which may further reduce the impact of these messages on EV purchases.

Support: N/A



Readiness: High. It doesn't require much further research or preparation to distribute these messages either through a national marketing campaign or through local authorities and their communications around local clean air zones.

Conclusion

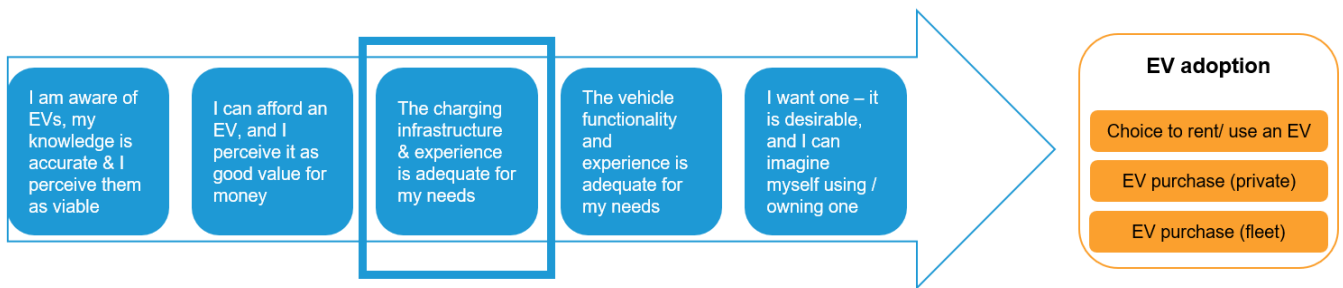
This is not the most impactful idea, but given it amounts to simply exploring a new angle within new and existing communications, it is worth exploring to ascertain whether it can be leveraged more effectively as an additional incentive.

Research next steps

The messages could be evaluated for impact on comprehension and desirability (via stated intention to purchase) in an online trial and mixed-methods consumer testing.

Objective 3:

“The charging infrastructure & experience is adequate for my needs”





#60: Set minimum standards for real-time data provision from charging points

Public chargepoint operators should be mandated to provide standardised data outputs so that real-time information on chargepoint status can be ascertained, e.g. whether it's working, occupied, or offline, etc. The minimum standards should also mandate that chargepoint providers indicate to users if the electricity provided is from renewable sources. Government's role could be to ensure open API and to regulate the minimum standards.

Rationale: This would simplify journey planning as consumers would have reliable access to real-time information, which would in turn reduce driver anxiety of not knowing where they will be able to charge.

Risks: Data protection and commercial sensitivities around data sharing need to be considered; these concerns have been flagged by chargepoint operators in the past. If data were integrated into journey planning applications, this should be done in a way that discourages phone use while driving.

Conclusion and recommendations



Impact: Moderate. Minimum standards for data provision should improve charging experience for current EV drivers and the immediate impact is expected to be greatest for this group. However social diffusion should serve to communicate those positive charging experiences to non-EV owners which would help to improve public perception and confidence in charging infrastructure generally.

Support: N/A



Readiness: High. We understand work is already underway with regards to chargepoint data sharing and standardisation, as such we consider this to have a high readiness level.

Conclusion

This idea is a valuable initiative which would help to improve charging experience for EV drivers by ensuring real-time information on chargepoint status could be remotely accessible from third-party applications such as Google Maps or Waze. This would reduce the likelihood of consumers arriving at a chargepoint and finding they are unable to charge. Positive experiences will likely diffuse from EV owners to non-EV owners.

Research next steps

Tracking of user experience will allow for baselining and measuring changes resulting from policy changes in future. The immediate need appears to be a technical regulatory response to standardise a relatively fragmented market that is known to impact on user experience.



#61: Target chargepoint installations at tourist spots

Increasing chargepoints in tourist/leisure areas would help with tourists' fears of an inadequate charging infrastructure, specifically at hotels, camping sites and other rural accommodation so that holiday makers can have confidence they will be able to charge at their destination.

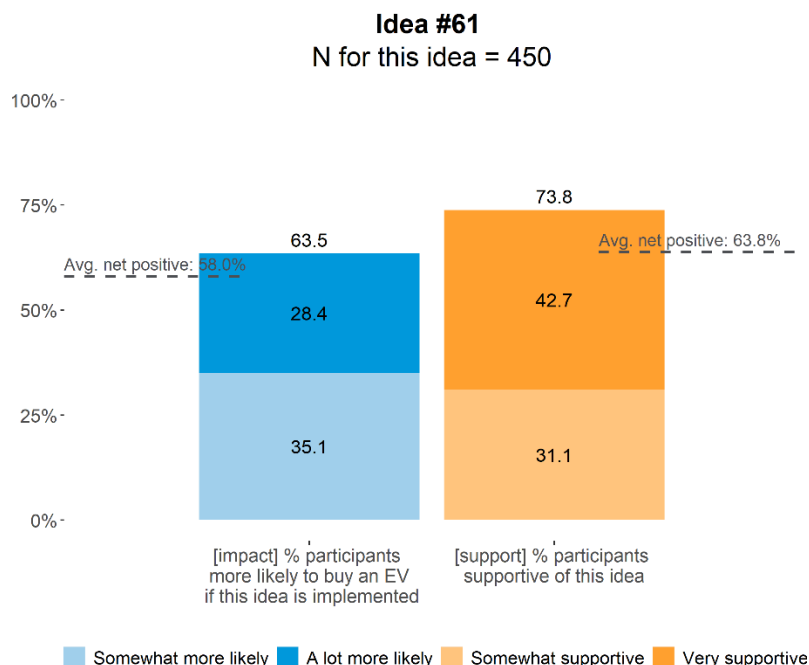
One mechanism to incentivise installations is to use the 'feed in tariff' system described in idea #71. By setting the right level of incentive, the installation of a chargepoint could become an attractive investment for owners of tourist facilities, in addition to future-proofing their business.

Rationale: Some qualitative feedback from previous TRL work suggested EV drivers struggled when going on holiday/weekends to rural/seaside areas where charging infrastructure is lacking. These journeys also tend to be longer. The feed-in tariff suggestion leverages a wider range of private sector players who might not have considered installing a chargepoint.

Risks: It's important to determine the right level for the incentive, and to implement it in a way that protects against misuse or fraud. The feed-in tariff might have adverse effects on the electricity network, for example, and installing chargepoints at locations where demand is too low could result in stranded assets.

Private consumer feedback

Survey description: Imagine the government installed more electric vehicle chargepoints in country, seaside or holiday locations.



Key findings from online survey

1. **Impact:** 63.5% of participants indicated they were somewhat or a lot more likely to buy an EV if such a scheme supported the rollout of chargepoints at tourist destinations - that's somewhat above the average net positive impact score of 58.0% across ideas.
2. **Support:** Around 73.8% of participants were somewhat or very supportive of this scheme - that's well above the average support rate of 63.8% across all ideas. This average also reflects the unusually high share of people being 'very supportive' of the idea (42.7%).
3. **Subgroups:** There are no notable differences between subgroups beyond those observed across all policy ideas.

Key findings from focus groups

1. The group was almost unanimously in favour of this idea and of the view that chargepoints in these locations would be in high demand. Perceived impact and support were both high as more charging infrastructure was considered a useful and positive step forward.
2. There were questions around whether it would be possible to install enough to meet demand, whether they would be free to use and whether the parking would be free.

Conclusion and recommendations



Impact: Moderate. Impact on EV uptake was rated above average. It would provide reassurance to those who fear EVs would be a hassle to drive on unknown routes and in particular to more rural and remote places. This will certainly be an important barrier for some people, even if journeys to these locations are infrequent. Indeed, for families who only own 1 car (or for whom the EV would be the bigger, family car), just 1 trip a year like this could mean EVs are judged infeasible if charging infrastructure is perceived as lacking.



Support: High. Support for this was high. Participants had no major concerns about the idea and thought it was sensible. It is expected that the tourist industry would support this idea, although no testing was conducted to validate this assumption.



Readiness: Low. Some work would need to be done to model demand, identify locations where chargepoints would be commercially viable and where government might need to support installation. The level of the incentive would also need careful consideration. Businesses at tourist destinations should also be consulted with to understand how interested they would be in this scheme.

Conclusion

Overall, the expansion of charging infrastructure in key areas and locations is necessary. To optimise impact, we think the rollout should not just focus on tourist destinations per se, a holistic and equitable

approach to public charging is needed using a variety of policy levers like incentives, mandates and subsidies to target supermarkets, petrol stations and other local businesses (combine with ideas #71 and #159).

Research next steps

Modelling work and feasibility studies are required to identify the optimal density and locations of an equitable chargepoint network. Further research might also explore the specific issue of perceived lack of charging infrastructure for occasional, long-distance journeys made by holiday makers. A small pilot study could be set-up in a given area alongside pre and post surveys to understand people's awareness and level of satisfaction with the local charging infrastructure and experience.

#62: Enhanced workplace charging scheme

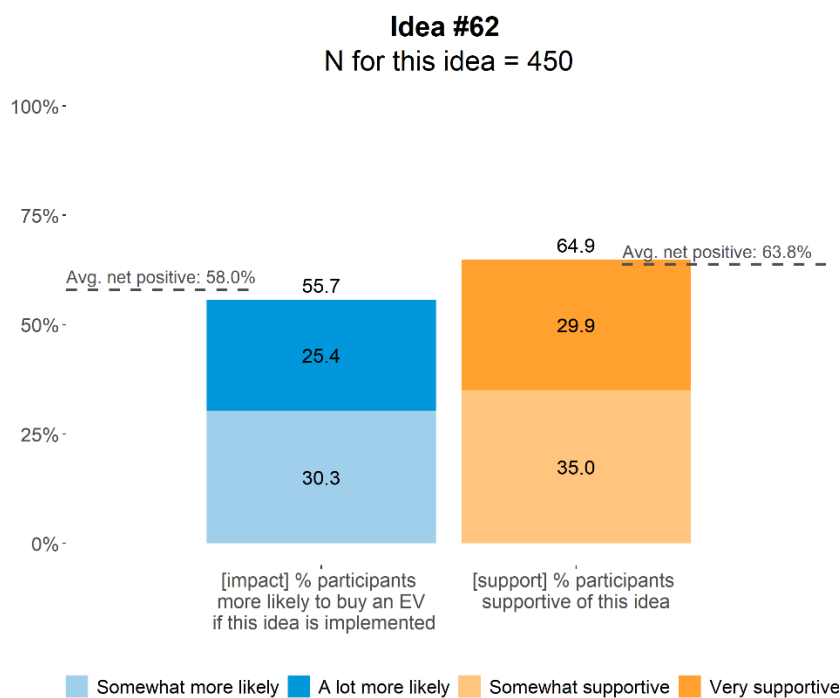
Enhance existing EV workplace charging schemes to subsidise mass installation of chargepoints at corporate car parks, in particular premises where EV purchases exceed a certain threshold set by government. This could, for example, supplement the current workplace charging grant at locations where there is considerable EV adoption (or willingness to adopt). This should be coupled with any necessary grid infrastructure upgrades to manage increased current demand.

Rationale: This could be an effective way of targeting an audience containing many potential early adopters. Further, big firms buying company cars accelerates their penetration into second hand market.

Risks: This may need to be means-tested or targeted in some way to certain businesses to avoid negative perceptions about subsidising big businesses to switch to EV.

Private consumer feedback

Survey description: The government currently supports companies by providing funds for the installation of chargepoints at corporate car parks. Imagine government would tie the funding to the level of EV ownership among employees (i.e. the higher the EV ownership, the greater the funding). This would be to ensure those employees can charge while at work.



Key findings from online survey

1. **Impact:** 55.7% of participants indicated they were somewhat or a lot more likely to buy an EV if this workplace charging scheme was implemented - that's slightly below the average positive impact rate of 58.0% across ideas.
2. **Support:** 64.9% of participants were somewhat or very supportive of this charging scheme - that's slightly above the average support rate of 63.8% across all ideas.

3. **Subgroups:** There are no notable differences between subgroups beyond those observed across all policy ideas..

Key findings from focus groups

1. While all participants were supportive of the idea, only about half of the participants thought that it would make them more likely to adopt an EV. For those who perceived a positive impact, the reasoning was that it would increase their confidence in being able to charge.
2. Participants who did not regularly attend a fixed workplace said it wouldn't make a difference to them, but they were still supportive of the idea in principle. One participant did not think providing charging in workplaces would be sufficient to sway their purchasing decisions, and instead felt that the charging network needed to be much more extensive.
3. Some participants suggested that combining this with a salary sacrifice scheme to purchase or lease a vehicle could be a particularly powerful incentive.

Commercial fleets feedback

Key findings from telephone interviews

1. Funding for workplace charging was seen as a positive policy idea by all organisations and support was high.
2. However, perceived impact was generally lower, instead organisations voiced a clear challenge in ensuring employees have access to charging at home. As such, it was felt that bigger impacts may be realised by helping to overcome the home charging issue, rather than increasing workplace charging.

Conclusion and recommendations



Impact: Moderate. Impact on EV uptake was perceived to be slightly below average. Those that were thinking of buying an EV soon seemed to be more in favour than others, which may be indicative of workplace charging being one barrier for those participants. While this might be true for some, it's obviously not the case for those who don't regularly attend a fixed workplace as shown in the focus groups. Putting more effort into the home charging infrastructure might cover a broader base of drivers – as also emphasised in the commercial interviews.

The focus groups suggested impact could be increased if this was coupled with a salary sacrifice scheme to purchase or lease an EV.



Support: Moderate. Support was also slightly lower than average. Neither private nor commercial consumer had any major concerns with this idea but their muted view on impact might explain their moderate rating of support.



Readiness: Low. Work would need to be conducted to model the required investment and assess how the impact compares to the impact of other alternative investments e.g. to expand home charging rather than workplace charging.

Conclusion

Overall, we think boosting at-work charging infrastructure is an important part of the charging solution, though focusing on the expansion of the charging infrastructure at people's homes may be a more critical starting point. However, in combination with the right incentives for EV purchase – such as a salary sacrifice scheme – the impact could be quite high.

Research next steps

Further research should be done to gauge the appetite among both employees and employers for combining the idea with a salary sacrifice scheme to buy or lease EVs. The impact of both of these in isolation or combination could be evaluated using a difference-in-differences approach.

#65: Make charging time more appealing

Make charging less of a 'hassle' and perceived as 'time well spent' by (1) improving charge-point design, and/or (2) bundling service facilities and 'freebies'. Specific approaches might include:

- Make charge points Wi-Fi hubs;
- Offer free or discounted car cleaning for charge point users, located at the charge points at key, long-distance junctures (i.e. certain service stations);
- Provide access to sleep pods at service stations (e.g. associated with long charges, rest breaks and/or slower charging that may be more economical);
- Provide discounts on food/drink while your car charges;
- Improve the information provision of chargepoints to harness green or financial motivations. e.g. could indicate cost saving compared to £ spent on petrol for same range (e.g. many water fountains disclose how many plastic bottles have been saved, here this could be trees or kg of carbon);
- Provide free newspapers, e-book swap system or e-magazine, when you plug in to charge (and have something to read while waiting); or
- Introduce video games/ smartphone games which you can only play while charging

Government's role would be to either i) mandate certain bare-minimum requirements, or ii) provide benefits at publicly funded charging infrastructure, or iii.) incentivise innovation in industry.

Rationale: Would make charging more attractive and possibly social, and increases exposure and awareness of EV charging infrastructure. Would help address the 'dead time' of charging during a long journey if that time can usefully or enjoyably be used.

Risks: Perks and services need to be designed such that drivers don't block chargepoints for longer than necessary.

Conclusion and recommendations



Impact: Low. Overall impact could be meaningful, but of course the extent depends on the appeal of the 'freebies' or services provided. Charging time is predominantly perceived as a hassle, especially in comparison to ICEVs, and it presents a big mental barrier for those who expect to be charging en route a lot. It is likely that people's perception of their potential charging behaviour is misguided by the belief that you charge your EV in the same way you fuel your ICEV. While we know that most people will actually be charging their vehicles at home or at work (in other words, at their destinations rather than en route), this misperception still presents a barrier that this idea would somewhat help to overcome.

Support: N/A



Readiness: Low. A fundamental question is whether government should play a role in this, or if it should be left to industry to innovate and come up with ways to make charging more appealing. If government does play a role, there is much more policy development to be done, to establish how government can best incentivise or regulate the charging sector.

Conclusion

Overall, this idea has the potential to help potential EV buyers to overcome perceptions that public charging is a frequent hassle. Challenge prize funds could be cost-effective ways for government to kick-start innovation among industry. However, this is ultimately just one of the issues that need to be addressed to improve the charging experience for EV users.

Research next steps

More research should be done to understand the level of support for this idea among private and commercial consumers, and also to identify the most popular and feasible of the above mentioned services and perks. Once implemented in a specific area, mixed methods research can track users' response to those features. Tracking wider perceptions of charging hassle will prove difficult to causally link to this policy, given the myriad changes simultaneously occurring with charge point and vehicle technology. In particular, it would be important to track the impact of these features on non-EV owners' attitudes towards EV charging, rather than people who already own an EV.

#69: Chargepoint reliability indicators

Implement a standardised system for checking and reporting reliability and performance of public charging infrastructure. This should aim to give a clear rating system based on objective metrics such as downtime and technical faults and supplemented by subjective metrics like user ratings. The system could link with services like Trustpilot to create a review system for chargepoints or chargepoint providers. The system could be combined with a mandatory 24/7 customer service line for public chargepoints.

Rationale: Poor reliability is a perennial issue for EV drivers. This would improve customer experience at chargepoints and increase responsibility on chargepoint networks to offer a competitive service. In turn this would reduce range anxiety and increase confidence in public charging.

Conclusion and recommendations



Impact: Moderate. User rating systems for public chargepoints already exist through services such as Zap-Map and Google Maps. We feel a coordinated and standardised system for evaluating and disseminating chargepoint reliability could be beneficial for increasing consumer confidence in charging infrastructure. Impact on EV adoption is likely to be modest, although a trickle-down effect on general perceptions of charging reliability and hassle would be expected.

Support: N/A



Readiness: Moderate. Given the prevalence of chargepoint databases there should be minimal additional development work to enable implementation of this idea. Government is currently taking forward work to consider how best to ensure EV drivers have the information they need with a policy proposal to be presented to industry in the forthcoming consumer experience consultation. An industry body such as the newly merged Renewable Energy Association (REA) and UK Electric Vehicle Supply Equipment Association (UK EVSE) could potentially be well placed to drive forward standardisation with minimal input from government.

Conclusion

Interventions which help to improve customer experience at public chargepoints are likely to have a positive impact on uptake in the long run, as those positive experiences diffuse from EV owners to non-EV owners. This idea could be combined with idea #60 and idea #70.

Research next steps

An online survey or experiment to determine the most effective methods of communicating and displaying chargepoint reliability indicators to consumers, to ensure information is clear and accessible. The more informative and impactful the communications are on customer perceptions and behaviour, the stronger the incentive will be on suppliers to improve their performance.

#70: Regulator to set penalties for chargepoint operators based on chargepoint performance

Provide a stronger regulatory environment for chargepoint providers by setting a system of penalties for inadequate service. This idea could be coupled with #69 (reliability indicators) to ensure that providers respond to substandard performance ratings. This mandate could also enforce standards on customer service (e.g. providing clear guidance for consumers and 24/7 contact numbers).

Rationale: Improved chargepoint reliability, improved customer experience and safety, and reduced range anxiety.

Risks: Could create a division between operators and government.

Conclusion and recommendations



Impact: Moderate. Idea likely to have greater impact on current EV drivers than non-EV drivers, but if the regulation was effectively enforced and compliance was high, it could help to improve experience with, and perceptions of, public charging infrastructure. This should diffuse from EV to non-EV drivers with time.

Support: N/A



Readiness: Moderate. Implementation of this idea is reliant on the mechanisms for regulation and enforcement of chargepoint providers being in place. Preparatory work by OLEV and DfT has already begun on this, so readiness considered to be 'moderate'.

Conclusion

On the 9th May the government signalled its intention to consult on how best to improve the consumer experience of EV chargepoints including issues relating to reliability, payment options and pricing transparency. As with idea #60 and #69, there is merit in pursuing interventions which help to improve the customer experience at public chargepoints. This idea may be less popular with the industry than other ideas, since it proposes to impose penalties for poor chargepoint performance. Further investigation is needed to consider the potential benefits and challenges associated with implementation of this idea.

Research next steps

Qualitative research and consultation with industry to develop details of the regulation, including levels of penalty, and appropriate mechanisms for enforcement.



#71: Offer incentives to petrol stations, hotels, supermarkets, and other local businesses to install public charging points

One type of incentive could be akin to a 'feed in tariff' where the owner of the chargepoint is paid for each kWh of electricity taken (in addition to the charge paid by the user). By setting the right level of incentive, the installation of a chargepoint could become an attractive investment, in addition to future-proofing businesses.

Rationale: Helps address the need for more chargepoints by leveraging a wider range of private sector players who might not have considered installing one. It provides value to government, who can provide a small investment through the (time limited) feed-in-tariff, which leverages private investment where it otherwise didn't quite make commercial sense.

Risks: Finding the right level of payment. Need to protect against fraud of businesses exploiting the incentive.

Conclusion and recommendations



Impact: High. Progress is already being made with respect to chargepoint provision at places like supermarkets, for example, the recent partnerships between Tesco, PodPoint and VW. However we believe government incentives to further accelerate chargepoint installation at these types of locations could have a high impact, since we know that availability of charging infrastructure is one of the most important barriers to adoption currently, and locations such as supermarkets offer a prime opportunity for people to charge whilst they go about normal daily activities.

Setting the right incentives which make it commercially attractive for businesses to install chargepoints (particularly where they anticipate having to do so anyway at some point in future) could be a more powerful way to leverage public investment compared to government simply paying directly for installations.

Support: N/A



Readiness: High. We believe this idea could be implemented with minimal further research and development. The main question to answer would be ensuring the right level of incentive is applied to be effective and ensure that businesses would be able to afford both installation of chargepoints and any underlying grid connection upgrades which were required.

Conclusion

Overall this has potential to be a powerful policy intervention which could help to expand public charging infrastructure in key locations. A dense network of charging stations is likely to have a particular benefit

to high-mileage drivers who are more likely to need to charge away from home, however benefits are also expected in terms of raising general consumer confidence in the availability of chargepoints.

Research next steps

Similar to idea #61, a feasibility study, including grid capacity assessment and engagement with stakeholders, would help to inform the level of incentive which should be applied and which sectors should be targeted. There may also be [regulatory changes](#) that mandate the requirement for new residential and non-residential properties to have chargepoints installed, shifting the focus of this incentive towards only existing properties.



#72: Allow reserved parking spaces for EV on-street parking & chargepoint installation

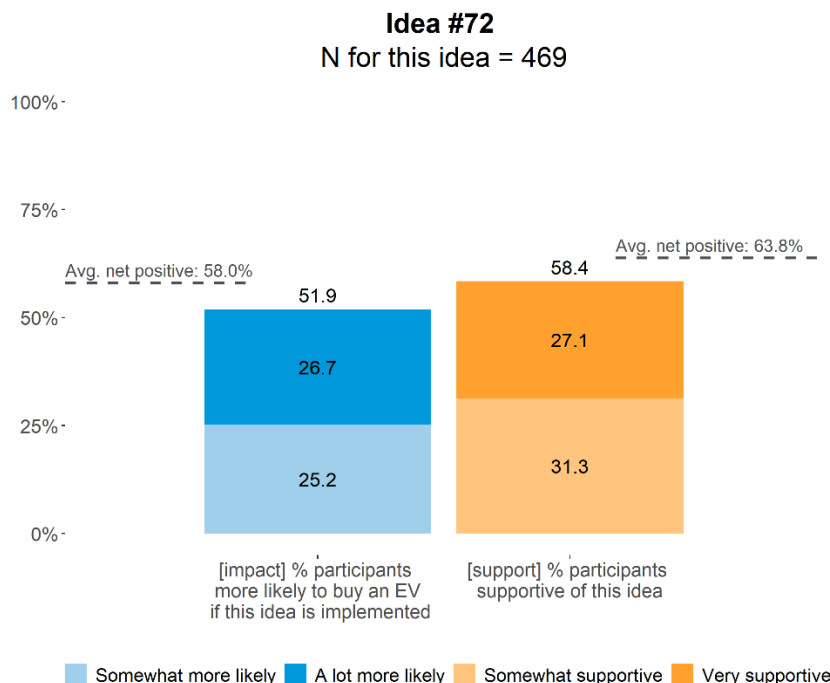
Allow buyers of new EVs to have a chargepoint installed on the kerb-side outside their home, along with a private parking space adjacent to the chargepoint (subject to certain criteria being met). This would not only address a major concern that they wouldn't be able to reliably charge their EV at home if they bought one, but the prospect of getting a private space outside their home may also be a major incentive in itself for those living on busy streets.

Rationale: Increases charging ease and provides additional incentives.

Risks: On-street parking is a contentious issue according to feedback from local authorities. Balance would be needed to ensure that this intervention did not discriminate unnecessarily against residents without off-street parking who are not able, or who do not wish to, convert to an EV yet. It has the potential to cause conflict amongst neighbours if not implemented carefully and considerately. It also assumes there are enough spaces on the street for everyone who lives there and has a car, which may not always be the case.

Private consumer feedback

Survey description: Imagine electric vehicle owners without off-street parking at home (e.g. driveway, garage, private parking lot) would be allowed to request an electric vehicle chargepoint to be installed on the curb-side in front of the house/ flat along with a private parking space next to the chargepoint so that they always had access to their charge point.



Key findings from online survey

1. **Impact:** 51.9% of participants indicated they were somewhat or a lot more likely to buy an EV if this priority parking scheme existed - that's substantially lower than the average net positive impact score of 58.0% across ideas.
2. **Support:** 58.4% of participants were somewhat or very supportive of this parking scheme - that's somewhat below the average support rate of 63.8% across all ideas.
3. **Subgroups:** Interestingly, as for idea #79 (priority public parking) there was almost no difference at all in the average response on both impact and support between those with (3.7 for impact and support) and those without off-street parking (3.8 for impact and 3.7 for support). We would have expected those without off-street parking to be more positive about the idea while those with off-street parking to be more negative.

Key findings from focus groups

1. Responses to this idea were very mixed and fairly evenly spread across the full spectrum from very unsupportive to very supportive.
2. There were a number of questions and concerns raised; feasibility issues for residents of flats (due to a lack of road space compared to other residences); potential increased numbers of vehicles parked on the road; how the rules would be enforced as parking enforcement is already a fraught issue, and; potential for increased parking to take over green spaces.

Conclusion and recommendations



Impact: Moderate. A smaller than average share of survey participants indicated this idea would make them somewhat or a lot more likely to adopt an EV. Perceived impact in the focus group was also mixed. Opinions were typically focussed on feasibility issues and potential negative consequences for parking availability and green spaces, which may have impacted their overall perceptions of perceived impact.



Support: Moderate. As with impact, the proportion of survey participants who were supportive of this idea was smaller than average, and feedback from focus group participants was mixed. The concerns cited above in relation to impact also apply here. Greater support for this idea may be realised if these feasibility issues can be overcome.



Readiness: Low. In addition to the concerns raised from consumers around feasibility and potential negative consequences, expert stakeholders perceived this idea as low in feasibility. Further development would be needed in order for this idea to be ready for real-world testing or implementation.

Conclusion

Overall, despite modest survey responses, we firmly believe that the challenge of providing an at-home charging solution to those without off-street parking will become a critical issue as EVs reach higher rates of market penetration. The incentive of having allocated parking if you own an EV is also a significant perk. We therefore recommend pursuing further research on this idea, or putting greater focus on alternative ideas which solve this same problem.

Research next steps

Stakeholder engagement with local authorities and urban planners to understand logistical and legal constraints associated with parking provision. If the idea is deemed worthy of further research, a large-scale online survey, ideally informed by initial qualitative research, with households who do not have off-street parking in order to understand travel and parking behaviours, local circumstances (and the variation in circumstances by key factors such household type, building type, and region), and what policy solutions are likely to have greatest impact. Finally, field research to understand travel and parking behaviours on residential streets where majority on-street parking is shared and not allocated.

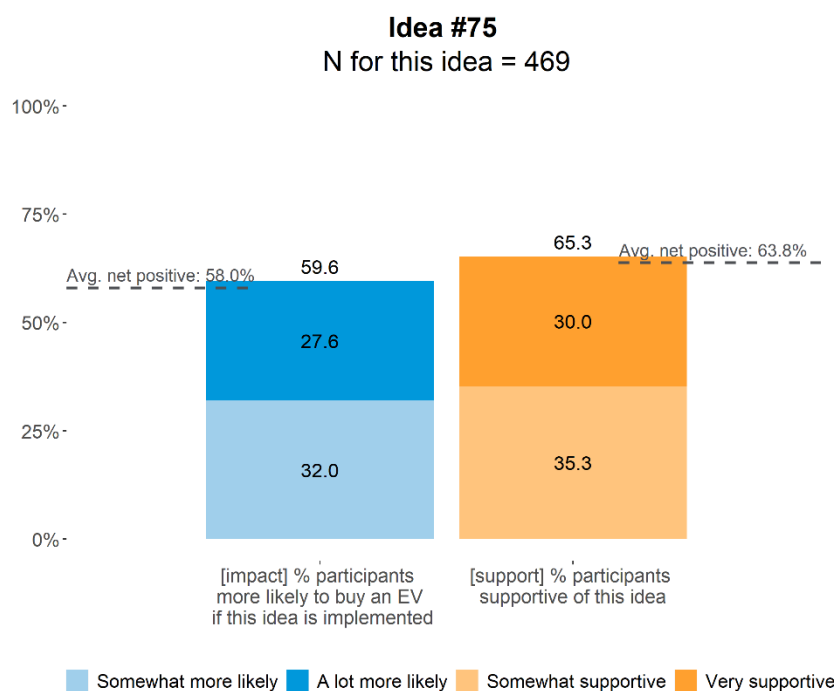
#75: Incentivise collective EV purchases with conditioned government investment in chargepoints

Facilitate collective EV purchases (by conditioning charging infrastructure benefits to the purchase of vehicles. If large groups of people together buy EVs, or if certain purchase thresholds are met within a locality, this could be linked to the provision of 'X' charging points, whereby the locations can be decided (or influenced) by those who bought the EVs. This could be combined with referral discounts to prompt users to recruit others to join the scheme.

Rationale: De-risks government expenditure on public charging infrastructure as upfront investment is contingent on EV adoption. This also reduces and pools the risk for individuals buying an EV but not being able to charge, and may help induce social purchasing.

Private consumer feedback

Survey description: Imagine a scheme whereby local authorities helped local residents group together to buy electric vehicles at a discount through bulk-buying directly from manufacturers. Now imagine, each time a group of people did this, the UK government committed to installing new charge points in this area - those people who bought the electric cars would be able to express their view on where the chargepoints should be installed.



Key findings from online survey

1. **Impact:** 59.6% of participants indicated they were somewhat or a lot more likely to buy an EV if collective EV purchases were incentivised by conditioned government investment - that's close to the average share providing a net positive impact score of 58.0% across ideas.
2. **Support:** 65.3% of participants were somewhat or very supportive this scheme - that's also close to the average support rate of 63.8% across all ideas.

3. **Subgroups:** There are no notable differences between subgroups beyond those observed across all policy ideas.

Key findings from focus groups

1. Support for this idea was relatively low and all participants said it would make no difference to whether they adopt an EV.
2. A number of concerns were raised: doubts that it was feasible to implement given a perceived lack of 'community spirit' making it difficult to achieve agreement; lack of off-street parking to accommodate chargepoints for everyone in the community; fears that council tax might have to increase to fund the scheme; fears that all people in the group would have to choose the same model and individuals might not get what they want.

Conclusion and recommendations



Impact: Low. Almost 60% of survey participants said they would be more likely to adopt an EV if this policy was available. All participants in the focus groups, however, indicated that this idea would make no difference to their likelihood to adopt. This was driven by a number of concerns with feasibility of the idea, and limitations that might come with the purchasing arrangement (such as reduced model choice). Greater impact may be realised if the intervention is further developed to clarify the process and alleviate some of these concerns. We note, however, that if collective purchase agreements can be made to work without government promises to install chargepoints (as per idea #27), then the offer of more chargepoints simply becomes an additional benefit, but also an additional cost to government.



Support: Moderate. A slightly higher than average share of survey participants indicated they were supportive of this idea, however support was generally low in the focus group participants, for the reasons discussed above regarding impact. We expect higher support for this idea can be gained with further development to alleviate concerns and demonstrate feasibility.



Readiness: Low. We believe this idea has merit; Phase 3 testing has shown moderate support and impact from private consumers, and high impacts were perceived by expert stakeholders in Phase 2. However, some further work is needed to alleviate concerns around practical feasibility before the idea can be implemented.

Conclusion

Overall, conditional investment in charging infrastructure did not seem to be a particularly strong incentive. However, if it proves possible to develop a system of collective purchase agreements (as per idea #27), providing EV buyers with worthwhile discounts, this idea would be worth exploring as an 'add-on' that may help address one further barrier to uptake.

Research next steps

Stakeholder engagement (e.g. with OLEV and local authorities) to understand the barriers and potential solutions to set-up and administration of this type of collective purchasing arrangement.

#77: Build on current initiatives and make EV chargepoints more noticeable by having art design competitions

Artists, local residents and school children (etc.) can pitch ideas on how to design and paint local chargepoints.

Rationale: Make chargepoints more visible and fun to engage with, can help to create positive image/framing of charging infrastructure.

Risks: Needs support from chargepoint owner and potentially land owner. Health and safety considerations will also apply.

Conclusion and recommendations



Impact: Low. We expect there is a narrow potential reach for these types of initiatives, which will limit the impact on nationwide EV adoption. That said, there could be positive impacts nonetheless, and readiness/feasibility is high. This could, for example, be integrated into existing or new school engagement projects (idea #111)

Support: N/A



Readiness: High. Builds on existing initiatives already in place, and minimal additional research or preparation required to implement the idea. It is also very low risk – at worst case, a local initiative to turn a small number of chargepoints into art, will generate some media and local interest at minimal cost.

Conclusion

Overall we consider this to be a low risk idea which could be easy to implement with little additional research required, albeit a low impact is expected.

Research next steps

Design and implement a pilot scheme to test impact on public engagement, and inform feasibility for wider national initiatives.

#78: Include chargepoints in EPC label for properties

Include an indicator of whether or not an EV chargepoint exists in the property's Energy Performance Certificate. It would be preferable if the existence of a chargepoint positively impacted the EPC score, though we expect this to be very difficult to implement, given a chargepoint does not impact the material properties or energy efficiency of the building fabric. A second-best alternative is therefore to use the EPC certificate as a salient location to advertise the presence of a chargepoint, alongside other 'green' credentials.

Rationale: A salient prompt to home-buyers, who might envisage owning an EV within the timeframe of living at their new house. This in turn acts as an incentive for home sellers to install chargepoints. The rental market may also be impacted, incentivising landlords to install chargepoints.

Conclusion and recommendations



Impact: Low. In the short term, this is unlikely to drive EV uptake but it might drive awareness of EVs and the chargepoint infrastructure given the salience of a new label. That said, reach will be modest, as not all prospective house-buyers / renters pay great attention to the EPC (or look beyond its score, which is why it would be more effective to have the charge point included in the score). Over the medium and long term however, once EV penetration is higher and home-movers start seeing value in having a chargepoints installed, this could start to have a more substantive impact. Ultimately we would hope property sellers (e.g. online listing sites such as zoopla and rightmove) might indicate 'chargepoint installed' alongside other key information such as EPC score, leasehold/freehold, and distance from the nearest train station.

Support: N/A



Readiness: High. Other 'green' appliances like solar panels, smart meters and heat pumps are already mentioned on EPC labels, so it should not be complicated to add EV chargepoints to that list.

Conclusion

Overall, we recommend implementing this idea given that it's low cost and low risk, and has good potential to be impactful in the medium to long term.

Research next steps

A random population survey could be used to assess if people have become aware of the changes to the EPC label and whether it had an impact on the house they bought/ rented. A quasi experimental analysis (e.g. matched-samples design) could also estimate the impact of the policy on house prices

with and without chargepoints. Likewise for rental values, and if this figure is substantive, this could be communicated to landlords.

#79: Priority public parking and charging for those without off-street parking at home

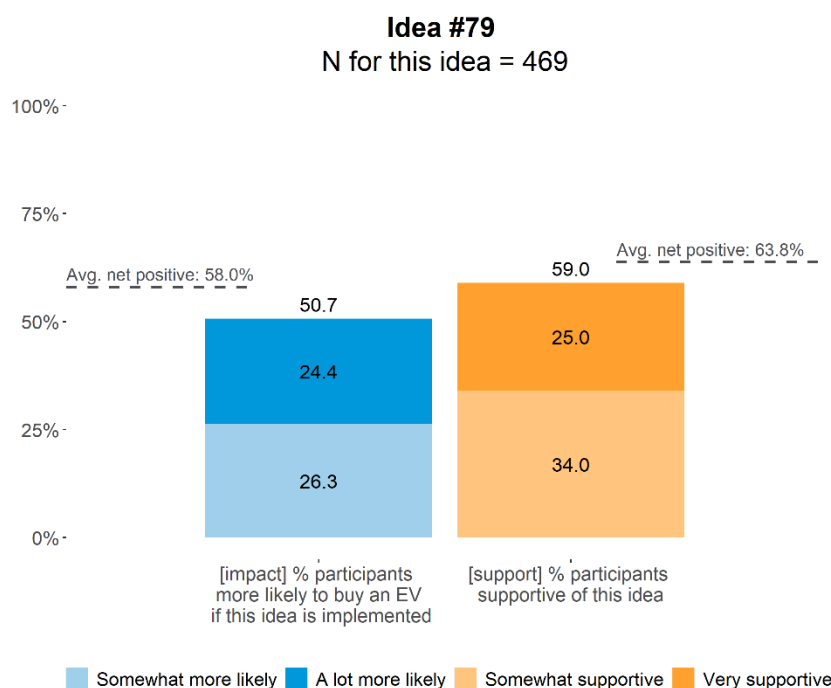
Provide priority passes for nearby car parks and supermarkets for those without off-street parking at home. This could be operated using a permit or priority booking system, for example.

Rationale: Reduced anxiety for consumers regarding not being able to charge at home - as they have a back-up in a nearby public location.

Risks: Could create chargepoint locations that are installed but inaccessible to anyone other than residents and are therefore under utilised (e.g. during working hours).

Private consumer feedback

Survey description: Imagine electric vehicle owners without off-street parking at home (e.g. they don't have a driveway, garage, or private parking lot at home) would receive free parking with chargepoints in selected city car parks and supermarkets near their home. This would provide them with somewhere they could plug in their car overnight if they are unable to charge it at home.



Key findings from online survey

- Impact:** Only half (50.7%) of participants indicated they were somewhat or a lot more likely to buy an EV if this priority parking scheme existed - that's quite a bit lower than the average share providing a net positive impact score of 58.0% across ideas.
- Support:** 59.0% of participants were somewhat or very supportive of this parking scheme - that's somewhat below the average support rate of 63.8% across all ideas.
- Subgroups:** Interestingly, there was almost no difference at all in the average response on both impact and support between those with and those without off-street parking (3.7 was the average score for both groups on both impact and support). We would've expected those

without off-street parking to be more positive about the idea while those with off-street parking to be more negative.

Key findings from focus groups

1. Perceived impact and support for this idea was mixed with no clear trend emerging from the group.
2. The principle of the idea was supported by most and there was recognition that a solution was needed for those without off-street parking.
3. However, common concerns raised were accessibility and security at the places where priority parking would be located. It was felt that EV users should not be disadvantaged by having to park far away from their homes or in unsafe locations where vandalism or theft may be high.

Conclusion and recommendations



Impact: Moderate. The proportion of survey participants who perceived a positive impact on likelihood to adopt an EV was lower than average for the sample. There was no clear trend in the focus group feedback, although most agreed that a charging solution is needed for households without off-street parking, however concerns were raised about the proposed solution of offering priority passes for car parks and supermarkets, since some felt these locations would be inconvenient (or in some cases, unsafe). Impact may be higher if a more universally acceptable solution is developed which doesn't have potential to inconvenience households without off-street parking.



Support: Moderate. A smaller than average share of participants were either somewhat or very supportive of this idea. Support was mixed amongst focus group participants for the same reasons raised in relation to perceived impact. Like impact, greater support may be realised if the idea is developed to reduce some of the concerns around inconveniencing drivers without off-street parking.



Readiness: Low. Further work is required before this idea is ready for implementation. This includes refining the details of the idea to address the common concerns raised above, to improve impact and support, and also address issues of low feasibility reported by expert stakeholders in Phase 2 of this project.

Conclusion

To achieve mass uptake, it is critical to develop interventions which will help alleviate barriers to adoption for consumers who do not have off-street parking. We therefore believe that this idea, along with idea #72, warrants further investigation to develop viable solutions.

Research next steps

Stakeholder engagement with local authorities and urban planners to understand logistical and legal constraints associated with parking provision.

Subsequently, a large-scale online survey, ideally informed by initial qualitative research, with households who do not have off-street parking in order to understand travel and parking behaviours, local circumstances (and the variation in circumstances by key factors such household type, building type, and region), and what policy solutions are likely to have greatest impact.

Finally, field research to understand travel and parking behaviours on residential streets where majority on-street parking is shared and not allocated.

#82: Landlord regulations to simplify chargepoint installation for tenants

Standardise (and simplify) a process for tenants to request their landlord to install a chargepoint in the property (or at least, investigate feasibility). Regulate so that the landlord is required to provide justification for NOT installing a chargepoint, i.e. the default is that they comply with the request, unless reasonable justification can be provided.

Rationale: Reduce hassle for tenants to obtain charging infrastructure at home.

Conclusion and recommendations



Impact: Moderate. If implemented this idea only has potential to impact those who live in private rented accommodation where installation of a private chargepoint is feasible (e.g. those with off-street parking). As such, we feel this idea has limited potential impact on nationwide EV adoption, though may become more critical over time once there is greater penetration of EVs among the private rental sector (i.e. including lower income households).

Support: N/A



Readiness: Low. Expert stakeholders consulted in Phase 2 rated this idea as low feasibility and feedback suggested that regulations in this area are complex. Challenges are also perceived with regards to who should be liable to paying for the chargepoint installation; the landlord or the tenant.

Conclusion

This is a low priority idea, given the low readiness score – reinforced by strong feasibility concerns raised by expert stakeholders – and the moderate impact due to limited reach of the idea if it were implemented. Drivers in the private rented sector should not be ignored however, and we suggest further research could be undertaken to understand the extent to which charging infrastructure provision is a barrier in this market.

Research next steps

An online survey (and potential qualitative work) with landlords and tenants in private rented sector (PRS) to understand scale of the issue, and inform design of suitable solutions which meet the needs of both parties.



#140: Develop consistent and clearer signage for public charging

Standardised signage for public chargepoints should be implemented, with full coverage across the network, including on the SRN and in towns.

Rationale: Increased confidence in public charging infrastructure, reduced range anxiety, and increased awareness of the extent of charging. If the perception of chargepoint availability is currently worse than the reality, a quick win is to improve the perception of availability to EV and non-EV users.

Conclusion and recommendations



Impact: Moderate. Negative perceptions about a lack of availability of public charging infrastructure is one of the most commonly cited concerns and a critical barrier to adoption of EVs. Investment into deployment of charging infrastructure will only be effective if consumers are able to easily find chargepoints, and are aware of their increasing availability. Standardised signing will help achieve this aim; we expect this will have a positive impact on current EV drivers and non-EV drivers, as chargepoints should become more salient in the environment, helping to raise awareness and improve consumer confidence.

Support: N/A



Readiness: Moderate. Whilst there are practical, financial and legal considerations to developing, manufacturing and implementing new signage, there is limited further development needed of the idea itself. As such we feel it has a moderate level of readiness for implementation.

Conclusion

We recommend this idea is considered further; interventions which help to increase visibility, awareness, and confidence in public charging infrastructure are likely to have a positive impact on EV adoption in the short and long-term.

Research next steps

Qualitative research and an online experiment to test and refine consumer understanding of a range of sign designs. Subsequently, development of a strategy for roll-out and navigation of approval processes.

#141: Using VMS to communicate chargepoint location and status on the SRN

A large proportion of the Strategic Road Network (SRN) is equipped with Variable Message Sign (VMS) technology, particularly Smart Motorways which are equipped with overhead gantries and MS4s with the ability to show strategic and tactical messages and signals to drivers. This technology could also be used to raise awareness of the location and status of public charging infrastructure on the SRN, including at Motorway Service Areas (MSAs). This could include installation of new VMS at the roadside, or use of existing MS4s at times when there is no operational need to display messages to drivers (as is currently done with some safety focussed campaigns, e.g. which warn drivers about middle lane hogging, tailgating, drink driving and wearing seatbelts). Existing static plate signing for MSAs could be replaced by VMS panels to enable dynamic communication of the number of available chargepoints at upcoming service areas and other key stopping areas on the SRN. The VMS technology could be used to disclose information about number of chargepoints, availability, charging speed and cost in real-time to drivers.

Rationale: Improve awareness and understanding of public charging.

Risks: VMS are more expensive than static plate signing, so there would be a reasonable upfront investment needed to upgrade the infrastructure. There would also be a reasonable management/maintenance cost - to ensure that data from the chargepoints was accurately fed into the VMS back-office, so that real-time information displayed to drivers is accurate and reliable.

Conclusion and recommendations



Impact: Moderate. Similar to Idea #140, we feel this idea should have a positive impact on perceptions of availability of public charging infrastructure; one of the key barriers impacting EV adoption today. The idea is expected to have a positive impact on the perceptions of both EV and non-EV drivers, which should in turn have a positive impact on likelihood to adopt.

Support: N/A



Readiness: Moderate. There are some logistical and financial challenges with implementation, as raised by expert stakeholders in Phase 2 of the project. In particular, VMS are more expensive than static plate signing and would require a greater level of ongoing maintenance and management. There is also preparatory work required to assess how new VMS displays could be incorporated with existing Variable Signs and Signals (VSS) policy.

Conclusion

The rationale for this idea is the same as that for idea #140; that is to increase visibility and confidence in public charging infrastructure. This idea has an added benefit over #140 in that VMS could be linked with real-time data streams from chargepoints (as outlined in idea #60) to communicate information

about current status to drivers as they travel on the SRN. We recommend further work is undertaken to explore feasibility of implementation.

Research next steps

Desk-based research and consultation with expert stakeholders to review current VSS Policy and understand how new signage could be incorporated.

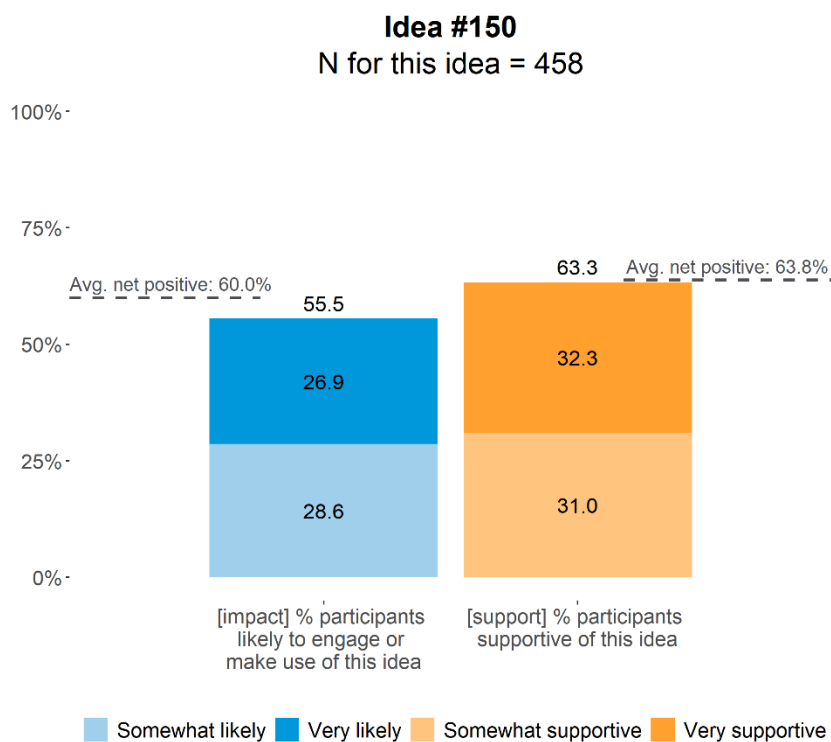
#150: Home mover bundle deals to promote chargepoint installation

Provide promotion and discounts for chargepoint installations for home movers. Some people are likely to buy a house and a car simultaneously (e.g. if moving out of a major city into a commuter belt). Even where this is not the case, home retrofit works are generally done when moving, but otherwise are commonly put off unless there is a strong need. Chargepoint installation could be offered as part of a discounted bundle with mortgages or estate agent services, or linked with payment of stamp duty land tax (SDLT).

Rationale: Timely communication and support can be more effective for encouraging behaviour change, by harnessing 'moments of change'.

Private consumer feedback

Survey description: Imagine you are buying a new property and you would get a discount on your stamp duty if you decided to pay for the installation of an electric vehicle chargepoint at your new property (that doesn't have a chargepoint yet). The discount would make up about half of the cost of the chargepoint.



Key findings from online survey

1. **Impact:** 55.5% of participants indicated they were somewhat or very likely to make use of this bundle deal - that's below the average engagement rate of 60.0% across ideas. Also note the policy was described in terms of a generous subsidy, within the survey.
2. **Support:** 63.3% of participants were somewhat or very supportive of this charging scheme - that's close to the average support rate of 63.8% across all ideas.

3. **Subgroups:** There are no notable differences between subgroups beyond those observed across all policy ideas.

Key findings from focus groups

1. Perceived impact and support were high. Participants were generally enthusiastic about opportunities to get a chargepoint at their property, citing reasons including the convenience for recharging and adding value to their property (“future-proofing”).
2. However, some concerns were raised about how properties without off-street parking would be serviced and felt it was unfair to discriminate against these types of consumers.
3. Participants also pointed out that stamp duty is not applicable to all home purchases, and so people would not benefit in these cases.

Conclusion and recommendations



Impact: Moderate. More than half of private consumers in the online survey indicated they would be likely to make use of this type of incentive, and qualitative feedback in the focus groups was also positive. Timely communications have been shown to be effective interventions in other areas of policy, however for this measure to have a high impact we feel further consideration is needed as to how it can be applicable for a greater share of consumers such as those living in (moving to) homes without off-street parking, those who privately rent, and those who purchase homes where SDLT is not applicable. The impact will also depend on the level of incentive given (i.e. a generous subsidy linked to SDLT, versus timely communications without incentive). In addition, this idea, by definition, can only impact those looking to move home, and so an overall moderate impact rating has been given. This would be **Low** if no incentive was attached.



Support: Moderate. There was reasonable support from survey and focus group participants for this idea, albeit some concerns were expressed about the intervention being implemented in a fair way which benefitted those without off-street parking or those who don't pay SDLT. As with impact, higher support may be realised by consideration of how to make the intervention applicable to a greater share of consumers.



Readiness: Low. The principle of this idea is sound; i.e. harnessing the power of timely communications to deliver an effective incentive, and results from Phase 3 testing show a broadly positive consumer response. However, there are challenges associated with implementing this, and further refinement and testing is needed to ensure the most effective level and type of incentive is applied in a way which benefits a large share of the private consumer market. Moreover, the version of this idea tested in the survey includes a strong incentive through SDLT. If this was not feasible, further research would be needed to estimate the impact when framing the incentive differently.

Conclusion

This idea has good potential, and the approach of harnessing timely communication has a strong basis in evidence. Further research is needed however to inform the most effective application which benefits a large share of the consumer market.

Research next steps

A policy review is first recommended to understand realistic routes to implementation.

Further development of this idea could then be supported through an online survey to test consumers' receptiveness to different approaches for coupling chargepoint incentives with timely moments.

Real-world evaluation could be undertaken using a randomised controlled trial, for example where the incentive is implemented in one or more local areas, and not in others (where the population demographics are broadly matched between areas) to examine uptake of the idea and subsequent EV adoption.

#153: Expand on existing initiatives using a trusted messenger to update beliefs about inadequacy of infrastructure

Ben Fogle is already used in GUL campaigns as a trusted messenger. A variety of alternative or additional messengers could be tested, to establish who the most effective messengers might be for different audiences. This may include celebrities, endorsement through car clubs, TV shows, or respected organisations such as the AA or the police or Highways England. It may also include the use of non-celebrity owners to enhance the normative value of EV ownership in individual's local communities.

Rationale: Trust in the messenger is as important as the message itself to capture attention and shift perceptions.

Risks: The message is forever linked with the messenger and their behaviour and attitudes.

Conclusion and recommendations



Impact: Low. We expect this could result in a positive, albeit low, impact on EV adoption. The principles of the idea are sound, however it involves expansion of existing initiatives already in place rather than a new intervention, and is in essence just a soft nudge. In addition the reach of these initiatives will be limited, as all media campaigns are.

Support: N/A



Readiness: High. The idea is an extension of existing initiatives already in place – so no particular additional work would be required to implement this. Some further research would be recommended to inform the choice of messengers.

Conclusion

This idea can be considered a 'quick win' in that it should be straight-forward to implement (extending current initiatives) and a positive (albeit small) impact is expected.

Research next steps

Online experiments and qualitative research are well suited to test the effectiveness of a range of alternative messengers.



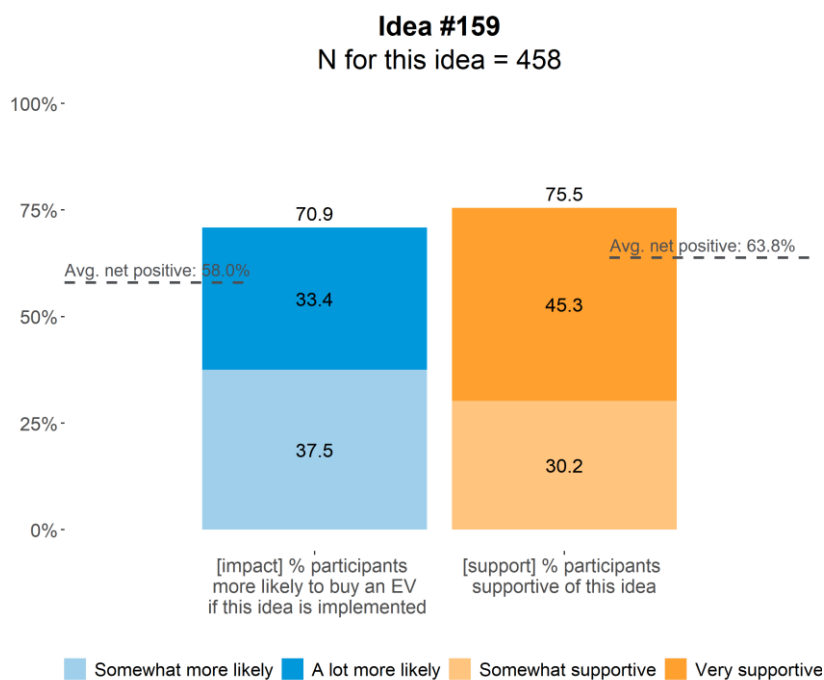
#159: Mandate that fuelling stations need to provide EV charging

This would provide an effective solution to barriers associated with actual and perceived lack of availability of charging infrastructure, as consumers are already familiar with the location of fuelling stations, and there is already a database of fuel station locations integrated into navigation apps like Google and Waze.

Rationale: Utilise existing salient infrastructure and the fact that consumers are accustomed to it to increase consumer confidence in public charging infrastructure. We also suspect that the idea of 'finding a petrol station' when in need of fuel is both less intimidating, easier (since they are large and visible) and more familiar than 'finding a chargepoint', and so may address range anxiety among those not yet familiar with using an EV.

Private consumer feedback

Survey description: Imagine fuelling stations were mandated to provide electric vehicle chargepoints, so that you knew every petrol station in the UK also had electric chargepoints.



Key findings from online survey

- Impact:** 70.9% of participants indicated they were somewhat or a lot more likely to buy an EV if petrol stations were mandated to provide chargepoints - that's well above the net positive impact score of 58.0% across ideas.
- Support:** 75.5% of participants were somewhat or very supportive of this charging scheme - that's also well above the average support rate of 63.8% across all ideas.
- Subgroups:** There are no notable differences between subgroups beyond those observed across all policy ideas.

Key findings from focus groups

1. About half of participants said this idea would make no difference to whether they would adopt an EV, and the other half said they would be somewhat or a lot more likely.
2. The group generally thought it would provide some reassurance about being able to find somewhere to charge. One participant who said it would make them more likely cited the benefits for driving in remote locations (this links with idea #61)..
3. Those who were indifferent were concerned about speed of charging and chargepoints being occupied or closed at night, causing delays. Some raised concerns about not wanting to sit and wait for a slow charge to complete on a station forecourt.

Conclusion and recommendations



Impact: High. Results from the survey suggest this idea has potential to have a high impact on EV adoption. It seems that petrol stations may be a symbolic, convenient, and salient location for installing chargepoints, therefore bringing greater benefits in terms of improved perceptions, per chargepoint installed, than some other locations. Whilst results from the focus group were more mixed, those who reported it would make no difference to their likelihood to adopt typically perceived cost as a big barrier for them, rather than availability of charging. Impact may be greatest if focus is given to provision of rapid chargepoints, to alleviate some of the concerns raised by focus group participants.



Support: High. Results from Phase 3 testing show a good level of support for this idea; the survey results showed a higher than average share of participants were somewhat or very supportive. Whilst individual ratings varied amongst focus group participants, there was general agreement that this idea would help to improve current and future EV drivers' ability to find and access charging infrastructure.



Readiness: Moderate. We consider the core principle of this idea has a high level of readiness – the idea is well developed, it tackles a critical barrier to adoption, and Phase 3 testing provides good evidence that it would be well supported and highly impactful in its current form. However, an overall moderate readiness level has been assigned to reflect the low feasibility ratings received from expert stakeholders in Phase 2 of this research and acknowledge the logistical and technical challenges and high costs associated with implementation of the initiative on a national scale.

Conclusion

This idea has considerable potential to be a powerful intervention which could facilitate substantial increases in actual and perceived availability of charging infrastructure; one of the key barriers influencing adoption of EVs.

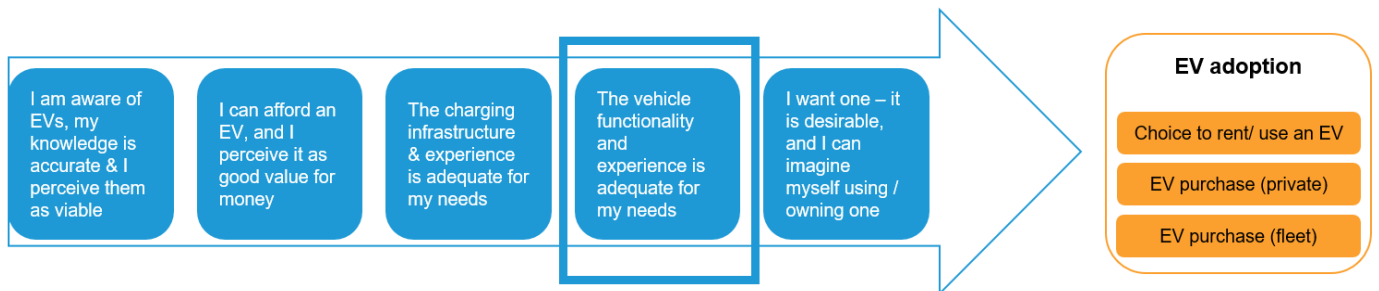
Research next steps

Further research should focus on improving readiness by overcoming technical, logistical and other challenges with implementation.

This should include engagement and consultation with industry and relevant stakeholders to assess support and feasibility.

Objective 4:

“The vehicle functionality and experience is adequate for my needs”





#50: Standardised tests on batteries to determine remaining range for used EVs

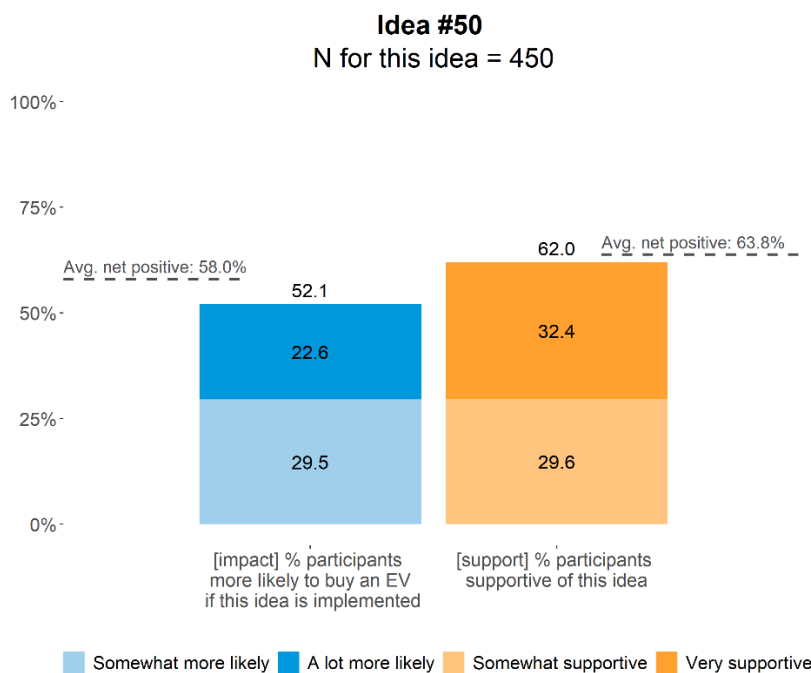
Standardised battery state-of-health tests would help to reduce uncertainty for prospective used EV purchases by determining the remaining range and battery capacity. The test could potentially be integrated into the MOT.

Rationale: Would offer certainty to second-hand buyers, addressing a key barrier for them, but also for new buyers who express concern over poor resale value due to battery degradation.

Risks: Would need to be framed carefully to avoid sending negative message about EVs vs ICEVs.

Private consumer feedback

Survey description: Electric vehicle battery capacity could degrade over time, giving you less range than when the car was new. Imagine there were standardised tests as part of an electric vehicle's MOT that would determine a used battery's range and state of health. This information could be particularly useful with regards to second-hand purchases.



Key findings from online survey

1. **Impact:** 52.1% of participants indicated they were somewhat or a lot more likely to buy an EV if standardised battery tests were introduced - that's well below the average share providing a net positive impact score of 58.0% across ideas.
2. **Support:** 62.0% of participants were somewhat or very supportive of this idea - that's close to the average support rate of 63.8% across all ideas.
3. **Subgroups:** Those who intend to purchase an EV as their next primary vehicle were much more positive about this idea than other respondents (4.1 on impact and 4.4 on support). Even

those that intend to buy an EV as their next secondary vehicle were less positive (3.3 on impact and 3.5 on support).

Key findings from focus groups

1. Participants' views were mixed on the extent to which standardised battery test reports would influence their buying decisions. Some thought it would be helpful to inform buying and selling decisions, and some did not think this would alleviate their broader concerns. As a group, they were slightly more supportive than not.
2. Three of the nine participants said they would be more likely to adopt an EV. These participants noted that this kind of information would be helpful to inform a decision on whether to purchase, and one noted it may help decide when to sell. These participants were all supportive or very supportive of the idea.
3. Three of the participants said that this idea would make no difference to their buying decision. These participants were mixed in their reasons – one was generally supportive but thought the information was already available through manufacturer' apps; one said it would influence their decision on a new but not a second-hand vehicle; and one thought it might not be useful due to differences between vehicles and batteries.
4. The remaining three participants said the idea would make them less likely to buy an electric vehicle and cited reasons such as confidence in the battery life, cost of battery replacement and other more general concerns about electric vehicles.

Conclusion and recommendations



Impact: Moderate. A lower than average share of survey participants indicated this idea would make them more likely to adopt an EV. Perceived impact amongst focus group participants was mixed. Some felt that 'official' figures stating battery life would be inaccurate, like fuel consumption figures have been shown to be for ICEVs. A key for increasing the impact of this idea is therefore to improve consumers' confidence in the outputs and by demonstrating validity and reliability, as far as possible.



Support: High. Despite lower than average perceived impact, there was generally a good level of support for the idea from survey and focus group participants; this is because most recognised the potential value of having an effective standardised test for battery life, if concerns around validity and reliability can be addressed. We also believe this will become increasingly important for consumers as the second-hand market expands.



Readiness: Low. Whilst the principle of the idea is well formed, further development is required to enable implementation of these types of standardised battery tests; including the mechanics of the test itself, the development of a testing standard, and decisions around suitable testing provider(s).

Conclusion

Overall, despite relatively low survey and focus group responses on likely impact of this policy, addressing concerns over battery health will become increasingly important as EVs further penetrate the second-hand market. We suggest that government action on this issue earlier rather than later will be beneficial.

Research next steps

Development of industry accepted and validated testing standard, to ensure viability and accuracy of the test and feasibility of implementing it at scale. Once developed, strategies for ensuring effective communication of the battery test standard to ordinary members of the public could be informed by further testing (such as an online survey or qualitative research). Much research by appropriate experts will be needed to develop a standardised, reliable and accurate battery test that provides meaningful and intuitive output to the consumer, and which can easily be undertaken by a wide range of garages and dealerships.



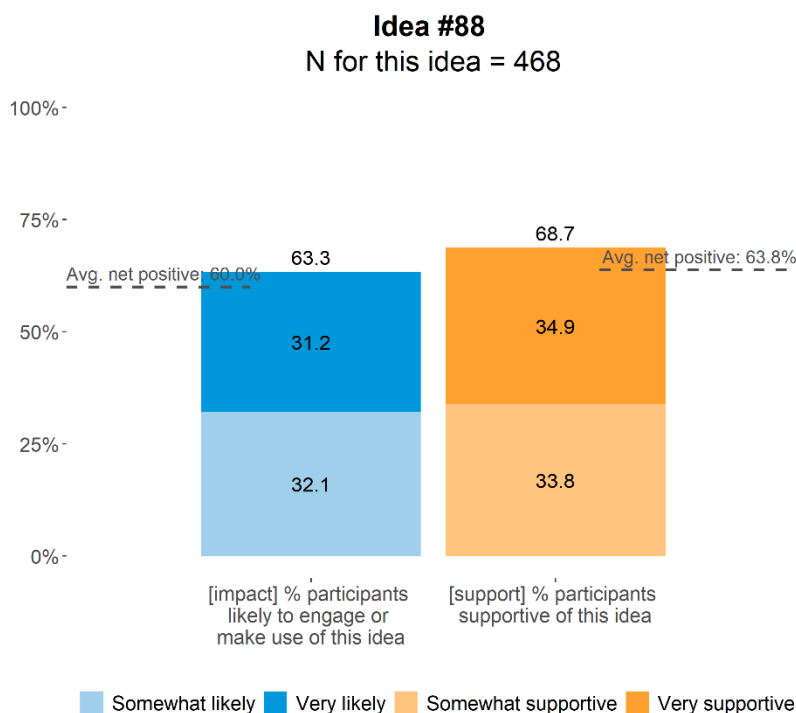
#88: Extended grace periods / generous 'try before you buy' deals

Providing extended no-fee cancellation periods for EV lease and Personal Contract Purchase (PCP) deals would give consumers more confidence in making the lifestyle change, since they can change their mind after trying it out if needed. This would need to be implemented by financial services, but could be backed by government to encourage the industry to adopt the practice.

Rationale: Reduces anxiety associated with making the switch to EV. Many markets provide measures to reduce risk of 'buyer's remorse' (such as no-quibbles returns policies, or no-win-no-fee offers). These tend to be effective at increasing uptake of the services/products to begin with, with the increased uptake generally *not* being offset by the numbers who use the return policy. Previous work by TRL has shown that increased experience of an EV can boost positive attitudes.

Private consumer feedback

Survey description: Imagine car manufacturers and dealerships had to provide free-of-charge extended grace periods or generous 'try before you buy' deals (e.g. for one week) to customers thinking about purchasing an electric vehicle.



Key findings from online survey

1. **Impact:** 63.3% of participants indicated they were somewhat or very likely to make use of extended grace periods - that's slightly above to the average engagement rate of 60.0% across ideas.
2. **Support:** 68.7% of participants were somewhat or very supportive of this charging scheme - that's above the average support rate of 63.8% across all ideas.

3. **Subgroups:** There are no notable differences between subgroups beyond those observed across all policy ideas.

Key findings from focus groups

1. Responses were very positive with all participants saying they would be somewhat or very likely to use this type of service, and most saying they were very supportive.
2. Participants liked the idea of an opportunity to experience using an EV as it would allow them to experience the practical day-to-day benefits and limitations prior to deciding whether to invest in one.
3. Concerns centred around risks of some abusing the system, and comments were made about needing to carefully vet users to ensure they were appropriately licensed. There were also some concerns about the popularity of the scheme causing long lead times for some vehicles.

Conclusion and recommendations



Impact: High. Both survey and focus group results suggest that consumers would be quite likely to make use of this initiative. Consumer research shows that experience with EVs can have a substantive positive impact on attitudes, particularly with regard to vehicle performance and driving enjoyment. This idea is likely to have greatest impact for consumers who are tempted to adopt an EV but have some reservations or anxieties. This initiative would allow them to ‘make the leap’ with the reassurance of a ‘get-out’ clause to avoid being locked in to a long-term finance deal. There is ample evidence that ‘risk aversion’ of various forms (including range anxiety), and familiarity / status quo bias, are major barriers to EV adoption. This policy directly addresses these barriers.



Support: High. A higher than average share of survey participants were supportive of the idea, and all participants in the focus groups suggested they would be likely to make use of such a scheme. Most participants recognised the value of being able to experience an EV, to increase their understanding and awareness, and to test compatibility with their daily travel needs.



Readiness: Low. Feasibility was rated as low by expert stakeholders in Phase 2 of this project, and some concerns were raised by consumers in Phase 3 testing. One particular challenge is mitigating against the risk of ‘cancelled’ lease or PCP agreements creating a fleet of ‘nearly new’ vehicles with reduced residual values leading to loss of revenue for dealerships and manufacturers. One potential and partial solution to this might be to have a smaller fleet of ‘try before you buy’ vehicles which, if the consumer chooses to commit to the purchase, is taken back and replaced with a new vehicle. Roles and responsibilities of government and industry also need to be developed and agreed

Conclusion

Both support and impact are rated high for this idea, but a low readiness was assigned as there are financial and logistical challenges which may be a blocker to implementation. As such we recommend further work is undertaken to develop the business model and address implementation challenges. This should be done in conjunction with idea #89 which offers a potential alternative solution for achieving a similar outcome, but has many of the same implementation challenges.

Research next steps

Stakeholder engagement and consultation in the automotive industry is needed to understand potential impact and possible mitigations against reduced residual values for vehicles which are returned within the grace periods.



#89: EV trials through short-term lease (or extended rental, without the typical rental cost)

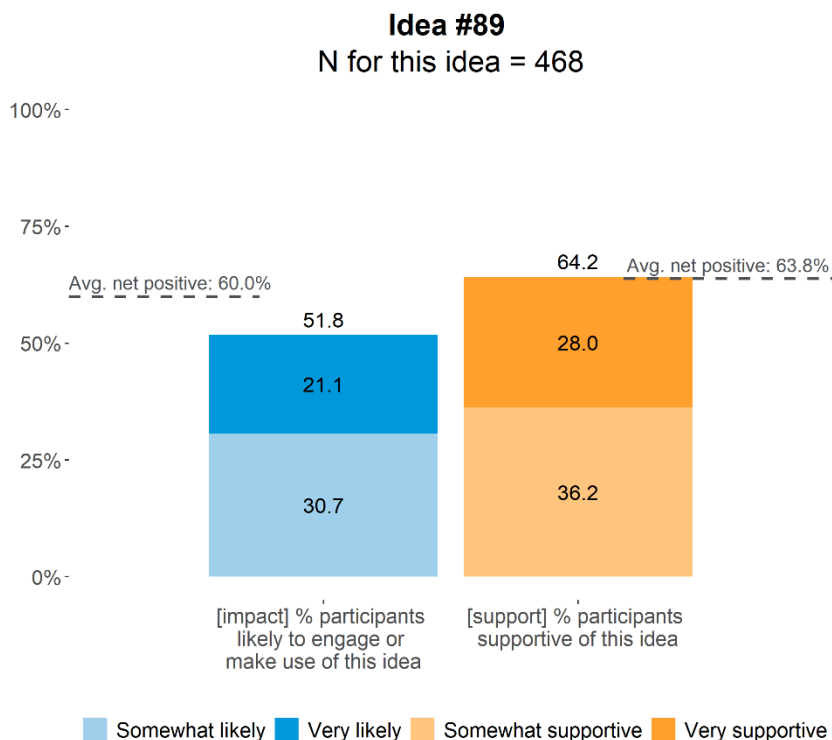
Provide short-term lease/rental options to try an EV for a 2 to 3 month period with consumers paying a monthly fee. Initiative could also work for businesses whereby they could hire a small fleet of electric cars/vans to test whether the vehicles were suitable for business operations.

Rationale: Increase experience of EVs, improve attitudes, better informed consumers, enable try-before-you-buy.

Risks: Likely to be costly to implement and providing cars for 2-3 months could be challenging. Would need to consider infrastructure requirements for short-term leases, particularly for businesses renting a fleet of EVs for a short period.

Private consumer feedback

Survey description: Imagine car manufacturers offered short-term leases or rentals of electric vehicles for a 2-3 month period, at a comparable monthly cost to normal car lease arrangements (which would typically last a few years). This means you could use an electric car sooner, without 'locking in' to a particular model for years to come.



Key findings from online survey

- Impact:** 51.8% of participants indicated they were somewhat or very likely to make use of such short-term lease deals - that's below the average take-up rate of 60.0% across ideas.
- Support:** 64.2% of participants were somewhat or very supportive of this charging scheme - that's very close to the average support rate of 63.8% across all ideas.

3. **Subgroups:** There are no notable differences between subgroups beyond those observed across all policy ideas.

Key findings from focus groups

1. All participants said they were somewhat or very likely to take up a short-term lease deal. Reasons for being very likely to use the service included the opportunity to see how an EV would work in their circumstances without having to commit to it. Participants who said they were somewhat likely to use the service had questions about what options this scheme would include for charging, whether the vehicle would be new or used, and what eligibility criteria would apply.
2. Most participants said they were very supportive of the concept, despite having reservations about the expense of leasing, charging costs and potentially driving a vehicle that had been used by many people before them. Only one participant said they were somewhat unsupportive of the scheme, and this was due to a concern that it would create a large market of 'just used' cars which they thought might reduce their value and be financially unsustainable.

Commercial fleets feedback

Key findings from interviews

1. In general, support for this idea was high as the organisations recognised the potential benefits of providing experience of EVs without a long-term commitment.
2. Concerns were expressed over how to get around a lack of charging infrastructure however; for some it was felt that this would be essential to be able to undertake a realistic assessment of whether EVs were suitable for the business.
3. Other concerns related to the operational requirements of fleet vehicles. In one case the organisation indicated that their commercial fleet vehicles are 'heavily used' and so expressed concerns over the return condition at the end of the 3-month period. Another organisation explained that they need to carry a lot of specialist equipment in their vehicles, which could be a logistical challenge if the vehicles were on a short/temporary lease.

Conclusion and recommendations



Impact: Moderate. A lower than average share of survey participants stated they would be somewhat or very likely to use this type of scheme. However, participants in the focus group and businesses who were interviewed were in favour of the idea. Clearly, consideration of lease deals is dependent on the detail of the arrangement for consumers; it is possible that perceived impact might be higher for some consumers if they had more detail about the specifics of the deal. The idea has potential to have a high impact, for the same reasons as outlined with idea #88: that is, experience with EVs can have a substantive positive impact on attitudes, particularly with regard to vehicle performance and driving enjoyment. We also believe there is a cohort of would-be-buyers who are holding back through not wanting to transition before the technology has matured, and this policy could directly cater to them. However, a moderate score has been given to reflect the lower survey scores assigned to this idea. Higher impact may be realised for consumers who are considering an EV, but are being held back from making the switch by particular concerns, as this initiative would allow them

to gain substantial real-world experience of using an EV without being locked in for a long period.



Support: High. Support was generally high amongst private consumers and commercial organisations included in Phase 3 testing. Most participants recognised the value of being able to experience an EV without a long-term commitment.



Readiness: Low. A number of points need to be addressed before this idea can be considered ready for implementation. These include: mitigating the risk of creating a fleet of 'nearly new vehicles with reduced residual values, working out how to handle heavy vehicle use during the short lease period where vehicles are then returned (particularly in the case of those used by commercial fleets), and resolving concerns around consumers and businesses needing charging infrastructure in order to trial the vehicles.

Conclusion

We recommend further work is undertaken on this idea, alongside idea #88, to develop the business model and address implementation challenges.

Research next steps

As with idea #88, stakeholder engagement and consultation in the automotive industry would help to understand potential impact and possible mitigations against creating a fleet of nearly new vehicles with reduced residual values.

#90: Shopping centre test drives

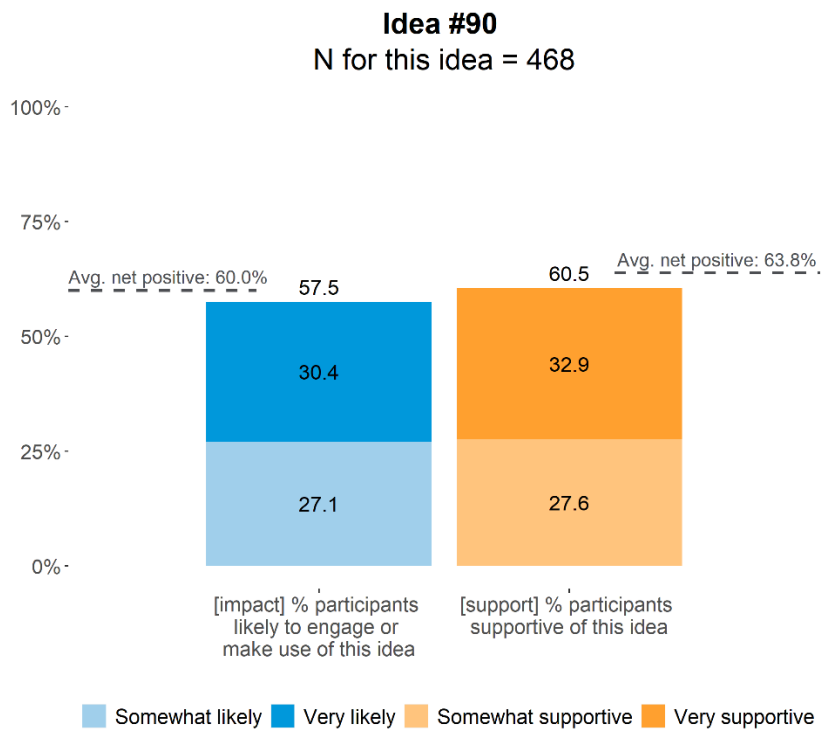
Provide free EV test drives for consumers at major shopping centres and other locations. Could be set up so as to encourage consumers to arrive by public transport, complete their shopping, and then get to drive home with their shopping in an EV, with the staff member taking the car back to the shopping centre at the end of the journey. This would offer a convenient service to consumers, and would also give them direct experience of driving an EV.

Rationale: Increased experience with EVs, reduce anxiety - more informed consumers.

Challenges: May be difficult to implement as an 'ad hoc' service because of the requirements for providing and checking identification and driving licence status ahead of the test drive (though car dealerships and existing test-drive centres manage this issue). It may be difficult to implement with sufficient scale to have impact on market.

Private consumer feedback

Survey description: Imagine your local shopping centre would provide free electric vehicle test-drives. You would be able to drive yourself (and your shopping bags) home with an electric vehicle for free. A driver would accompany you so that they can drive the vehicle back at the end.



Key findings from online survey

1. **Impact:** 57.5% of participants indicated they were somewhat or very likely to make use of shopping centre test drives - that's slightly below the average take-up rate of 60.0% across ideas.
2. **Support:** 60.5% of participants were somewhat or very supportive of this service - that's also below the average support rate of 63.8% across all ideas.

3. **Subgroups:** Those in urban areas tend to be more positive about this idea (3.8 on impact and 3.9 on support) on both accounts than those living in rural areas (3.3 on impact and 3.5 on support). That trend is also visible across regions, where participants from London are most positive compared to all other regions. Perhaps this is driven by people in urban areas tend to visit shopping centres more than those in rural areas.

Key findings from focus groups

1. The group generally indicated high interest in this type of service, saying they would see benefits in being able to try out an EV if it was convenient.
2. However, support was more polarized and criticisms centred around the shortness of the test drive not being able to alleviate concerns about battery capacity over longer journeys. Concerns about the practicality of getting to the shopping centre without a car were also noted, as were concerns that this type of scheme would have limited reach.

Conclusion and recommendations



Impact: Low. A lower than average share of survey participants stated they would be somewhat or very likely to use this service, albeit the share was close to 60%. We feel this type of scheme would have limited nationwide reach, as large numbers of sites would be needed in order to make the service available to the majority of consumers. In practice, those who live close to and/or visit shopping centres regularly are likely to be impacted most; as suggested by the survey findings. Higher impact may be realised by other ideas which also aim to provide experience of EVs to consumers.



Support: Moderate. Support was mixed in the focus group participants, and a bit lower than average in the survey. Practical concerns were raised such as the test drive only providing a very short experience, and the service only reaching a small proportion of consumers who regularly use shopping centres. Higher support was observed for other ideas which provide consumers with opportunity to try an EV (e.g. idea #88 and #89).



Readiness: Moderate. This idea is reasonably well developed, however practicalities of delivering this service would need to be decided before it could be implemented, namely who would operate the service, where the service would be run, and who would cover the costs (and how).

Conclusion

This is a low priority idea; whilst some positive impact is expected, the reach of an initiative like this will be highly limited and there are alternative ideas (e.g. #92 and #94) available which are likely to be more effective at achieving the same outcome (increased opportunity to test drive EVs).

Research next steps

A feasibility study and pilot at a trial shopping centre to test implementation and uptake by members of the public.



#92: Roaming fleet of test EVs

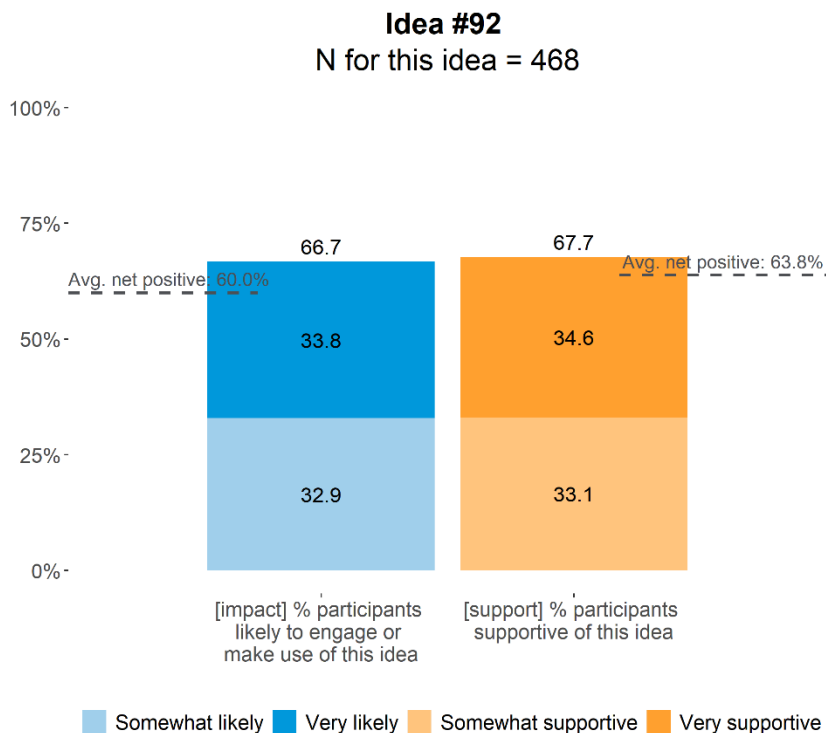
Provide a fleet of test EVs for loaning to large companies (e.g. for one week each), so that employees can use them in place of their normal company cars. Over the course of a year-long campaign, 5 fleets of 20 cars could cover 250 large employers. If the fleet of EVs was subsequently sold after the year, the cost to government should be low, particularly with appropriate manufacturer partnerships. Campaigns could be repeated over multiple years as required, with a new fleet of EVs (using latest models) acquired at the start of each year.

Rationale: Would provide an efficient way to increase exposure and experience with EVs among a key target audience, in addition to creating a media-worthy campaign.

Risks: Would need to consider infrastructure requirements for enabling one-week test drives. At the very least, some communication about public charging in local areas would be needed to help company car drivers understand where they can charge during the week trial.

Private consumer feedback

Survey description: Imagine you could sign up to test-drive an electric vehicle through your employer for free and take the vehicle home for a few days. This service would be sponsored by government providing a roaming fleet of electric vehicles to interested companies.



Key findings from online survey

1. **Impact:** 66.7% of participants indicated they were somewhat or very likely to make use of this service - that's above the average take-up rate of 60.0% across ideas.

2. **Support:** 67.7% of participants were somewhat or very supportive of this service - that's also above the average support rate of 63.8% across all ideas.
3. **Subgroups:** Those aged over 55 (3.5) are somewhat less likely to use this service than those aged 25-54 and those under 25 (3.9 each), perhaps due to being less likely to be employed. Nevertheless, they are similarly supportive of the idea (3.8) than the younger age groups. (4.0 those 25-54 and 3.9 those under 25).

Key findings from focus groups

1. Most participants said they would be very likely to use this scheme, and cited the convenience of being able to access the vehicle through their workplace as a benefit.
2. There were two participants who said they would be very unlikely to use the service because they were retired and therefore not eligible for the scheme. Nevertheless, they were supportive of the idea in principle, especially if it was broadened to include others not eligible (e.g. retirees, unemployed, students). One participant, a university student, suggested that a similar scheme through universities would be highly attractive to students.

Commercial fleets feedback

Key findings from interviews

1. Perceived benefits and support for this idea varied according to the circumstances of the business. Where generic EVs were suitable for the business, support was good.
2. However, concerns were raised about feasibility where the organisation had particular fleet vehicle needs, including a need to carry specialist equipment.
3. Concerns were also raised about how to get around the lack of charging infrastructure; this would be needed during the test drives in order to get a realistic experience.

Conclusion and recommendations



Impact: Moderate. A higher than average share of survey participants stated they would be somewhat or very likely to use this service. Most focus group participants also stated they would be likely to use the service, however older participants were less likely because they were retired and no longer involved with a workplace where this scheme would be facilitated. Younger student participants were also less likely to use the service for the same reason. These trends of varied impact by age group were also identified in the survey responses. Higher impact may be realised by modifying the idea to enable it to be accessed by a greater proportion of consumers, and not just those who are in employment. Perceived impact for businesses was also mixed, and varied according to the organisation's fleet vehicle needs.



Support: Moderate. Support was good amongst survey participants but mixed in the focus group and amongst businesses. Reasons for mixed support included employment status (as discussed above) and, in the case of businesses, concerns over a lack of charging infrastructure, and suitable models of EV which would meet the needs of the fleet.



Readiness: Moderate. Similar to other ideas involving provision of EV test drives, the practicalities of delivering this service would need to be decided before it could be implemented. For this idea specifically, storage, transport, and maintenance of the roaming fleet of EVs are key elements which need to be resolved.

Conclusion

Further work is recommended to assess feasibility of this idea; if the practicalities and challenges associated with implementing this can be resolved, then we recommend it is a worthy policy idea to pursue as increasing access to EV test drives is likely to have a positive impact. Further work could be combined with that needed for idea #94.

Research next steps

Feasibility study, including stakeholder engagement and a pilot, to test implementation and gather detailed feedback from small sample of organisations who have experienced the service.



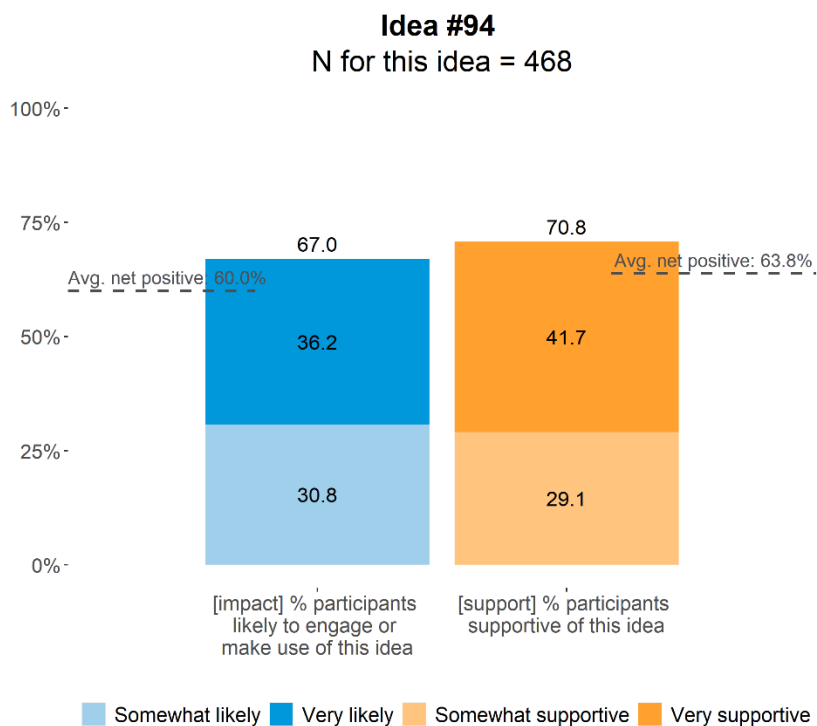
#94: EV test-drive sites across the UK

Set up 'EV clinics' across the country, in urban and suburban areas where people can show up and test-drive an EV for an hour or two in the area. The service should be made as easy as possible for consumers to sign up (including online sign-up). The test drive sites could also be promoted by inviting celebrities to come along on certain days, or couple the EV clinics with other events in the local area, such as concerts or festivals.

Rationale: Test drives can help overcoming range anxiety for some groups. Some test driving services are also available through platforms like the Go Ultra Low campaign, the EV Experience Centre and Octopus Electric Vehicles. Increasing the scale of this through a central government approach could be effective.

Private consumer feedback

Survey description: Imagine there were electric vehicle test-drive sites across the UK. You would be able to sign up and test-drive an electric vehicle for free. This scheme would be sponsored by government.”



Key findings from online survey

1. **Impact:** 67.0% of participants indicated they were somewhat or very likely to make use of such test drive sites - that's above the average take-up rate of 60.0% across ideas.
2. **Support:** 70.8% of participants were somewhat or very supportive of this initiative - that's also above the average support rate of 63.8% across all ideas.

3. **Subgroups:** Those who currently own a petrol or diesel car seem to be more positive about this idea (3.9 impact and 4.1 support) than for other ideas (average engagement 3.6 and support 3.8).

Key findings from focus groups

1. Likelihood to use this service was broadly mixed: most participants said they were likely to use this service, while some were indifferent.
2. Most respondents said it would be good to experience an EV, but did not feel this service would facilitate a realistic assessment of what it would be like to rely on an EV day-to-day and on 'normal' roads with varying surface conditions. Participants emphasised that experiencing the charging process was very important to them, as well as experiencing the implications of the range of the vehicle. They also said it would be good to have access to a range of brands/ types of vehicles to enable them to make comparisons and inform their buying decisions.
3. All participants said they were somewhat or very supportive of the concept. They varied somewhat in their reservations/ points of agreement. One thought it would help to counter perceptions that EVs are slow and boring to drive; one questioned the cost to government of implementing such a scheme when people can already go to dealers for a similar experience; while another pointed out that it would be good to have the experience without sales pressure.

Conclusion and recommendations



Impact: Moderate. A higher than average share of survey participants stated they would be somewhat or very likely to use this service; 67% of the sample. Likelihood to use the service was more mixed in the focus group participants; some felt that it would not offer them a realistic driving and charging experience. Consumer research shows that experience with EVs can have a substantive positive impact on attitudes, particularly with regard to vehicle performance and driving enjoyment, however the reach of this scheme will be limited by definition, as only a select number of EV test drive sites could be set-up in practice.



Support: High. Despite mixed perceptions of impact, participants in the focus group were generally supportive of this concept and recognised the benefits of being able to test drive EVs. Support was also higher than average amongst survey participants. Some concerns were raised, including whether this idea would offer benefits over and above test drives through dealerships, although being able to try an EV without sales pressure may be valuable to some consumers.



Readiness: Moderate. This idea would offer a similar service to the Milton Keynes EV Experience Centre, and so a model already exists which can inform implementation of this idea. There are still practical issues to consider and resolve however, including where the sites will be located, who will pay for the service and who will operate it.

Conclusion

As with idea #94, further work is recommended to assess feasibility of this idea and address the practicalities and challenges associated with implementation.

Research next steps

A feasibility study to inform implementation, including a review of potential sites, and local surveys with consumers and businesses to understand demand. Ultimately the impact of these test drive opportunities can be tracked with user surveys, or more ambitiously, by comparing purchase trends in matched regions with and without test drive sites.

#95: Telematics service to provide journey need assessments

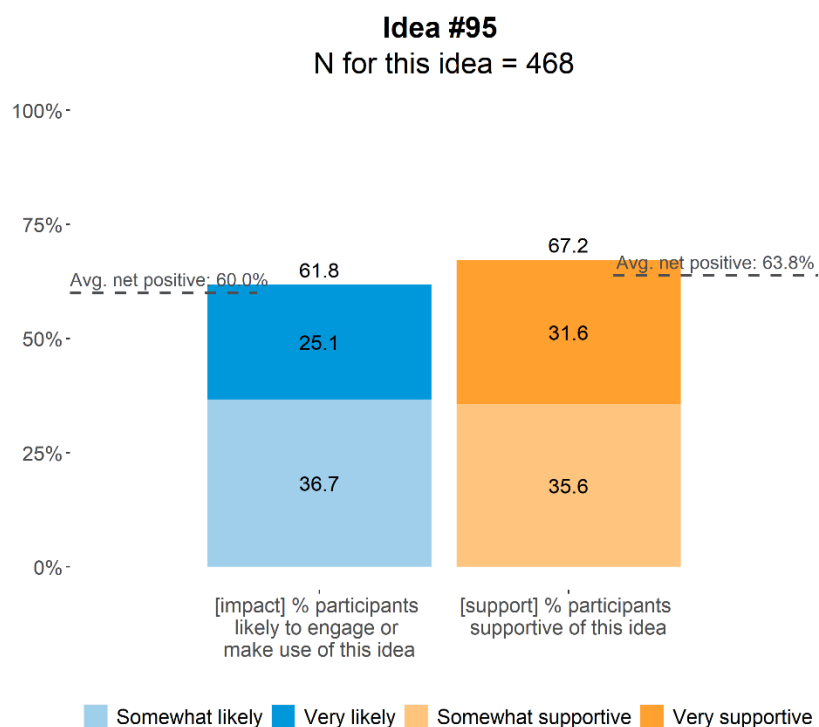
Provide a loan of an in-vehicle telematics data logger to prospective vehicle purchasers to track their journey patterns over a one to two-month period. The data would then be reviewed by a dedicated EV advisor to assess their journey needs - including opportunities for charging, and estimated range requirements - and provide recommendations about potential EV models which could suit their needs. This could potentially be done through a mobile phone app, either in isolation of connected to a very low-cost telematics dongle. This idea would couple well with #146, the EV Lifestyle Tool.

Government's role would be to encourage manufacturers and dealerships to offer this service and get them and other third parties (e.g. Autotrader) to promote it to the public.

Rationale: This would lead to more informed consumer choices, reduced range anxiety through data-led understanding of journey needs.

Private consumer feedback

Survey description: Imagine you could borrow a device (or download an app) that tracks the journey patterns while you drive over a number of weeks or months. Based on the data, you would receive a recommendation on whether an electric vehicle would be suitable for your needs.



Key findings from online survey

1. **Impact:** 61.8% of participants indicated they were somewhat or very likely to make use of this bundle deal - that's slightly above the average engagement take-up rate of 60.0% across ideas.
2. **Support:** 67.2% of participants were somewhat or very supportive of this initiative - that's above the average support rate of 63.8% across all ideas.

3. **Subgroups:** Participants who don't intend to buy another car in the future, rated the idea relatively low on impact (3.6) while at the same time being very supportive of it (4.2). Those who do intend to buy another car in the future rated the idea slightly higher on impact (3.8) but were somewhat less supportive (4.0).

Key findings from focus groups

1. Just over half said they would be likely to use the service, and on balance the group was more supportive than not.
2. Those who said they would use a journey need assessment cited reasons such as gaining useful information to better understand their driving patterns and whether an electric vehicle would be a good fit.
3. Those who said they were indifferent or unlikely to use it cited reasons such as being able to figure this out for themselves. The group also raised concerns about data privacy.

Conclusion and recommendations



Impact: Moderate. More than 60% of survey respondents indicated they would be likely to use this service, which was a higher share than average. Impact has been rated as moderate however, since it is not guaranteed that all or most users of this service would conclude that an EV is right for them. It is also uncertain what proportion of consumers would voluntarily opt to engage in the scheme.



Support: High. There was quite a high level of support from survey and focus group participants for this idea.



Readiness: Moderate. It is proposed that government's role in this idea would be to encourage manufacturers and dealerships to develop this service for consumers. Development work would be required by these bodies before the service could be taken to market.

Conclusion

This idea has some merit, although it is lower priority than others in this objective. Government's role is likely to be light touch in this case; serving as a facilitator to encourage manufacturers, dealerships, or other third-parties to develop and implement this kind of service.

Research next steps

A pilot/feasibility study with a small number of consumers to get initial feedback on the basic approach and technological aspects of journey needs assessment. Subsequently, user testing to refine the consumer proposition.

#108: EVs promoted for car rental when booking flights

When booking a flight, and are offered car rental, prompt going EV using behaviourally-informed messaging. One motivation to be harnessed may be that it offsets a portion of the flight emissions.

This would be industry-led but government's role could be to incentivise or mandate.

Rationale: Harnessing 'moral licensing' effect to influence decision making, and subsequently increasing exposure to EVs for a more substantial period of time (that is, e.g. a week's rental).

Conclusion and recommendations



Impact: Low. Expert stakeholders in Phase 2 of this project rated the idea as low impact. This type of initiative will have limited reach; it would only target consumers who book flights online and who are looking for car rental as part of their trip. Amongst that subset it is likely to only impact those who sympathise with environmental concerns, or those who would prefer to drive an EV – which may generally be low, if there are concerns about unknown access to charging in an unfamiliar location. This said, impact will not be zero – a rental period over a 1-2 week holiday is a relatively unique opportunity to try an EV for longer than a test drive, so we do believe the rental market offers an interesting point of leverage to increase consumers' familiarity and experience with EVs.

Support: N/A



Readiness: High. This idea could be implemented reasonably easily by existing travel websites. However government's role in promoting or incentivising this, is less clear at this stage.

Conclusion

This is a low priority idea. Whilst it could be a quick-win, given the high level of readiness, there may be little need for government involvement in implementing this type of system.

Research next steps

If implemented, the impact of such prompts on rental vehicle choices could easily be tested in a randomised controlled trial.



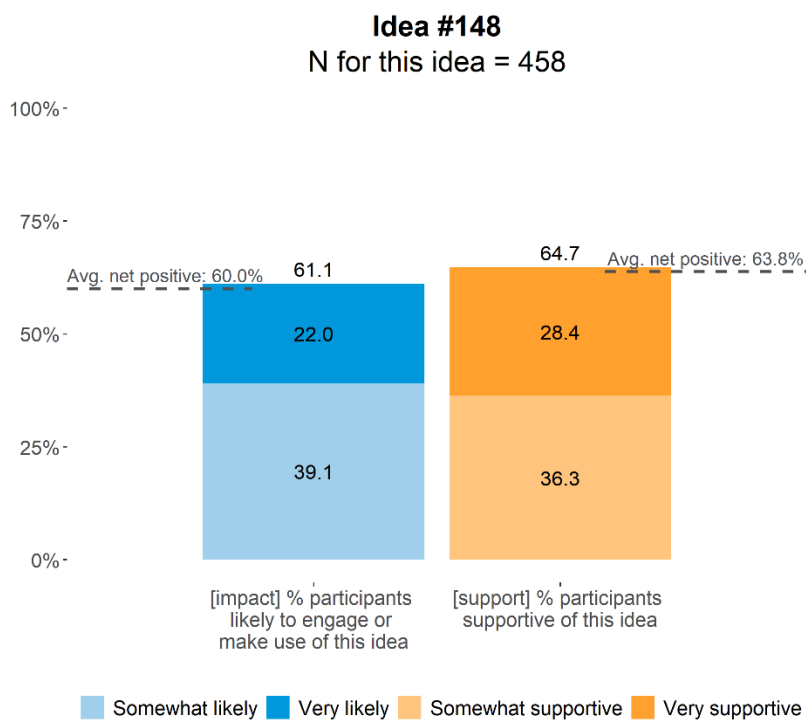
#148: Increase uptake of (and awareness of) current Dealership EV accreditation initiative

Dealerships can already enrol in the National Franchised Dealers Association's (NFDA) Electric Vehicle Approved (EVA) scheme. However, an EV accreditation initiative membership is not widespread and not salient to consumers. Making accreditation status more salient will incentivise consumers interested in EVs to seek an accredited dealership. This further incentivises dealerships to become accredited. The accreditation itself should be improved by including further training on communicating about total costs of ownership of EVs vs. ICEVs, info on charging infrastructure, and DNO registration for at-home charging.

Rationale: Reduce barriers at point of sale and remove frictions and perceived risk through the customer journey to EV purchase.

Private consumer feedback

Survey description: Some car dealerships have earned an accreditation status certifying their expertise for selling electric vehicles. This accreditation is currently not required to be able to sell electric vehicles, but it guarantees they know what they're talking about. Imagine government invests in further promoting the uptake of this accreditation status among dealerships.



Key findings from online survey

1. **Impact:** 61.1% of participants indicated they were somewhat or very likely to make use of accredited dealerships - that's above the average take-up rate of 60.0% across ideas.
2. **Support:** 64.7% of participants were somewhat or very supportive of this initiative - that's also above the average support rate of 63.8% across all ideas.

3. **Subgroups:** There are no notable differences between subgroups beyond those observed across all policy ideas.

Key findings from focus groups

1. Participants were unanimous in saying they would be somewhat or very likely to take up the opportunity to talk to approved EV experts at dealerships. They noted that it would be particularly valuable for those who do not use the internet for information.
2. The enthusiasm of some was tempered by a distrust of dealers, while others indicated that they trusted information from dealers. Support for the idea was split between indifference and highly supportive, depending on people's trust in car dealers to provide accurate and unbiased information.

Conclusion and recommendations



Impact: Moderate. 61% of survey participants stated they would be somewhat or very likely to use this service; this was only just higher than average. All participants in the focus group said they would be likely to make use of accredited dealerships. Impact may be higher if measures are taken to improve some consumers' innate distrust in manufacturers and dealerships; for those who were particularly negative, an accreditation scheme seemed to do little to offer them reassurance.



Support: Moderate. There was about an average level of support from survey participants; perceived support from focus group participants were more mixed depending on their level of trust in dealerships. As with impact, higher support may be realised by addressing these trust concerns.



Readiness: High. This idea centres on increasing awareness and uptake of an existing government scheme, and so readiness for implementation is high.

Conclusion

We recommend that this idea is implemented and consider it to be a quick-win, given the accreditation scheme has already been set-up. Further work is recommended to assess what can be done to alleviate high levels of distrust in dealerships held by some consumers, so as to improve the likely impact of these types of schemes. We recommend continuing to use campaigns such as Go Ultra Low to promote the scheme to an extended audience.

Research next steps

Stakeholder engagement and potentially an online survey with dealerships to understand uptake of existing scheme, and reasons why some choose not to engage.

Development and testing of potential communication campaigns to promote the scheme and improve consumer perceptions of dealerships (reducing innate distrust held by some).

#149: Introduce standardised training for lease companies

Standardised training would ensure that lease companies are better equipped to help organisations work through perceived barriers to uptake. Create demand for training by making the accreditation official and salient, such that a large company with any interest in exploring EVs would seek an advisor who knows the options. It would be possible to have a single, common scheme of accreditation for 'EV experts' across different parts of the industry (lease companies, dealerships, mechanics, etc.). Could possibly build on existing EVA scheme (see #148).

An alternative option is to create a 'turnkey' organisation for fleets which take responsibility for all of a fleet's EV needs (i.e. infrastructure, grid connections, employee engagement, tax implications, vehicle strategy, vehicle supply, etc).

Rationale: improved understanding and awareness in fleets

Commercial fleets feedback

Description: Imagine that standardised training was introduced for vehicle lease companies, so that they were better equipped to help organisations work through their perceived and actual barriers to making the switch to electric. The training would be accredited by government, so that standardised approaches are used, and the credentials of the leasing company can be recognised.

Key findings from interviews

1. Businesses were generally supportive of this idea, although perceived level of impact was mixed - some felt impact would be minimal because they felt they already put efforts into staying on top of new vehicle developments even if leasing companies were less clued up.
2. One company reported that the leasing company they use did not always "have all the answers" and such a scheme could therefore be valuable.

Conclusion and recommendations



Impact: Moderate. Mixed responses were received from commercial organisations in the interviews; some felt it would have a positive impact on their business whilst others perceived no impact. The level of impact is likely to vary depending on the knowledge of the fleet manager (or similar) and the existing knowledge of the leasing company the business uses.



Support: High. There was generally a high level of support for the idea from commercial organisations, despite the mix of perceived impact.



Readiness: Low. The idea has merit but further development and testing would be needed before it can be implemented. This would include development and testing of suitable training materials and approach, and establishing the mechanism for training delivery (e.g. online, in person, by government, or by other independent body).

Conclusion

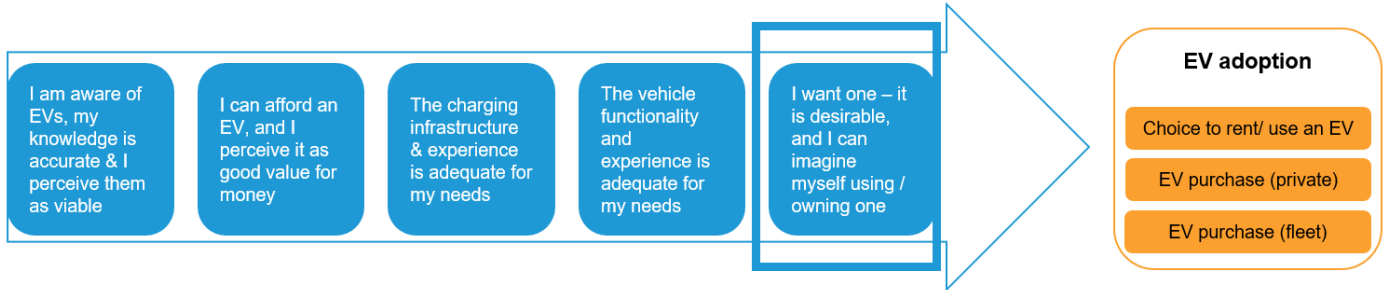
This is a low priority idea; further work would be required before implementation to establish effective training materials and approaches, and even then the impact is likely to be mixed. Other ideas in this objective are considered to be more promising.

Research next steps

Development and piloting of training materials and delivery methods is necessary, including initial piloting with a small number of leasing companies to gather feedback on the approach before wider implementation. Consideration of the organisational structure and responsibility for providing accreditation will also be key.

Objective 5:

“I want one – it is desirable, and I can imagine myself using/ owning one”



#33: Discounted personalised number plates

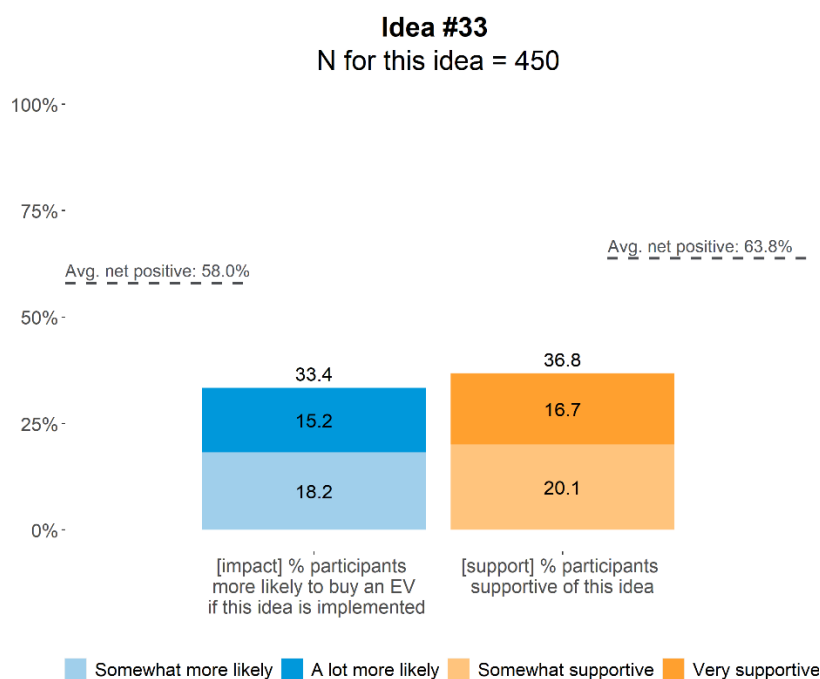
Often popular with high income individuals - discounts or preferential choices of personalised number plates could be offered to EV owners, and linked with existing ideas around green plates. More powerful yet, only allow personalised number plates to be registered to EVs.

Rationale: Additional incentives for EV drivers.

Risks: May only target small portion of generally high-net-worth individuals.

Private consumer feedback

Survey description: Imagine personalised number plates were sold at a significant discount when being registered to an electric car, compared to a petrol or diesel car.



Key findings from online survey

- Impact:** 33.4% of participants indicated they were somewhat or a lot more likely to buy an EV if personalised number plates were discounted for EV owners - that's well below the average share providing a net positive impact score of 58.0% across ideas. However this is to be expected, given most people do not buy personalised number plates.
- Support:** 36.8% of participants were somewhat or very supportive of discounted personalised number plates for EV owners - that's also well below the average support rate of 63.8% across all ideas.
- Subgroups:** Most notable for this idea is that the 'middle option' was the most popular rating for both metrics. 55.6% of participants said this idea would not make a difference to their likelihood of buying an EV and 44.7% of participants were indifferent to this idea.

Key findings from focus groups

1. Most participants did not think that discounted personalised number plates would make any difference to their decision about whether to adopt an EV; most had no interest in personalised number plates.
2. Only one person was supportive of the idea, and that was because they had a substantive interest in personalised plates.

Conclusion and recommendations



Impact: Low. It is clear from the survey responses and feedback received during the focus groups that this idea would have a very low impact; unless consumers have particular interest in personalised number plates this incentive is unlikely to make a difference to their likelihood to adopt an EV. However, there could be a more subtle benefit of making EVs more appealing to high-status individuals, and thus making EVs more high-status.



Support: Low. Similar to perceived impact, support was also much lower than average in the survey sample, and most focus group participants were also unsupportive.



Readiness: High. Whilst we do not recommend implementation of this idea, readiness is reasonably high if it were to be implemented, as it should be reasonably straight-forward to set-up discounting for these products.

Conclusion

Overall, a stronger case is needed to pursue this idea given the relatively low support. However, the knock-on effects of drawing high-status individuals towards EVs could be worth further consideration.

Research next steps

Further psychological and sociological research on the implications of associating high-status symbols such as personalised plates, with EVs.

#112: Concerted push to increase product placement in mainstream media, inc. TV shows and video games

This should complement and build on the existing GUL campaign to:

- Widely promote images of 'ideal' multi-car home / business in media (e.g. product placement in TV shows, marketing campaigns, social media).
- Target affective attitudes and the promotion of the beneficial feelings of driving an EV.
- Appeal to green identity
- Increase awareness about push to use EVs for high performance public service vehicles (e.g., military, police, ambulance service) to signal their quality and use of range.
- Collaborate with video game developers to include EVs into their games - as a publicity stunt and for eventual gameplay. Manufacturers can be invited to get involved and well known games like Forza can promote themselves too. In racing games, EVs can be given greater acceleration than ICEVs.
- Commission a fast & furious style TV show or film to promote EV racing.

This could take a number of different directions. e.g. increased exposure to EVs within 'normal' situations in TV, film and video games could help normalise their ownership. For example, everyday scenes at home or on the road include EVs, EV charging etc. Alternatively, aspirational ownership can be boosted, aiming to generate a 'spark head' culture similar to petrol head culture for ICEVs, though imagery of high-status ownership, pop-culture, etc.

Rationale: Increased exposure, familiarity, awareness and desirability.

Conclusion and recommendations



Impact: High. This idea has a good basis in evidence (e.g. [consumer research of EVs](#)) and high impact ratings were perceived by expert stakeholders in Phase 2 of this project. A varied and targeted approach to campaigns can help to increase awareness and understanding of EVs in the general public, which should help to improve attitudes, dispel myths, and facilitate more informed consumer choices. However, ultimately the impact will depend on the degree of increased EV exposure that is feasible through government action.

Support: N/A



Readiness: Moderate. This idea builds on existing GUL campaigns, although it is expected that some areas would require more development (e.g. video gaming) and further research is recommended to inform the approaches. Therefore, readiness is considered to be moderate.

Conclusion

We recommend this idea is pursued further given the high expected impact. Applying best practice principles from the behavioural sciences will help to ensure positive results. Nevertheless, it is acknowledged that some areas may be more ready than others and further work would be required to develop relationships and strategies (e.g. collaboration with video games industry).

Research next steps

A review of behavioural science and marketing evidence to narrow the list of potential approaches to enhancing awareness of EVs, such as through product placement online, social media, on TV or in video games. An online experiment could be used to generate primary evidence if necessary, on the impact of different approaches (e.g. measuring implicit association tests, attitudes, and recall). Monitoring and analysis of media reach through random population surveys, clicks, and views, to evaluate impact.



#114 and #151 combined: (Continue to) Trial behaviourally-informed communications through Go Ultra Low, such as timely messaging, to make EVs more desirable and normal

A coherent and evidence-based comms strategy is critical, to be deployed through the GUL communications campaign, but also to inform elements of others' campaigns (e.g. local authorities).

NB: We note that since this idea was first developed, GUL have already adopted a similar approach that we propose to continue and refine relying on behavioural science and testing.

Behavioural science suggests the following approaches may be worthwhile, though all should be empirically tested.

- ❖ Communicate the 'dynamic social norms' (the increasing number of people, rather than absolute number, who are buying EVs).
- ❖ Communicate the increasing number of charging points.
- ❖ Emphasise similarities of EVs over their distinctiveness, e.g. don't make them appear niche, or less 'potent' by over-emphasising their sustainability.
- ❖ Harness different motivators, e.g. their high rated safety, their performance / acceleration.
- ❖ Highlight novel benefits to certain audiences - e.g. no engine noise = good for audiophiles who enjoy listening to music in the car.
- ❖ Highlight the TCO benefits through a variety of framings (see idea #136)).
- ❖ Develop simple heuristics on range to help address range anxiety (e.g. vehicle range = average user needs to charge it once per fortnight, or vehicle range = from London to Manchester and back).
- ❖ Implement targeted messaging campaigns through estate agents to reach consumers who are in the process of moving home (both sales and lettings relevant).
- ❖ Use existing communication channels (e.g. first council tax bill) to promote EVs, or perhaps provide information on number of local charging points, or the option of having a charging point installed at home (since some people, when moving home, may be buying a new car).
- ❖ Encourage RightMove/Zoopla to include chargepoints on their 'closest to' list of local facilities and as a feature in a house that can be searched for.
- ❖ Target new employees, new drivers, when people are moving jobs, or those who have recently had a failed MOT (i.e. target those who just paid a lot to repair an ICEV by highlighting the lower maintenance and fuel costs of EVs). Targeted messaging should include promotion of EV test drives.

Rationale: There are various framings and points of emphasis that can be brought to the fore through communications campaigns. The evidence base on what is most effective, is currently limited, though the wider behavioural sciences suggest many good opportunities.

Conclusion and recommendations



Impact: High. The list of approaches captured in this idea have a good but broad basis in evidence from the behavioural sciences, and so subject to further testing and refinement we feel there is potential for this idea to have a high impact on making EVs 'normal' and desirable. Ultimately, however, as with any behaviourally-informed communications campaign, the details matter and we would not presume impact without first testing the approach.

Support: N/A



Readiness: Moderate. Further research and testing is needed to refine the list of potential activities and determine which of these potential approaches is likely to be most effective, and what the specific framing of the approach should be.

Conclusion

Further work is needed to refine the specific approach(es) that would be taken to widen the current communication campaign. Overall we recommend that this idea is taken forward as it has a good basis in evidence and is likely to have a high impact.

Research next steps

A review of behavioural science evidence to narrow the list of potential campaign strategies that could build on the current communication campaign. New approaches can be piloted through online experiments and consumer testing. In the field, a randomised controlled trial could determine the effectiveness of campaigns on sales data, or (more feasibly) intermediate outcomes such as click-through rates to book test drives or seek more information.

#116: Smart signage at entry points to clean-air zones, highlighting the number of EVs which have entered (toll free)

Implement smart signs at entry points to clean air zones which show the number of EVs using the area. This could present an accumulating total (racking up into the tens of thousands), or daily or monthly totals, and may be an effective tool for raising awareness of EVs. Vehicles are required to register to pay or avoid the fee, so the data should be readily available, and ANPR technology could also be utilised.

Rationale: Raises awareness, and harnesses a strong social norming effect, as well as loss aversion (since you're missing out if you're not driving an EV).

Conclusion and recommendations



Impact: Moderate. Impact will largely be dependent on the number and characteristics of the locations where smart signage is installed, and so cost may be prohibitive for achieving high impacts. Moderate impacts are expected if busy routes in major cities are prioritised; messaging which harnesses social norms and loss aversion has been shown to be effective in other areas of policy.

Support: N/A



Readiness: Low. Development work is required to consider a number of factors relevant to implementation of this idea, including procuring and installing appropriate technologies (e.g. ANPR cameras), setting up database management processes, costs of implementation and operation (and who bears the cost) and where the monitoring and signage should be located.

Conclusion

We suggest this is a low priority idea for meeting this objective, and is likely to be more challenging and costly to implement at scale than some of the other ideas in this catalogue.

Research next steps

If implemented, the impact of the initiative on EV awareness could be explored through targeted before-after surveys in the locations where signage is installed. Before implementation, consideration of public acceptability could be important.



#120: Green parking spaces for EVs

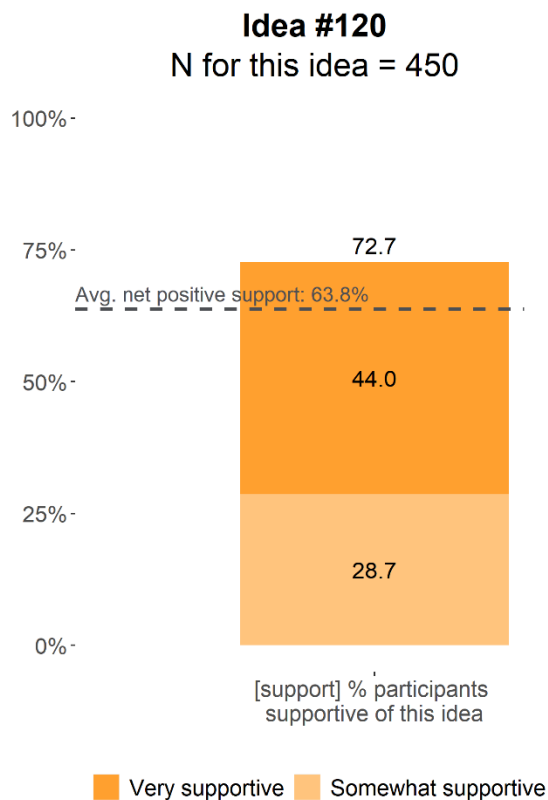
All EV parking/charging spaces to be painted green, or otherwise made more distinct and salient.

Rationale: increased visibility of EV facilities, makes their benefits more salient, and their prevalence.

Risks: need some consideration to local aesthetics, particularly in conservation areas.

Private consumer feedback

Survey description: Imagine all public parking spaces that have an electric vehicle chargepoint were painted green. This would make them easier to spot and help people become aware that there are lots of chargepoints available.



Key findings from online survey

1. **Impact:** N/A
2. **Support:** 72.7% of participants were somewhat or very supportive of green-painted EV parking spots - that's well above the average support rate of 63.8% across all ideas.
3. **Subgroups:** There are no notable differences between subgroups beyond those observed across all policy ideas.

Key findings from focus groups

1. Most participants were either somewhat or very supportive of the idea, believing that the green parking spots would make chargepoints much more visible (“eye-catching”) and raise awareness of the number of them available, which in turn could help to encourage people to adopt EVs.

Conclusion and recommendations



Impact: High. Whilst no direct data on perceived impact were received during Phase 3 testing, expert stakeholders in Phase 2 perceived this idea would have a high impact. We agree with this view (at least relative to the cost), and feel it could be a simple and effective solution for raising awareness of EVs and improving confidence in the availability of charging infrastructure; a key barrier for EV adoption.



Support: High. A much higher than average share of survey participant were somewhat or very supportive of this idea, and most participants in the focus group were also supportive. Participants reported that they felt green parking spaces would help to draw attention to EVs and charging infrastructure.



Readiness: High. Practical considerations associated with the implementation and maintenance of green parking spaces should not be underestimated, however aside from factors such as this we feel the idea is well developed and has a good basis for implementation.

Conclusion

We highly recommend implementation of this idea; there is a strong case in favour of the idea from Phase 3 testing, both in terms of support and perceived impact, and readiness is also considered to be high. Compared with some of the more complex policy ideas in this catalogue, this could be considered a reasonably quick-win.

Research next steps

The next steps should focus on agreeing the approach to implementation and maintenance of this idea, and seeking local authorities willing to pilot the idea. Some light-touch consumer testing to measure the impact on awareness and public acceptability to local residents, may be valuable.

#122: Salient indication that you're inside an EV

Like green number plates highlight other EVs on the road, a standardised label/sign/symbol could be placed inside electric taxis, buses and other public transport vehicles to signal to passengers that they are inside an EV.

Rationale: Increases awareness of the increasing norm of EV use, and makes people's experience of an EV more salient.

Conclusion and recommendations



Impact: Low. The expert stakeholders in Phase 2 considered that this idea would have a low impact and we agree with this view. Potential impact is limited by definition as it would only reach users of the public transport / private taxis where the signage was located. Even amongst that subset of the sample, there is no guarantee that all users would notice the sign. However, given the low cost, we would not rule this out. Over time, a lot of people could find themselves in an electric Uber, for example, and this could start to subtly change perceptions of normality and familiarity.

Support: N/A



Readiness: High. Whilst we do not actively encourage implementation of this idea, if it were to be taken forward we feel readiness is high, as it should be straight-forward to develop and implement a standardised sign so long as support from transport providers can be gained.

Conclusion

We suggest this is a low priority idea which is not taken forward for implementation at this time.

Research next steps

A simple online experiment could help inform the design of the label / sticker, to ensure it is intuitive understood by passengers. Field experiments could also test whether users were aware they had just ridden in an EV comparing vehicles with and without the sticker.

#128: Enter users into a lottery every time they choose an EV through partnering organisations (rental companies, Uber, etc.)

Government's role may be to regulate or officiate the lottery (though is unlikely to fund it). Service providers may fund it (since being part of the lottery may provide a small boost to business). E.g. Uber plan to transition to electric - this mechanism will create consumer demand for electric, thus aiding that transition.

Rationale: lotteries can have out-size impacts relative to the small value of the average return, as we overestimate small probabilities and tend to focus on the size of the prize.

Conclusion and recommendations



Impact: Moderate. The idea has potential to have a moderate impact as lottery incentives can be an effective means of encouraging behaviours for low cost. The initiative has potential to incentivise the partnering organisations to adopt more EVs, if they turn out to be popular with consumers because of the lottery incentive, thus acting as a 'double nudge'.

Support: N/A



Readiness: Moderate. The funding and delivery mechanisms need to be developed for this idea to be taken forward for implementation. Further research and testing is also recommended to understand public support for this idea as a government-led initiative, as well as to understand what type of prize incentive might be most appealing to the public

Conclusion

Further work would be needed to enable implementation of this idea, particularly to understand public support. Overall, we suggest this is a low priority idea compared with others in the catalogue.

Research next steps

The impact of the lottery on consumer choice could readily be evaluated using an online experiment simulating a taxi-booking service, or in a field trial collaborating with a provider such as Uber.

Appendix A - Robust evaluation of behavioural policy interventions

Human behaviour is complex, unpredictable and context-dependent. As such we can never be sure, even with the best understanding of the behavioral literature, that our intervention is going to be effective. History is littered with examples of ‘common sense’ initiatives which, years later under scrutiny, were found to be ineffective or even harmful. For example, the administration of steroids for head injuries to reduce inflammation was standard practice until as late as 2005 when [a large-scale evaluation](#) found them to significantly increase mortalities. Moreover, even if we’re confident our intervention will have a positive impact, we don’t know to what magnitude - a critical piece of information when trading off different options or allocating finite budgets.

Evidence-based policy demands robust empirical evidence. The quality and relevance of this evidence depends on the quality and appropriateness of the research undertaken. In this section we provide a step-by-step guide to robust evaluation of behavioural policy interventions.

Step 1: Identify the driving research questions

There are many ways to approach research design, many potential research questions to answer, and many research tools available to us. To avoid possible confusion from the outset, it is useful to put some structure to the different kinds of research question we might seek to answer. We break these down into four categories:

Impact evaluation – **research intended to quantify the impact of an intervention or policy change on the outcomes of interest.** Probably the most common type of evaluation, this aims to answer questions like ‘what is the impact of a targeted messaging campaign on the public’s level of awareness and knowledge on EVs (e.g objective 1)?’, or ‘what is the impact of the new feebate scheme on the EV adoption rate (e.g. objective 2)?’.

Subgroup (segment) analysis - **usually supplementary to an impact evaluation, research intended to illuminate variation in impact between subgroups.** This aims to answer questions such as ‘to what extent does the impact of my campaign differ for those with above average and below average incomes, or between those with and without off-street parking?’.

Process evaluation – **also often supplementary to an impact evaluation, process evaluations aim to understand the ‘how’ and ‘why’ of the intervention’s impact.** A process evaluation seeks to evaluate the mechanisms through which the intervention ‘works’ and understand the delivery of the intervention to identify any problems. Knowing the mechanics of an intervention’s success helps us extrapolate beyond the context of the particular trial and predict when, where and with whom an intervention might work more broadly.

Process evaluations can also be used as a diagnostic tool to help us understand any issues in delivery of the intervention, such that it might be improved next time. Typical questions include ‘what were the experiences of the suppliers under the new procurement point system (#157)?’, ‘what were the motives for changing their behaviour?’, ‘did all intended recipients actually receive the intervention (i.e. did they notice the change, were they aware of the new communications)?’, ‘why did some not act on it?’ and so on. In this manner process evaluations are also integral to the development of a ‘Theory-of-Change’, which aim to illustrate the mechanisms and logic of an intervention’s impact.

A process evaluation may have its own segment analysis associated with it, in other words, it may ask if the mechanism of the intervention differs for different segments of the population.

Exploratory research – research with no a-priori hypothesis being tested, but rather an open-ended exploration for interesting findings. Typically, this involves data analysis looking for trends and non-causal relationships which exist in the data.

Here we refer to exploratory research (as in not pre-specified or with specific hypotheses in mind) undertaken on data collected during a trial or experiment. Exploratory analysis is inherently less rigorous due to the very high risk of drawing false-positive conclusions: when we look for patterns in the data long enough, we are almost guaranteed to find them. If not done with a framework in mind it can also drain overall resources. This is why our primary analysis associated with an impact evaluation should be pre-specified (that is, planned in advance before we start exploring the data).

Step 2: Identify the outcome measure

What is the intervention designed to impact? In this case, the outcome may directly be EV adoption, or instead it may be one of the 5 'intermediate objectives' identified in this project. Often, we might measure multiple outcomes, for example we might measure both the number of people using certain chargepoints on the back of better signage (#140) as well as the rate of EV adoption in that county, on the premise that our intervention might impact both.

Sometimes the outcome measure may not pertain to a concrete behaviour, but to an attitude or belief - such as awareness of the public charging infrastructure, perceptions towards vehicle range, or comprehension of the total cost of ownership of EVs. To keep our evaluation robust, it is useful to classify different types of outcome measure:

Primary outcome measures – the metric of most importance to the research. Usually, the prevalence of a behaviour we are trying to change, i.e. EV adoption. That said, if we are trialling the impact of new EV lifestyle tool (#146), the primary outcome measure of that particular trial might be objective 1 (the level of awareness and accurate knowledge) rather than EV adoption, as the direct impact on the latter will likely be too small to detect.

Secondary outcome measures – those which are either of subordinate or peripheral importance to the main research question (e.g. awareness of TCOs, perceptions of the charging infrastructure, attitudes towards vehicle range, etc.) or those which make little sense in their own right but which add second-order detail to primary outcomes (e.g. if free parking increases the overall number of cars in city centres).

Intermediary outcome measures – metrics which are 'en-route' to the primary outcome measure we care about, often relating to a particular theory-of-change we have with respect to the behavioural mechanisms on which our intervention depends. For example, if testing the impact of an email campaign on a particular behaviour, the email opening rates may be an intermediate outcome of interest. The five objectives outlined in Section 2 are intermediary outcome measures to the primary goal of EV adoption, but they may be considered as primary outcome measures for particular trials where the impact of the intervention on EV adoption is too small to detect.

Proxy outcome measures – imperfect/indirect metrics of something else we would ideally measure. For example, the number of test drives booked may be a (potentially inaccurate) proxy for future EV purchases. Researchers generally use proxies because they can be easier to obtain and may, by virtue of being reliable in their own right even if not a perfect proxy for the thing we care about, still be more reliable than collecting bad or incomplete data on the main variable of interest. When budgets are limited and no perfect measure of behaviour exists, it is quite reasonable to 'follow the existing data' and aim to measure something which is available and reliable, so long as we are aware of the caveats of doing this.

Where we have multiple outcome measures, we must be aware of the inflated risk of false-positive results. In other words, if we run statistical tests on 20 different outcomes, we're likely to find one significant result simply by chance. To control for this, it is good practice to limit our outcomes to only those which we deem important, to relegate others to secondary or exploratory analysis (such that it is interesting to know but isn't retrospectively claimed to be the main result just because it came out as positive). If after this we still have several primary outcomes we want to measure, we should undertake 'multiple comparison corrections' – a statistical technique, like Bonferroni corrections – which make the threshold of claiming statistical significance more stringent to counter the inflated probability of spurious results.

Typically, as behavioural scientists seeking to influence the adoption of EVs or other pro-environmental behaviours, our outcome measure will relate to a behaviour (or awareness or attitudes, if those are what we are interested in), rather than an environmental outcome. For instance, if we want to test the impact of feebates on EV adoption, our outcome of interest will be the rate of adoption. As behavioural scientists the ultimate impact – on carbon emissions - is not our primary concern. In other words, we are seeking to increase the share of EVs bought over that of ICEVs because policy-makers in the UK have decided it's good and necessary to meet wider environmental goals. In cases where the environmental impact of a policy goal is *not* known, then certainly this should be evaluated as the first priority, but it is a different research question.

Step 3: Identify the best research design

With the main objective being to run an impact evaluation of a particular behaviour-change intervention or campaign (and with subgroup analysis, process evaluations, and exploratory research being additional elements of this, rather than standalone objectives), we must next determine the best research design. A wide range of options are available.

Randomised Controlled Trials (RCTs)

RCTs are the 'gold standard' of impact evaluation research designs. They aim to identify the causal impact of an intervention or some other change, on outcome(s) of interest. They do this robustly by incorporating two key components: 1. the presence of a counterfactual sample who do not receive the intervention (creating a 'treatment' and 'control' group), and 2. random assignment of the sample into these two groups (or more, as there may be multiple different 'treatments' we wish to compare against the control and each other, such as different variants of campaign materials).

The purpose of the control group is to identify what would have happened without the intervention. Without this counterfactual, it would be impossible to attribute any differences we see in our outcomes to the intervention itself, as other extraneous factors may have confounded us. For example, if we want to measure the impact of a campaign on meat consumption among US citizens, a subsequent drop in meat consumption may be down to our campaign or may have happened anyway due to wider cultural shifts - only a good counterfactual group (who also experience the same cultural shifts, but don't experience the campaign) can address this problem. The purpose of allocating the sample randomly is to ensure that the two or more groups are like-for-like in every respect except for their receipt of the intervention (treatment). Randomisation achieves this if the sample size is large enough (through the law of large numbers). Small samples risk 'randomisation failure' (imbalance between the groups on confounding factors). This is one of the two major reasons for having large samples in experiments, the other reason being to maximize statistical power (our chance of detecting an impact of the intervention, if one really exists) – see comments on 'sample size' later.

We outline the basic structure of an RCT below.

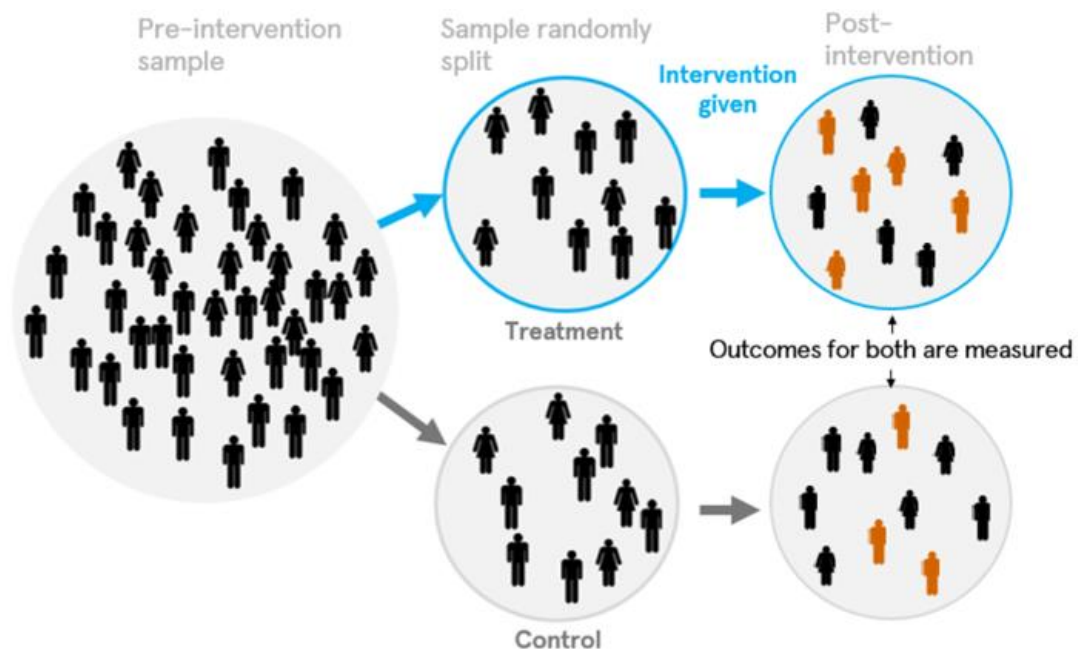


Figure 5. Structure of randomised controlled trials

Randomisation strategy and clustering

When we randomly allocate our intervention to a sample population, we must be wary of spillover and contamination. Spillover occurs where those in the treatment group interact with the control participants, who therefore indirectly benefit from treatment. For example, if testing an educational intervention (e.g. #111), we might attempt to deliver it to half the students but not the others - however since students talk to each other, those in the control group might indirectly be exposed to the treatment. A similar concept, contamination, occurs where control participants directly receive treatment, e.g. because treatment is delivered in one region, and control participants from another region travel into the treatment region.

Both spillover and contamination undermine our ability to robustly estimate the true impact of the intervention. The most common solution is to 'cluster' treatment delivery, randomising by, say, classroom or perhaps by school, rather than by individual pupil. This aims to keep the treatment and control groups isolated from each other. Our outcome measure may still be at the level of individual student (e.g. exams testing knowledge of EVs, or individual (and parental) attendance at a school's EV day).

However, clustering comes with trade-offs. Our statistical power is usually reduced because we have fewer truly independent observations: each observation within a single class will be correlated as they share other features in common. We also risk randomisation failure, since randomising 10 schools into two groups of 5 schools will less reliably give us like-for-like treatment and control groups than randomising the 2000 pupils at those 10 schools into two groups of 1000 pupils. It is therefore best to randomise at the 'lowest' level possible without risking spillover or contamination (where randomising the sample into groups 'by pupil' is lower than 'by classroom', which is lower than 'by school').

Quasi-experimental studies

The main benefit of an RCT is that bias is avoided in the simple and elegant design of the trial, and therefore analysis is simple and there is no need to statistically control for bias. However, running an RCT is not always possible, in which case a quasi-experimental study may be the next-best option.

A quasi-experimental design is one which contains elements of a true experiment but elements which are missing. Most commonly this means the intervention has not been randomly allocated to the sample. For instance, treatment may have been self-selected, such as if trying to evaluate the impact of telematic devices on EV uptake – this depends on people voluntarily signing up to this service who we must compare to people who have not signed up (here, the two groups clearly differ in various attitudinal, and possible socio-demographic characteristics). There may be solutions to this which allow us to maintain a true RCT - such as selecting a sample from only those who have signed up, and then disabling certain features among a random half to test the impact of those features. However, this may not be desirable. Similarly, we might need to cluster our intervention delivery, for instance running a campaign in one region and comparing it to another region - and unless we can do this across a sample of many regions, we won't have equivalent treatment and control groups as the two regions will differ.

In situations such as these the general aim is to try to recreate the conditions of a 'true' RCT. Recall the two critical features of an RCT - first, that we have a counterfactual (control group). This rules out the option of simply doing a longitudinal study (pre-post comparison) among those who receive the intervention, as we won't be able to disaggregate the impact of our intervention from changes which might have occurred anyway. Second, we want our control and treatment group to be comparable to each other before the intervention is delivered. This is achieved through randomisation of a large sample in an RCT, but through other means in a quasi-experiment. Most commonly: 1. matching (in which we create a control group which we know is comparable), on any variables we can measure, or 2. Difference-in-difference, which doesn't aim to remove differences between our two groups, but simply measures them so we can account for them. We might also combine the two - attempting to create matched groups but recognising this won't be perfect so also accounting for any residual differences between them.

Matching (Exact matching, and Propensity Score Matching).

Matching techniques aim to create a control group which is matched to the treatment group on all important variables. This will always be imperfect because we can only match on observable characteristics, and some bias is still likely to exist on unobservables (albeit we benefit from the fact that the observables we match on will often be correlated with other unobservables).

Many matching methods exist. The first choice should generally be exact or coarsened exact matching, where each treatment participant is matched on every known characteristic to a control participant. However often there are too many variables on which to match ("the curse of dimensionality"). A suitable method in this case is Propensity-Score-Matching (PSM). PSM aims to identify the observable characteristics which predict someone's propensity to have the treatment. For example, where it is possible to do so, we can ascertain which characteristics (age, income, education level, address etc.) predict someone's likelihood of signing up to the telematics service. We can then build a control sample which have the same propensity to adopt the service based on their known characteristics. The control group is therefore defined by characteristics which means they are just as likely to have adopted it, albeit we know they did not.

Difference-in-differences (diff-in-diff)

An alternative solution for a non-randomly allocated treatment, is to accept that the two groups are different at baseline (before intervention), but to measure and account for this difference. This is possible if we are able to measure our outcomes before intervention. Sometimes this is straightforward because we can retrospectively access data (e.g. EV sales data in certain counties at certain dealerships). Other times this must be considered in advance of the intervention being delivered, to include an extended period of baseline data collection.

The principle of a difference-in-difference is therefore to measure the difference between the two groups before the intervention is delivered, and again after the intervention is delivered. It is the difference between the differences which can be attributed to the impact of the intervention itself. We illustrate this simple logic of a diff-in-diff design below. For instance, if we want to increase the level of awareness and usage of the public charging network through clear and standardised signage, we might start out by looking at two local authorities only - one receiving the signage, the other not. Recognising that the awareness and use of public charging already differ between the two, we might see the following (where 'outcome' is usage per month).

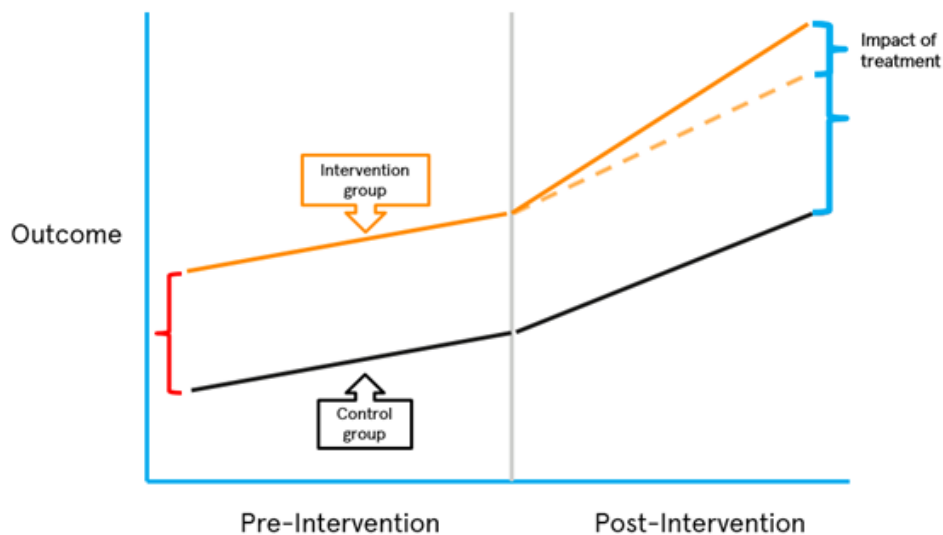


Figure 5. Difference-in-differences design

Diff-in-diff designs rely on the critical assumption of 'parallel trends.' This assumption dictates that in the absence of the intervention, the difference between the two groups would remain constant, i.e. their trends are moving in parallel. To test this assumption, we need multiple data points before intervention.

Laboratory experiments

The laboratory (online or in-person) offers a controlled environment in which to test hypotheses. Their main advantage is that the researcher has great control over all factors, and usually has the opportunity to measure things with great precision and specificity. This means, for example, we could measure such things as eye-movement and gaze, or comprehension and retention of information, when testing the design of campaign materials or new EV labels. By having such control over the environment, we can be highly confident that measured effects are attributable to the intervention being studied. This means they have very high internal (causal) validity.

However their main drawback is weak external validity (our ability to generalize the result to real-world contexts). There are often many reasons why a result identified in a lab would not be observed in the real world. This can sometimes be partially addressed, for example introducing real financial incentives to mimic real-world consequences, or undertaking 'lab-in-the-field' studies where controlled experiments are done with the target audience in their environment. As with all research designs, we should use the appropriate tool for the job, and these pros and cons should be borne in mind when considering a particular research question.

One powerful application for laboratory studies is as a precursor to a field trial, for example to test multiple variants of an intervention, or to hone certain design elements in detail and in a manner which is often quicker and cheaper than a field trial. The most promising design can then be run in a field trial compared to a control group.

Surveys, focus groups and interviews

Surveys, focus groups, and interviews are research *tools* for the collection of data. When campaigns are said to be *evaluated* through consumer surveys, commonly this means 'just asking', such as: "are you more or less likely to purchase an EV after seeing this campaign?" This is generally a weak predictor of actual behaviour - there is no counterfactual group to compare the responses to, and there will be severe self-report bias as respondents err towards the answer expected of them. Even sincere responses won't reflect real-world behaviour, which is determined by many forces like procrastination, our tendency to choose the path of least resistance, cognitive dissonance and many more biases that create a gap between our attitudes, our intentions and our ultimate actions – we've all experienced this when failing to follow through on commitments like going to the gym more often, eating healthier, drinking less alcohol etc.

However, surveys can also be used well. All of the above research designs (RCTs, quasi-experimental, lab experiments) could use surveys to collect outcome measures, such as attitudes or self-report data if no other data is available at that point in time – as we did in Phase 3. Alternatively, we might use surveys to collect other demographic data such as age, gender and income, to run balance checks, assist with our matching, or to feed into our statistical analysis as control variables. Within the context of a robust trial design, the issue here is not with using surveys per se, but rather with ensuring the data we collect is a reliable outcome measure for the thing we care about.

More specifically, surveys are appropriate for subjective outcomes (such as people's experiences of an intervention, metrics of emotion, awareness, comprehension or attitudes). They are also fine for outcomes where respondents have no conscious or unconscious reason to be untruthful - such as capturing basic demographic information. They are flawed but sometimes necessary where we rely on memory (e.g. keeping a food diary to measure amount of meat consumed), but here, we can often be confident the self-reported behaviour is at least correlated to actual behaviour, so making comparisons between two large groups should still be reliable. They are more flawed for outcomes where there may be a motivation to be untruthful (e.g. illicit behaviours like corruption or fraud, or where respondents otherwise aim to please the researcher with the correct answer), or where we infer something beyond the face-value of the response (e.g. assuming that attitude changes lead to behaviour-changes, which they often don't).

Where we must rely on self-reported behaviour, various techniques exist to improve the validity of responses. These generally aim to create some kind of anonymity, so respondents feel comfortable giving the truthful answer. For example, 'unmatched count technique' presents a list of behaviours to respondents and asks them how many they do, without specifying which. By comparing two groups' responses, one who receive a list of 10 irrelevant behaviours and one who receive a list of the same 10 plus the one relevant behaviour, we can estimate the prevalence of the relevant behaviour in our

sample. Similarly, if we want to understand how many times people have parked their ICEV in front of an EV chargepoint, we can ask them to add a random number between -10 and +10 to their response. Their own behaviour is then hidden within random noise, but across a large enough sample, the average response will be accurate (as the random numbers average to zero). However, these methods present a major trade-off: they rapidly become convoluted and we may do more harm than good by reducing respondents' comprehension of the question. Simple reassurance of confidentiality and anonymity can often be just as effective, or asking people 'how often do you think your friend does X' instead of 'how often do you do X'? All of these approaches have pros and cons, and the skills of a good researcher are invaluable in designing the best solution.

Beyond surveys, we might use focus groups, interviews, ethnography and other qualitative research tools.. They bring value by capturing the depth and range of insights. For example, they are key components of a process evaluations to understand the mechanisms, customer journey and experiences of an intervention. They are also useful in early exploratory research to create hypotheses, or to aid the design of an intervention through a better understanding of the problem and the people we are delivering the intervention to.

Ultimately, we must aim to use the most appropriate tool for a particular purpose. Importantly, the data-collection tools (including surveys as well as more concrete sources of data) should be employed within a robust research design - RCT or otherwise.

Step 4: Pre-specify a research protocol, only launch the trial and collect data afterwards

Researcher bias - seeking out and focusing on the result we would like to see - is a very real problem even among those conscientious researchers. For instance, if the data suggest our intervention had no impact, we'd be more inclined to triple-check the analysis and run additional tests on secondary outcome measures than if we find a significant effect. It is therefore good practice to pre-specify the research and evaluation strategy before data is collected, clearly specifying the hypotheses, the primary analysis and outcomes, and the statistical tests to be used. Additional tests on other outcomes or alternative statistical analysis can be undertaken but would generally be secondary or exploratory, and thus not detract from the main result.

Appendix B – Phase 3 research activities

This appendix documents the methodology and detailed findings from three research activities conducted in Phase 3 of the project:

- An online survey with private consumers
- Three focus groups with private consumers
- Phone interviews with five commercial organisations who operate vehicle fleets

Online survey with private consumers

Introduction

We conducted an online survey between February 26-28, 2020 using BIT's in-house online experimentation platform called Predictiv. The platform provides access to a large international panel, including more than 500,000 individuals in the UK and 1,000,000 in the US, as well as the functionality to run a range of online experiments and surveys. Despite the size of the panel, like with all online research, there is the risk of a selection bias given that internet access and a certain level of digital savviness is required to complete the survey. The purpose of the survey was to understand the public's level of support and the potential impact of a selection of shortlisted ideas.

It is common practice to use surveys, including online surveys to collect data on self-reported measures such as preferences, attitudes, or level of support, as in our survey. We discuss the research limitations of our research in Section 4 including the limitations with asking the public to anticipate the level of impact of a policy idea.

This survey is therefore in no way a replacement for field evaluations that measure the impact of interventions actually implemented (whether as part of a trial or fully rolled out). We've outlined our recommended 'research next steps' for each idea in the catalogue of ideas (Section 6), including proposed methodologies for evaluating the impact of individual ideas.

Methodology

Selection of ideas to be tested

In order to 'test' ideas with consumers in the format of an online survey, we simplified the idea descriptions to 1-2 sentences per idea. Some ideas in the shortlist, we felt, were not suited to be put to the public, so from a shortlist of 65 ideas, we selected 35 ideas to be tested in the survey. We excluded some of the ideas either because their content was somewhat sensitive, or indeed because we felt the discrepancy between self-reported impact and actual impact might be too large where the behavioural mechanism behind the policy wouldn't be intuitively understood by the public.

Impact and support measures

As outlined above, each idea was tested on two metrics, anticipated impact and support. We used a 5-point Likert-scale to ascertain how supportive participants were of each of the tested ideas – we used the same question and scale to measure support for each of the ideas (see below, support scale).

Support scale:

- *How supportive/ unsupportive would you be of this idea/ initiative?*

- 1 - *Very unsupportive*
- 2 – *Somewhat unsupportive*
- 3 - *Indifferent to it*
- 4 – *Somewhat supportive*
- 5 - *Very supportive*
- *Don't know*

This scale was used across all ideas tested. Idea #120 (green parking spots was only tested for support, not for impact, we felt the behavioural mechanism would not be intuitively understood and was therefore less suited to be measured through self-report.

To measure 'impact', we had to resort to three different scales given the different types and goals of the ideas tested. For most of the ideas it made sense to ask whether participants' likelihood of buying an EV would change if the idea was implemented (impact scale 1). For another set of ideas, instead of asking about the direct impact of the idea on EV uptake, it made more sense to ask if participants were likely to engage/ use the service or product offered in the ideas (impact scale 2). Finally, for three of the ideas where the focus was on information provision, it made most sense to ask participants if they would find the information format or content proposed in the ideas helpful (impact scale 3). Impact scale 1 comes closest to a measure of anticipated impact, whereas impact scales 2 and 3 primarily indicate the level of engagement with the service, information or product proposed, from which we then have to infer the impact on EV adoption more generally.

Impact scale 1: Change in likelihood of buying an EV

- *If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?*
 - [1] *A lot less likely*
 - [2] *Somewhat less likely*
 - [3] *No difference*
 - [4] *Somewhat more likely*
 - [5] *A lot more likely*
 - *Don't know*

This scale was used for the following ideas (#): 11A, 11B, 12, 159, 161, 162,163, 21, 22, 27, 33, 41, 44, 45, 5, 50, 61, 62, 72, 75, 79, 9.

Impact scale 2: Likelihood of engagement/ take-up

- *If you had access to this service, how likely/ unlikely would you be to use it?*
 - 1 - *Very unlikely*
 - 2 - *Somewhat unlikely*
 - 3 – *Neither likely nor unlikely*
 - 4 - *Somewhat likely*
 - 5 - *Very likely*
 - *Don't know*

This scale was used for the following ideas (#): 118, 88, 150, 90, 89, 95, 94, 146, 148, 92.

Impact scale 3: Helpfulness of the information provided

- *How helpful/ unhelpful would you find this information when choosing a new vehicle?*
 - 1 - *Very unhelpful*
 - 2 - *Somewhat unhelpful*
 - 3 – *It would make no difference*
 - 4 – *Somewhat helpful*

- 5 - Very helpful
- Don't know

This scale was used for the following ideas (#): 131, 136A, 136B, 109.

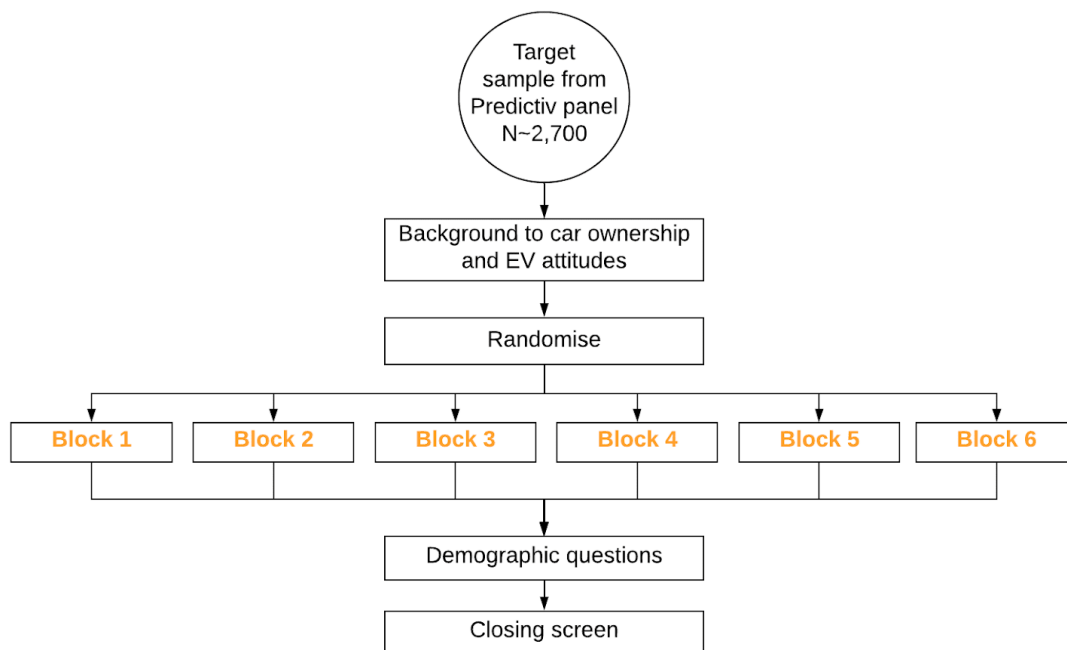
Inferential significance testing

In addition to these descriptive analytics, given the experimental setup of the survey, we ran significance tests on ideas #11 and #136 both of which had two versions tested in the survey, to ascertain if the difference in responses to versions A and B of each idea were statistically significant.

Participant journey and randomisation element

Participants in the study could select to participate in this research through the panel survey website on which they are registered. They were then taken through several stages as shown in Fig.1 below:

Fig. 1 Online survey - participant journey



- ❖ **Background to car ownership and EV attitudes:** Participants were asked questions on whether they currently own or intend to buy an EV in the next 5 years. Participants were also be given questions on their car ownership and attitudes towards EVs.
- ❖ **Ideas stage:** The total number of ideas tested was split into 6 blocks to limit the total number of ideas and questions participants had to respond to. To ensure that all blocks of ideas were treated equally and rated by a similar number and composition of participants, participants were randomly allocated to one of the six blocks. Each block showed participants 6 (or 7 in blocks 5 and 6) of the selected ideas, which participants were asked to rate on anticipated impact and support. The order of the questions within each block was randomised for each

participant. Participants could spend as much time as they wanted reading and answering the questions. The ideas were pre-allocated to the blocks to ensure ideas that are very similar or substitutes to one another were in separate blocks to avoid confusion and possible bias. The allocation of ideas per block is shown in Table below.

- ❖ **Socio-demographic questions:** Finally, participants answered several socio-demographic questions capturing characteristics that could influence the participant's stated response to the policy ideas, including demographic variables like income, age, gender, location, whether they lived in an urban/rural environment, whether they had off-street parking, whether they owned or rented their homes, etc. (see Appendix C for full list of questions).

When the participant had completed these stages, the survey closed with thanking them for their participation.

The table below shows the allocation of policy ideas to blocks 1-6 in the online survey.

Table 2: Allocation of policy ideas to blocks 1-6.

Block	Idea #	Idea title
1	118	National EV day or National zero-emission day
1	9	Implement a Feebate system to supplement existing grants
1	131	Create and standardise key stats to enable easier comparison between EVs and ICEVs
1	12	Re-frame some (or all) of plug-in car grant as voucher or lump sum cash back
1	88	Extended grace periods / generous 'try before you buy' deals
1	150	Home mover bundle deals to promote charge point installation.
2	75	Incentivise collective EV purchases with conditioned government investment.
2	162	Higher rates of vehicle tax for high-polluting vehicles.
2	41	Free parking for EVs
2	136 A	Mandate a new price labelling standard to better inform consumers of long-term costs [simple TCO figure]
2	161	Convert the grant (or create a similar fund) to operates as a true scrappage scheme, allowing it to be used for second-hand purchases too.
2	90	Shopping centre free test-drives
3	61	Support chargepoint rollout at tourist/ leisure destinations
3	22	Differential VAT rates on vehicles depending upon emissions
3	120	Green EV parking spaces
3	21	An 'EV-to-work' scheme

Block	Idea #	Idea title
3	95	Telematics service to provide journey need assessments
3	89	EV trials through short-term lease (or extended rental, without the typical rental cost)
4	50	Standardised tests on batteries to determine remaining range for used EVs
4	45	Significantly increase fuel duty
4	136 B	Mandate a new price labelling standard to better inform consumers of long-term costs [pence for mile]
4	109	Mandate the disclosure of vehicle emissions by delivery firms and other large fleet operators and thereby incentivise EV adoption
4	163	An 'EV to work scheme' for second hand purchases from company fleets.
4	72	Allow reserved parking spaces for EV on-street parking & chargepoint installation
5	27	Local authorities to coordinate and support collective purchase agreements of EVs among local groups
5	11 A	Re-frame existing government grants to make them more appealing [control-current grant]
5	5	Green credit for EVs
5	44	Reduce insurance premiums for EVs
5	159	Mandate that fuelling stations need to provide EV charging
5	94	EV test-drive sites across the UK
6	62	Enhance existing EV workplace charging scheme to subsidise mass installation of chargepoints at corporate car parks / premises where EV purchases exceed a certain threshold
6	146	Go Ultra Low (GUL) to collaborate with industry (e.g. LexAutolease) to develop interactive EV lifestyle tool
6	148	Increase uptake of (and consumer awareness of) current Dealership EV accreditation initiative.
6	79	Priority public parking and charging for those without off-street parking at home
6	11 B	Re-frame existing government grants to make them more appealing [fuel cost framing]
6	33	Free vanity plates / discounted personalised number plates / exclusive access to personalised plates.
6	92	Roaming fleet of test vehicles

Sample composition

The table below shows the sample composition of the online survey. We recruited a sample of N=2,756 participants. The sample composition is representative of the UK average in terms of age, income, gender and location. We screened out participants who indicated not to have a driving license.

Table 3: Sample composition of online survey

Variable		Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Total	
Overall	Number of participants	458	450	450	469	461	468	2756	
	Percentage of sample (in %)	16.6	16.3	16.3	17	16.7	17		
Number of cars (in %)	0 cars	6.3	6.9	8.4	7.5	6.9	6.8	7.1	
	1 car	57.9	54.9	53.1	52.2	56	55.8	55	
	2 cars	26.4	28.9	30	31.8	28	30.3	29.2	
	3 or more cars	9.4	9.3	8.4	8.5	9.1	7.1	8.6	
	2 or more cars	35.8	38.2	38.4	40.3	37.1	37.4	37.9	
Car ownership (in %)	Petrol/diesel car owners	82.5	85.1	82.4	85.5	84.8	85.9	84.4	
	EV owners	11.1	8	9.1	7	8.2	7.3	8.4	
	No car	6.3	6.9	8.4	7.5	6.9	6.8	7.1	
Future car purchase (in %)	Petrol/diesel next	48.5	52.9	49.1	52.2	49.7	51.5	50.7	
	EV next - primary	34.1	32.2	33.6	30.9	31.7	31.6	32.3	
	EV next - secondary	2.8	2.2	2.7	2.8	2.6	1.9	2.5	
	No future car purchase	3.3	4	3.1	4.3	3.5	4.3	3.8	
	Don't know	11.4	8.7	11.6	9.8	12.6	10.7	10.8	
EV attitude (in %)	I already own an EV	11.4	4.7	7.8	3.8	4.8	6.2	6.4	
	I am thinking about buying an EV quite soon	15.1	18.9	17.6	16	16.7	17.9	17	
	I am thinking about buying an EV, but I haven't thought about when	22.5	27.1	21.8	26.4	25.2	24.1	24.5	
	I have thought about buying an electric vehicle, but have decided not to at this stage	14.4	13.1	18.7	14.5	19.1	15	15.8	
	I haven't thought about buying an electric vehicle but I would consider it	8.7	10.7	11.1	11.5	11.5	12.4	11	
	I haven't really thought about buying an electric vehicle	11.8	9.6	11.1	10.4	8.2	11.3	10.4	
	I have heard of electric vehicles but won't consider buying one	9.4	10.4	8	10.9	8.5	7.9	9.2	
	I have never heard of electric vehicles	0.7	0.2	0	0	0.7	0.2	0.3	
	I don't drive / don't need a car	2.4	2.9	2.9	3.4	2.4	3	2.8	
	Don't know	3.7	2.4	1.1	3	3	1.9	2.5	
	EV purchase consideration	57.6	61.3	58.2	57.8	58.1	60.7	58.9	
	EV advantages (in %)	1 - Electric vehicles are cheaper to run or maintain, or are more economical	27.9	33.1	32.7	33.7	32.8	32.9	32.2

Variable	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Total
2 - Electric vehicles are cheap to buy, or cheaper than petrol or diesel vehicles	8.5	10.2	8.9	7.7	10.2	10.3	9.3
3 - There are environmental benefits with electric vehicles, such as reduced pollution	54.6	55.6	58.2	52.5	57.9	55.8	55.7
4 - There are reduced road tax or insurance costs with electric vehicles	36.9	42.7	37.3	40.3	39.3	38.5	39.2
5 - Electric vehicles are quieter or less noisy	33.8	37.8	41.8	42	42.1	40.8	39.7
6 - Recharging an electric vehicle is easier or more convenient than re-fuelling a petrol or diesel car. For example, I can charge it at home or at work	17.5	19.8	19.1	15.8	21.9	20.5	19.1
7 - Electric vehicles hold their value better than petrol or diesel cars when selling them on	12.2	18.4	15.1	11.3	13.4	13	13.9
8 - Electric vehicles are safer	12.2	12.4	9.6	10.2	10.6	8.8	10.6
9 - Electric vehicles have better performance for speed, handling, size, practicality, or looks	12.7	12.2	10.9	10	15	9.8	11.8
10 - The technology used for electric vehicles is more reliable, or lasts longer	13.3	16.9	17.8	13.4	12.8	14.7	14.8
11 - Other	0.4	1.6	0.2	0	1.5	1.1	0.8
12 - No advantages	5	4.9	5.3	6.4	4.6	4.7	5.2
13 - Don't know	7.2	5.1	4.7	6.4	3.9	4.3	5.3
Any cost advantages	57.4	66	60.9	60.1	59.7	64.3	61.4
Any advantages	87.8	90	90	87.2	91.5	91	89.6
EV disadvantages (in %)							
1 - EVs cost more to run, maintain, or to fix faults	14.8	14.9	18.4	17.7	17.4	14.7	16.3
2 - EVs cost more to buy	40.2	40.2	45.8	43.9	40.6	39.5	41.7
3 - EVs cost more in general	28.4	30.7	28.2	33.3	30.6	31.2	30.4
4 - You cannot travel far on a single charge	41.9	47.3	40.2	41.8	38.4	40.4	41.6
5 - There is more uncertainty around recharging EVs	37.8	37.3	39.8	33.7	38.2	35.3	37
6 - There are not enough charging points for EVs	45.6	48	50.2	48.2	49.2	49.4	48.4
7 - It takes a long time to recharge EVs	35.4	39.3	38.2	37.5	38	33.5	37
8 - The resale value is lower when selling on an EV	10.3	9.6	8.7	6.8	6.9	9.6	8.6
9 - EVs are less safe	4.1	5.8	4.9	4.7	5.6	6.2	5.2
10 - EVs have worse performance for speed,	10.5	15.3	12.7	13	10.4	11.8	12.3

Variable		Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Total
	handling, size, practicality, or looks							
	11 - The technology in EVs doesn't work, or needs more testing	14.6	11.1	11.1	11.7	9.3	10.3	11.3
	12 - There is limited choice of EVs on the market	28.8	29.3	27.6	32.2	30.2	32.5	30.1
	13 - The disposal of EV batteries has a negative impact on the environment	25.1	25.6	24.4	20.7	22.8	22.9	23.6
	14 - There is not enough information or knowledge about EVs	26.2	20.4	21.3	19	24.3	23.5	22.5
	15 - Other	0.4	1.3	1.8	2.1	0.7	1.3	1.3
	16 - No disadvantages	0.7	2.9	1.8	2.3	2	2.6	2.1
	17 - Don't know	5.2	5.3	2	4.7	3	3.6	4
	Any cost disadvantages	57	58.2	63.6	61.8	57	58.8	59.4
	Any charging disadvantages	72.9	74.9	76	71.2	75.9	71.8	73.8
	Any disadvantages	94.1	91.8	96.2	93	95	93.8	94
Social grade (in %)	ABC1	59	58.9	60.9	58.4	59.4	56.8	58.9
	C2DE	40.6	40.4	38.4	40.3	40.3	42.7	40.5
	Prefer not to say	0.4	0.7	0.7	1.3	0.2	0.4	0.6
Location type (in %)								
	Urban	36	35.8	34	32.4	37.3	36.3	35.3
	Rural	25.5	35.8	34	28.6	23.4	26.1	28.8
	Sub-urban	36	41.3	36.2	36.9	36.9	35.5	37.1
	Don't know	2.4	1.3	2.9	2.1	2.4	2.1	2.2
Housing arrangements (in %)								
	Homeowners	52.8	52.7	53.3	54.2	49.2	53.2	52.6
	Private rental	21.4	21.1	20.7	16.4	19.5	22	20.2
	Social housing	14.2	16	12.4	15.8	15	12.8	14.4
	Living with parents	10	8.4	12	11.7	15	10.7	11.3
	Other	0.9	1.3	1.1	1.1	0.9	0.9	1
	Don't know	0.7	0.4	0.4	0.9	0.4	0.4	0.5
Off-street parking (in %)								
	Has off-street parking access	77.5	78.7	78	74	75.7	75.9	76.6
	No off-street parking	21.2	20.2	20.4	24.9	23.2	23.1	22.2
	Don't know	1.3	1.1	1.6	1.1	1.1	1.1	1.2
Location (in %)								
	London	14.8	13.3	16.7	14.3	14.3	16	14.9
	North	23.6	26.9	24.4	22.4	23.2	25.6	24.3
	South and East	29.3	29.1	28.2	30.3	30.8	29.9	29.6
	Midlands	16.2	18.9	15.8	18.6	16.7	15.4	16.9
	Wales, Scotland, NI	16.2	11.8	14.9	14.5	15	13	14.2
Gender (in %)								
	Men	51.7	52.9	50	53.9	48.2	47.2	50.6
	Women	48.3	47.1	50	46.1	51.8	52.8	49.4

Variable		Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Total
Age (in %)	Under 25	29.3	30.4	28.9	30.1	32.1	28.6	29.9
	25-54	41	43.6	40.2	40.1	40.6	41.7	41.2
	Over 55	29.7	26	30.9	29.9	27.3	29.7	28.9
Income (in %)	Under £30k	52.8	49.8	45.3	50.7	52.9	51.3	50.5
	Over £30k	47.2	50.2	54.7	49.3	47.1	48.7	49.5

Focus groups with private consumers

Introduction and overview of approach

Participant sample

Three focus groups were conducted with 22 members of the public between 21st February and 2nd March 2020. Prospective participants were screened using a filter survey and only those with a valid UK driving licence were invited to take part in the study. Where possible, a balance of gender and age groups was sought to minimise bias from any one particular demographic. The breakdown of participants by age, gender and focus group session is shown in Table .

Table 4: Participant sample

Final sample		Session 1	Session 2	Session 3	TOTAL
Gender	Male	5	5	3	13
	Female	4	2	3	9
Age	17-24	1	2		3
	25 - 40	1	1	3	5
	41 - 50	1		3	4
	51 - 60	1			1
	61 - 70	3	2		5
	71 - 80	2	2		4
TOTAL		9	7	6	22

Further details about the characteristics of the sample are provided below. Participants were asked to provide information on the social grade of the 'Chief Income Earner' in the household (see Table). Almost half of the sample reported they were 'Intermediate managerial / Professional / Administrative'. The next largest group was 'Supervisory or clerical / Junior managerial / Professional / Administrative'.

Table 5: Distribution of participants by occupation

Which of the following groups does the Chief Income Earner in your household belong to?	Count of participants
Intermediate managerial/ Professional/ Administrative	10

Supervisory or clerical/ Junior managerial/ Professional/ Administrative	5
Higher managerial/ Professional/ Administrative	2
Skilled manual worker	2
Housewife / Househusband / Homemaker	1
Retired and living on state pension only	1
Student	1
Total	22

All participants owned (or had continuous use of) at least one car in the household. Nine participants had two cars, and six participants had three or more cars (see Table). All participants reported that they had off-street parking. Participants were also asked to indicate the type of vehicle(s) they owned (or had continuous use of) – the responses are shown in Table .

Table 6: Type of vehicles in household

Vehicle type	Count of participants (note some had more than one vehicle in household)
Petrol	18
Diesel	10
HEV	1
BEV	2
PHEV	2

Most of the sample reported having petrol or diesel vehicles in their household. One participant had an HEV; two participants reported having a BEV; and two participants reported having a PHEV.

Qualitative research uses small sample sizes to obtain an in-depth understanding of the topic of interest, in this case the response to policy ideas. The aim when sampling for qualitative research is to explore a broad range of perspectives rather than to obtain a nationally representative sample, which might be the aim for quantitative approaches such as a survey, for example. Nevertheless, it is important to be aware and considerate of potential sampling biases when interpreting the results of qualitative research, that in this case include:

- More males (13) took part than females (9)
- Participants were not evenly distributed across the age groups; although a range of age was included, from young (17-24) to middle-aged (41-50) to older/retired (61-80)
- Most of the sample fell into two social grades: “Intermediate managerial/ Professional/ Administrative” and “Supervisory or clerical/ Junior managerial/ Professional/ Administrative”
- All of the sample were recruited from the south-east of England.

Structure of each session

Each focus group session lasted approximately two hours. All sessions were conducted at TRL’s head office at Crowthorne House in Berkshire. A total of 36 ideas were tested in the focus groups; these were evenly split across the three sessions (12 ideas per session). To ensure a similar spread of a range of ideas was included in each focus group session, the ideas were grouped into three categories (see Table 7).

Table 7: Distribution of ideas by focus group session

Category of ideas	Session 1	Session 2	Session 3	Total
A – Simplifying information and raising awareness	5	5	5	15
B – Financial incentives and other perks	5	5	5	15
C – Improving chargepoint provision	2	2	2	6
Total	12	12	12	36

Each focus group session was split into three parts with each part covering one of the categories. The categories were discussed in the same order for all sessions (Category A, then B, then C). The same structure was used throughout:

- The research team presented the ideas in the category, and asked questions to check participant understanding
- After each idea had been presented and understood, participants were asked to individually rate the idea using a personalised workbook. The rating task was only used as a method for promoting consideration of pros and cons of an idea, and was not used to gather quantitative data. The two ratings questions were identical to the questions used in the survey ; one focussed on understanding the participant’s perceived impact of the idea on their likelihood to adopt an EV (or likelihood to engage with the idea), and one focussed on understanding their support for the idea. Free text boxes were provided for participants to note down the reasons for their scores.
- Once all ideas in the category had been individually scored, participants were split into two breakout groups (of approximately equal size) and asked to discuss their scores, giving justification for their answers.

This process was repeated for each category, until all 12 ideas had been discussed. At the end of the session, participants were given a short debrief to confirm the next stages of the research and reconfirm how their data would be used. Participants received £25 cash as compensation for their time.

Individual responses for each policy idea have been summarised and are laid out in the Annex to this report, which is a separate document to this one.

Telephone interviews with commercial fleets

Introduction and overview of approach

Telephone interviews were conducted with representatives from five different commercial organisations who operate large vehicle fleets as part of their business operations. Participants were identified from TRL's, BIT's and DfT's existing network of fleet contacts. Interviews were conducted between 20th February and 6th March 2020. Twelve ideas were tested with these commercial consumers; the ideas were selected from the full shortlist of ideas as the most relevant to commercial fleets.

Each interview lasted approximately one hour. The interviews followed a structured discussion guide, whereby the researcher talked through each idea in turn (in a varied order), and asked a set of open-ended questions to cover the following areas:

- **Support:** Questions to understand the level of support that the commercial organisations had for each idea, e.g.:
 - *To what extent would your organisation be supportive of this policy idea? Why?*
 - *To what extent is this idea acceptable or unacceptable in your opinion? Why?*
- **Impact:** Questions to explore commercial consumers perceptions about whether they thought the idea would have an impact on their organisation's likelihood to adopt EVs in the fleet, or whether they felt they would engage with the individual policy idea or service offering that might in turn promote EV uptake, e.g.:
 - How likely or unlikely do you think you would be to engage with (take up) this incentive if it was offered?
 - To what extent would this idea have an impact on your business? Positive, negative or otherwise?
 - To what extent would this idea make you more or less likely to adopt EVs in your fleet, and why?

To contextualise the discussion and findings, background information on the size and composition of each organisation's vehicle fleet was captured prior to the interview, and an opening question at the start of the interview also asked respondents to describe the main barriers to adoption of electric fleet vehicles by their organisation. A summary of this information is provided in the following section.

Profile of commercial organisations

ID	Company description	Approx. number of vehicles in fleet	Approx. split between light-duty (cars & vans) and HGVs	Approx. split between ICEVs and EVs	Approx. split between 'depot-based' vehicles ¹ , and 'home-based' vehicles ²	Selection process for company cars	Summary of main barriers to adoption of EVs
A	Engineering and construction company	600 (plus additional plant vehicles)	250 cars (all company cars/ grey fleet) 400 vans 50 HGVs	6 PHEVs in car fleet, all other cars and vans mix of petrol and diesel All HGVs diesel	All company cars home-based 75% vans are home-based All HGVs depot-based	Restricted list for employees, but large choice including EVs 8 manufacturers on list, including VW Group (VW, Skoda, Audi)	Cost – company car scheme based on salary bandings and organisation struggling to enable EVs to be included in the shortlist for the majority of employees because of the high cost. Infrastructure for charging, and range anxiety – lack of infrastructure both at home (i.e. employees can't have chargepoints at home) and at office locations, and cost/logistic

ID	Company description	Approx. number of vehicles in fleet	Approx. split between light-duty (cars & vans) and HGVs	Approx. split between ICEVs and EVs	Approx. split between 'depot-based' vehicles ¹ , and 'home-based' vehicles ²	Selection process for company cars	Summary of main barriers to adoption of EVs
							<p>challenges associated with addressing this.</p> <p>Lack of understanding – employees not educated on the choice of EV models, and the BiK benefits.</p>
B	Construction company	1,450	1,350 cars 100 vans	Cars: 20 BEV, 100 HEV, 120 PHEV, rest diesel Vans: 4 BEV, rest diesel	Majority home-based	Defined list for all employees, except directors. List includes EVs	<p>For home-based vehicles, employees have a challenge with lack of off-street parking (and therefore nowhere to install a chargepoint).</p> <p>Lack of supply - very few EVs currently available which has hindered ability to add models to company car list.</p>
C	Facilities management and professional services	5,500	2,000 company cars, +700 car	Cars: 228 BEVs, rest diesel	Vast majority (90%) home-based Some vehicles kept at client	Relatively short list for employees; very limited choice 1,600 of the 2,000 cars are 'job cars' – required to do the	<p>Low availability of models – particularly for vans.</p> <p>Installation of charging infrastructure at employees' homes where off-street parking is not</p>

ID	Company description	Approx. number of vehicles in fleet	Approx. split between light-duty (cars & vans) and HGVs	Approx. split between ICEVs and EVs	Approx. split between 'depot-based' vehicles ¹ , and 'home-based' vehicles ²	Selection process for company cars	Summary of main barriers to adoption of EVs
		allowance recipients	Vans: 72 BEVs, rest diesel	Vans: 72 BEVs, rest diesel	sites as part of business contracts	role, but drivers have private use of them too. Typically Vauxhall Astras, or Insignias for more senior employees	available is challenging. Amongst their employees, the proportion of those without off-street parking is larger than the national average, as many employees live in low-cost housing. Providing charging infrastructure for those with on-street communal parking is a big issue in particular.
		3,500 vans (most Vauxhall Combo size, rest 3.5T)	Virtually no PHEVs in car or van fleet	Virtually no PHEVs in car or van fleet		400 of the 2,000 are part of remuneration package but not 'job cars'; typically more choice for these employees.	
		<50 HGVs	~75 BEVs added to fleet p/m	~75 BEVs added to fleet p/m		No choice for any employees wanting an EV – the specific models of EV chosen by the organisation on the basis of availability at time of order.	Has also been considerably challenging getting approval to install chargepoints at employees' homes where the employees do not own their properties. Obtaining landlord permission has been very difficult.
							Electrical capacity is also an issue – challenging to sort out the required grid connections, both in terms of how difficult it is logistically and how expensive it is.

ID	Company description	Approx. number of vehicles in fleet	Approx. split between light-duty (cars & vans) and HGVs	Approx. split between ICEVs and EVs	Approx. split between 'depot-based' vehicles ¹ , and 'home-based' vehicles ²	Selection process for company cars	Summary of main barriers to adoption of EVs
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Organisation feels that **public infrastructure does not work well for fleets** – fleet managers need to be able to aggregate all the expenditure across chargepoints in order to manage budget. Not currently possible to get a clear itemised bill from chargepoints which enable this. Being able to log energy use at home as a corporate cost is also difficult.

Commercial business case for vans is less attractive at the moment than cars, because the Benefit in Kind savings don't apply to vans (employees don't have private use of them). Cost savings are therefore reduced compared with cars, meaning the benefits of switching to EV are less.

ID	Company description	Approx. number of vehicles in fleet	Approx. split between light-duty (cars & vans) and HGVs	Approx. split between ICEVs and EVs	Approx. split between 'depot-based' vehicles ¹ , and 'home-based' vehicles ²	Selection process for company cars	Summary of main barriers to adoption of EVs
D	Digital network management	26,000	1,600 small vehicles 16,700 medium vehicles 7,700 large vehicles 23 electric vans 102 4WD	23 electric vans (on trial), with 8 more planned. Other orders already placed for BEVs & PHEVs. Rest diesel.	58% home-based 42% depot-based	2 classes of company cars: - Business needs - Rewards cars – choice from a fixed list of options	Biggest issue is organisation's desire to support British manufacturing. There is no end-to-end process run by the government for manufacturing EVs, which means that EVs are less likely to be produced in the UK (leads to issues with importing etc.). Currently no British-manufactured mid-range van on the market that would be suitable for this organisation in terms of payload. Overall a limited choice for van models. Most vans get taken home by engineers overnight, so need comprehensive charging infrastructure . Organisation happy to pay for chargepoints at engineers' homes, but homes not always suitable (e.g. lack of driveway parking).

ID	Company description	Approx. number of vehicles in fleet	Approx. split between light-duty (cars & vans) and HGVs	Approx. split between ICEVs and EVs	Approx. split between 'depot-based' vehicles ¹ , and 'home-based' vehicles ²	Selection process for company cars	Summary of main barriers to adoption of EVs
E	Materials and logistics management company	160	60 vans 100 HGVs	All diesel	Less than 10 home-based	No company cars – car allowance only.	<p>Organisation would start with replacing smaller vans first, but no plans to do this until next year; 2020 finances have already been largely spent. This means investment in charging infrastructure will be delayed until next year at earliest..</p> <p>Costs of buying EVs are high, which affects business case.</p> <p>Not many EVs on the market that would be suitable to replace HGVs.</p>

Individual responses for each policy idea have been summarised and are laid out in the Annex to this report, which is a separate document to this one.

Appendix C – Phase 3 survey questionnaire

[Intro text - upon entering the survey, participants are shown the below text]

“Welcome and thanks for participating in this survey.

In this exercise, we are going to ask you to consider a variety of hypothetical government policies and measures in relation to electric vehicles.

We’re going to show you several different scenarios, and ask you to consider if, under that scenario, you would be more likely to consider buying an electric vehicle (EV). We’re also going to ask you how supportive you are of the policy idea.

Please, note that all these ideas are just hypothetical scenarios and NOT government policy.

We will also ask you a few questions about car ownership, your general views on EVs and general questions about you to ensure we survey a diverse group of people.

Electric vehicles are vehicles that plug into the mains and use electricity instead of, or alongside, a petrol or diesel engine for power. This includes fully electric vehicles, plug-in hybrids and hydrogen fuel cell electric cars. All these vehicles are ultra low emission vehicles. The term “electric vehicles” excludes cars which do not plug in to charge.

The survey should take about 10 minutes to complete and requires your attention, so please only participate if you can dedicate this time!”

Thank you

[Background to car ownership and EV attitudes]

Q1-[current vehicle ownership - number from DfT public attitude tracker wave 1 - Q5] How many cars or vans does your household own or have continuous use of at present?

1. None
2. 1
3. 2
4. 3 or more

Q1.1- [to those who responded 2-4 in Q1 – fuel/ type of vehicle owned - number from DfT public attitude tracker wave 1 - Q.6 Fuel]. Thinking of all cars and vans in your household, what types of fuel do they use? *CODE ALL THAT APPLY.*

1. Petrol
2. Diesel
3. Electric\battery only
4. Plug-in hybrid (petrol\electric)
5. Other
6. Don't know

Q2-[next car purchase - from DfT public attitude tracker wave 1 - Q.17 (CarNext)] *What type of car or van do you think you will most likely purchase or lease next time, either new or second hand?*

1. *Petrol*
2. *Diesel*
3. *Electric\battery only*
4. *Plug-in hybrid (petrol\electric)*
5. *Other*
6. *Don't know*
7. *I don't ever intend to purchase or lease another car or van*

Q2.1[*follow-up to Q3 for those participants who have responded with 1-5] And would this new vehicle become the main vehicle you use?*

1. *Yes*
2. *No*
3. *Don't know*

Q3-[*Go Ultra Low Campaign 2019/2020: Pre-wave questionnaire - C4] Which of these statements best describes your current attitude towards buying an electric car or vehicle?*

1. I already own an electric vehicle
2. I am thinking about buying an electric vehicle quite soon
3. I am thinking about buying an electric vehicle, but I haven't thought about when I will buy it
4. I have thought about buying an electric vehicle, but have decided not to at this stage
5. I haven't thought about buying an electric vehicle but I would consider it
6. I haven't really thought about buying an electric vehicle
7. I have heard of electric vehicles but won't consider buying one

8. I have never heard of electric vehicles
9. I don't drive/ don't need a car
10. Don't know

Q3.1 [follow-up to Q4 if answered 4, 6 or 7] *Why do you say that? FREE TEXT*

Q4-[next car purchase - from DfT public attitude tracker wave 1 - Q.26 (EVEnc)] *What do you think are the advantages, if any, of electric over petrol or diesel vehicles? Please select all that apply.[RANDOMIZE CODES 1-10, ANCHOR CODES 11-13 TO THE BOTTOM – CODES 12 AND 13 ARE EXCLUSIVE].*

1. *Electric vehicles are cheaper to run or maintain, or are more economical*
2. *Electric vehicles are cheap to buy, or cheaper than petrol or diesel vehicles*
3. *There are environmental benefits with electric vehicles, such as reduced pollution*
4. *There are reduced road tax or insurance costs with electric vehicles*
5. *Electric vehicles are quieter or less noisy*
6. *Recharging an electric vehicle is easier or more convenient than re-fuelling a petrol or diesel car. For example, I can charge it at home or at work.*
7. *Electric vehicles hold their value better than petrol or diesel cars when selling them on*
8. *Electric vehicles are safer*
9. *Electric vehicles have better performance for speed, handling, size, practicality, or looks*
10. *The technology used for electric vehicles is more reliable, or lasts longer*
11. *Other*
12. *No advantages*
13. *Don't know*

Q5- [next car purchase - from DfT public attitude tracker wave 1 - Q.27 (EVProb)] *What do you think are the disadvantages, if any, of electric vehicles over petrol or diesel cars? Please select all that apply. [RANDOMIZE CODES 1-14, ANCHOR CODES 15-17 TO THE BOTTOM – CODES 16 AND 17 ARE EXCLUSIVE].*

1. *Electric vehicles cost more to run, maintain, or to fix faults*
2. *Electric vehicles cost more to buy*
3. *Electric vehicles cost more in general*
4. *You cannot travel far on a single charge*
5. *There is more uncertainty around recharging electric vehicles, including the price, where you can charge (eg at home, elsewhere), and how to charge*
6. *There are not enough charging points for electric vehicles*
7. *It takes a long time to recharge electric vehicles*
8. *The resale value is lower when selling on an electric vehicle*

9. *Electric vehicles are less safe*

10. *Electric vehicles have better performance for speed, handling, size, practicality, or looks 11.
The technology in electric vehicles doesn't work, or needs more testing*

12. *There is limited choice of electric vehicles on the market*

13. *The disposal of electric vehicle batteries has a negative impact on the environment*

14. *There is not enough information or knowledge about electric vehicles*

15. *Other*

16 *No disadvantages*

17 *Don't know*

[Randomisation to one of six blocks]

[Main survey/ 38 framings + respective questions]

[DISPLAY TO ALL, AT THE START OF THE BLOCK]

We are now going to ask you to consider a variety of hypothetical government policies and measures in relation to electric vehicles. We're going to show you several different scenarios, and ask you to consider if, under that scenario, you would be more or less likely to consider buying an electric vehicle (EV). We're also going to ask you how supportive or unsupportive you are of these policy scenarios.

Everyone can answer these questions, whether you are planning to buy a new or second-hand vehicle in the future or not, and whether you are planning to buy an electric or conventional vehicle.

[118] Imagine there was a 'national zero-emissions day', an annual event to celebrate environmentally-friendly technology like electric vehicles. On that day you would find free test drives in city centres, exhibits or speaking events on electric cars and the future of transport. On that day, petrol and diesel vehicles may be banned from entering city centres.

- *How likely/ unlikely would you be to attend this event?*
 - 1 - Very unlikely
 - 2 – Somewhat unlikely
 - 3 – Neither likely nor unlikely
 - 4 – Somewhat likely
 - 5 - Very likely
 - Don't know
- *How supportive/ unsupportive would you be of this idea/ initiative?*
 - 1 - Very unsupportive
 - 2 – Somewhat unsupportive
 - 3 - Indifferent to it
 - 4 – Somewhat supportive
 - 5 - Very supportive
 - Don't know

[146] Imagine there was an online tool (in the form of a questionnaire) for consumers like you that identifies what type of electric vehicle could be a good fit for you. The tool might ask you about things like your annual commuting mileage and, based on the data you provide, it could help you understand the yearly running costs (i.e. charging costs) of an electric vehicle compared to a petrol or diesel vehicle. The tool might also be able to estimate how long it would take you to make up for the higher upfront costs of an electric vehicle through your annual savings on fuel.

- *If you had access to this service, how likely/ unlikely would you be to use it?*
 - 1 - Very unlikely
 - 2 - Somewhat unlikely
 - 3 – Neither likely nor unlikely
 - 4 - Somewhat likely
 - 5 - Very likely
 - Don't know
- *How supportive/ unsupportive would you be of this tool being made available?*
 - 1 - Very unsupportive

- 2 - Somewhat unsupportive
- 3 - Indifferent to it
- 4 - Somewhat supportive
- 5 - Very supportive
- Don't know

[9] Imagine the government introduced a fee or higher tax (for example, approximating £500 - £1,500, depending on the price of the vehicle) on newly purchased diesel or petrol vehicles and used the money to make electric or hybrid vehicles cheaper. This system would replace the current government grant applied to electric vehicles purchases.

- *If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?*
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know
- *How supportive/ unsupportive would you be of this idea/ initiative?*
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[11 A- control] The government currently offers a £3,500 grant on new EV purchases. This is automatically deducted from the upfront cost of the vehicle.

- *Does this policy make you more or less likely to buy an electric vehicle next time?*
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know
- *How supportive/ unsupportive are you of this idea/ initiative?*
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[11 B - fuel cost framing] - Imagine the government paid for the fuel (i.e. electricity cost) used for the first 120,000 miles you drove in a new EV. This is approximately worth £3,500.

- *If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?*
 - [1] A lot less likely
 - [2] Somewhat less likely

- [3] No difference
- [4] Somewhat more likely
- [5] A lot more likely
- Don't know
- How supportive/ unsupportive would you be of this idea/ initiative?
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[162] Imagine government increases vehicle tax (i.e. the tax you pay on your vehicle annually) for all diesel and petrol vehicles, so that the cost of taxing these vehicles roughly doubled (e.g. from £145 currently to £290), but electric vehicles remained vehicle tax-free.

- If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know
- How supportive/ unsupportive would you be of this idea/ initiative?
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[22] Imagine government introduced different VAT rates on new vehicles depending upon emissions, i.e. high-polluting vehicles like diesel or less efficient petrol vehicles would have a VAT rate at the current level of 20% and low-emission vehicles like electric and hybrid vehicles would have a VAT rate of only 5% or would be exempt from VAT entirely.

- If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know
- How supportive/ unsupportive would you be of this idea/ initiative?
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[45] Imagine government increased fuel duty, so that petrol and diesel were both 5p more per litre, for example.

- *If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?*
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know
- *How supportive/ unresponsive would you be of this idea/ initiative?*
 - [1] Very unresponsive
 - [2] Somewhat unresponsive
 - [3] Indifferent to it
 - [4] Somewhat responsive
 - [5] Very responsive
 - Don't know

[136a - simple TCO] Imagine a new law requires car dealers to display an estimate for the lifetime costs of all vehicles (the upfront price plus all fuel and running costs). This would help you compare the running costs of electric vehicles to petrol and diesel vehicles, for example.

- *How helpful/ unhelpful would you find these labels when choosing a new vehicle?*
 - [1] - Very unhelpful
 - [2] - Somewhat unhelpful
 - [3] - They would make no difference
 - [4] - Somewhat helpful
 - [5] - Very helpful
 - Don't know
- *How supportive/ unresponsive would you be of this idea/ initiative?*
 - [1] - Very unresponsive
 - [2] - Somewhat unresponsive
 - [3] - Indifferent to it
 - [4] - Somewhat responsive
 - [5] - Very responsive
 - Don't know

[136 C - pence per mile] Imagine a new law requires car dealers to advertise the 'pence per mile' cost of driving for all vehicles. This would help you compare the running costs of electric vehicles to petrol and diesel vehicles, for example.

- *How helpful/ unhelpful would you find these labels when choosing a new vehicle?*
 - [1] - Very unhelpful
 - [2] - Somewhat unhelpful
 - [3] - They would make no difference
 - [4] - Somewhat helpful
 - [5] - Very helpful
- *How supportive/ unresponsive would you be of this idea/ initiative?*
 - [1] - Very unresponsive

- [2] - Somewhat unsupportive
- [3] - Indifferent to it
- [4] - Somewhat supportive
- [5] - Very supportive
- Don't know

[12] The government currently offers a £3,500 grant on new electric vehicle purchases. At the moment, this is automatically deducted from the upfront cost of the vehicle. Imagine this money was instead directly transferred to you when you purchase the vehicle as 'cash back' to do what you want with, even if you bought the car on credit or lease.

- If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know
- How supportive/ unsupportive would you be of this idea/ initiative?
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[161] The government currently offers a £3,500 grant on new electric vehicle purchases (therefore not including second hand purchases). This is automatically deducted from the upfront cost of the vehicle.

Imagine this money was now available even when buying a second hand electric vehicle, so you would receive £3,500 when you trade in your old petrol or diesel car for a second hand electric vehicle.

- If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know
- How supportive/ unsupportive would you be of this idea/ initiative?
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[44] Currently, insurance for electric vehicles tends to be slightly more expensive than for petrol or diesel vehicles. Imagine government waived the insurance premium tax of 12% for electric vehicles, meaning insurance was roughly the same between electric vehicles and petrol/diesel vehicles.

- *If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?*
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know
- *How supportive/ unsupportive would you be of this idea/ initiative?*
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[109] Imagine operators of large numbers of vehicles (e.g. food and parcel delivery companies, supermarkets that deliver) were required to publish information on their vehicles' carbon emissions. This information could enable you to compare between companies to assess their 'green credentials'.

- *How helpful/ unhelpful would you find this information when choosing between these companies?*
 - 1 - Very unhelpful
 - 2 - Somewhat unhelpful
 - 3 - It would make no difference
 - 4 - Somewhat helpful
 - 5 - Very helpful
 - Don't know
- *How supportive/ unsupportive would you be of this idea/ initiative?*
 - 1 - Very unsupportive
 - 2 - Somewhat unsupportive
 - 3 - Indifferent to it
 - 4 - Somewhat supportive
 - 5 - Very supportive
 - Don't know

[5] Imagine you are either leasing a car or buying a new car on credit. Now imagine you could borrow more money if you chose an electric vehicle instead of a petrol or diesel vehicle.

- *If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?*
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know

- *How supportive/ unsupportive would you be of this idea/ initiative?*
 - [1] *Very unsupportive*
 - [2] *Somewhat unsupportive*
 - [3] *Indifferent to it*
 - [4] *Somewhat supportive*
 - [5] *Very supportive*
 - *Don't know*

[21] Imagine you could buy an electric car using your pre-tax income, which could equate to up to roughly 30% off the car's price for lower-rate tax payers, and up to roughly 50% discount for higher-earners.

- *If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?*
 - [1] *A lot less likely*
 - [2] *Somewhat less likely*
 - [3] *No difference*
 - [4] *Somewhat more likely*
 - [5] *A lot more likely*
 - *Don't know*
- *How supportive/ unsupportive would you be of this idea/ initiative?*
 - [1] *Very unsupportive*
 - [2] *Somewhat unsupportive*
 - [3] *Indifferent to it*
 - [4] *Somewhat supportive*
 - [5] *Very supportive*
 - *Don't know*

[163] Imagine you worked for a company that allowed you to buy an electric car, which had previously been used as a company car, out of your pre-tax salary. This would allow you to buy it at the second-hand price, but also save 30% - 50% off this price through tax benefits.

- *If you had access to this scheme through your employer, would you be more or less likely to buy an electric vehicle next time?*
 - [1] *A lot less likely*
 - [2] *Somewhat less likely*
 - [3] *No difference*
 - [4] *Somewhat more likely*
 - [5] *A lot more likely*
 - *Don't know*
- *How supportive/ unsupportive would you be of this idea/ initiative?*
 - [1] *Very unsupportive*
 - [2] *Somewhat unsupportive*
 - [3] *Indifferent to it*
 - [4] *Somewhat supportive*
 - [5] *Very supportive*
 - *Don't know*

[41] Imagine parking in public spaces (those owned by local authorities) was free for all electric vehicles.

- *If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?*
 - [1] *A lot less likely*
 - [2] *Somewhat less likely*

- [3] No difference
- [4] Somewhat more likely
- [5] A lot more likely
- Don't know
- How supportive/ unsupportive would you be of this idea/ initiative?
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[27] Imagine your local authority helped a group of you and other people in your area to each buy an electric car by negotiating a bulk-buy discount with a manufacturer.

- If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know
- How supportive/ unsupportive would you be of this idea/ initiative?
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[61] Imagine the government installed more electric vehicle chargepoints in countryside and seaside holiday locations.

- If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know
- How supportive/ unsupportive would you be of this idea/ initiative?
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[62] The government currently supports companies by providing funds for the installation of chargepoints at corporate car parks. Imagine government would tie the funding to the level of electric vehicle (EV) ownership among employees (i.e. the higher the EV ownership, the greater the funding). This would ensure those employees can charge their electric vehicles while at work.

- *If your employer had access to this scheme and would therefore be able to provide sufficient chargepoints at work, would you be more or less likely to buy an electric vehicle next time?*
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know
- *How supportive/ unsupportive would you be of this idea/ initiative?*
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[75] Imagine a scheme whereby local authorities helped local residents group together to buy electric vehicles at a discount through bulk-buying directly from manufacturers.

Now imagine, each time a group of people did this, the UK government committed to installing new charge points in this area - those people who bought the electric cars would be able to express their view on where the chargepoints should be installed.

- *If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?*
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know
- *How supportive/ unsupportive would you be of this idea/ initiative?*
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[79] Imagine electric vehicle owners without off-street parking at home (e.g. they don't have a driveway, garage, or a private parking lot at home) would receive free parking in selected city car parks and supermarkets with chargepoints near their home. This would provide them with somewhere they could plug in their car overnight if they are unable to charge it at home.

- *If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?*
 - [1] A lot less likely
 - [2] Somewhat less likely

- [3] No difference
- [4] Somewhat more likely
- [5] A lot more likely
- Don't know
- Not applicable to me, I have off-street parking
- How supportive/ unsupportive would you be of this idea/ initiative?
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[72] Imagine electric vehicle owners without off-street parking at home (e.g. they don't have a driveway, garage, or a private parking lot at home) would be allowed to request an electric vehicle chargepoint to be installed on the curb-side in front of the house/ flat along with a private parking space next to the chargepoint so that they always had access to their charge point.

- If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know
 - Not applicable to me, I have off-street parking
- How supportive/ unsupportive would you be of this idea/ initiative?
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[159] Imagine fuelling stations were mandated to provide electric vehicle chargepoints, so that you knew every petrol station in the UK also had electric chargepoints.

- If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know
- How supportive/ unsupportive would you be of this idea/ initiative?
 - [1] Very unsupportive
 - [2] Somewhat unsupportive
 - [3] Indifferent to it
 - [4] Somewhat supportive
 - [5] Very supportive
 - Don't know

[95] Imagine you could borrow a device (or download an app) that tracks the journey patterns while you drive over a number of weeks or months. Based on this data, you would receive a recommendation on whether an electric vehicle would be suitable for your needs.

- *If you had access to this service, how likely/ unlikely would you be to use it?*
 - 1 - Very unlikely
 - 2 – Somewhat unlikely
 - 3 – Neither likely nor unlikely
 - 4 – Somewhat likely
 - 5 - Very likely
 - Don't know
- *How supportive/ unsupportive would you be of this idea/ initiative?*
 - 1 - Very unsupportive
 - 2 – Somewhat unsupportive
 - 3 - Indifferent to it
 - 4 – Somewhat supportive
 - 5 - Very supportive
 - Don't know

[148] Some car dealerships have earned an accreditation status certifying their expertise for selling electric vehicles. This accreditation is currently not required to be able to sell electric vehicles, but it guarantees they know what they're talking about. Imagine government invests in further promoting the uptake of this accreditation status among dealerships.

- *If you had the opportunity to ask about electric cars at a car dealership with an approved expert, how likely would you be to do so?*
 - 1 - Very unlikely
 - 2 – Somewhat unlikely
 - 3 – Neither likely nor unlikely
 - 4 - Somewhat likely
 - 5 - Very likely
 - Don't know
- *How supportive/ unsupportive would you be of this investment?*
 - 1 - Very unsupportive
 - 2 - Somewhat unsupportive
 - 3 - Indifferent to it
 - 4 - Somewhat supportive
 - 5 - Very supportive
 - Don't know

[50] Electric vehicle battery capacity could degrade over time, giving you less range than when the car was new. Imagine there were standardised tests as part of an electric vehicle's MOT that would determine a used battery's range and state of health. This information could be particularly useful with regards to second hand purchases.

- *If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?*
 - [1] A lot less likely

- [2] Somewhat less likely
- [3] No difference
- [4] Somewhat more likely
- [5] A lot more likely
- Don't know
- How supportive/ unsupportive would you be of this idea/ initiative?
 - 1 - Very unsupportive
 - 2 - Somewhat unsupportive
 - 3 - Indifferent to it
 - 4 - Somewhat supportive
 - 5 - Very supportive
 - Don't know

[88] Imagine car manufacturers and dealerships had to provide free-of-charge extended grace periods or generous 'try before you buy' deals (e.g. for one week) to customers thinking about purchasing an electric vehicle.

- If you had access to this service, how likely/ unlikely would you be to use it?
 - 1 - Very unlikely
 - 2 - Somewhat unlikely
 - 3 - Neither likely nor unlikely
 - 4 - Somewhat likely
 - 5 - Very likely
 - Don't know
- How supportive/ unsupportive would you be of this idea?
 - 1 - Very unsupportive
 - 2 - Somewhat unsupportive
 - 3 - Indifferent to it
 - 4 - Somewhat supportive
 - 5 - Very supportive
 - Don't know

[89] Imagine car manufacturers offered short-term leases or rentals of electric vehicles for a 2-3 month period, at a comparable monthly cost to normal car lease arrangements (which would typically last a few years). This means you could use an electric car sooner, without 'locking in' to a particular model for years to come.

- If you had access to this service, how likely/ unlikely would you be to use it?
 - 1 - Very unlikely
 - 2 - Somewhat unlikely
 - 3 - Neither likely nor unlikely
 - 4 - Somewhat likely
 - 5 - Very likely
 - Don't know
- How supportive/ unsupportive would you be of this idea/ initiative?
 - 1 - Very unsupportive
 - 2 - Somewhat unsupportive
 - 3 - Indifferent to it
 - 4 - Somewhat supportive

- 5 - Very supportive
- Don't know

[90] Imagine your local shopping centre would provide free electric vehicle test-drives. You would be able to drive yourself (and your shopping bags) home with an electric vehicle for free. A driver would accompany you to drive the vehicle back.

- If you had access to this service, how likely/ unlikely would you be to use it?
 - 1 - Very unlikely
 - 2 - Somewhat unlikely
 - 3 – Neither likely nor unlikely
 - 4 - Somewhat likely
 - 5 - Very likely
 - Don't know
- How supportive/ unsupportive would you be of this idea/ initiative?
 - 1 - Very unsupportive
 - 2 - Somewhat unsupportive
 - 3 - Indifferent to it
 - 4 - Somewhat supportive
 - 5 - Very supportive
 - Don't know

[92] Imagine you could sign up to test-drive an electric vehicle through your employer for free and take the vehicle home for a few days. This service would be sponsored by government providing electric vehicles to interested companies.

- If you had access to this service, how likely/ unlikely would you be to use it?
 - 1 - Very unlikely
 - 2 - Somewhat unlikely
 - 3 – Neither likely nor unlikely
 - 4 - Somewhat likely
 - 5 - Very likely
 - Don't know
- How supportive/ unsupportive would you be of this idea/ initiative?
 - 1 - Very unsupportive
 - 2 - Somewhat unsupportive
 - 3 - Indifferent to it
 - 4 - Somewhat supportive
 - 5 - Very supportive
 - Don't know

[94] Imagine there were electric vehicle test-drive sites across the UK. You would be able to sign up and test-drive an electric vehicle for free. This scheme would be sponsored by government.

- If you had access to this service, how likely/ unlikely would you be to use it?

- 1 - Very unlikely
 - 2 - Somewhat unlikely
 - 3 – Neither likely nor unlikely
 - 4 - Somewhat likely
 - 5 - Very likely
 - Don't know
- How supportive/ unresponsive would you be of this idea/ initiative?
 - 1 - Very unresponsive
 - 2 - Somewhat unresponsive
 - 3 - Indifferent to it
 - 4 - Somewhat responsive
 - 5 - Very responsive
 - Don't know

[33b] Imagine personalised number plates were sold at a significant discount when being registered to an electric car, compared to a petrol or diesel car.

- If this idea was implemented, would you be more or less likely to buy an electric vehicle next time?
 - [1] A lot less likely
 - [2] Somewhat less likely
 - [3] No difference
 - [4] Somewhat more likely
 - [5] A lot more likely
 - Don't know
- How supportive/ unresponsive would you be of this idea/ initiative?
 - 1 - Very unresponsive
 - 2 - Somewhat unresponsive
 - 3 - Indifferent to it
 - 4 - Somewhat responsive
 - 5 - Very responsive
 - Don't know

[131] Imagine car dealerships were required to publish information, for the whole range of vehicles they sell, that makes it easier to compare electric vehicles to petrol and diesel cars on a range of important factors such as fuel efficiency, running costs, vehicle performance, vehicle features.

- How helpful/ unhelpful would you find this information when choosing a new vehicle?
 - 1 - Very unhelpful
 - 2 - Somewhat unhelpful
 - 3 – It would make no difference
 - 4 – Somewhat helpful
 - 5 - Very helpful
 - Don't know

- *How supportive/ unsupportive would you be of this idea/ initiative?*
 - 1 - *Very unsupportive*
 - 2 - *Somewhat unsupportive*
 - 3 - *Indifferent to it*
 - 4 - *Somewhat supportive*
 - 5 - *Very supportive*
 - *Don't know*

[120] Imagine all public parking spaces that have an electric vehicle chargepoint were painted green. This makes them easier to spot and helps people become aware that there are lots of chargepoints available.

- *How supportive/ unsupportive would you be of this policy?*
 - 1 - *Very unsupportive*
 - 2 - *Somewhat unsupportive*
 - 3 - *Indifferent to it*
 - 4 - *Somewhat supportive*
 - 5 - *Very supportive*
 - *Don't know*

[150] Imagine you are buying a new property and you would get a discount on your stamp duty if you decided to pay for the installation of an electric vehicle chargepoint at your new property (that doesn't have a chargepoint yet). The discount would make up for about half of the cost of the chargepoint. A chargepoint installation typically costs around £1000, so you would get a discount of around £500.

- *If you had access to this discount, how likely/ unlikely would you be to have a chargepoint installed at your new home?*
 - 1 - *Very unlikely*
 - 2 - *Somewhat unlikely*
 - 3 - *Neither likely nor unlikely*
 - 4 - *Somewhat likely*
 - 5 - *Very likely*
 - *Don't know*
- *How supportive/ unsupportive would you be of this idea/ initiative?*
 - 1 - *Very unsupportive*
 - 2 - *Somewhat unsupportive*
 - 3 - *Indifferent to it*
 - 4 - *Somewhat supportive*
 - 5 - *Very supportive*
 - *Don't know*

[General demographic questions - all participants would see these]

[Gender, age, income and location are already collected through the panel, we won't re-ask those questions]

- Q6 [social grade] Which of the following groups does the Chief Income Earner in your household belong to? The Chief Income Earner is the person in your household with the largest income, however this income is obtained.
 - **Semi or unskilled manual worker** (e.g. manual jobs that require no special training or qualifications; manual workers, apprentices in skilled trades, caretaker, cleaner, nursery school assistant, park keeper, non-HGV driver, shop assistant etc.)
 - **Skilled manual worker** (e.g. skilled bricklayer, carpenter, plumber, painter, bus/ambulance driver, HGV driver, unqualified assistant teacher, AA patrol officer, pub/bar worker etc.)
 - **Supervisory or clerical/ Junior managerial/ Professional/ Administrator** (e.g. office worker, student doctor, foreman with 25+ employees, salesperson, student teacher etc.)
 - **Intermediate managerial/ Professional/ Administrative** (e.g. newly qualified (under 3 years) doctor, solicitor, board director of a small organisation, middle manager in a large organisation, principle officer in civil service/local government etc.)
 - **Higher managerial/ Professional/Administrative** (e.g. established doctor, solicitor, board director in a large organisation of 200+ employees, top level civil servant/public service employee, headteacher etc.)
 - Student
 - **Retired and living on state pension only** (if the Chief Income Earner is retired and has an occupational pension, please select according to their previous occupation)
 - **Unemployed (for over 6 months) or not working due to long-term sickness** (if the Chief Income Earner is not in paid employment and has been out of work for less than 6 months, please select according to previous occupation)
 - **Housewife / Househusband / Homemaker**
 - Prefer not to say

- Q7 -[urban/ rural] How would you describe the area you live in?
 - Urban
 - Rural
 - Sub-urban
 - Don't know

- Q8 -[housing type] Which of these best describes your living arrangements?
 - I own my home (outright, or mortgaged)
 - I rent my home privately
 - I rent my home from a social landlord or local authority
 - I am living with my parents or other family members that own or pay the rent for the property
 - Other
 - Don't know

- Q 9 -[Off-street parking] Do you have access to off-street parking (e.g. a driveway, garage or private parking lots) at home?
 - Yes, I have access to off-street parking
 - No, I can only park on the street outside my house
 - Don't know

PPR 967

ISBN: 978-1-913246-50-1