



# On the Road to Sustainable Growth

Boosting Electric  
Vehicles in the UK.

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## The Case for Change

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Consumer demand and carbon emissions targets are driving significant growth in electric vehicles. This is not a 'future' issue. Electric Vehicles are already here and receiving Government support in the form of buyer subsidies and initiatives to support the development of an appropriate 'green' infrastructure

Fuel cell electric vehicles (FCEVs) are arriving and the Government has invested in the technology

Autonomous cars are being developed

The UK by the nature of its size and geography has a natural advantage in the rapid adoption of vehicles with the new power train technologies

The UK has the research and development capacity to lead in the development and implementation of the new power trains

There is a major economic benefit from the UK taking the lead position in this area

However, as a result of the skills gap when it comes to maintaining these new and complex vehicles, the benefits to the UK economy may not be fully realised.







# Contents

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## **1.0**

Executive Summary / **05**

## **2.0**

Sins of Omission, Commission  
and Emission / **09**

## **3.0**

Current Employment  
Challenges in the Sector / **15**

## **4.0**

The Need for Registration / **19**

## **5.0**

A Strategy for the Future / **22**

## **6.0**

Recommendations / **25**

Bibliography / **26**





# 1.0 Executive Summary

The UK automotive industry employs almost **800,000** people of which **158,000** are involved in manufacturing, with the remaining **641,000** being employed in the supply chain including the retail and service side of the sector. The car market in the UK is booming with an increase of **6.3 per cent** in 2015 – to **2,633,503** units. This record outperforms even the previous high in 2003. This is only the fourth time that the market has passed 2.5 million in a full year. Gains were reported across all fuel types but the demand for Ultra Low Emission Vehicles grew a record **40.3%** giving the highest market share to date of **2.8%** for the year. Plug in hybrids experienced phenomenal growth, with numbers more than doubling while pure electric vehicles saw an up lift of around **50 per cent**. The Society of Motor Manufacturers and Traders (SMMT) have estimated that with the current rate of development in electric cars and autonomous vehicles, by 2030 there will be key benefits to the UK economy, society and the environment:

- The overall economic and social benefit of EVs, connected and autonomous vehicles could be in the region of **£51 billion** per year by 2030
- Connected and autonomous vehicles could create an additional **320,000** jobs in the UK, **25,000** of which would be in automotive manufacturing by 2030
- Connected and autonomous vehicles could save **2,500** lives and prevent more than **25,000** serious accidents in the UK by 2030

The Climate Change Act (2008) made the UK the first country to establish a long term legally binding framework to cut carbon emissions. It contains a target requiring emission reductions of **80 per cent** by 2050. A wider legal landscape also exists spanning the UK, the EU and globally to address climate change.

This legislation is being supported by current Government policy with the launch of the 'Go Ultra Low City Scheme' in January 2016 announced by the Transport Secretary Patrick McLoughlin. As part of this initiative Nottingham,

Bristol, Milton Keynes and London will share **£40 million** to fund the roll out of cutting edge technology such as rapid charging hubs and street lighting that doubles as charge points. Electric car drivers will also be given local privileges such as access to bus lanes in city centres. It is proposed that **25,000** parking spaces will also be opened up for plug-in car owners, saving as much as **£1,300** per year per car. The funding is provided in addition to the Government subsidies being offered to customers buying electric vehicles.

McLoughlin has stated: "The UK is a world leader in the uptake of low emission vehicles and our long term economic plan is investing **£600 million** by 2020 to improve air quality, create jobs and achieve our goal of every new car new car and van in the UK being ultra – low emission by 2040."

To achieve this, there is a need for a holistic approach to the infrastructure, both technical but also human. The UK needs to have consistent and sustainable EV charging facilities across the country and will need **1,150** hydrogen fuelling stations by 2030. However a potentially larger problem will come in the major skills gap facing the industry. A recent study conducted on behalf of the Institute of the Motor Industry (IMI) showed that **81 per cent** of independent garages found it difficult to recruit technicians with the skills and competences needed to undertake work on technologically advanced vehicles such as hybrid and electric vehicles.

As a result **82 per cent** of them either do not or would not take on this type of work going forward. The skills shortage is such that the study identified that **94 per cent** said they would need to train existing technicians to undertake the work, and **90 per cent** stated that Health and Safety training would also have to be done before they could start work. With major problems over recruitment and large skills shortages within the hybrid and electric sector, it is clear that unless a proactive strategy is undertaken the UK will not be able to support the growth of low carbon emission vehicles.

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One final aspect is the implications of the development of autonomous cars. As yet, it is unclear how the distribution of these vehicles will occur especially as new manufacturers such as Google are entering the market. If the autonomous car does develop into a reasonable market proposition, there will have to be consideration given as to the type of maintenance the vehicle requires and the computer software skills that would be necessary to repair any malfunction. This would present a major challenge to the existing workforce currently operating in the sector.

The paper proposes that on economic, health and safety and environmental grounds it is critical that the status of the sector is raised to attract better quality, technically proficient young people. It is argued that setting up a licensing system for technicians will raise both the quality but also the standing of the profession as it has done in other sectors. If successful it will form a key pillar in supporting the Government's strategy to attract more young people into apprenticeships.

The following report explores in more detail the underpinning evidence to support this argument.











Source  
LONDON

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## 2.0 Introduction - Sins of Omission Commission and Emission

When a small workshop at the University of West Virginia identified the “defeat software” installed by VW to “fix” the results of its diesel engine emissions, the motor industry came to a crossroads. For years, there had been the mantra that it was possible to have “clean diesel” with low emissions. It may still be the case that this is possible. But in the eyes of the world’s consumers this claim is perceived as being far from convincing. If one of the world’s largest car makers has to cheat to get the emissions down to accepted limits then there is a major problem.

The VW scandal has reopened the debate as to what is going to be the powertrain of the future. If clean diesel is not an option, alternatives will have to become even more central in reducing vehicle emissions.

The choice of powertrain is just one of a number of potentially disruptive influences that are predicted to change the nature and structure of the retail motor sector, and pose challenges to one of the UK’s largest employment sectors. This paper systematically explores the forces at work and the implications for the consumer, employers, employees and Government Policy.

### Alternative Powertrains

Climate change, consumer opinion and international legislation are all working together to force an industry that has been based for over 100 years on the internal combustion engine to rethink its approach to how cars are powered. After the “dieselgate” scandal at VW, the industry will be under intense scrutiny to comply with not only the emissions and miles-per-gallon targets set by national and intra-national organisations, but also to show that they are acting responsibly to improve the environment.

The first major shift away from the internal combustion engine came in 1997 with the launch of the Toyota Prius. This has now sold 8 million vehicles worldwide, making Toyota the leading “green” car company. Very few companies followed Toyota’s lead in this area until about 5 years ago, when a large number of manufacturers started to move towards petrol/hybrid options and electric vehicles.

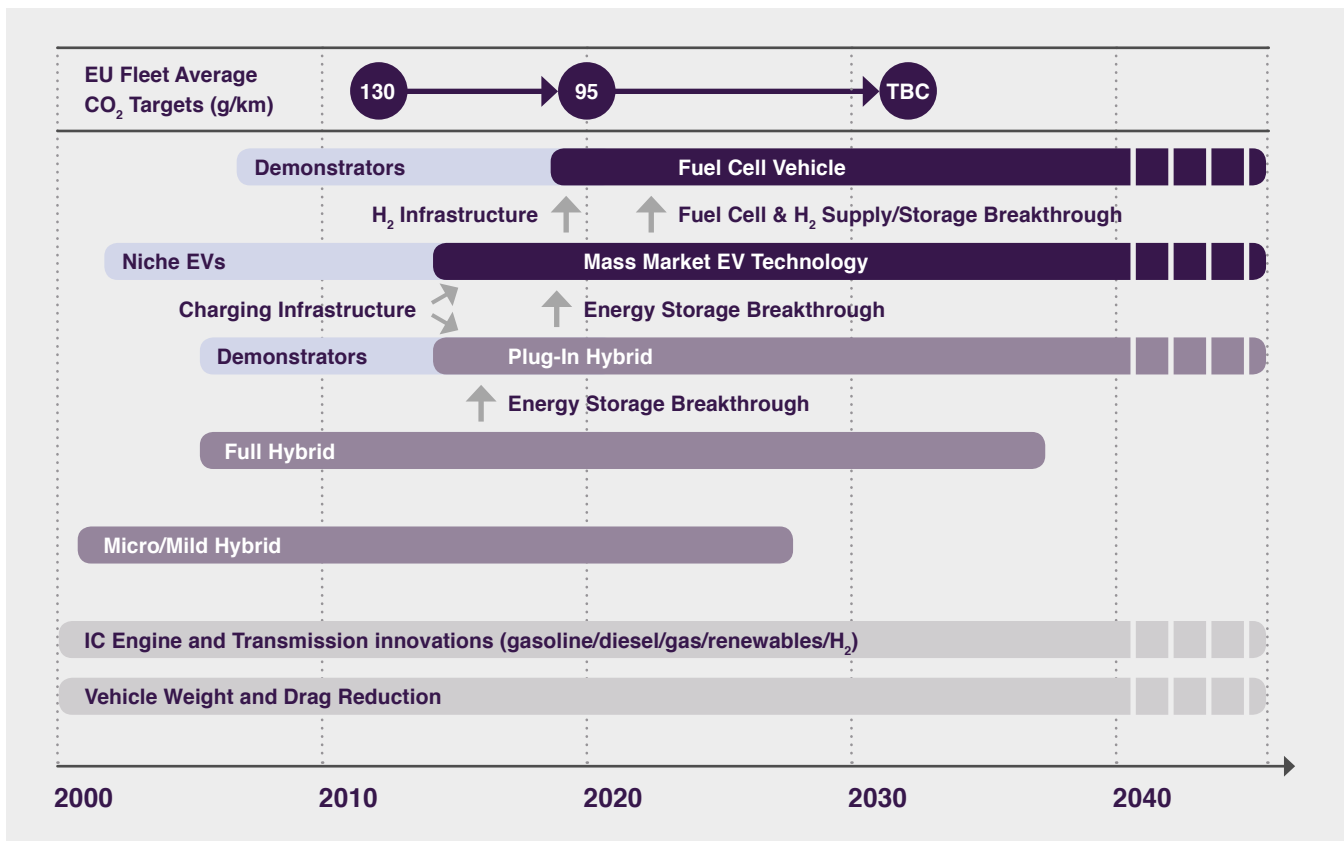
### The Rise of the Ultra-Low Emission Vehicle (ULEV)

Since 1997 the term “hybrid” has been used to refer primarily to cars with small petrol engine that charges an electric power train. “Electric vehicles” (EV) refers to cars that are powered purely by batteries charged from an external source. In addition to this there has been seen in recent years the development of “hydrogen fuel cell electric vehicles” (FCEV) where the fuel cell technology charges an electric engine, which powers the car. In this report the term Ultra Low Emission Vehicles (ULEV) will be used to describe both EV and FCEVs.

The move to ULEV vehicles is the obvious direction for the motor industry to take, even with the current fall in oil prices. The “diesel gate” scandal and the issues of carbon dioxide pollution in India and China as well as in parts of the UK means that the only politically and socially responsible route is a move towards ULEVs. The current challenge is working out which of the options is going to be the sustainable one for the future.

In 2009 the Government set up the New Automotive Industry Growth Team (NAIGT), tasked with looking at the future of the car industry in the UK. They put forward the following diagram that described how they saw the future of the car propulsion would be achieved. This task force identified the key role that EV and FCEV would play going forward. To a large extent, their forecasts have already become reality.





The New Automotive Industry Growth Team (NAIGT) proposed that the timescale for the real arrival of ULEVs would be in 2020. This however appears to be wrong, with manufacturers launching alternatively powered vehicles now. The projection of the NAIGT is that there are only two ways forward as regards the future power train of vehicles and that is EV and FCEVs. They predicted that there would be increased numbers of hybrid vehicles generally, and there would be improved aerodynamics with lighted cars being produced from new generation materials. The speed of progress is such that the skills shortage to support these technologies is going to hit sooner than originally thought.

## Electric Vehicles

There have been an increased number of manufacturers who have launched EVs into the UK market. These include:

- Nissan Leaf
- Renault Twizy
- BMW
- Kia Soul EV
- VW E-Golf
- Renault Zoe

## FCEV –Toyota and Hyundai

Toyota being the world's largest car manufacturer it is significant that the company has recently launched its new FCEV: the Mirai, meaning the "future". It is Toyota's aim to eliminate petrol and diesel from their range entirely by 2050. The chief engineer of the Mirai is quoted as saying that "no matter how good a job Toyota does, Toyota cannot make this technology popular. We need to build an ecosystem." The issue with FCEVs is that by comparison to the EV they cannot be recharged at home, and are reliant on public filling stations for hydrogen which are at the moment rare. There are four hydrogen filling stations in Hamburg alone, which is the same number as currently available in the UK.

The lack of infrastructure to support the FCEVs is a major issue, as although the Mirai can do 550km on one tank, without a growth in hydrogen refuelling stations the range will inevitably be limited. Refuelling only takes 3-5 minutes, but as Andy Palmer who oversaw the development of the Nissan Leaf stated, if there is "range anxiety" in EVs then for FCEVs the current lack of hydrogen filling stations should be described as "range panic" as many drivers would not be able to use the car at all.



By comparison to EVs, the FCEVs in the form of the Hyundai ix35 and the Toyota Mirai are a lot more expensive too, with the Hyundai being priced at £53,000 while the Toyota is over £60,000.

As more manufacturers move into FCEVs there is going to be pressure for a hydrogen fuel infrastructure to be built. The central problem, according to estimates from Goldman Sachs, is that hydrogen stations require an upfront investment of \$3.2 million versus \$800,000 for petrol stations. This would suggest that organic growth is likely to be fairly slow. It is argued therefore that the growth of fuel cell vehicles will be driven by government policy rather than consumer demand.

## The Connected Car and Autonomous Vehicle Technology

The EV–FCEV debate cannot be seen in isolation of other technical changes taking place within the sector. One major change is the move towards connected and autonomous vehicles, which has seen the UK Government set up a £200 million fund announced at the last budget to help promote work in this area. Fully autonomous vehicle pilots have started in Bristol, Coventry, Greenwich and Milton Keynes.

## Implications

These forces and disruptive technologies have massive potential to change the shape of the UK motor industry as well the opportunity for Britain to become world leading in the introduction of ULEVs with the positive impact this would have on CO emissions. They also give the opportunity to exploit specialist technologies developed in the UK, benefiting related sectors such as the creative industries using digital and media as they serve new markets created by connected and autonomous vehicles.

## The Need for Physical Infrastructure

The UK is in a unique position to exploit both the EV and FCEV changes. The 2012 UK H2 Mobility survey reported that once hydrogen refuelling stations are available, early adopters were likely to generate 10,000 vehicle sales per annum by 2020. They predicted that as the vehicle costs became more competitive and the refuelling network develops FCEV uptake will increase rapidly. In the UK H2 Mobility road map, by 2030 there will be 1.6 million FCEVs in the UK with annual sales of more than 300,000.

The analysis and network modelling undertaken by UK H2 indicated that 65 hydrogen refuelling stations across the UK could provide sufficient initial coverage to start the market covering major population centres and the connecting roads. Thereafter they predict that the network should develop and extends in line with demand for hydrogen by vehicle owners. The road map would suggest that a full national coverage could be achieved with 1,150 stations by 2030 providing close to home refuelling for the whole of the UK. The problem identified for this type of project is the low profitability for the hydrogen refuelling stations with a low volume of business. In reality, for a long period of time there will be a mixed economy of petrol cars, petrol hybrids as well as EVs and FCEVs. It would be a sensible progression for incentives to be in place that accommodated hydrogen supply alongside traditional fuels at larger petrol stations. This would overcome some of the downside of the lack of profitability within the financial structure.

It would appear from the figures and the analysis that as the New Automotive Industry Growth Team (NAIGT) proposed there will be a progression from petrol/diesel to EV and FCEVs, with the EVs being prominent in the early years of the 20-year timescale envisaged.

The development of both technologies will be dependent on the development of the infrastructure, in the same way as petrol cars were restricted by the access to petrol stations before the oil companies developed more integrated systems, which have been supplemented by selling other products.



## The Need for a Maintenance Infrastructure

The internal combustion engine has been developed and improved over more than 100 years. A body of knowledge has been developed and passed down through the generations in both classrooms and on the workshop floor. The new technologies of EV and FCEV are completely new technologies and do not have this backdrop of knowledge development.

One of the major challenges that has been overlooked in the discussions and studies of the introduction of new alternative power trains is the human support required in the form of service and aftercare on sales.

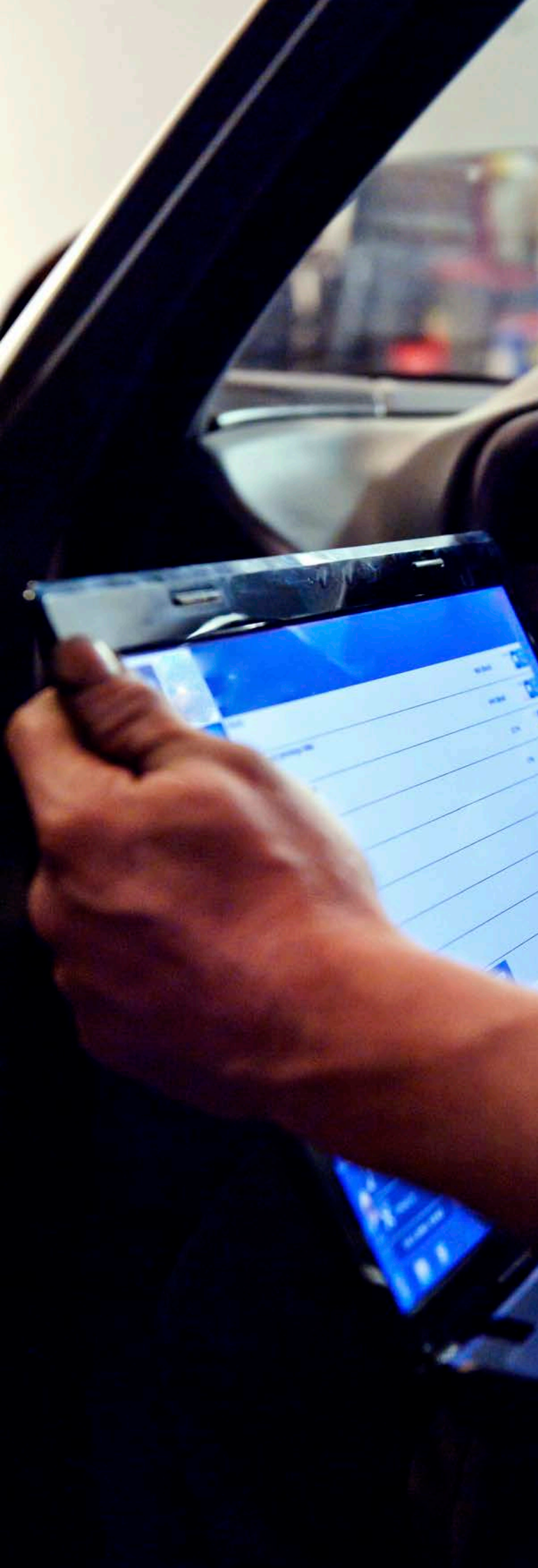
EV and FCEV are technologies that have little in common with the internal combustion engine, although outwardly parts of any vehicle will remain the same e.g. wheels. Cars of the future will require potentially less input from the driver and there will be a much greater reliance on the technology to perform the transportation as well as protect the travellers, and the environment outside of the car. The autonomous car is perhaps the extreme example of the importance of high quality technicians, as the maintenance of the systems is critical as the driver is intended to have little or no control. There will be a shift from problems with mechanical parts to ones associated with software and digital malfunctions. A failure of an automatic braking system is an obvious example.

The technology moves the main maintenance task from that of a mechanic/technician to that of a systems analyst. Computer diagnostics are present in the motor industry today but the bulk of the work in servicing is still of a mechanical nature. In addition to this there is evidence that there are major health and safety risks in the repair of electric cars, and in most dealerships the electric cars are serviced in specialist work bays with barriers around to stop non-qualified staff from having access to the car. The level of technical sophistication in the work force will need to rise.

BMW are one of the leaders in the development of EVs and Alastair Scott, Senior Product Engineer at BMW Group UK Limited, highlights the health and safety issues and the importance of training when servicing these types of vehicles. He has said:

**“The challenges we face with electric and hybrid vehicles is that the engine could be a potentially lethal - 400 volt, 240 mains AC machine with power electronics on top, or it could be a piece of metal that is not dangerous at all. There is nothing to tell the vehicle technician that it is dangerous, but if they’re qualified and follow the right procedure we can make this just a piece of metal that is very safe. If they’re not, the only way they’ll find out is if they touch it and they live to tell the tale then it was safe, but if they don’t live to tell the tale then it wasn’t safe. That is 400 volts DC and you will not survive that, and that is why the training is so important.”**

One of the major issues being addressed within the industry is that of cyber security within cars. The ability to influence the running of a vehicle remotely is available now. The potential for criminal or terrorist activity utilising vehicles is yet to have been fully exploited, but the manufacturers are already looking at protecting vehicles from cyber-attack. Looking at the supply chain and its operation the most vulnerable time for a car to be affected is at the point where a car is being serviced. The technician has access to all of the cars operating systems and data communication portals. Under the current regulatory arrangement, there is no registration of technicians, no security checks and no tests of competence. The prospect that an autonomous car can be driven loaded with explosives at a target raises major concerns for counter-terrorism organisations.



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## Summary

- The Government has shown commitment to the new technologies in the motor industry with the subsidy for the purchase of electric cars and the investment in autonomous vehicles.
  - The nature and geographical structure of the UK presents the opportunity for the country to be world leading in the implementation of the new technologies.
  - EVs and FCEVs will continue to make advances in the market place but the progress will be dictated by the development of the supporting infrastructure. This is likely to be dependent on Government investment to pump prime this initiative.
  - With the development of the new technologies there is potentially going to be a major skills gap both in quality and quantity to support the servicing and maintenance of these new vehicle types.
- As a result of the skills gap, it is likely that the potential benefits to the UK economy from these developments will not be realised.





## 3.0 Current Employment Challenges in the Sector

It has been widely recognised that the retail automotive sector struggles to recruit people into the technical side of their businesses. The number of young people wishing to take apprenticeships has remained fairly static over the last five years according to Government statistics seen below.

The motor industry does attract apprentices but the most highly sort after are with the manufacturers in their technical and production facilities.

**Apprenticeship starts in England by framework since 2009/10, thousands**  
20 most popular frameworks in 2014/15

		09/10	10/11	11/12	12/13	13/14	14/15
1	Health and Social Care	18	54	71	81	70	85
2	Business Administration	27	39	45	49	44	49
3	Management	10	30	45	48	33	43
4	Hospitality and Catering	21	30	36	36	32	32
5	Customer Service	29	54	59	45	31	31
6	Children's Care Learning & Development	20	27	26	26	24	22
7	Retail	17	41	31	25	17	18
8	Engineering	15	18	13	14	16	18
9	Construction Skills	14	16	14	14	16	17
10	Industrial Applications	1	4	19	15	15	14
11	Hairdressing	16	16	17	16	15	14
12	IT and Telecoms Professionals	8	12	12	9	10	11
13	Active Leisure and Learning	11	18	16	12	9	9
14	Vehicle Maintenance and Repair	10	9	8	8	9	9
15	Warehousing and Storage	3	6	7	7	7	9
16	Accountancy	5	7	8	8	7	8
17	Electrotechnical	5	6	5	5	5	8
18	MES Plumbing	5	5	4	5	5	7
19	Public Services	2	1	3	4	4	7
20	Sales and Telesales	2	2	4	4	4	6

### Notes

Data are for academic years (August 1st to July 31st).

Source: BIS *FE data library: apprenticeships*



To undertake an apprenticeship in the sector a young person needs at least three GCSEs in Maths, English and a Science subject. College courses are available that generally cover three levels:

- **Level 1** – Certificate/Diploma in Vehicle Maintenance
- **Level 2** – Certificate in Light Vehicle Maintenance & Repair Principles
- **Level 3** – Certificate /Diploma in Vehicle Technology

These cover areas such as:

- Fault finding and diagnosis
- Transmission, suspension, braking and engine management systems
- Auto electrics and security
- Tyres, trim and general fitting
- Body, repair, spray painting and finishing

The challenge is that the curriculum that most technicians have trained on has been based on the existing technology. Colleges are unlikely to have access to the more sophisticated technology based around EVs and FCEVs. As most of the knowledge of these new powertrains will be held by the manufacturers, there will be a tendency for them to only wish to share the technology with their own franchised network. As a result, college tutors may struggle to be able to train new apprentices appropriately.

The present Government's initiative to raise the profile and approach to apprenticeships in schools coincides with the changing technology taking place in the motor industry. EV and hybrid vehicles require a higher level of technical sophistication, requiring people to be trained in new innovative skills. The modern technology should attract young people who see this as a potentially rewarding and modern occupation, offering opportunities for professional and career development. This change if implemented effectively and supported by the industry will open up attractive educational paths that are an alternative to the A level / University route.

With the changing technology it is self-evident that the manufacturers hold the technical knowledge underpinning the new developments. With this comes power over the franchised and authorised repairers. The original Block Exemption Regulation forced manufacturers to provide technical information and tooling at a reasonable price to the network of repairers in the market. This was recognised as working well by the EU, and only minor amendments were made when the regulation was revised in 2013. The problem is that the car market has changed and this has not been recognised by the EU.

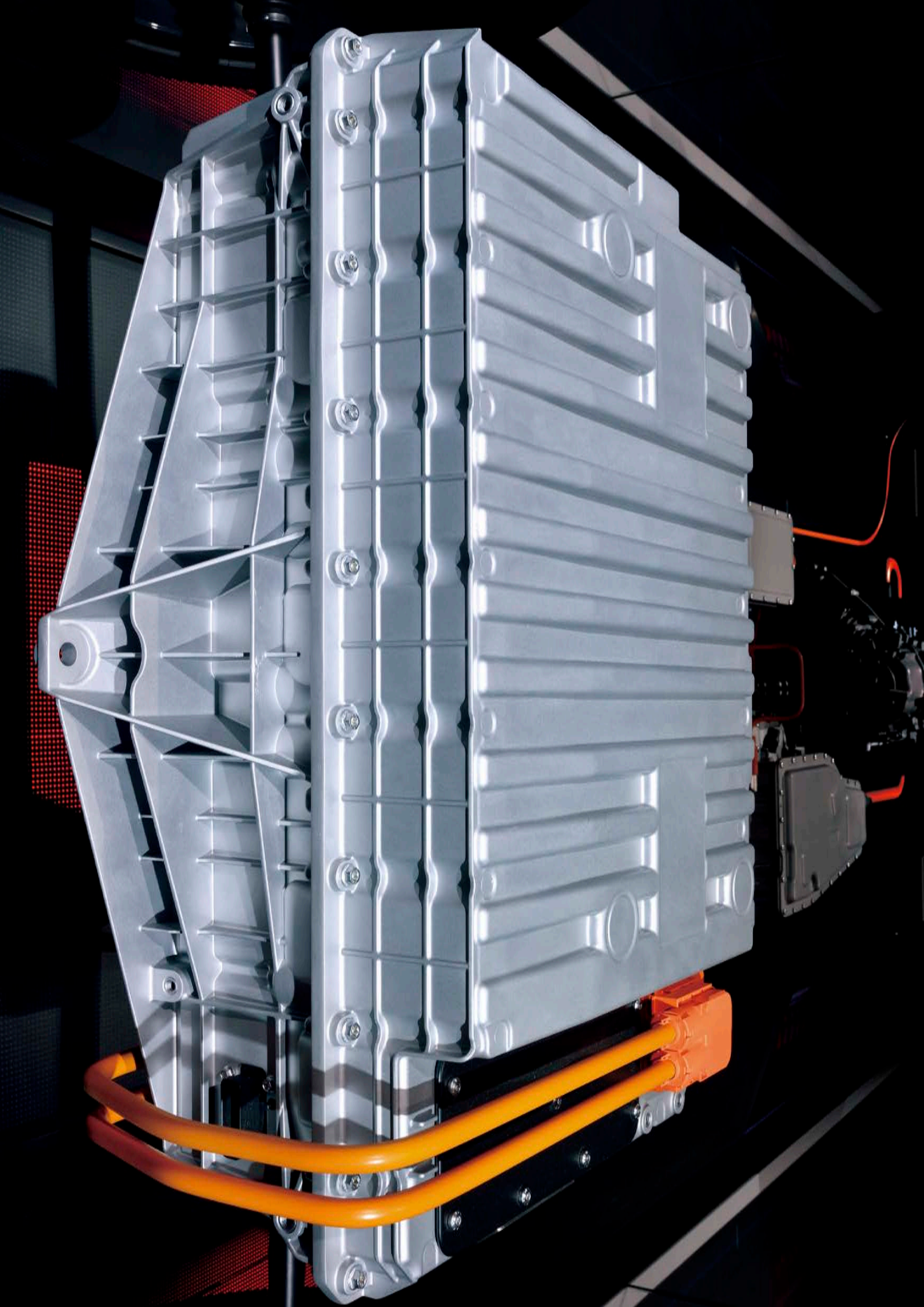
This lack of competition will exasperate the issue of the skills gap that will occur in the market. Manufacturers will train up technicians and provide them with the equipment to repair EV and FCEV, leading to a group of people who can repair the modern vehicles and a large rump of technicians who have only been trained on the old technology. This will mean that the market will fail to open up and develop to the benefit of the UK economy.

## Summary

- The retail automotive sector fails to attract top young people into technical roles within the industry
- Without proper regulation a skills gap will emerge with only a limited number of technicians working in the franchised sector being able to service and repair new technology vehicles
- Without competition in the market place the UK consumer will potentially suffer from higher pricing and poorer service
- If this trend is found to be true then it is likely that the independent sector of the retail automotive sector will decline.







## 4.0 The Need for Registration

There are few sectors that are so technically complex and yet have such limited regulation. The retail automotive sector sells and services products that can travel at extremely high speeds and cause irreparable damage, yet there are virtually no controls on the ability to practise.

Within the franchised system, manufacturers lay down standards of training specifying that dealership employees should attend a range of training programmes and that certain thresholds of attainment are assessed. However there are few controls on the independent sector, nor is there policing of the franchised sector.

The impact of this lack of control is detrimental to the standing and status of the profession. With few barriers to entry, the role of service technician or mechanic becomes simply a job as opposed to a vocation that has a clear career development.

Throughout history many professions have developed an “Institute” or “Professional body” to raise the profile of a particular role or cluster of related occupations. These institutions developed professional registers of people who had either a certain status or a right to practise within that occupational field.

The historic development of professional registers associated with institutional or vocational bodies appears to have been driven by four basic forces. The concept of registration is required when there is a need for standardisation of processes or procedures, when there is a need to safeguard the general public, when there is need for the status of a profession to be recognised and also when that profession needs support within itself. These are all fundamental requirements in the retail automotive sector.

### • The Need for Standardisation

There needs to be a base standard of professionalism across the sector. This provides reassurance to the consumer but also to the manufacturer ensuring that their product is being maintained to an appropriate standard.

### • The Need to Safeguard

A number of institute-based registers have been set up as a result of legislation usually to protect the general public from potentially life-threatening situations. One of the most obvious examples is the General Medical Council (GMC) which regulates British doctors through the Medical Act. It registers doctors for UK practice, sets professional standards, regulates basic medical education, and manages doctors’ fitness to practise. The GMC often sits uneasily at the interface between the medical profession, the public, Parliament and the National Health Service.

A strong case can be made that vehicle maintenance is an area where the public needs to be protected against unscrupulous or poorly trained mechanics. In an increasingly complex technical environment, the risk of mistakes and major incidents is more likely and there is a need for a higher level of technical competence to protect the public.

### • The Need for Status

A critical area for the automotive industry is its low status in the eyes of young people, careers officers, and parents. By having an institute-backed professional register the occupation will gain an uplifted status as it offers the power of exclusion to those who have not been appropriately trained. This raising of status could lead to:

- Higher earnings, better employment prospects and career mobility
- Acknowledgement of professional standing by peers and colleagues
- Access to a vast network of qualified professionals in your area of expertise, so you keep abreast of the latest developments
- Recognition by employers of your internationally renowned professional standard



### • The Need for Support

In some circumstances members of a profession join or form a group as part of a self- help / credibility raising / lobbying organisation. An example of this would be the Institute of Directors, which has a fairly open access, but also has a continuing professional development process embedded within it, while also lobbying Government on business issues.

## Typology of Institute Registers

There are four basic types of institute professional register:

- **Permit to Practice (PtP):** These are the registers often associated with Chartered Institutes whereby there is a legal requirement to be registered if you are going to operate in this profession or vocation.
- **Recognised to Practice (RtP):** These are registers where the profession restricts entry (not by legislation) and this becomes the only way into the profession or vocation.
- **Acknowledged to Practice (AtP):** This is a register where a qualification or standard is acknowledged as being beneficial although not a prerequisite to practice.
- **Volunteer to Practice (VtP):** This register is brought together from people who wish to coalesce as a group. This register is often driven by the members as opposed to the general public, Government or outside agency.

The strongest position will obviously be the PtP and although these are actually very few in number in reality some of the registers have such power that without being part of the relevant institution it is almost impossible to practice in that profession. It is interesting to note that some organisations that start almost informally as a VtP soon drive the case for moving towards an AtP or RtP fairly quickly.

At the moment the Institute of the Motor Industry has its “IMI Technical Accreditation” scheme. This is a voluntary assessment programme for individuals working in the retail automotive sector. In the scheme of registrations

described above, this has the standing of Acknowledged to Practise (AtP) where it is an individual's proof of current competence. Each individual with the accreditation has completed a series of knowledge and practical assessments to demonstrate their skills, and has signed up to an ethical code of conduct. The accreditation process should be renewed every three years.

Most of the organisations mentioned above are traditional established professions, which have well defined training programmes often at degree level. There has however been a trend in recent years for other occupations to seek some form of professional registration. An obvious example is the “Gas Safe Register”, which is the official gas registration body for the UK, Isle of Man and Guernsey and is appointed by the relevant Health and Safety Authority for each area. The main focus of the Register is on improving and maintaining gas safety. The aim is to protect the public from unsafe gas work through:

- A dedicated national investigations team tracking down individuals working illegally
- Regular inspections of Gas Safe registered engineers
- Educating consumers and raising awareness of gas safety
- Investigating reports of unsafe gas work

The concern in the automotive retail sector is that there is not a requirement to register to practise. People can work in the sector without qualifications, potentially putting peoples' lives at risk. In addition to this it can be argued that with the new technologies will come issues of data protection. More information will be available about customers, their behaviour, and their financial status. With the connected car and autonomous vehicles the location of any individual will be known in real time, opening up issues of opportunist crime while people are away from their home or work.

The question has to be asked as to where the checks are going to be made that will secure customer information, if there is no formal listing of those eligible to have access to this data. On top of this, failures in EV and FCEV maintenance will present a considerably greater threat to safety than the conventional vehicles on the market.



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## Summary

- The vehicle repair and maintenance sector has a low standing by comparison to other industries
  - There is no barrier to practise within the sector leading to a general devaluing of the occupation
  - There is a need to raise the attractiveness of the sector and it is argued that this should be done by replicating the activity of other professions in having a benchmark against which people need to achieve if they are to enter the industry
- The current “IMI Technical Accreditation” programme should be made an industry-wide RtP, not as it currently is an AtP



## 5.0 A Strategy for the Future

### The Need for a Holistic Approach

The UK has historically played a key role in research and development of the automotive industry, with strong manufacturing capability and skills. The barriers to the growth and development of the new power trains come in two major areas:

1. The need for an effective refuelling network; and
2. The need to have a suitably trained aftercare sales workforce, able to sustain and support alternatively powered vehicles.

### The Infrastructure

For the market to develop there needs to be investment in the refuelling infrastructure in the UK. The investment in electric charging stations at places of work would encourage the use of EVs particularly on commuting routes. Until there is more development in battery capacity versus weight there will inevitably be issues over “range anxiety”. Until this is overcome there is likely to be a limit on the number of cars being sold. There is also a need to have conformity in the charging mechanisms between the different models of cars. This would also apply to any super chargers being developed. Without this conformity there will be a need for drivers to carry a range of adaptors to make the connection between their car and any charging post.

With respect to the FCEVs, these vehicles are only limited by the access to hydrogen. The UKH2 survey found that the whole of the UK would only require 1,150 hydrogen refuelling stations to make the vehicles a viable proposition in the UK. As more cars potentially enter the market, if the initial price of the car comes down with the provision of hydrogen at certain existing fuel stations, then the demand for these vehicles will inevitably grow.

With both the EVs and FCEVs, the connected car concept becomes a fundamental asset in providing the driver knowledge of where the next charging / refuelling station is, and the route the car should take to get there.

Companies should therefore be given tax breaks to allow for the development of the H2 network with the best option being that they be installed in a planned way, and centrally controlled until a strategic network is in place. It could then be left to the market to decide the location of the remaining network.

### The Support Network

Infrastructure is key. But infrastructure is not the only limit on the growth and development of the sector. There is a need also to have a trained workforce operating in a competitive aftercare sales sector. At the moment with the existing technology both of the factors are in place. The disruptive new technologies will change the nature of the aftercare sales market.

### Enhanced Competence and Registration of Staff

At the moment, the service sector of the industry is epitomised by mechanically based technicians. The future of the industry will move towards cars that are digitally controlled with a much higher level of sophistication. The skill set required to operate effectively will be very different with a far greater emphasis on computer diagnostics and software manipulation.

The management of new and sophisticated technologies requires a level of competence. The general public should be safeguarded against poor practise and the employees also should not be put at risk by having being placed in a hazardous working environment, without the proper training.





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## Summary

- There is a need for the UK to be leading the way in the roll out of ULEVs.
- There is a need for the Government to invest in the infrastructure of both EVs and in the long term FCEVs.
- There needs to be a more sophisticated workforce in the automotive service sector.
- There is a higher risk of injuries or fatalities, for both workers and consumers, if ULEVs are not serviced correctly
- There needs to be a legal register of technicians who are trained to work on these vehicles





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## 6.0 Recommendations

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### Manufacturers

- That the manufacturers should promote the concept of “licensed technicians” incorporating them as part of their own apprenticeship training for dealers. This would enhance the status of the role and ensure that there is a pipeline of enough talented and qualified people to support the new technological developments.
- That manufacturers should mandate that only “licensed technicians” should be allowed to work in their franchised dealerships.
- That the manufacturers should allow information about the new forms of technology to be made available to colleges and other training institutions. This would allow for the general upskilling of the pool of labour in the employment market and allow for more competition to enter the servicing of EVs and hybrids, via independent garages. This would stop the technological exploitation of the public, and bring down prices.

### Dealers

- That dealers should actively promote engagement with local schools to help to raise the profile, not only of their business but also the industry as a whole. This would be in line with Government policy of encouraging alternative career paths via the apprenticeship route as opposed to ‘A’ levels and University.
- That dealers should only employ “licensed technicians”. Initially from 2016 onwards this should apply to EV and hybrids, but by 2020 all technicians working on motor vehicles should be licensed. This is unlikely to happen without Government intervention.

### Government

- That Government should commit to supporting the installation of at least 1,150 hydrogen refuelling stations across the UK. This is in line with the UKH2 report that estimates this number of strategically placed hydrogen refuelling sites could service the whole of the UK by 2020.
- That the Government should make it illegal for unregistered technicians to work initially on EV and FCEV cars from 2016, with the scheme being rolled out for all technicians by 2020.
- That the Government mandate the Institute of the Motor Industry along with the Health and Safety Executive to maintain a register of “licensed technicians”. This is proportionate and in line with the potential risks that the new technologies present to untrained technicians servicing vehicles.



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