



INSTITUTE OF THE
MOTOR INDUSTRY

ELECTRIC VEHICLE MAINTENANCE STANDARDS



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DISCUSSION

WITH THE MINISTER JOHN HAYES



Former minister John Hayes indicated that he understands and supports the IMI’s call for an accreditation or licensing of technicians:

“...As the professional body for the automotive industries, the Institute of the Motor Industry is well placed to help the Government understand the challenge of ensuring that vehicle maintenance and repair is carried out in a professional and safe manner for both technicians and drivers.”

I agree with the hon. Member for Kingston upon Hull East. Furthermore, I agree that we need to codify and accredit such skills. The argument becomes, therefore, not about intent, but about method. It is probable that we are at too early a stage to be certain about what that kind of accreditation might look like. Nevertheless, I am happy to agree to have further discussions with the Institute of the Motor Industry and others to help the Government to understand the challenge of ensuring that vehicle maintenance and repair is carried out in a professional and safe manner for technicians and drivers.

“Skills are critical to the success of this industry. I recommend to my hon. Friend the report by the Institute of the Motor Industry that addresses exactly those points. It highlights the accreditation system that it has put in place and recognises that, so far, only a small proportion of the technicians and people who service cars more widely have achieved the necessary competences to work on electric vehicles—of course, autonomous vehicles are yet to come.”

As per the request of the Minister the IMI and the Office for Low Emission Vehicles designed three recommendations of how accrediting and certifying technician skills should be applied.

Recommendation 1: Reforming the Electricity at Work Regulatory Framework to ensure that all technicians working on electrically propelled vehicles are competent to do so.

Under this proposal, government would support a licensing register that proves individuals are competent, skilled and identifiable through a mandatory instrument, such as an industry supported professional register.



Recommendation 2: Regulating a Competency-Based Standard

Government would mandate a comprehensive and robust electrically propelled vehicle Competency-Based Standard, which clearly defines the technical details required to achieve safe working activities on Hybrid and Electric and Fuel Cell Vehicles and achieves compliance with the legal requirements of the EWR 1989 and the Safety at Work Act 1979. Government mandation signals that anyone who wishes to work on Electric Vehicles must satisfy the standards set, which would be implemented by the industry professional body.

A Competency-Based standard would be designed with the objective of ensuring that technicians are competent to prevent electrical danger and injury and therefore possess the relevant technical knowledge or experience demanded when working on such vehicles.

Recommendation 3: Mandating in apprenticeship standards

In this recommendation, a Competency-Based Standard or qualification would be mandatory to the completion of an apprenticeship.

A primary example of completing a mandatory qualification relevant to the automotive sector is seen through the 'F-Gas' (EU No 517/2014) qualification that must be completed in the End-Point Assessment for all automotive technical routes. The qualification assesses installation, commissioning, service, maintenance and testing of refrigeration, air conditioning and heat pump equipment containing or designed to contain refrigerants.

The industry preferred approach

The industry favours the first recommendation offered in this presentation, for reforming the Electricity at Work Regulatory Framework to ensure that all technicians working on electrically propelled vehicles are competent.

The IMI have worked closely with the industry for decades and throughout this time has ensured that its views on licensing are guided by those who would work within the parameters set by such legislation.

The IMI would like to request that the Minister considers the views of his esteemed colleague the Rt Hon John Hayes MP and the views of the sector and work with the IMI to ensure that the industry is skilled, competent and remains resilient to the challenges it faces in the next five to ten years.



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INTRODUCTION

The Institute of the Motor Industry (IMI) is the Professional Body for people working in the automotive sector. The sector as a whole—supply chain, manufacturing and retail—generates £160 billion in turnover every year. The IMI certifies 100,000 people per year from its range of over 300 regulated and non-regulated qualifications and skills accreditations. These include apprenticeships and DVSA MOT tester assessments which supports business across the sector. The motor industry remains largely unregulated, so anyone can set up in business to repair and service motor vehicles. In this environment the IMI attempts to protect the

safety of individuals working in the sector and to defend the interests of consumers. It does this by running a voluntary licence to practise based on skills accreditation, qualifications and Continuous Professional Development (CPD). The Professional Register is a publicly searchable database that allows the public to find appropriately skilled and qualified industry professionals. The Professional Register is the British Standards Institute’s preferred register for auditing for BS10125 – the specification for vehicle damage repair processes applying to body-shops and garages.

The IMI urges the Government to consider one of the three recommendations made in this paper as a means of regulating motor vehicle technicians who will endanger themselves or others by working on Electric and Hybrid Vehicles. Current regulation does not adequately extend to Electric and Hybrid vehicles as outlined by the Health and Safety Executive¹.

There are four principles that the IMI’s recommendations seek to underpin:

1. **Ensure a skilled workforce.** New technologies provide the UK automotive industry with an unparalleled opportunity to lead the global skills race.
2. **Guarantee a mobile and agile workforce.** Standardising skills ensures that the UK has an automotive workforce that is mobile and adaptable to change.
3. **Improved Health and Safety standards-** untrained “have-a-go” individuals, are putting their lives at risk by attempting to repair and maintain Electric and Hybrid Vehicles.
4. **The UK leading the global skills agenda.** Regulating the repair of vehicles with automated and electrically propelled technology will ensure that the UK’s workforce is safe and well trained, underpinning a global presence that sets precedence in the international community.



RECOMMENDATIONS

I. LICENSING COMPETENCY:

The IMI believes that the most efficient way to ensure that the automotive retail sector lives up to the core principles outlined is for the Government to support a licensing register which proves individuals are competent, skilled, and identifiable through a mandatory instrument, such as, the industry endorsed Professional Register.

The IMI recommends that to ensure Electric Vehicle Competency-Based Standards meet the requirements of business and protect technicians from the danger posed by working on Hybrid and Electric Vehicles, government will need to bring about significant changes to consolidate and extend the provisions of the Electricity at Work Regulations (EWR) 1989. The EWR 1989 is the statutory framework that outlines precautions against the risk of death or personal injury from electricity in work activities. These regulations extend from the primary source of legislation governing occupational health and safety in the United Kingdom, the Health and Safety at Work Act 1974.

Whilst the IMI acknowledge the purpose of the regulations in upholding safety for those encountering electricity during work activities, the IMI consider the language of the regulations to be lacking when applied to the skilled, yet potentially dangerous, practice of maintenance and repair of Hybrid and Electric Vehicles.

The Health and Safety Executive (HSE) takes a 'catch-all' broad approach, stating that regulation covers almost every conceivable electrical danger, that 'systems in vehicles' are covered and embraces all work which could lead to electrical danger. The open-ended wording of the regulations in the EWR 1989 is sufficient to catch the activity of technicians working on 'vehicles'. But it is precisely the broad interpretation of the regulation which creates difficulty by failing to establish the technical details and procedures required and subsequently upheld in helping to keep technicians safe from the danger of electricity when working on such complex vehicles.

Consequently, reform is needed to fill the regulatory void created by the EWR 1989 and to help keep the existing regulations modern and in line with rapid changes to technology within the automotive sector.

As the industry's professional body the IMI would assist the Government in revising the statutory framework so that it is fit for purpose, future-proofed, and transparent for industry audit.

II. REGULATING COMPETENCY-BASED STANDARD:

The IMI proposes that if statutory reform is not on the agenda, then as a minimum, the Electricity at Work Regulation 1989 (EWR) must be supported by a comprehensive and robust Electric Vehicle Competency-Based Standard. The standard adequately defines the technical details required to achieve safe working activities concerning Hybrid and Electric Vehicles and to achieve compliance with the legal requirements of the EWR 1989. By implementing this change, a proposed standard would complement other provisions of the EWR 1989, such as Regulation 16 and its objective to ensure that technicians are competent to prevent danger and injury and therefore, possess the relevant technical knowledge or experience of electricity demanded when working on such vehicles.

The IMI recommends that the Government mandate that any individual or business that wants to work on Electric Vehicles must satisfy the standards set by the Electric vehicle Competency-Based approach implemented and monitored by the industry’s professional body, i.e. the IMI, that have the proven skills and industry endorsed model to do so.

The IMI aim to work with the Health and Safety Executive to create a regulatory best practice framework that will detail the operational safety requirements needed to work on Electric Vehicles. Employers will determine the Electric Vehicle Competency-Based Standard drafted by the IMI. The standard will broadly set out that anyone working on and around electric and hybrid vehicles should be able to demonstrate competency to do so safely. Currently, the industry indicates this equates to a Level 3 qualification.

It is clear that an Electric Vehicle Competency-Based Standard should not be restrictive to IMI Qualifications. For that reason, the IMI advocates an open entry route, implying that anyone with a relevant level of Qualification, Accreditation, or Apprenticeship can be assessed against the proposed mandated Standard. In keeping with current industry standards such as BS10125, which the IMI helped develop, it would be integral to the model for the individual to be audited for competency against the Standard and that it is maintained through Continuous Professional Development (CPD) (see Figure, 1).

The IMI would work with industry auditing authorities such as the Health and Safety Executive and British Standards Institute among others, to access the Professional Register to randomly audit professionals who have met the mandated Electric Vehicle Competency-Based Standard.

The proposed model does not differentiate from other regulatory standards and will positively impact business in the sector by minimising transactional costs, mitigating risk, and minimising reputational costs. The IMI identifies that improved training and recognition of skill and competency has led businesses in the sector to realise more extensive economic opportunities, and improve public confidence that repairs and maintenance are completed correctly and safely.

The IMI strongly recommends that the Government mandate an Electric Vehicle Competency-Based Standard that sets guidelines for technicians, proves skills and knowledge, and importantly ensures that Vehicle Technicians adhere to the regulations established by the Electricity at Work Regulations 1989 and the Health and Safety at Work act 1974.

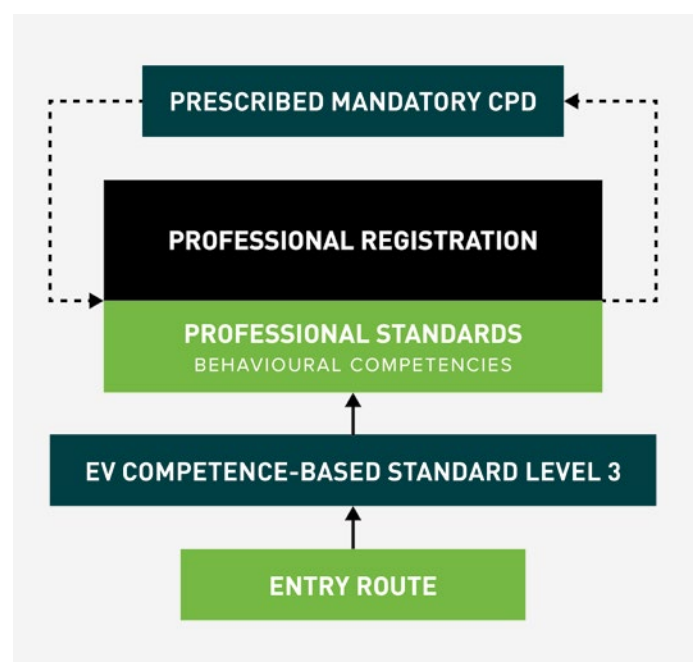


Figure 1. A model for a Competency-Based Standard

III. MANDATING THROUGH APPRENTICESHIP STANDARDS:

Apprenticeships represent one of the best routes to employment. The automotive retail sector benefits from approximately 12,000 apprenticeship starts each year, boosting the economy and productivity of the sector. Mandating a qualification or a Competency Standard within the Apprenticeship is not radically different to today's structure. The F-Gas qualification (EU No 517/2014), for example, is a mandatory requirement for completion of the End-Point Assessment for all automotive technical routes, in line with EU legislation. The regulation specifies that everyone involved in the installation, commissioning, service, maintenance and testing of refrigeration, air conditioning and heat pump equipment containing or designed to contain refrigerants needs to hold this qualification – the industry has accepted the requirement across the board. In a similar vein, the IMI and the industry believe that introducing an Electric Vehicle Competency-Based Standard, which in its first iteration would focus on the electrification of vehicles, but evolve to include automated technology, would benefit the sector at large (See Figure 2.). By including the mandated Electric Vehicle Competency-Based Standards into the current Apprenticeship Standards the Minister will future proof skills and by proxy the health and safety of future technicians.

However, there are some challenges to implementing this approach, which we will highlight. 1. There are currently six pathways in the automotive retail sector that an Electric Vehicle competency/qualification should be mandated within including:

- **Automotive retail motor vehicle service and maintenance - Light Vehicle L3**
- **Bus & Coach L3**
- **Heavy Vehicle L3**
- **Accident & Repair MET L3**
- **Motorcycle Maintenance Technician L3**
- **Land Based Engineering L3**

Changes to these standards would require each of the Employer Working Groups to assess and agree on the addition of the mandated route, although the Institute for Apprenticeships can insist on proof of completion before

End-Point Assessment. 2. The addition of further technical training may affect the current funding bands that apply to each of the pathways. For instance, Heavy Vehicle attracts £18,000 of funding today - this could increase to the highest funding band which the IfA would have to assess. 3. Finally, including the Electric Vehicle Competency/qualification in an apprenticeship will only ensure that candidates, three years after implementation of the mandate, are skilled to work on electric vehicles, which does nothing to address the current concerns outlined by the IMI and the sector. In fact, it creates a broader skills gap between current technicians and apprentices.

While including a Competency-Based Standard or qualification within the current Apprenticeship Standards may cause some disruption. Apprentices will benefit greatly by having early exposure to advanced vehicle technology in their training.

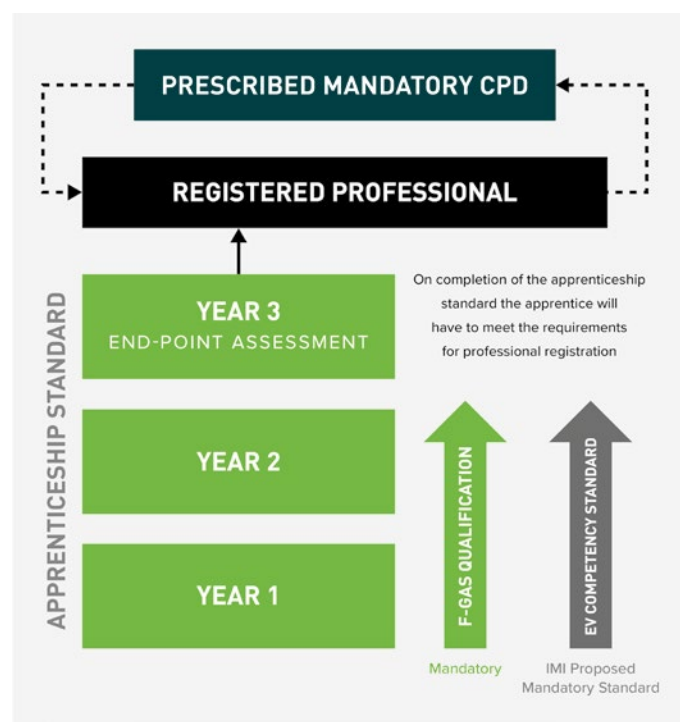


Figure 2. Apprenticeship Standards and mandating of the Electric Vehicle Competency-Based Standard

CONCLUSIONS



In this paper, we have outlined three recommendations for supporting the automotive retail sector’s transition from internal combustion engines to advanced Hybrid and Electric powered vehicles. The risk to health and safety is real and needs to be addressed with urgency. However, it is also an imperative that the regulatory mechanisms are in place to support micro and SME businesses that will come into contact with these vehicles and will have to defer business because of a lack of skills. The automotive sector is “coin-operated” and independents are guilty of being complacent and not investing in training unless a regulatory instrument suggests otherwise. The IMI is seeking government support in mandating a requirement for Competency-Based Standards to support the industry in technologically disruptive times.



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SUPPLEMENTARY EVIDENCE



This supplement provides the Office for Low Emission Vehicles (OLEV) additional evidence in support of the IMI's recommendations for a mandatory competency based standard for Technicians working on Hybrid and Electric Vehicles.

1. Have any other countries adopted a licensing approach for individuals working in the automotive sector? If so, what is the impact?

Countries that have adopted a mandatory qualification approach for the automotive sector include Canada and Germany. The Canadian approach is to licence all Automotive Technicians who work on maintenance and repair of vehicles, not just those that work on the dangerous high voltage Electric and Hybrid Vehicles. Through a Red seal standard (www.red-seal.ca) technicians must demonstrate competency to work to an approved level. The licence holder must demonstrate knowledge and skills required by each jurisdiction fulfilling regional labour market need. The Ontario College of Trades regulates 150 trades including automotive and requires compulsory trade membership to the college to practise or work legally. Similarly, Germany requires technicians working on high voltage systems to follow the requirements set by the German occupational safety and health act, and the regulation BGV/GUV-V A3, regulation which covers "Electrical installations and equipment", through the DIN VDE 0105-100, "Operation of electrical installations, and the DIN VDE 1000-10. These requirements are for persons working in a field of electrical engineering and set out the minimum health and safety prerequisites. In these examples, a regulatory mechanism has increased productivity and protected the skills of the industry. Interestingly, ZF, one of Germany's largest drivetrain manufactures, is mapping the Hybrid and Electric Vehicle

qualifications they offer to the IMI standard to ensure global parity of training.

In addition, the IMI is the leading skills initiative globally. The IMI is working with the South Africa Government regulated industry body merSETA (manufacturing, engineering and related services sector education and training authority www.merSETA.org.za), to support the delivery of Hybrid and Electric Vehicle standards for use in apprenticeship frameworks. Similarly, the IMI are also developing standards in the UAE, alongside delivering approved qualifications in Malaysia, Italy, Cyprus, Egypt, China, Indonesia, and Thailand. More recently, the IMI have been involved in a European wide project called Green Wheels, which sees the IMI leading the development of Electric Vehicle qualifications in Hungary, Slovakia, and Czech Republic standardising skills across the automotive workforce, globally.

2. Are there any increased costs to the consumer by confining the maintenance and repair of vehicles to manufacturers?

In short, yes. Although there are several reasons for this price difference, manufacturer franchise dealer labour rates in particular are significantly more expensive. A Labour Rate survey (2014) by Warranty Direct of 10,000 garages indicates that on average the hourly franchise labour rate is 44% higher than independent labour rates (blog.warrantydirect.co.uk). Furthermore, Motor-Easy also analysed the labour rates of 6,000 garages in 2017 and identified that the

percentage gap had remained constant at 43.4% (www.motoreasy.com). Therefore, by reducing consumer choice for car repairs, consumers could be penalised, having to pay, on average, 44% more for repairs or servicing by manufacturer franchise dealers.

3. Will repairs and maintenance continue to be carried out through independent garages? The warranty for batteries from most manufacturers (lasting 8 years or 100,000 miles on average) dictates that work should be done through franchised dealerships.

In accordance with EU regulations (**EU No 330/2010**) pg11, Paragraph 69, of the guidance provided by the EU commission: manufactures cannot legally restrict the maintenance service or repair of warranty goods to their network in accordance with Article 101(1) of the TFEU treaty. The regulation thereby increases the competitiveness in the sector and increased choice for consumers. Nevertheless, the IMI's recommendation for competency-based standards are not designed for those that have the knowledge and competency (a Level 4 qualification) to maintain or repair battery packs. The recommendations made are to permit those who will be maintaining and servicing an Electric or Hybrid vehicle, which we have assessed at a Level 3 qualification. In doing so, it will allow anyone who meets the standards to repair and maintain vehicles in a safe competent manner, aligned to manufacturer standards of repair and meeting the objectives of the treaty.

4. In regard to the procedures outlined in the HSE MVR what are the proposed details in relation to the technical and procedural operations, which require amendment in order to comply with a standard of safe working practises?

The Health and Safety Executive (HSE) guidance takes a 'catch-all' approach, stating that the Electricity at Work Regulation (1981) covers almost every conceivable electrical danger from 'systems in vehicles' and embraces all work which could lead to electrical danger. However, in the HSE guidance that specifically addresses motor vehicle repair (**MVR**), there is little consideration given to Hybrid

and Electric vehicles. The IMI believe fervently that further clarity is needed surrounding issues such as battery isolation, using the right equipment, including personal protection equipment, and ensuring that the environment is safe for work to commence, etc. Although it is not appropriate to detail a step-by-step procedural approach, the HSE documentation does make reference to a need for individuals to have **"Additional skills and training... necessary to allow people to work safely with E&HVs..." alluding to "Specific training with qualifications awarded by organisations such as IMI Awards"** (HSE common repair topics: MVR).

5. Does the IMI anticipate any costs in regards to a revision of the Statutory Framework?

The IMI does not anticipate any ongoing costs once the statutory reform for licensing technicians is applied. As the industry's professional body the IMI works with DVSA to qualify approximately 36,000 MOT testers annually, the British Standards Institute (through BS10125 standard) to audit the accident and repair sector and, through a voluntary professional register, accredits and audits 34,000 professionals. The IMI has an existing model for which regulation objectives set can be met to demonstrate compliance. In summary, the IMI envisage a cost neutral approach to the exchequer.

6. What education level do the IMI believe a competency-based standard should be targeted to?

Inextricably there are varying degrees of competency in the automotive sector. Therefore, mapping the competences needed to repair and maintain vehicles across to Electric and Hybrid Vehicles is essential. The IMI have carefully considered what the necessary skills would be for the appropriate competency level and suggest that as a minimum a mandatory level 3 competency-based standard is required. Levelling the standard to this minimum provides employers with a well-understood currency of skill and knowledge. Further, it supports the inclusion of individuals that complete the apprenticeship standard supporting social mobility. For those who hold a level 2 or a similar level

apprenticeship standard, prescribed CPD could support individual development and progression into competency based jobs supporting the UK productivity drive.

7. In relation to the IMI’s recommendation for the Government to mandate an Electric Vehicle Competency-Based Standard (Level 3) what cost would there be to government to implement?

The IMI foresees minimal administrative costs to the Government in the long term. The anticipated costs are associated with aligning the Health and Safety Executive directive to ensure that a collaborative approach in writing the guidance, after which, the IMI would work with others including the British Standards Institute to promote and audit the approved requirements. With this method, the IMI would audit against the Professional Register much like British Standard Institute does with BS10125 to ensure parity with the objectives set by the standards. The IMI will assume the running and operating costs and provide the auditing body (HSE or other) with the necessary evidence to demonstrate compliance. Again, this results in a cost neutral approach to the exchequer.

8. Would any of the existing Apprenticeship standards be able to deliver the competent-based standards for electric vehicle maintenance?

The existing apprenticeship standards in Motor Vehicle Service and Maintenance already provides candidates with a rudimentary awareness of Hybrid and Electric Vehicle systems. However, unlike the process with the F-Gas qualification, which is an additional qualification to the apprenticeship standard, the learning is designed to provide initial awareness. Therefore, in order for candidates to be competent an additional mandated qualification would be required to run alongside current apprenticeships. For those that have completed their Apprenticeship Standard, competency can be achieved through post apprenticeship qualification or accreditation. Although, it is preferable that apprentices are fully competent upon completion of their apprenticeship. The proposed competency-based standard that the IMI recommends builds on the knowledge gained through apprenticeships and aims to support the careers of individuals in the sector.

9. Would it be necessary for Employer Working Groups to review the Competency-Based standard, if it were mandated?

The appropriate Standard Employer working group reviews any changes to the Apprenticeship Standards. The F-Gas (or refrigerant handling) qualification is a mandated qualification which sits across the breadth of the automotive sector. Therefore, regardless which automotive pathway is chosen, be it Light Vehicle maintenance and repair, Heavy Vehicle, maintenance and repair or Bus and Coach, etc., proof of achieving the F-Gas qualification is necessary as it meets the regulation (EU) No 517/2014) objectives set by the European Council for fluorinated greenhouse gases. The current training on Hybrid and Electric vehicles does not carry the same requirements in the UK. However, it is being adapted in other countries such as Slovakia. To implement the IMI proposed competency-based standards across the sector as a mandatory obligation the Government must consider revising the Statutory Framework making it mandatory for all technicians to prove competency to work in this potentially lethal environment. Introducing this mandatory instrument will demonstrate a proactive approach in supporting the health and safety in the automotive sector and progression for apprentices.

10. Would embedding a change to the Apprenticeship Standards, suggested, have an impact on the funding bands?

The DfE and IfA set the Apprenticeship funding criteria based on what the employer working groups believe the apprenticeship standards will cost to deliver. In addition, the Government recognised the cost to deliver STEM aligned standards and accordingly uplifted funding in related routes. By changing the agreed standards to include a Competency-based standard as a standalone qualification, such as F-Gas, it may affect the current funding levels applied. Subsequently, there would be some administrative impact to the DfE and / or the IfA to review the content and attach any additional funding warranted by the increased skills required.

11. As the Electric Vehicle market is still in its infancy, if competency-based standard is applied to apprenticeships, can this be seen as a proactive approach to addressing future skills issues at an early stage?

The SMMT estimate that 47,000 new plug-in cars had been registered over the course of the year in 2017, an average 3,916 vehicles per month. Data from the Department of Transport suggests, that from 2010 to 2017 (Q3), 272,970 Hybrid and Electric Vehicles were registered for the first time. These figures of course do not include the number of vehicles registered since 1998 when the first Hybrid, the Honda Insight, was sold in the UK. The estimates indicate a dramatic growth in the number of vehicles with an Electric or Hybrid engine. In addition, Autotrader one of the UK's largest used car selling platforms currently has 7,285 Hybrid and 714 Electric cars for sale, demonstrating that the used car segment will grow as fast as the new car segment. Therefore, the proliferation of the Hybrid and Electric Vehicles entering the independent sector for maintenance and repair will inevitably increase. Supporting an approach that mandates qualification competency standards to apprenticeships is proactive. However, it is also necessary to consider the 242,868 technicians who are already engaged in the service and repair of vehicles. A solution for this group as proposed by the IMI is equally important.

12. Does the IMI anticipate any cost implications for small businesses?

Operationally the IMI anticipates the proposed recommendations will be of nominal cost to business, in a similar vein to the DVSA MOT qualification. Inevitably, those who have a lower skill threshold will require more training than those that meet the qualifying criteria. However, mandating a competency requirement will inevitably drive out the bad practises of not training at all. The standard also provides the Independent part of the sector an added business opportunity in their ability to continue to compete with the franchised dealer networks, offering maintenance and repair on new and used Hybrid and Electric Vehicles, whilst meeting the required standard of repair expected by manufactures.

13. Have you gauged any interest in this proposal in industry?

The IMI has been calling for a licence to practise for those working on electrified vehicles since 2012 when Steve Nash was appointed CEO. As a professional body, the IMI strives to voice the concerns of the sector it represents, from which there is resounding support for licensing. In fact, in December 2017 the IMI asked the sector (34,000 people from independents and manufacture franchise groups) whether they still thought a licence to practise was right for the industry and a resounding 98% agreed that government should regulate the industry to maintain standards and safety. In addition, the IMI also contacted several employers for direct support. Employers including Halfords, BMW, Scottish Motor Trade Association, Marshal Motor Group, The London EV Company, Kwik-fit, and others all support a licence to practise. Why? Because the standards recommended by the IMI are already in place across the manufacturer network's and standardisation of skills has improved productivity and social mobility of technicians across the country.



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