



Ultra-Low Emission Vehicle (ULEV) Skills Baseline Study

Final Report

Transport Scotland
Skills Development Scotland

March 2020
J3172





Executive Summary

Demand for hybrid/ electric vehicles in Scotland has increased significantly over the past few years and is expected to grow at an even quicker pace in future. Developments in vehicle technology are expected to reduce the cost of hybrid/electric vehicles and increase driving range. Social attitudes towards climate change and local air pollution are increasing demand from an environmental and health perspective. Government policy targets, including the target to remove the need for new petrol and diesel cars and vans by 2032, are setting the direction for vehicle manufacturers.

As this demand for hybrid/ electric vehicles increases, so does the need for skills to support this shift in vehicle type.

Skills to support the mass uptake of hybrid/ electric vehicles are required across a range of activities, including:

- Vehicle repair and maintenance
- Vehicle sales
- Emergency services (when dealing with incidents involving vehicles)
- Roadside assistance and recovery
- Charging point repair and maintenance

This research study has reviewed a range of available information and gathered evidence from over 300 organisations active in the above areas, to identify the current availability of relevant skills and any barriers to increasing them in future.

There is strong evidence of the need to build the skills base that will be required in future. It is estimated that over 65,000 people could need to undertake training, at various levels, to provide full coverage of skills to support the uptake of hybrid/ electric vehicles in Scotland. This includes 15,000 repair and maintenance staff, 20,500 vehicle sales staff, 22,000 emergency service personnel and 7,800 other staff in the automotive retail sector (e.g. roadside assistance and recovery personnel).

There is currently a broad range of qualifications and accreditations available for different levels of hybrid/ electric vehicle training, which align with relevant National Occupational Standards. Training for these qualifications and accreditations is carried via a combination of manufacturers, private training providers and colleges.

The current uptake of training and the barriers and issues faced vary between the different sectors.

Vehicle repair and maintenance

Fewer than 10% of vehicle repair and maintenance staff have any recognised qualification/ accreditation to enable them to work safely on hybrid/electric vehicles. Whilst over three quarters of garages agree that providing repair and maintenance services for hybrid/ electric vehicles will be a necessary part of their business in future, 31% currently do so. Franchised dealers are significantly more likely than independent garages to offer these services, due to their relationship with vehicle manufacturers. Of the garages not currently offering repair and

maintenance services for hybrid/ electric vehicles, 43% plan to do so in future. To enable this, a significant amount of training will be required across the sector. The key barriers to increasing skills in this sector include:

- perceived lack of commercial return due to current relatively low demand for hybrid/electric vehicles, although future demand is expected to grow significantly
- limited, or no, training budget
- a lack of awareness about what training is required and where to access it
- concerns about staff safety and availability of vehicle data

Vehicle sales

Over two thirds of vehicle retailers agree that selling hybrid/ electric vehicles will be a necessary part of their business in future. Currently, 27% sell hybrid/ electric vehicles, with this falling to 11% when considering just independent garages (compared to 64% of franchised dealers). A total of 26% of vehicle retail staff have had some specific training to support the sale of hybrid/electric vehicles and the majority of this has been provided by the vehicle manufacturer (to franchised dealers). Of those vehicle retailers not currently selling hybrid/ electric vehicles, 36% plan to do so in future, with franchised dealers significantly more likely to do so in comparison to independent garages. The key barriers to increasing skills in this sector include:

- perceived lack of commercial return due to current relatively low demand for hybrid/ electric vehicles, although sales are projected to increase significantly
- limited, or no, training budget
- limited accessible training options for independent vehicle retailers

Emergency services

The fire, police and ambulance services need to provide staff with skills, at various levels, to enable them to safely conduct their duties at incidents involving hybrid/electric vehicles. This is a recognised issue and it is estimated that 13,200 police officers, 6,400 firefighters and 2,400 paramedics are likely to require some level of training. This could range from general safety awareness training for forensic staff investigating the scene of a vehicle accident, to more comprehensive training for firefighters involved in using cutting equipment on vehicles. The key barriers to increasing skills in this sector include:

- limited resources to plan and implement this large-scale training task
- lack of vehicles for practical training (fire service)
- availability of critical vehicle data (e.g. to identify the location of the battery isolation switch across an increasing range of different vehicle types)

Roadside assistance and recovery

Many of the issues and barriers identified for repair and maintenance garages are also applicable to roadside assistance and vehicle recovery operators. There is a specific qualification (VR27 – Electric (EV) and Hybrid Vehicle Awareness) developed by the Institute of Vehicle Recovery, available to vehicle recovery operators for working with hybrid/electric vehicles and there is some evidence that this is being used in public sector procurement as a

method of ensuring recovery staff have the required skills. Additional barriers specific to increasing skills in this sector include:

- the need, by some operators, to invest in recovery vehicles with lift, rather than towing capabilities (as towing hybrid/electric vehicles can generate an electrical charge)
- a relatively high turnover of staff in the sector resulting in higher barriers to investment in training

Charging point repair and maintenance

There is strong support in the sector for the skills of those repairing and maintaining EV charging points to be a minimum of a qualified electrician plus specific training in working with charging points.

It is difficult to estimate the number of employees potentially requiring additional skills to service the charging network, but research identified at least 50 companies providing installation services for EV charging points in Scotland. Key players in the provision of training in this area are the charging point manufacturers. There is some evidence that these manufacturers can require that only individuals who have completed the manufacturer approved training can repair and maintain equipment, in accordance with warranty requirements. The key barriers to increasing skills in this sector include:

- ensuring charging point owners are aware that staff repairing and maintaining their equipment should be qualified as an electrician with additional training specific to safely working with charging points
- accessibility of skills, where a manufacturer requires that only individuals with their 'manufacturer approved' training can repair and maintain charging points to avoid non-compliance with warranty conditions



Table of Contents

1	Introduction	1
1.1	Study background and objectives	1
1.2	Context	2
2	Research Method	5
2.1	Secondary data review	6
2.2	Engagement with stakeholders	6
2.3	SMTA member survey	7
2.4	Charging repair/ maintenance	7
3	Results and analysis	7
3.1	The automotive retail sector in Scotland (Enterprises and Employment)	8
3.2	Growth in demand for hybrid and electric vehicles	10
3.3	Relevant qualifications, accreditations and training providers	12
3.4	Vehicle repair and maintenance	17
3.5	Vehicle sales	26
3.6	Priorities for sales, repair and maintenance garages	30
3.7	Emergency services	30
3.8	Roadside assistance and recovery	32
3.9	Charging infrastructure repair and maintenance	32
4	Key findings, barriers and issues	35

Appendix A: Contributors to the research study

Appendix B: Profile of the SMTA member survey respondents

Prepared By: John Taylor, Mark Morrison, John Bingham and Katrina Watson	Date: 4 th March 2020
---------------------------------------------------------------------------------	-----------------------------------------

Approved By: Iain Weir	Date: 4 th March 2020
-------------------------------	-----------------------------------------

1 Introduction

This report has been prepared by Optimat Limited and the Energy Technology Centre for Transport Scotland and Skills Development Scotland. The report provides a baseline of evidence about skills to support the uptake of Ultra Low Emission Vehicles (ULEVs) in Scotland and the achievement of the Scottish Government objective to remove the need for new petrol and diesel cars and vans by 2032. The evidence gathered for this report includes a survey of 269 member companies of the Scottish Motor Trade Association and feedback from 37 other organisations and businesses with an interest in the study.

The study has been closely guided and supported by a Steering Group consisting of representatives from Skills Development Scotland, Transport Scotland, the Scottish Motor Trade Association (SMTA), The Institute of the Motor Industry (IMI), ESP and Scottish Enterprise.

1.1 Study background and objectives

The study was commissioned by Skills Development Scotland (on behalf of the wider Steering Group mentioned above) in September 2019. The outputs of the research will be part of a baseline of evidence used to create an action plan for skills to support Scottish Government policy objectives around low carbon mobility and transport, specifically the mass uptake of ULEVs.

The research focused on mandatory skills required across several main areas, including:

- Hybrid and electric vehicle repair and maintenance
- Hybrid and electric vehicle sales
- Emergency Services (in terms of their response to incidents involving hybrid/electric vehicles)
- Roadside assistance and recovery
- Charging point repair and maintenance

Through consultation with stakeholders operating in the above areas, the study sought to identify:

- The extent to which Scotland has, or is developing, the mandatory skills necessary to support ULEV uptake
- Current levels of capacity and capability for mandatory skills to support mass ULEV uptake
- Strengths of the current provision/uptake of mandatory ULEV skills development
- The barriers to developing mandatory skills required to support mass ULEV uptake
- The specific areas that need greater support/specific interventions to support mandatory skills requirements

1.2 Context

1.2.1 Transport and Energy Policy

The Scottish Government has set ambitious targets for addressing the three energy/climate issues currently facing industrialised nations:

- Climate change
- Air quality
- Security of energy supply

Furthermore, it is seeking to achieve a ‘just transition’ to a low carbon economy with net-zero greenhouse gas emissions by 2045 at the latest and Scotland becoming carbon neutral by 2040. These targets will require a mix of technology development and behaviour change. The technology challenge is now recognised as an energy system challenge, with the harnessing, supply and demand for energy seen as an interconnected system. In Scotland, typical figures for energy usage are:

- Electricity 22%
- Heat 53%
- Transport 25%

At the strategic level, transport means the movement of people and goods and includes all modes of travel:

- Road transport:
 - Cars and light vans
 - Buses
 - HGVs
 - Last mile delivery
- Aviation
- Marine
- Decarbonisation of freight

With a few exceptions, the vehicles, aircraft and ships used in Scotland are built outside the country. There is, however, a significant opportunity to deliver green energy for transport by generating electricity from renewable sources and at the same time produce green hydrogen. As low carbon modes of transport are introduced, new support activities will be required for procurement/sales, maintenance, generation of low carbon fuels and electricity, refuelling and charging infrastructure and strategic planning of energy supply and demand, recognising that battery vehicles and dockside charging of ships may be in themselves a means of energy storage. Changes in behaviour which may impact some of these elements include (1) a possible fall in car ownership due to car clubs and greater use of public transport and (2) less travel due to increased use of video conferencing, or deliberate decisions to avoid travelling.

1.2.2 Scope and Impact of Current Study

The current study is confined to the road transport sector and relates particularly to the skills required for the selling, support and maintenance of hybrid/electric vehicles (cars and light vans) in view of the Scottish Government’s commitment that there will not be a need to buy

petrol or diesel cars and vans after 2032. It is recognised that there are significant developments in low carbon transport outside the scope of this study, for instance there are a number of hydrogen projects and initiatives including buses in Aberdeen, vehicles and a ferry service in Orkney, and plans for hydrogen fuel cell vehicles in Dundee and Glasgow. These projects will also demand upgraded skills in Scotland for infrastructure installation and maintenance, vehicle maintenance and other safety and operational considerations so further skills mapping may be needed to support the wider uptake of electric and fuel cell vehicles outside the car and light van subsector.

Within the transport sector, when considering the use of road vehicles, there is a particular urgency to improve air quality in urban environments which will be helped by the adoption of hybrid/ electric vehicles. If the electricity to charge vehicles comes from renewables, the vehicles can claim to be low carbon as well. It should be noted that this does not include embedded carbon from the vehicle manufacture (e.g. natural gas used in manufacturing processes, oil used in tyre production, etc). The provision of skills in Scotland to sell, maintain and address all related issues with these new technologies operating on Scottish roads is therefore key to achieving the Scottish Government's targets for improved air quality and reduced carbon emissions.

1.2.3 Observations on ULEV Technologies

To provide some wider context, a series of observations can be made about the move towards electric or hydrogen fuel cell vehicles:

1. The energy stored in the batteries of an electric vehicle will be taken from the grid; so as the carbon content of grid electricity falls, due to increased renewable electricity generation, the vehicles themselves will be lower carbon modes of transport
2. The energy used to propel a vehicle of a given size and mass is approximately the same irrespective of the propulsion system, but the total energy required to do so depends on the efficiency of the engine or motor. Since petrol and diesel engines waste about 66% of the fuel energy as heat, the energy required to be stored in batteries for an electric vehicle is about 33% of the stored energy in a fossil fuelled vehicle to travel the same distance.
3. A detailed assessment of the electricity infrastructure in terms of generation, transmission and distribution will be required, especially considering the need to support vehicles which will increasingly demand rapid charging. Skills required for the repair and maintenance of vehicle charging units are included in this study.
4. Electric motors are ideally suited to vehicle propulsion; the challenge has always been to store sufficient energy on the vehicle to provide an acceptable driving range. Advances in battery technology have provided the current generation of electric vehicles with acceptable range as well as performance. However, compared with fossil fuel, batteries have a lower energy density by mass and volume; so energy demands for electric ancillaries (lights, heater, wipers, etc.) will affect the range of the electric vehicle.

5. The issue of limited range is addressed in hydrogen fuel cell vehicles, where energy is stored as hydrogen and converted to electricity via an onboard fuel cell. The uptake of hydrogen fuel cell vehicles (HFCV) will require a supply of hydrogen refuelling stations and this is currently confined to specific locations in Scotland such as Orkney, Aberdeen and Dundee. However, Glasgow has major plans for HFCV and this pattern is expected to grow lead to the increased adoption of such vehicles in the period up to 2032.
6. The drivetrain of an electric vehicle has fewer components and moving parts than that of a typical internal combustion engine driven vehicle. Because of this, it is expected that maintenance of electric vehicles will be simpler, with many subsystems and components demanding little routine maintenance.

1.2.4 New Skills for the Motor Trade, Charging Providers and Emergency Services

The motor trade and associated services which support the motorist, comprise commercial companies ranging from small enterprises to corporate garage groups with national coverage. The customer base ranges from private individuals with varying understanding of energy and vehicle technology to company fleet buyers. This garage sector is a critical resource in the implementation of the Scottish Government’s ambitious ULEV plans. Key tasks which must be undertaken and new knowledge and skills which must be acquired are summarised in the following list:

1. **Vehicle sales.** There will be a requirement for sales staff to be able to answer customer questions accurately and with authority on electric charging, vehicle range, the effect of driving conditions on range, vehicle reliability, expected battery life and replacement, government policy on tax and cost of electricity through the vehicle’s life. Since sales staff do not necessarily have technical skills, training will be required on all of these points, particularly the definition of energy storage, which may be expressed as gallons of fuel, kWh, Joules, miles of range possible, etc.
2. **Repair and maintenance.** Initial sales of electric and fuel cell vehicles will be through franchised dealers, so factory training will be available. However, apprentice training and technician retraining will be needed to provide an understanding of the new technologies on the next generation of ULEVs. In general terms the maintenance of vehicles can be split into the following categories:
 - a. Bodywork – similar skill requirements as at present, except that the batteries may be widely distributed in the floor pan or other parts of the body structure
 - b. Interior – similar to the latest models with digital dashboards
 - c. Heating and air-conditioning. The source of heat will be different (so training needed) but the air conditioning will be similar
 - d. Suspension and steering – similar to present skill requirements
 - e. Brakes – hydraulic brakes similar, regenerative brakes will need new skills
 - f. Powertrain – needs skills upgrade covering motor operation, installation, faults, connection to battery and regenerative braking

It should be noted that the motor trade depends on vehicle manufacturer or aftermarket diagnostic equipment for fault detection and also that many components are not repaired but are simply replaced. This is increasingly expected to be the case for hybrid/ electric vehicles, possibly with larger modules or subsystems being replaced rather than dismantled and repaired.

3. **Charging Infrastructure.** Charging points are already being installed throughout Scotland, so the electrician training/experience for this is already in place. Many of these charging points are still under warranty; so repair and maintenance is carried out by manufacturer approved suppliers. In many cases the charging point is repaired by replacing faulty modular components rather than the repair being carried out onsite. In other cases repairs can be carried out onsite, such as faults in cooling fans for fast chargers. In addition to this, the increase in smart chargers can lead to greater IT skills being required.
4. **Emergency services and roadside services.** Emergency and roadside service training is complex because matters relating to vehicle safety, battery isolation after an accident, moving a stranded vehicle on to a recovery vehicle and diagnosing a fault may all be vehicle-specific. Following basic general training, a structured approach to the dissemination of information and procedures for different vehicles will be required. At the time of writing the UK Government is consulting on the option of sales of petrol and diesel vehicles being discontinued after 2035¹. Depending on the outcome of this consultation this could be an issue that will increasingly require attention throughout the UK.

1.2.5 Drivers for Skills Enhancement

Garages will implement training for their staff in hybrid/electric vehicles in response to two primary drivers:

- Market demand, or clear evidence of future demand
- Regulatory requirement

In the event that enhanced skills training for repairing the next generation of low emission cars and light vans is not mandated by government, then it is important to understand what the barriers and issues are to this being carried out voluntarily by garages and other related sectors.

2 Research Method

The research for this study was carried out between October 2019 and January 2020 and involved a combination of reviewing secondary data, interviews with a wide range of stakeholders and surveying members of the Scottish Motor Trade Association. Additionally, a

¹ <https://www.bbc.co.uk/news/science-environment-51366123>

second survey was carried out to obtain feedback from companies involved in the repair and maintenance of charging points. This section describes how the research was carried out.

2.1 Secondary data review

Initial secondary research was carried out to identify the type and level of current skills provision aimed at different segments of the automotive retail sector. This activity also helped to identify potential stakeholders to approach for interview and was used to help develop questions for both surveys.

A review of data on the numbers of enterprises and employees (in relevant Standard Industry Classification (SIC) Codes) was carried out using the Nomis dataset². This included the following SIC Codes:

- 45111 Sale of new cars and light motor vehicles
- 45112 Sale of used cars and light motor vehicles
- 45190 Sale of other motor vehicles
- 45200 Maintenance and repair of motor vehicles
- 45310 Wholesale trade of motor vehicle parts and accessories
- 45320 Retail trade of motor vehicle parts and accessories
- 45400 Sale, maintenance and repair of motorcycles and related parts and accessories

A number of reports were reviewed to identify the trends in hybrid and electric vehicle sales that would provide a comparison with current rates of hybrid and electric vehicle skills training. These reports included:

- Greenhouse Gas Emission Reduction Potential in the Scottish Transport Sector from Recent Advances in Transport Fuels and Fuel Technologies, Transport Scotland/Element Energy, January 2017
- Electric Vehicle and Battery Safety Skills for Emergency Services, Vehicle Repair and Auto Retailers, Faraday Institution, Nov 2019
- Future Energy Scenarios, National Grid, May 2018 and July 2019

2.2 Engagement with stakeholders

An initial list of stakeholders was developed in conjunction with the study Steering Group. This included representatives from different sub-sectors of the automotive retail sector, colleges, private training providers, local authorities, emergency services, enterprise agencies and other public bodies.

² <https://www.nomisweb.co.uk/>

Each stakeholder was contacted with information about the study and a face-to-face or telephone interview arranged with those interested in participating. A total of 40 stakeholders from 32 separate organisations were interviewed.

In addition to this, a stakeholder roundtable event was held at the end of Jan 2020, with 30 stakeholders attending from the private and public sectors. The purpose of this was to present the key findings to attendees and to confirm that the most relevant issues and barriers had been identified. The event also provided the opportunity to identify and discuss potential actions to address these issues and barriers.

A list of stakeholders who participated in the study (through the interviews and/or the stakeholder roundtable) is included in Appendix A.

2.3 SMTA member survey

An SMTA member survey was developed with support from the SMTA and input from the wider Steering Group. The survey was made available online and invitations were sent by the SMTA to its member garages. In addition to online responses, the members were followed up by telephone to ensure a robust level of response. A total of 269 surveys were completed by the end of December 2019 (a combination of online surveys and telephone surveys). An overview of the characteristics of the respondents and more detail on how the analysis was carried out is provided in Appendix B.

2.4 Charging repair/ maintenance

An additional survey was developed to obtain feedback from companies involved in the repair and maintenance of electric vehicle charging points. A database of 50 such companies was developed and a link to an online version of the survey was emailed to these companies. A total of ten survey responses were received.

3 Results and analysis

This section presents the results and analysis of the study. Firstly, an overview is provided of the automotive retail sector in Scotland to provide context for the analysis. The historic and projected growth in demand for hybrid/ electric vehicles is summarised. This is followed by a review of relevant qualifications, accreditations and training providers.

The remainder of the section presents the results and analysis of the research for the following groups:

- Vehicle repair and maintenance
- Vehicle sales
- Emergency services
- Roadside assistance and recovery
- Charging infrastructure repair and maintenance

3.1 The automotive retail sector in Scotland (Enterprises and Employment)

The automotive sector in Scotland in 2019³ comprised:

- 3,220 enterprises and 15,000 employees involved in vehicle maintenance and repair
- 925 enterprises and 20,500 employees involved in new and used vehicle sales
- 490 enterprises and 7,850 employees involved in the trade of motor vehicle parts and accessories, and the sale, maintenance and repair of motorcycles and related parts and accessories

The tables below provide a summary of how each segment of the automotive sector has changed over the past several years in each Local Authority (LA) in Scotland. Key points to note are:

- The number of enterprises involved in vehicle maintenance has grown by 13% across Scotland since 2010 to 3,220 in 2019, however the number of employees fell by 27% between 2015 and 2018, to 15,000. 24 LAs have seen employee numbers decline by more than 25%, with the largest losses in Shetland, and Argyll and Bute. Only Midlothian showed an increase (of 26%).
- The number of enterprises involved in vehicle sales (comprising the following SIC codes: 45111 sale of new cars and light motor vehicles; 45112 sale of used cars and light motor vehicles; and 45190 sale of other motor vehicles) has decreased by 8% across Scotland since 2010 to 925, while the number of employees increased by 17% to 20,500. There were significant increases in employment in all cities and most of the adjoining LAs, with the exception of Perth and Kinross which saw a decline of 15%.
- The number of enterprises involved in parts and motorcycles (comprising the following SIC codes: 45310 wholesale trade of motor vehicle parts and accessories; 45320 retail trade of motor vehicle parts and accessories; and 45400 sale, maintenance and repair of motorcycles and related parts and accessories) fell by 2% between 2010 and 2019 to 490, while the number of employees increased by 26% to 7,850. Glasgow has the largest number of employees followed by Aberdeen, Edinburgh, Fife and North Lanarkshire. Glasgow, Aberdeen and Fife showed double digit increases in employment, while Edinburgh grew by 6% and North Lanarkshire shrank by 6%.

³ Data derived from Nomis

Area	Maintenance & Repair		Vehicle Sales		Parts Sales & Motorcycles	
Aberdeen City	105	24%	30	-2%	20	6%
Aberdeenshire	240	9%	70	-7%	30	4%
Angus	80	7%	20	-22%	0	-100%
Argyll and Bute	65	-1%	5	-55%	5	-10%
City of Edinburgh	165	2%	45	-17%	20	-25%
Clackmannanshire	20	0%	5	50%	10	200%
Dumfries and Galloway	110	9%	35	-18%	20	3%
Dundee City	95	16%	30	13%	5	0%
East Ayrshire	75	9%	20	-14%	10	-31%
East Dunbartonshire	50	2%	10	-45%	5	80%
East Lothian	60	3%	15	-4%	0	-100%
East Renfrewshire	30	-2%	10	-10%	5	0%
Falkirk	95	13%	20	-22%	15	-16%
Fife	220	17%	60	-13%	45	3%
Glasgow City	260	18%	75	-1%	55	-2%
Highland	210	5%	45	-11%	20	0%
Inverclyde	35	21%	5	-40%	0	0%
Midlothian	60	4%	10	-40%	15	4%
Moray	75	12%	40	13%	15	13%
Na h-Eileanan Siar	30	8%	5	0%	0	-100%
North Ayrshire	65	4%	20	24%	10	0%
North Lanarkshire	190	20%	55	-20%	35	24%
Orkney Islands	15	23%	10	0%	5	-40%
Perth and Kinross	125	15%	50	1%	10	-38%
Renfrewshire	95	21%	25	-6%	20	6%
Scottish Borders	110	8%	30	-13%	20	0%
Shetland Islands	20	0%	5	0%	0	-100%
South Ayrshire	70	14%	25	-15%	10	-5%
South Lanarkshire	210	19%	60	-4%	35	-10%
Stirling	55	13%	15	-16%	0	-100%
West Dunbartonshire	50	15%	5	-53%	5	-36%
West Lothian	135	30%	40	4%	15	13%
Scotland	3,220	13%	925	-8%	490	-2%

Table 1 - Total number of enterprises in each Local Authority and across Scotland in 2018. Graphs illustrate trends between 2010 and 2019. The percentage change in 2019 from the average of 2010 to 2018 is also given. Maintenance & Repair is SIC code 45200; Vehicle Sales combines SIC codes 45111, 45112 and 45190; Parts Sales & Motorcycles combines SIC codes 45310, 45320 and 45400. (data from Nomis)

Area	Maintenance & Repair		Vehicle Sales		Parts Sales & Motorcycles	
Aberdeen City	600	-33%	1,475	29%	590	16%
Aberdeenshire	800	-26%	485	30%	185	8%
Angus	300	-31%	280	30%	65	8%
Argyll and Bute	225	-44%	85	96%	40	71%
City of Edinburgh	1,750	-5%	1,200	11%	575	6%
Clackmannanshire	100	-14%	5	0%	30	50%
Dumfries and Galloway	400	-29%	465	-13%	365	105%
Dundee City	350	-25%	890	22%	185	8%
East Ayrshire	225	-36%	390	9%	140	4%
East Dunbartonshire	200	-33%	325	6%	60	-3%
East Lothian	225	-18%	85	9%	0	-100%
East Renfrewshire	175	-28%	265	2%	30	50%
Falkirk	400	-29%	540	25%	335	21%
Fife	1,000	-29%	905	21%	575	30%
Glasgow City	1,250	-25%	3,600	33%	1,000	24%
Highland	900	-33%	1,025	13%	270	4%
Inverclyde	125	-32%	170	23%	50	20%
Midlothian	800	26%	130	123%	140	14%
Moray	350	-5%	375	20%	110	5%
Na h-Eileanan Siar	100	-33%	20	71%	40	33%
North Ayrshire	300	-18%	265	27%	100	43%
North Lanarkshire	1,000	-29%	975	6%	550	-6%
Orkney Islands	35	-38%	65	50%	25	25%
Perth and Kinross	700	-5%	980	-15%	155	-11%
Renfrewshire	600	-22%	1,410	31%	345	29%
Scottish Borders	350	-34%	480	24%	260	26%
Shetland Islands	50	-50%	50	20%	50	7%
South Ayrshire	300	-28%	705	20%	235	41%
South Lanarkshire	1,000	-29%	1,060	18%	440	21%
Stirling	250	-12%	885	28%	120	47%
West Dunbartonshire	200	-29%	185	4%	75	15%
West Lothian	600	-31%	975	21%	300	48%
Scotland	15,000	-27%	20,500	17%	7,850	26%

Table 2 - Total number of employees in each Local Authority and across Scotland in 2018. Graphs illustrate trends between 2015 and 2018. The percentage change in 2018 from the average of 2015 to 2017 is also given. Maintenance & Repair is SIC code 45200; Vehicle Sales combines SIC codes 45111, 45112 and 45190; Parts Sales & Motorcycles combines SIC codes 45310, 45320 and 45400. (data from Nomis)

3.2 Growth in demand for hybrid and electric vehicles

3.2.1 Historic growth in demand

The historic growth in demand for plug-in cars and light goods vehicles in Scotland and by Local Authority can be identified from Department of Transport statistics⁴.

⁴ Plug-in cars and light goods vehicles licensed by Local Authority, Vehicle Licensing Statistics, Table VEH0131, Department for Transport (data up to Q3 2019)

The growth in licensing of plug-in cars and light goods vehicles in Scotland is shown in the figure below.

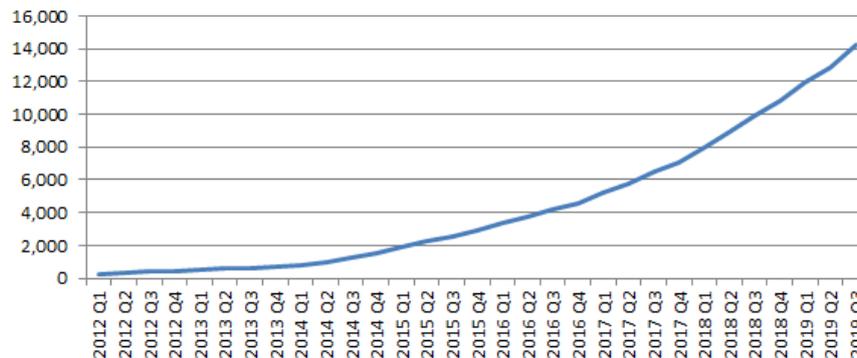


Figure 1 - Number of plug-in cars and light goods vehicles licensed in Scotland per quarter (Q1 2012 to Q3 2019)

There has been a clear trend of increasing growth in the number of plug-in cars and light goods vehicles licensed in Scotland, with over 135,000 licensed in the last eight years (excluding the fourth quarter of 2019, as figures are not yet published). Note that these figures do not include non-plug-in hybrid cars and vans. The current total number of cars and light goods vehicles licensed in Scotland (as at Q3 of 2019) is 2,839,000⁵.

3.2.2 Projected growth in demand

A report published by Transport Scotland⁶ in 2017, pre-dating the 2017 commitment indicates that, under conditions of strong policy support for the uptake of hybrid and electric vehicles, there is projected to be significant growth in the proportion of annual new vehicle sales that are electric by 2030. Under a scenario where there is strong policy support for hybrid/electric vehicles, the 2030 market share of new vehicle sales that are electric is projected to be:

- 71% for new cars
- 55% for new vans

This is broadly consistent with projections for the growth in the annual market share of electric vehicles as a percentage of total new vehicle sales in the UK, as presented in a recent report by the Faraday Institution⁷. This shows a projected uptake of 64% by 2030 of all vehicle sales (including cars, vans and other vehicle types).

⁵ Licensed vehicles at the end of quarter by body type and region, UK, 2019 Q3, Table VEH0104, Department for Transport Vehicle Licensing Statistics

⁶ Greenhouse Gas Emission Reduction Potential in the Scottish Transport Sector from Recent Advances in Transport Fuels and Fuel Technologies, Transport Scotland/Element Energy, January 2017

⁷ Electric Vehicle and Battery Safety Skills for Emergency Services, Vehicle Repair and Auto Retailers, The Faraday Institution, November 2019

Further support for the scale of the projected electric vehicle market share by 2030 is provided by a recent National Grid report⁸ stating that at least 50%, and as many as 70%, of new car sales will be ultra-low emission vehicles.

According to another National Grid report⁹, by 2030, there could be 9.3M hybrid and electric cars on the road in the UK.

3.3 Relevant qualifications, accreditations and training providers

3.3.1 Occupational standards and qualifications

Qualifications and accreditations are designed to enable vehicle technicians to develop the knowledge and competence required in the National Occupational Standards. For hybrid and electric vehicles there are five National Occupational Standards¹⁰:

- IMIEV1 – Carry out non-high energy electrical system work on or near electric and hybrid vehicles
- IMIEV2 – Carry out work on broken down and damaged electric and hybrid vehicles
- IMIEV3 – Service and repair non-live electric and hybrid vehicle systems
- IMIEV4 – Isolate and reinstate an electric and hybrid vehicle
- IMIEV5 – Diagnose, test and repair electric and hybrid vehicle high voltage batteries

The IMI has developed a number of qualifications that provide a route to developing the knowledge and competences defined in the above National Occupational Standards. These are:

- L1 Award in Electric/ Hybrid Vehicle Awareness
- L2 Award in Electric/Hybrid Vehicle Hazard Management for Emergency and Recovery Personnel
- L2 Award in Electric/ Hybrid Vehicles Routine Maintenance Activities
- L2 Award in Preparing Heavy Electric/ Hybrid Vehicles for Repair (including Bus & Coach)
- L3 Award in Electric/ Hybrid Vehicle System Repair and Replacement
- L3 Award in Heavy Electric/ Hybrid Vehicle System Repair & Maintenance
- L4 Award in the Diagnosis, Testing and Repair of Electric/ Hybrid Vehicles and Components

City & Guilds offer two levels of award:

- L2 Award in Hybrid Electric Vehicle Operations and Maintenance
- L3 Award in Hybrid Electric Vehicle Operations and Maintenance

⁸ Future Energy Scenarios, National Grid, July 2019

⁹ National Grid, Future Energy Scenarios, Charts Workbook v2.3, May 2018, Figure 3.13, under a scenario to limit the increase global warming to a maximum of 2 degrees

¹⁰ <https://www.theimi.org.uk/sites/default/files/documents/342390.pdf>

3.3.2 Qualifications and courses for specific sectors

For franchised dealerships, vehicle manufacturers will typically train the vehicle technicians specifically on their own hybrid/ electric vehicles. This will be carried out internally or by working in partnership with specialist private training providers. The IMI works with some manufacturers to accredit their training and certify that vehicle technicians can demonstrate critical competences.

For companies involved in vehicle recovery, the Institute of Vehicle Recovery (IVR) has developed a one-day course call VR27 – Electric (EV) and Hybrid Vehicle Awareness¹¹. This course is delivered by private sector training providers that are assessed by the IVR. Trainers must be qualified to a minimum of IMI Level 2. VR27 is also a mandatory requirement for vehicle recovery operators carrying out contract work for the Police service.

For companies involved in the repair and maintenance of the charging infrastructure, City & Guilds offer a Level 3 Award in Electric Vehicle Charging Equipment installation. This is offered by West College Scotland and Fife College and promoted by Scotland’s electrical trade association, SELECT.

For those involved in vehicle sales then training is typically provided by the vehicle manufacturers (for dealership staff). This is often delivered online.

The Energy Saving Trust (EST) offer short (2-4 hour) training sessions on hybrid and electric vehicles. In England, the Department for Transport covers the cost for participants and the training has been delivered to a number of retail garages. The EST has also delivered a number of training sessions to motor auctions to improve the knowledge of buyers from garages about hybrid and electric vehicles.

Hybrid/ electric vehicle driver training is offered by some private training providers and includes the driving performance and safety aspects (including what to do in the event of an incident).

3.3.3 College Provision

Each of Scotland’s colleges that offers automotive training and education has a representative on ESP’s Automotive Training Network (ATN). This has been running for 3.5 years and in the last year has had a specific focus on the provision of hybrid and electric vehicle training. ESP, through funding from Transport Scotland, has supported teaching staff in Scotland’s colleges to be trained to IMI L2, L3 and L4 standards. Some of the college staff are qualified sufficiently to train staff (in their own and other colleges) to IMI L2 and L3 standards. ESP also provides access to Electude high voltage safety interlock trainer modules¹² which simulate the procedures required to isolate hybrid and electric vehicle battery systems, allowing individuals

¹¹ <https://www.theivrgroup.com/course-element/vr27-electric-ev-and-hybrid-vehicle-awareness>

¹² <https://www.electude.com/trainingaidseurope>

to work safely on the vehicles. There are two banks of four Electude modules. Other colleges have an LJ Create hybrid training panel¹³ that is similar to the Electude.

Sixteen of Scotland’s colleges provide automotive training. Of these, seven are currently offering either IMI or C&G accredited hybrid and electric vehicle courses:

- Ayrshire
- Dundee & Angus
- Edinburgh
- Fife
- New College Lanarkshire
- West College Scotland
- West Lothian

Others plan to do so, and most have staff trained to L2 or L3.

Several of the colleges have access to hybrid and/or electric vehicles. Some colleges also operate hybrid and electric vehicles as pool cars for staff and these can also be used for training purposes.

Modern Apprentices

There are two relevant Modern Apprenticeship (MA) Frameworks for ULEVs:

- Automotive
- Bus and Coach Engineering and Maintenance

There have been, on average, 1,112 starts on these Frameworks each year between 2014 and 2018. This is around 4.2% of total MA starts each year. Over 97% of these starts are in the Automotive Framework, with just under 3% in Bus and Coach Engineering and Maintenance. Over 96% of individuals undertaking these MAs are male.

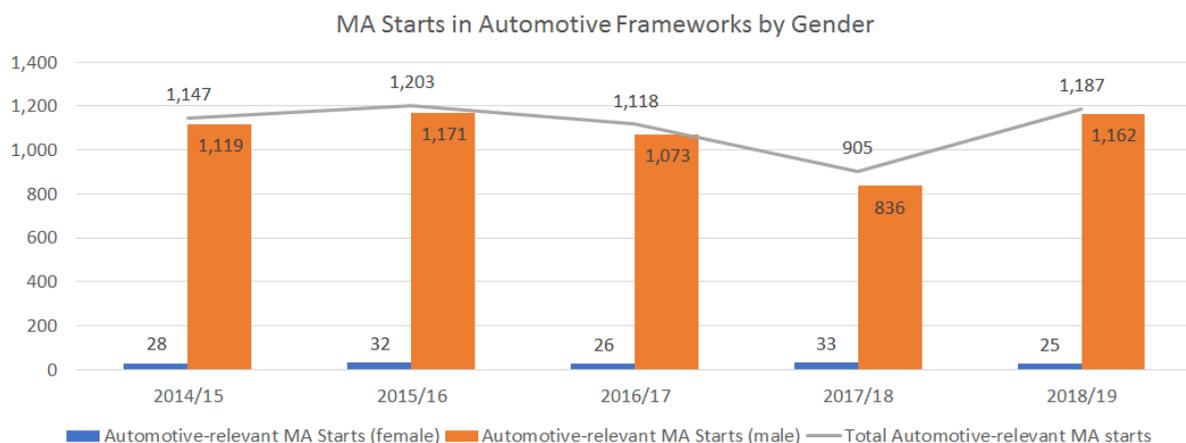


Figure 2 - MA starts in Automotive Frameworks (data from Skills Development Scotland)

¹³ <http://www.ljcreate.com/uk/programs/automotive/automotive-hardware/267/hybrid-vehicle-systems-panel-trainer-detail>

Discussions with colleges which provide training in the Automotive MA indicated that a number are already including the IMI and C&G hybrid and electric vehicle courses as part of the training programme, while others offer these at an additional cost.

The Electrical Installation MA Framework will be relevant to EV charger installation and maintenance but is not included here as it covers much broader aspects.

Other Relevant College Training Provision

In addition to MAs, colleges deliver training towards a range of qualifications in automotive in three subject superclasses:

- Road Vehicle Engineering
- Vehicle Maintenance/Repair/Serviceing
- Motor Trade Operations

Individuals training in these areas are also likely to have relevance for hybrid and electric vehicle training. Qualifications in the Vehicle Maintenance/Repair/Serviceing constituted almost 93% (2,092) of the total of these superclasses in 2018, while there were only 10 qualifications in Motor Trade Operations (divided between Fife and Inverness Colleges). These were mainly in non-advanced qualifications and units. There were 14 Higher National Certificates (HNC) awarded in Road Vehicle Engineering and 6 in Vehicle Maintenance/Repair/Serviceing awarded in 2018. This suggests that the majority of individuals undertaking longer-term, structured training in automotive are doing so through the automotive MA Framework.

New College Lanarkshire delivered 28.8% of these qualifications, followed by West College Scotland (15.9%) and Edinburgh College (12.5%). All other colleges had less than 10% share, with 10 delivering no automotive related qualifications.

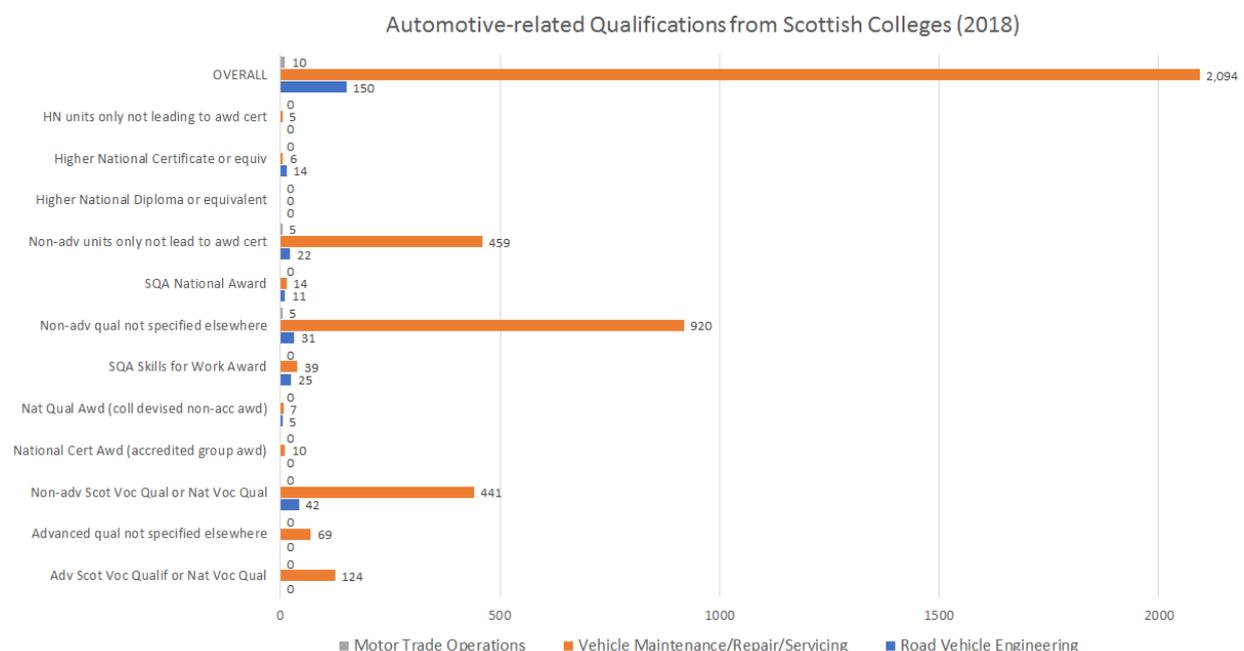


Figure 3 - Qualifications in Automotive-related subject superclasses across Scotland's colleges (2018) (Data from Scottish Funding Council Infact database)

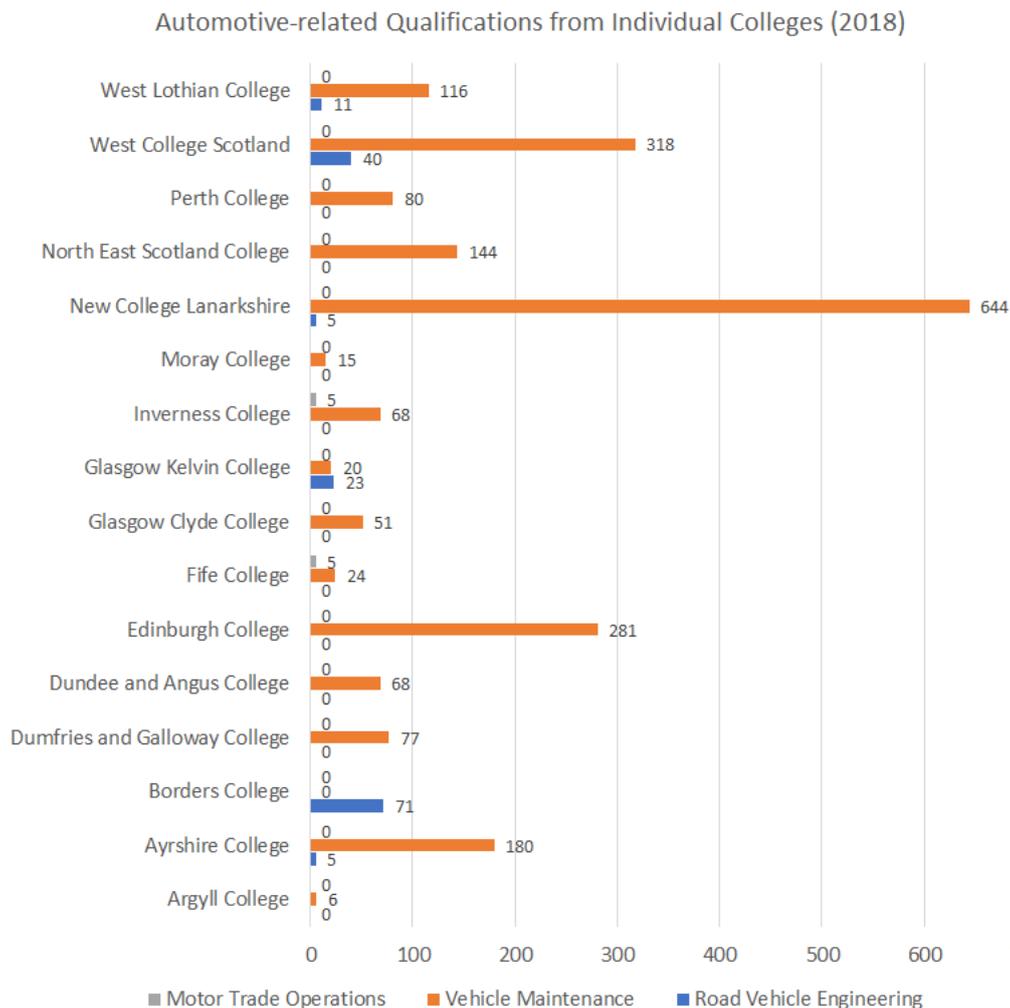


Figure 4 - Qualifications in Automotive-related subject superclasses in individual colleges (2018) (Data from Scottish Funding Council Infact database)

Completion Rates for IMI and C&G Hybrid/Electric Vehicle Awards

As noted earlier, hybrid and electric vehicle training is delivered by both colleges and private providers. Colleges have only started providing this training in the last year, and, as indicated above, several already offer hybrid and electric vehicle training to apprentices and full-time students. Semi-quantitative data from colleges suggests that there have been around 230 individuals trained at L2/L3 to date, with most undertaking this through a CPD route. Based on prospective numbers and individual college approaches, we expect that, at present <100 Modern Apprentices/students will undertake the training each year. As MAs represent the majority of new entrants into the sector and this is <10% of total MA starts, it is clear that the uptake of hybrid and electric vehicle training within MAs is limited. There is no mandatory hybrid/electric vehicle training requirement within the current automotive MA Framework. Feedback from colleges suggest that it is easier to include hybrid/electric vehicle repair and maintenance training in full time courses as there is more time available compared to the scope to include more training in the MA curriculum.

Based on feedback from stakeholders, combined with evidence about market share of those awarding certifications for hybrid/ electric vehicle training, it is estimated that there have

been approximately 930 hybrid/electric vehicle certifications issued in Scotland since they were made available (mainly IMI awards, vehicle manufacturer certification and City & Guilds awards). It should be noted that an individual vehicle technician could have been awarded more than one certificate (e.g. if they had completed Level 2 then went onto complete Level 3) and that certifications may have been issued to those involved in vehicle sales, emergency services, etc.; so, not all will necessarily relate to repair and maintenance staff.

3.4 Vehicle repair and maintenance

As mentioned previously, there are approximately 3,220 vehicle repair and maintenance enterprises in Scotland employing 15,000 people.

Analysis of the SMTA member survey (269 responses) and the key findings relating to repair and maintenance are described below.

3.4.1 Garages current activity and future plans about offering repair and maintenance services

A total of 81 respondents stated that they currently provide services to make safe, repair and maintain hybrid/ electric vehicles, representing 31% of total respondents.

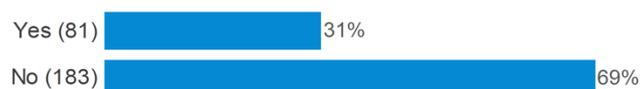


Figure 5 - Proportion of Scottish garages offering repair and maintenance for hybrid/ electric vehicles

If the sample of 269 respondents is representative of the total 3,220 vehicle repair and maintenance enterprises in Scotland then this would mean there are approximately 1,000 enterprises offering services to make safe, repair and maintain hybrid/ electric vehicles.

The response to this question about currently offering hybrid/electric vehicle repair and maintenance services can be analysed by type of business (i.e. franchised dealer or independent garage).

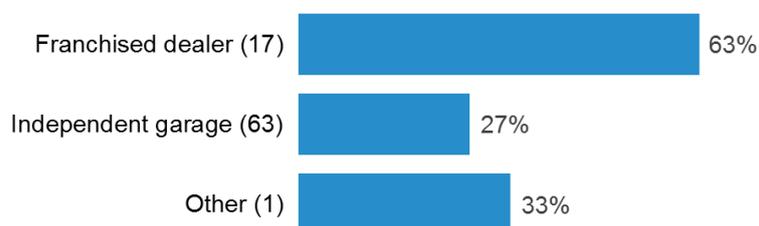


Figure 6 - Breakdown of garages offering hybrid/ electric vehicle repair and maintenance, by type

Of the 81 respondents stating that they offer services to make safe, repair and maintain hybrid/ electric vehicles, 17 are franchised dealers. This represents 63% of all franchised dealers responding to the survey. There are 63 independent garages offering hybrid/electric vehicle services, representing 27% of the total number of independent garages responding to

the survey. It is clear that franchised dealerships have a significantly higher propensity to offer hybrid/electric vehicle repair and maintenance services. This is consistent with the evidence from the survey that manufacturers are the main provider of training in hybrid/electric vehicle repair and maintenance.

The response to this question can also be analysed by whether the respondent has a single or multiple sites. Of the 81 respondents offering services to make safe, repair and maintain hybrid/ electric vehicles, 16 stated they operated multiple sites, representing 57% of the total number of respondents with multiple sites. There were 65 respondents stating they operated from a single site, representing 28% of the total number of respondents operating from a single site. Therefore, it is clear that those operating from multiple sites have a significantly higher propensity to offer hybrid/electric vehicle repair and maintenance services.

Another variable that can be used to analyse this question is the number of employees of the respondent. The figure below summarises the relationship between employee size and propensity to offer hybrid/ electric vehicle repair and maintenance services.

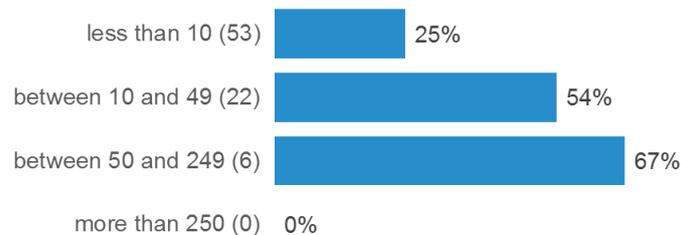


Figure 7 - Percentage of each employee size-band that currently offer hybrid/electric vehicle repair and maintenance services

Of the 81 respondents who stated that they currently offer hybrid/electric vehicle repair and maintenance services, 53 had less than 10 employees, representing 25% of all respondents with less than 10 employees. There were 22 respondents with between 10 and 49 employees who stated that they currently offer hybrid/electric vehicle repair and maintenance services, representing 54% of all respondents in this employee size-band. Finally, there were 6 respondents with between 50 and 249 employees who stated that they currently offer hybrid/electric vehicle repair and maintenance services, representing 67% of all respondents in this employee size-band. This analysis clearly demonstrates that as the number of employees increases so does the likelihood that the business will offer hybrid/electric vehicle repair and maintenance services.

The group of 81 respondents can also be analysed by their self-classification of the geographical area they provide services to.

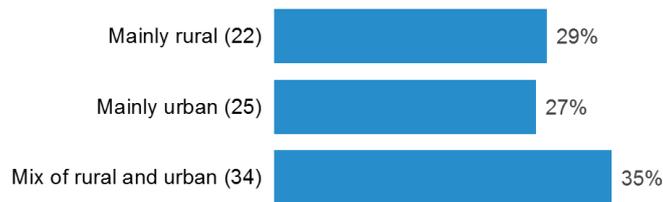


Figure 8 - Breakdown of those garages offering hybrid/ electric vehicle repair and maintenance by type of geographical area serviced

Whether a garage is located in a rural or urban area does not appear to have a significant determining factor about whether they offer hybrid/ electric vehicle repair and maintenance services.

For those garages that do not currently offer hybrid/ electric repair and maintenance services the main reasons given for not doing so are summarised in the figure below.

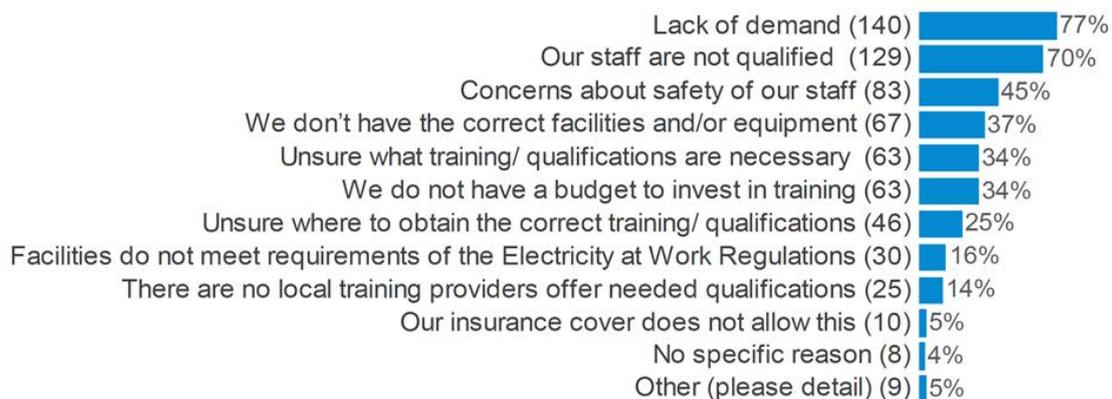


Figure 9 - Reasons why hybrid/ electric repair and maintenance services are not currently offered

The top reason, stated by 77% of those who do not currently offer hybrid/electric repair and maintenance services, is lack of demand. This is a fundamental market failure for skills training for hybrid and electric vehicles: whilst demand is low there are limited immediate economic/commercial drivers for investing in staff training. This is consistent with the 70% who stated that lack of qualified staff is also a significant reason for not offering hybrid/electric vehicle services. Concerns about staff safety, lack of appropriate equipment/ facilities, lack of a training budget and uncertainty of where to access training were also highlighted as reasons why garages did not currently offer hybrid/ electric vehicle repair and maintenance services.

The 183 garages that do not currently offer hybrid/ electric vehicle repair and maintenance services were asked about whether they had plans to start providing these services in future.



Figure 10 - Garages not currently providing hybrid/ electric vehicle repair and maintenance services and their view on whether they have plans to do so in future

Of the garages who do not currently offer hybrid/ electric vehicle repair and maintenance, 43% stated they had plans to do so in future. Of this group with plans to introduce hybrid/electric vehicle services, 42% said they would do so in the next 12 months and 41% said they would do so in the next 1-3 years. This is consistent with the need to build the skills base in anticipation of future growth in demand.

The group of 79 garages that do not currently offer hybrid/ electric vehicle repair and maintenance services but plan to do so in future can be further analysed by type of business.

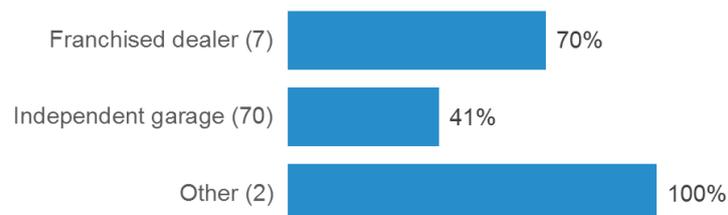


Figure 11 - Garages not currently offering hybrid/ electric vehicle repair and maintenance services but have plans to do so in future, by type of business

The above figure shows that 41% of independent garages that do not currently offer hybrid/ electric vehicle repair and maintenance services plan to do so in future.

Of those not currently offering hybrid/electric vehicle services, 31% stated they were unsure whether they would do so in future. The level of uncertainty is consistent with feedback from some garages that do not offer hybrid/electric vehicle services, that are unsure what training/ qualifications are necessary (34%) and where to obtain the correct training/qualifications (25%). This indicates that there are a significant number of garages with potential to add repair and maintenance of hybrid/electric vehicles to their services that would benefit from support to reduce uncertainty. The proposed new SMTA Auto-ESURE initiative¹⁴ is likely to provide a framework to educate and support garages which plan to start offering these services and also reduce the level of uncertainty of those still unsure whether they should do so.

¹⁴ Auto-ESURE is a new initiative to be launched by the SMTA early 2020. Open to members and non-members, the initiative will provide a way for repair and maintenance garages to identify and access the training provided before being audited to confirm that their facilities, equipment and competent staff meet a minimum standard. A directory of garages meeting the standard will be available on the SMTA website.

As highlighted in Figure 9, the lack of budget was identified by 34% as being a reason not to train staff in hybrid/electric vehicle repair and maintenance. There is currently no financial support available for the qualifications described in section 3.3. For new entrants into the sector, via the Modern Apprentice route, there is no mandatory inclusion of hybrid/ electric training within the core qualifications required in the MA Frameworks at Level 5 SCQF and Level 7 SCQF (hybrid/electric vehicle training is only delivered to a minority of MA students as a voluntary ‘bolt-on’ by some training providers, or at an additional cost by others). Making hybrid/electric vehicle training a mandatory part of the automotive MA could be a challenge for some existing training providers that do not have the correct facilities, equipment and trained staff. This change would need to be at the request of industry.

One of the stakeholder interviews highlighted that, for existing vehicle technicians looking to upskill in the area of hybrid/ electric vehicles, there is no SCQF Level 8 qualification that includes hybrid/ electric vehicle repair and maintenance in contrast to the Level 4 Technician Award delivered as a diploma in England and Wales.

3.4.2 Garages current and future plans about staff training

A total of 77 (29%) of all respondents stated that they have staff with a recognised qualification/accreditation which allows them to work on hybrid/ electric vehicles.

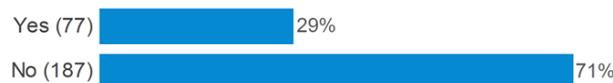


Figure 12 - Percentage of total repair and maintenance garages employing staff with recognised qualifications/ accreditations enabling them to work on hybrid/ electric vehicles

On first inspection this looks to be at a similar level to those stating they currently offer hybrid/ electric vehicle repair and maintenance (81 respondents/ 31% of total responses). However, further analysis has identified that 20 of the 81 garages offering hybrid/electric vehicle services also state that they do not have any staff with a recognised qualification/accreditation which allows them to work on hybrid/electric vehicles, and only 10 of the 20 stated that they had plans for staff to gain these qualifications/accreditations in the future. 17 of these 20 garages have less than 10 employees with the average number of employees being 5.5. All 20 of these garages are independent and they, therefore, represent 32% of the 63 independent garages offering hybrid/electric vehicle services. All 17 franchised dealers that offer hybrid/electric vehicle services stated that they have staff with recognised qualifications/accreditations allowing them to work on hybrid/electric vehicles.

Analysis also identifies 16 respondents who stated that they have staff with recognised qualifications/accreditations which would allow them to work on hybrid/electric vehicles, but that they do not currently offer this service. The most common reason this group of garages gave for not offering hybrid/electric vehicle services was a lack of demand, with some also highlighting that they did not have the correct facilities and/or equipment.

Respondents who stated that they have staff with a recognised qualification/accreditation allowing them to work on hybrid/electric vehicles were then asked to indicate which age groups these staff could be categorised in.

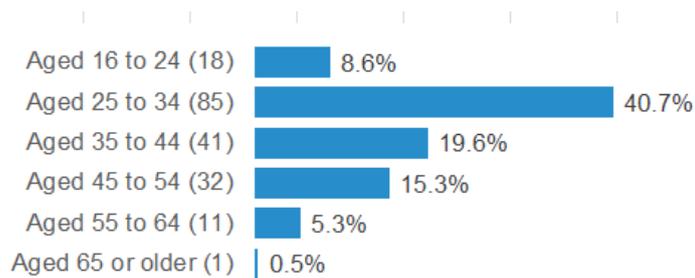


Figure 13 - Categorisation of qualified/accredited employees by age-band

The above figure shows that staff with recognised qualifications/accreditations enabling them to work with hybrid/electric vehicles are most commonly aged between 25 to 34. Feedback received during the stakeholder workshop highlighted that it can be difficult to persuade some newly qualified, younger employees, to take an interest in hybrid/electric vehicles due to a perception that they are less attractive to work on compared to high performance petrol/diesel alternatives.

The 187 repair and maintenance garages that do not currently have staff with recognised hybrid/ electric vehicle qualifications/ accreditations were also asked if they planned for staff to be trained in this area in future.



Figure 14 - Views of garages, currently without staff that are qualified/ accredited to work with hybrid/ electric vehicles, about their plans for their staff to gain such qualifications/accreditations

Of those garages that do not have staff with a recognised qualification/ accreditation to make safe, repair and maintain hybrid/electric vehicles, 38% stated they had plans to do so in future, with 37% stating they were unsure. Only 26% said they had no plans to train staff in this area.

Of those who planned to train staff, 46% stated that they intended to do so in the next 12 months and 40% said they would do so in the next 1-3 years.

3.4.3 Training certification and provision

Those respondents from garages where staff had recognised qualifications/accreditations for electric/hybrid repair and maintenance were asked to identify the certifying body. The responses are summarised in the figure below.

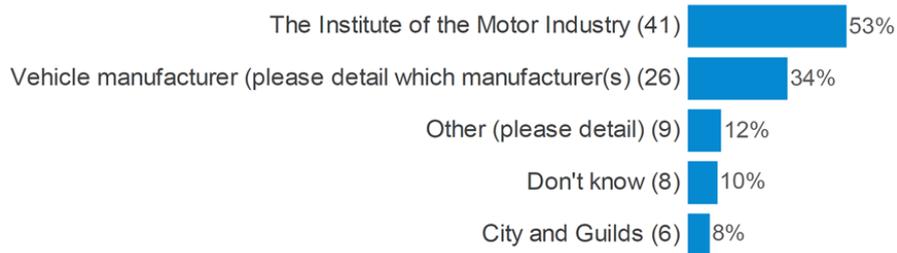


Figure 15 - Certifying body for hybrid/ electric qualifications/accreditations

The IMI is the certifying body for over half (53%) of all recognised hybrid/electric vehicle qualifications/accreditations. Vehicle manufacturers are also significant certifying bodies (34%) but these will only be to staff in franchised dealers, although individuals may then move to independent garages.

Respondents were then asked to identify who the providers of the training were. The responses are summarised in the figure below.

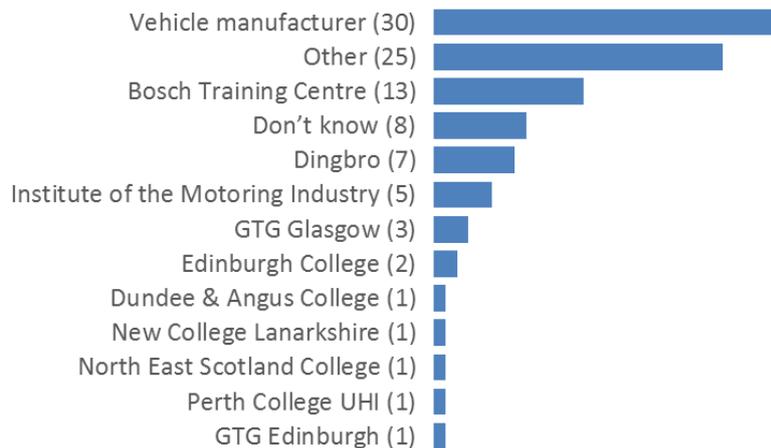


Figure 16 - Providers of hybrid/electric training

The 'Other' training providers included Dingbro, Eurocar and IMI online (amongst others, mostly unspecified). The lack of college provision is unsurprising as they have only introduced such courses in the last year or so.

The level/type of training is shown in the figure below.



Figure 17 - Level/type of training in hybrid/electric vehicles

The Level 2 IMI Award in Electric/ Hybrid Vehicles Routine Maintenance Activities is the most common training undertaken (41%) followed by IMI Level 1 Award in Electric Hybrid Vehicle Awareness (28%) and the IMI Accreditation (27%).

3.4.4 Views and attitudes

Respondents were asked to highlight the extent to which they agreed or disagreed with a number of statements relating to training and skills for repair and maintenance of hybrid/electric vehicles.

To what extent do you agree or disagree with the following statements: *(Tick one on each row)*

	Strongly agree	Agree	Unsure	Disagree	Strongly disagree	NA
Being able to provide hybrid/electric vehicle repair and maintenance services will be a necessary part of our business in future	32%	44%	16%	6%	2%	0%
We have a good understanding of what qualifications our repair and maintenance staff should hold to enable our business to offer hybrid/electric vehicle services	16%	37%	24%	16%	6%	1%
We have a good understanding of where to access training for the qualifications necessary to offer hybrid/electric vehicle repair and maintenance services	16%	43%	21%	13%	5%	2%
Online training is a practical way to improve knowledge about hybrid/electric vehicle repair and maintenance services	12%	53%	19%	9%	6%	1%
We would support an industry standard for garages to demonstrate to consumers that they have achieved hybrid/electric vehicle repair and maintenance qualifications and skills	34%	56%	8%	0%	1%	0%
To ensure they keep up to date with rapidly changing hybrid/electric vehicle technology it is important that qualified repair and maintenance staff are professionally registered, have had continuous update training and are regularly assessed	32%	60%	6%	1%	1%	0%

Table 3 - Views and attitudes about training and skills for the repair and maintenance of hybrid/electric vehicles

The key findings from this question are:

- 76% agree or strongly agree that hybrid/electric vehicle repair and maintenance will be a necessary part of their business

- However, there is significant uncertainty about what qualifications are required to address the opportunity, with 46% not knowing or unsure about what qualifications are necessary. This implies the need for education and awareness raising of what is required
- There is also uncertainty about where to access training with 39% not knowing, or being uncertain, where hybrid/electric vehicle training can be obtained. Again, this implies a need for education and awareness raising around this issue. The proposed SMTA Auto-ESURE initiative includes an initial training needs analysis and this could help address both of the above issues
- Online training is supported by 65% of respondents although several of the qualitative comments gathered at the end of the survey highlighted that online learning is useful but practical, ‘hands-on’ training is essential
- There is strong support for an industry standard to demonstrate competence to consumers (90%). This can reasonably be interpreted as demonstrating significant support for the proposed SMTA Auto-ESURE standard
- There is also strong support for the idea of continuous development training and regular assessment (92%). Demonstration of this can be facilitated by the IMI TechSafe register

All respondents involved in vehicle repair and maintenance were asked whether they had a view on the key action(s) needed to help ensure vehicle repair and maintenance staff have the skills necessary to work on hybrid/electric vehicles. Over 100 comments were received with the main themes including (in order of priority):

- Whilst online training can be a useful part of the solution, it is not sufficient on its own - hands-on training is required
- Training needs to be cost effective with financial support provided by Government or Manufacturers
- Government and support bodies must be involved to raise awareness and provide relevant information
- Health and Safety is paramount – need easy access to information about vehicles
- Only licensed, registered or accredited personnel/ garages should be allowed to work on hybrid/electric vehicles
- Continuous training will be required to keep up with technology

In another part of the garage sector, the National Body Repair Association is working with IMI to provide access to Electric Vehicle eLearning for staff working in NBRA Member Bodyshops. The five eLearning modules will range from Electric Vehicle Introduction to Safe Working and Charging¹⁵.

¹⁵ <https://www.theimi.org.uk/news/nbra-and-imi-partner-offer-ev-training-body-repair-industry>

3.5 Vehicle sales

As stated in section 3.1, there are approximately 925 vehicle retailers in Scotland. Some of these have multiple sites so the actual number of vehicle retail sites will be larger than this.

3.5.1 Vehicle retailers current activity and future plans about selling hybrid/ electric vehicles

Analysis of the SMTA member survey has been carried out and the findings are summarised below.

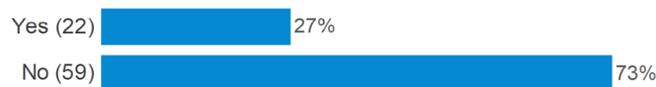


Figure 18 - Proportion of garages involved in vehicle sales that currently sell hybrid/ electric vehicles

The 22 vehicle sales garages that currently sell hybrid/ electric vehicles can also be analysed by business type.

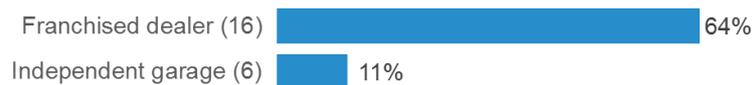


Figure 19 - Vehicle sales garages currently selling hybrid/electric vehicles, by business type

This means that, of all independent garages involved in vehicle sales, 11% currently sell hybrid/ electric vehicles. By comparison 64% of all franchised dealers involved in vehicle sales currently sell hybrid/ electric vehicles.

The 59 vehicle sales garages that do not currently sell hybrid/electric vehicles were asked whether they intended to start doing so in future.

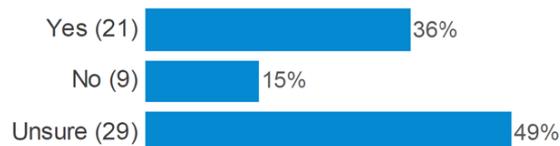


Figure 20 - Vehicle sales garages not currently selling hybrid/ electric vehicles and future plans

Of those vehicle sales garages not currently selling hybrid/ electric vehicles, 36% intend to sell them in the future with 49% being unsure. Only 15% stated they would not sell them in future.

The 21 vehicle sales garages that intend to start selling hybrid/ electric vehicles in the future can be analysed further based on type of business.



Figure 21 - Breakdown of vehicle sales garages intending to start selling hybrid/ electric vehicles, by business type

Of the 21 vehicle retailers who do not currently sell hybrid/electric vehicles but intend to do so in future, 14 are independent garages. This means that 28% of independent vehicle retailers, that do not currently sell hybrid/ electric vehicles, plan to do so in the future.

The 21 vehicle retailers that have plans to start selling hybrid/ electric vehicles were also asked to indicate the timescale involved in implementing this plan.

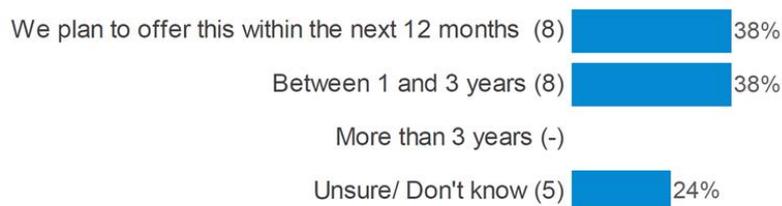


Figure 22 - Implementation timescale of those vehicle retailers planning to start selling hybrid/ electric vehicles

Of those that plan to start selling hybrid/electric vehicles in the future, 38% intend to do so within the next 12 months and 38% within the next 1-3 years. This is consistent with the need to develop the skills of sales staff to meet future expected increases in demand for hybrid/ electric vehicles. 24% were unsure of the timescale.

The analysis also investigated whether being in an urban or a rural area influenced the likelihood of selling hybrid/electric vehicles. The figure below shows that there is a greater likelihood of vehicle retailers located in mainly urban locations offering hybrid/electric vehicles for sale.



Figure 23 - Percentage of vehicle retailers currently selling hybrid/electric vehicles by urban/rural classification

This finding is consistent with demand being higher in areas where range anxiety is less of a factor and the density of charging points is likely to be greater compared to that in rural areas.

Of those stating that they did not intend to sell hybrid/ electric vehicles in the future, the main reasons given were a personal dislike of hybrid/electric vehicles and lack of demand in their area. Of those stating they were unsure whether they would sell them in future, the main reason given was the lack of demand for hybrid/electric vehicles.

3.5.2 Vehicle retailers current and future plans about staff training

Vehicle retailers were asked whether any of their staff had received specific training to help them sell hybrid/ electric vehicles. The figure below summarises the response to this question.

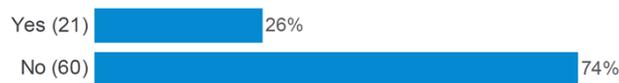


Figure 24 - Proportion of total vehicle retailers stating their staff have received specific training in hybrid/electric vehicle sales

The percentage of vehicle retailers stating that some of their staff have received specific training to help them sell hybrid/electric vehicles is 26%. This is similar to the percentage of vehicle retailers that currently sell hybrid electric vehicles (27%). However, six out of the 22 vehicle retailers that currently sell hybrid/electric vehicles state they do not have any sales staff who have received specific sales training for hybrid/electric vehicles (with five of the six being independent garages).

3.5.3 Training provision

The vehicle retailers who do have staff that have received specific training for the sales of hybrid/electric vehicles were asked how this training had been accessed. The responses are summarised in the figure below.

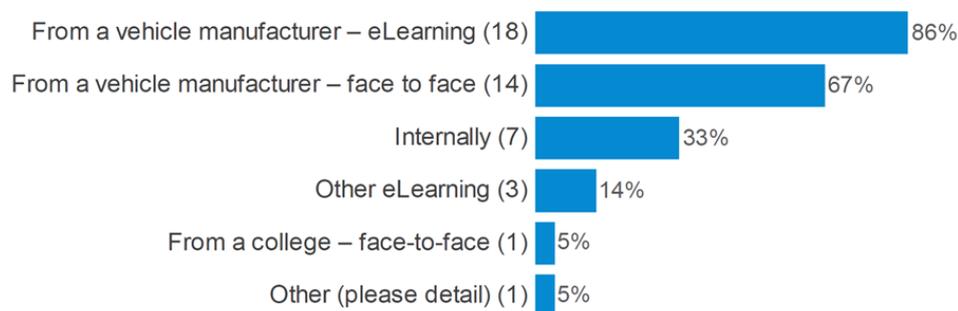


Figure 25 - Provision of specific hybrid/electric vehicle training for sales staff

Vehicle manufacturers play a key role in training sales staff about hybrid/electric vehicles. However, independent garages appear to have limited options available to them. Only one of the six independent vehicle retailers currently selling hybrid/electric vehicles had staff that had received specific training and this was accessed by eLearning (from sources other than a manufacturer).

3.5.4 Views and attitudes

Respondents were asked to highlight the extent to which they agreed or disagreed with a number of statements relating to training and skills for selling hybrid/electric vehicles.

To what extent do you agree or disagree with the following statements: *Tick one on each row*

	Strongly agree	Agree	Unsure	Disagree	Strongly disagree	NA
Selling hybrid/ electric vehicles will be a necessary part of our business in future	30%	38%	24%	6%	3%	0%
It is important that our sales staff receive specific training if they are selling hybrid/ electric vehicles	32%	56%	9%	1%	3%	0%
We have a good understanding of what skills are required by our sales staff to help them sell hybrid/ electric vehicles	18%	44%	16%	18%	4%	1%
We have a good understanding of where to access training for our sales staff to help them sell hybrid/ electric vehicles	20%	41%	15%	19%	4%	1%
We would support an industry standard for vehicle retailers to demonstrate to consumers that they have been assessed as competent to provide advice about, and sell, hybrid/electric vehicles	23%	64%	11%	1%	1%	0%
Online training is a practical way to improve knowledge for staff involved in selling hybrid/electric vehicles	20%	58%	10%	9%	3%	0%

Table 4 - Views and attitudes about training and skills for selling hybrid/electric vehicles

68% of all vehicle retailers, who completed the survey, stated that they agreed or strongly agreed that selling hybrid/electric vehicles would be a necessary part of their future business and 88% think that specific sales training for staff will be necessary. Given that 87% of respondents to the survey are independent garages, this may present challenges in accessing specific training considering the dominant role that manufacturers currently play in providing this (to franchised dealers).

38% stated that they were unsure or disagreed that they had a good understanding about what skills are required for sales staff, and 38% were unsure or disagreed that they had a good understanding of where to access training. Defining sales skills and identifying relevant training providers is not intended to be part of the Auto-ESURE initiative (which is focused on repair and maintenance of hybrid/ electric vehicles rather than sales). The Electric Vehicle Approved standard¹⁶ presents a solution to this for some garages, but others may require a preliminary step requiring fewer resources. The Energy Saving Trust offers a 2-4 hour electric vehicle awareness workshop that has been used by garages in England (with the Department for Transport covering the cost for participants). It is understood that EST in Scotland is investigating funding routes to enable them to offer this training to garages.

There is strong support for an industry standard to help vehicle retailers demonstrate competence in hybrid/electric vehicle sales (87%). The Electric Vehicle Approved standard is a potential route for some vehicle retailers to pursue. It is currently uncertain how much financial support will be available to garages to help with the audit fees associated with obtaining this standard (the audit is carried out by the EST).

¹⁶ A newly launched standard to help all types of garage (franchised and independent – new and used car sales) demonstrate competence in selling hybrid and electric vehicles - <https://www.evapproved.co.uk/>

There is also strong support for online training as a way to improve the knowledge of sales staff (92%). Providing an online training course could be a cost effective way to enable smaller independent vehicle retailers to access the required sales training.

Although training to increase knowledge about the hybrid/ electric vehicles is an essential part of the sales training, there is a need to increase knowledge to be able to respond to customer enquiries about charging networks, home charger installation, energy tariffs and the use of different types of home renewable energy generation, etc. Addressing this gap in information provision to the customer would require collaboration between the vehicle retailers, charging installers and energy companies.

There could be benefits to providing training in hybrid/ electric vehicles to a wider range of businesses than just vehicle retailers. This could include, for example:

- Training for buyers working in the aftermarket to help them understand second-hand EVs (e.g. education, awareness at car auction sites for trade buyers)
- Used car finance industry (to make sure the finance they are giving is appropriate)

3.6 Priorities for sales, repair and maintenance garages

At the end of the survey of garages, all 269 respondents were asked to identify priority areas of action that could help them better develop the skills needed to sell, repair and maintain hybrid/ electric vehicle services. A total of 93 respondents provided feedback to this request. The responses have been analysed and grouped into the themes below (in order of priority):

- Government funding to support training is required, particularly as demand is not currently strong enough to be a commercial driver
- Flexibility of training provision is needed. This should improve accessibility to rural garages, with evening and weekend options suggested by some to avoid reducing capacity in garages during normal working hours
- Certification of competence, regulation and standards were all highlighted as being important to ensure safe working with hybrid/electric vehicles and being able to demonstrate this competence to consumers

3.7 Emergency services

The Scottish Ambulance Service has 5,100 directly employed staff and an additional 1,200 Community First Responder volunteers¹⁷. According to figures published in a recent paper on electric vehicle skills for the emergency services (and others)¹⁸, 47% of ambulance service staff, at a UK level, are advanced paramedics or paramedics. Applying the same proportion to

¹⁷ Scottish Ambulance Service Annual Report and Accounts for the year ended 31st March 2019 - <https://www.scottishambulance.com/TheService/annualreport.aspx>

¹⁸ 'Electric Vehicle and Battery Safety Skills for Emergency Services, Vehicle Repair and Auto Retailers', The Faraday Institution, Nov 2019 - https://faraday.ac.uk/wp-content/uploads/2019/11/Faraday_Insights_4.pdf

the direct staff numbers in the Scottish Ambulance Service (5,100) indicates that there are approximately **2,400** advanced paramedics and paramedics that require training in how to safely work at an incident involving a hybrid/ electric vehicle. Training of the Community First Responders may also be necessary, depending on the scope of their potential involvement in road traffic incidents.

The Faraday Institution paper highlights recommendations from the National Ambulance Resilience Unit (NARU)¹⁹ that the NHS Ambulance Service works with the Joint Royal Colleges Ambulance Liaison Committee (JRCALC)²⁰ educational sub-groups to include risks associated with EVs in a clinical practice guideline, and that they also work with NARU to build standard training requirements into ambulance service contracts. The paper further states that JRCALC and NARU are best positioned to work with partner organisations in Scotland, Wales and Northern Ireland in order to achieve national coordination for standards development and training delivery.

Police Scotland has a workforce of 22,000 staff²¹ of which 17,250 are police officers.²² The Faraday Institution paper estimated that 60% of the total UK police workforce (officers + other staff) could be classed as ‘visible’ or ‘specialist’ and would be likely to require comprehensive training in hybrid/ electric vehicles. This equates to training being required for **13,200** police officers in Scotland. The Faraday Institution paper states that the National Police Chiefs’ Council would be an ideal focal point to co-ordinate a national response to this issue along with the College of Policing. Whilst the NPPC has a UK wide remit, the College of Policing is a body with responsibility only in England and Wales, so involvement of the Scottish Police College would be required.

The Scottish Fire & Rescue Service has 8,000 staff (including firefighters and other staff)²³. The Faraday Institution paper estimates that 80% of total UK fire service employees are firefighters (wholetime, retained and volunteer). In Scotland this would equate to **6,400** firefighters requiring training in dealing with hybrid/electric vehicles. In addition to this, there are a significant number of volunteer firefighters (particularly in rural areas) that would require training. The paper makes a recommendation that the National Fire Chiefs Council (a body with a UK wide remit) works with the sector skills council, Skills for Justice: Fire and Rescue. To develop a national occupational standard or training framework, Skills for Justice needs to be given this request by a national fire service. This could be delivered through the Scottish Fire and Rescue College. The equivalent body for the rest of the UK (Fire Service College) offers two new courses related to EV Hazards.

¹⁹ <https://naru.org.uk/>

²⁰ <https://www.jrcalc.org.uk/>

²¹ Scottish Police Authority Annual Report and Accounts 2017/18 - <http://www.spa.police.uk/assets/128635/293627/518982>

²² <https://www.bbc.co.uk/news/uk-scotland-48187176>

²³ <https://www.firescotland.gov.uk/about-us/our-corporate-structure.aspx>

A number of specific issues have been highlighted that are relevant to skills required by the emergency services. These are:

- Budgetary constraints – it is estimated that 22,000 emergency service personnel could require some level of training in hybrid/ electric vehicles. This will require significant resources to plan, co-ordinate and implement
- For all emergency services, having up-to-date information about hybrid and electric vehicles (e.g. where to find the switch to isolate the battery) is crucial
- Greater consultation is required between vehicle manufacturers and the emergency services to help address some issues with isolation switches being in difficult to access parts of the vehicle which can create challenges at a road traffic incident
- Hybrid/electric vehicles with their shells cut away to expose areas where high voltage wiring runs would be a useful training aid for the fire service
- Given that it would not be unusual for all three emergency services to attend a road traffic incident, it is likely that the three organisations will be sharing their approaches to this issue with one another. Co-ordinating this, within Scotland, and with wider UK initiatives to address this issue, will require management resources

3.8 Roadside assistance and recovery

Many of the issues faced by roadside assistance and recovery operators are similar to the issues faced by repair and maintenance garages. The training provision is similar, although there is an additional qualification available specifically for vehicle recovery operators.

There are examples of best practice in the roadside assistance sector with regards to training of staff to deal with hybrid/electric vehicles. For example, it is known that one of the larger roadside assistance/ recovery operators is training their staff to a Level 4 IMI Award.

In the vehicle recovery sector, the industry body, the Institute of Vehicle Recovery, has developed a one day course specifically for the recovery of hybrid/ electric vehicles. The course, VR-27 Electric (EV) and Hybrid Vehicle Awareness, is delivered by trainers with a minimum of IMI Level 2 Award. There have been examples of a larger roadside assistance/recovery operator subsidising participation in the VR-27 training for vehicle recovery operators to help upskill the supply chain. Police Authorities also require recovery operators, working on their recovery contracts, to have completed this training.

3.9 Charging infrastructure repair and maintenance

SELECT (Scotland’s Electrical Trade Association) offer subsidised access for members to participate in specialist training in EV Charging installation and repair. This City and Guilds Level 3 Award in Electric Vehicle Charging Equipment Installation²⁴ is currently delivered by West College Scotland and Fife College.

²⁴ <https://www.select.org.uk/wp-content/uploads/2019/08/324-Electric-Vehicle-Charging-Equipment-Installation.pdf>

SELECT are also engaged in a campaign for the introduction of regulation to ensure the term ‘electrician’ can only be used by properly qualified and assessed individuals, as currently anyone can claim to be an electrician and carry out electrical work²⁵. Being a properly qualified electrician and having additional specialist training in installation and repair of electric vehicle charging points is viewed by some as a minimum threshold necessary to carry out work on electrical vehicle chargers.

The National Inspection Council for Electrical Installation Contracting (NICEIC) provides assessment and certification services for contractors, including electricians, in the UK. The organisation promotes an ‘Electric Vehicle Charging Course’²⁶ which is currently delivered in a number of Scottish locations, such as Glasgow and Inverness (the latter hosted at Inverness College). The course trains participants on how to install electric vehicle charging points in compliance with BS7671, the Electrical Safety Quality and Continuity Regulations and the IET Code of Practice for Electric Vehicle Charging Equipment Installation, 3rd Edition.

The awarding organisation, EAL, promotes a Level 3 Award in the Requirements for the installation of Electric Vehicle Charging Points.

Other examples of skills training include a 22 day Domestic Installer & EV Car Charger course (with City & Guilds accreditation) that is designed for people with little or no electrical installation experience²⁷.

The survey of charging installers was carried out to identify views on minimum qualifications and skills required to work safely on repairing and maintaining charging points. A total of 50 companies offering charging installation services were contacted to participate in the survey and ten provided feedback. The key findings of this survey are summarised below.

Respondents were asked to indicate (using a predefined list of options) what best described their view of the minimum level of qualification/accreditation necessary to repair and maintain an electric vehicle charging point.

²⁵ <https://www.select.org.uk/safer/>

²⁶ <https://www.niceic.com/contractor/training/scotland-training/electric-vehicle-charging-course>

²⁷ <https://www.tradeskills4u.co.uk/courses/domestic-ev-installers-package>

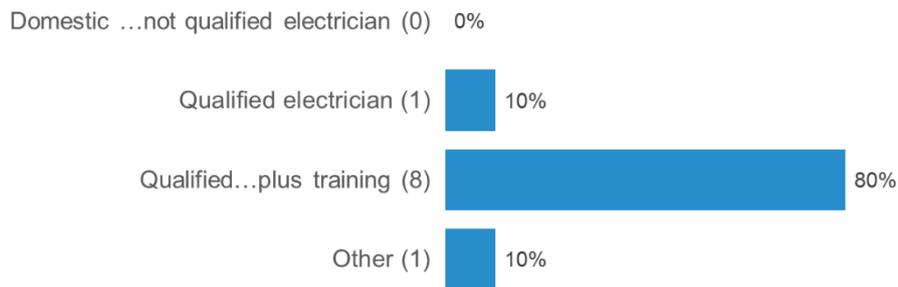


Figure 26 - Views on minimum qualification/ accreditation necessary to repair and maintain an EV charging point

A significant majority of respondents (80%) stated their view that a qualified electrician with specific additional training in electric vehicle charging points was the minimum level of qualification/ accreditation necessary.

Respondents were asked to identify which training courses their staff had completed to help develop skills in working on EV charging points.

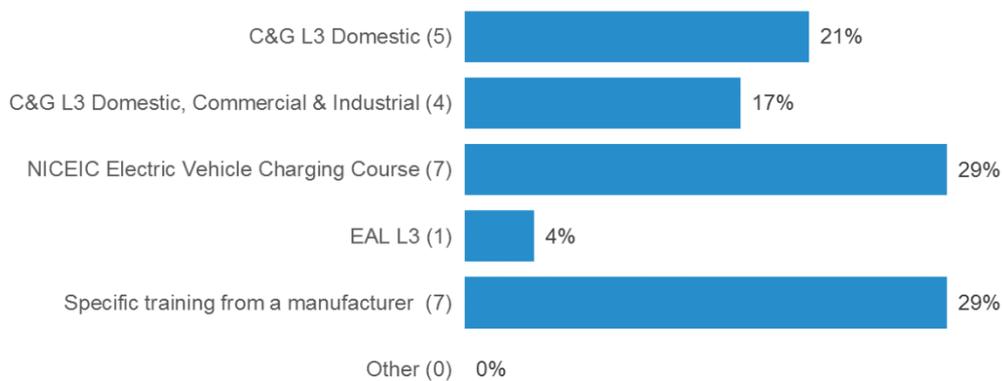


Figure 27 - Training courses completed by staff to develop skills in working on EV charging points

Training courses developed by charging point manufacturers and the NICEIC course were identified as the most common qualifications. Respondents were also asked to identify the type of organisation delivering the training and charging point, with manufacturers highlighted as the most common source. Separate discussions with stakeholders identified that there can be issues with warranties if a charging point is repaired by someone that has not received manufacturer specific training. This can be a barrier to repairing charging points in remote locations where the (manufacturer trained) responsible company has no presence in Scotland.

Respondents to the survey were asked to agree or disagree with a number of statements, resulting in the following findings:

- 40% agree or strongly agree that any qualified electrician should be able to repair and maintain EV charging points

- 90% agree or strongly agree that it is essential to be a qualified electrician in order to repair and maintain EV charging points
- 90% agree or strongly agree that qualified electricians should undertake specific training in EV charging points before carrying out repair and maintenance
- 80% agree or strongly agree that charging points are becoming more complex and new skills are likely to be required in future

Finally, respondents were asked to highlight the key barriers and issues they faced relating to skills for EV charger repair and maintenance. The key issues highlighted were:

- Health & safety concerns relating to the lack of transparency about the level of qualification and skills of employees working on EV charging points
- Manufacturer warranty conditions can limit options for repair and maintenance of EV charging points
- Accessibility of training in some geographical areas could be improved

4 Key findings, barriers and issues

The key findings, barriers and issues identified in this baselining study are summarised below.

General

1. There are over 65,000 employees working across different sectors that could require some level of training to support the uptake of hybrid and electric vehicles in Scotland. Two thirds of these are employed in the automotive retail sector and one third in the emergency services
2. Current demand for hybrid/ electric vehicles is relatively low compared to traditional internal combustion engine vehicles. This means there is currently a limited economic/commercial incentive for parts of the automotive retail sector to train staff in this area. However, the projected significant increase in demand provides an economic/commercial incentive to develop the hybrid/electric vehicle skills to meet this future demand
3. Recent historic trends in sales of hybrid/ electric vehicles, combined with future projections, indicate rapid growth, with hybrid/ electric vehicle sales expected to account for 60% of total annual vehicle sales and represent 30% of all cars and vans on the road by 2030. There is a clear need to increase the number of staff skilled in selling, repairing and maintaining hybrid/ electric vehicles alongside those in the emergency services responsible for dealing with road traffic incidents

Vehicle repair and maintenance

4. The lack of a visible, qualified workforce in repair and maintenance is likely to have some impact on demand for hybrid/ electric vehicles as some consumers may view this as a barrier to ownership. This limitation on demand, in turn, creates a barrier to investment in training by some garages as they do not see enough potential income to provide a reasonable payback on the cost of staff training and equipping their facility to work on hybrid/ electric vehicles. There is, however a recognition that the hybrid/electric vehicle market is growing with 76% agreeing or strongly agreeing that

hybrid/electric vehicle repair and maintenance will be a necessary part of their business in future

5. Current provision of training for hybrid/ electric vehicle repair and maintenance is mainly carried out by vehicle manufacturers and private sector training providers. Colleges in Scotland have recently (with support from Transport Scotland and ESP) been increasing the number of automotive training staff with the qualifications necessary to train students on working with hybrid/ electric vehicles. The delivery of hybrid/electric vehicle repair and maintenance training by these colleges has mainly been through continuous professional development of existing garage staff (and others, such as emergency services). Currently seven of the sixteen colleges in Scotland that provide automotive training also offer training in repair and maintenance of hybrid/ electric vehicles
6. The majority of new entrants to the repair and maintenance garage sector come via the Modern Apprenticeship route and there is no mandatory requirement to teach hybrid/electric vehicle repair and maintenance skills in the MA Frameworks. Some colleges do offer 'bolt-on' hybrid/electric vehicle qualifications from either IMI or City & Guilds but overall this is limited to approximately 10% of those qualifying via the automotive MA route. This is, in part, due to the current mandatory requirements of the MA Framework taking up the available teaching time. Feedback from colleges suggest it is easier to fit hybrid/electric vehicle training into full time courses as there is more time available for additional elements to be included. Any change to the MA Framework to include a mandatory element of hybrid/ electric vehicle repair and maintenance must be driven by the sector
7. There are a good range of hybrid/electric vehicle qualifications available for training providers to deliver. The Institute of the Motor Industry is the market leader in this area and they also accredit hybrid/electric vehicle repair and maintenance training courses delivered by vehicle manufacturers. City & Guilds also offer qualifications in this area and both these and the IMI courses form the basis of the training offers available through Scottish colleges
8. It is estimated that there have been 930 hybrid/electric vehicle certifications issued in Scotland since they were made available. Due to the fact that multiple certifications can be issued to a single candidate and that participants can come from outside the automotive retail sector (e.g. from emergency services) it is difficult to calculate an exact proportion of repair and maintenance staff that are qualified to work on hybrid/electric vehicles. However, data from the survey suggests the figure is currently less than 10%
9. Although the percentage of the overall repair and maintenance workforce that are qualified to work on hybrid/ electric vehicles is less than 10%, the survey findings indicate that 31% of garages offer services to repair and maintain hybrid/ electric vehicles
10. There is a significant difference between independent garages and franchised dealers. Just over one quarter of independent garages offer repair and maintenance services for hybrid/ electric vehicles compared to nearly two thirds of franchised dealers. The closer relationship between franchised dealers and manufacturers means there are

stronger commercial incentives for these garages to develop the necessary skills for their staff and a clearer path to access the necessary training

11. The most common reasons for garages not currently offering hybrid/ electric vehicle repair and maintenance services are: lack of demand (77%), staff not being qualified (70%), concerns about the safety of staff (45%), lack of correct facilities/equipment (37%), lack of clarity about what training/qualifications are required (34%), lack of training budget (34%) and, uncertainty about where to obtain the correct training/ qualifications (25%)
12. Feedback from the private training provider sector highlights that there are limited options for garages to access financial support to upskill existing vehicle technicians. It was highlighted that a Level 8 qualification exists in England which provides a mechanism to reduce the cost of CPD for existing vehicle technicians, but that this is not currently available in Scotland
13. Of those garages not currently offering hybrid/ electric vehicle repair and maintenance services, 43% plan to do so in the future. Of the group that plan to start offering the service, 38% plan to do so in the next 12 months and 44% plan to do so in the next 1 to 3 years. A greater percentage of franchised dealers are likely to offer hybrid/electric vehicle repair and maintenance services in the future (70%) compared to independent garages (41%)
14. A total of 29% of repair and maintenance garages have staff with recognised qualifications/accreditations in repairing and maintaining hybrid/ electric vehicles. However, the garages with qualified/accredited staff do not align completely with those offering hybrid/ electric vehicle repair and maintenance services, meaning that some garages are providing the service without staff specifically qualified/accredited in this area and some garages with qualified/accredited staff are not providing the service
15. A significant number of garages are providing hybrid/electric vehicle repair and maintenance services without having staff with recognised qualifications/ accreditations in this area. Of the total number of independent garages currently providing hybrid/ electric vehicle repair and maintenance services, 32% do not have staff with recognised qualifications/accreditations specifically relating to working on hybrid/electric vehicles
16. Of those garages that do not currently have staff with recognised qualifications/accreditations in repairing and maintaining hybrid/electric vehicles, 38% plan to do so. Of this group who plan to have qualified/accredited staff in future, 46% plan to do so in the next 12 months with 40% planning to do so within 1 to 3 years
17. There is very strong support (90%) for an industry standard to enable garages to demonstrate competence in repairing and maintaining hybrid/electric vehicles to consumers. The emerging Auto ESURE initiative from the SMTA will address this
18. There is very strong support (92%) for staff with qualifications/accreditations in hybrid/ electric vehicles to be professionally registered and have continuous updated training and assessment. The IMI TechSafe Register addresses this
19. The key barriers identified as influencing the development of hybrid/ electric vehicle repair and maintenance skills include:

- a. Consumer demand for hybrid/ electric vehicles is perceived by many as being limited. This view impacts on the commercial attractiveness of investing in staff training, facilities and purchase of equipment to enable garages to offer repair and maintenance of hybrid/ electric vehicles. Part of the reason for lack of demand may be that some consumers factor in the availability of repair and maintenance garages in their decision about whether to purchase a hybrid/ electric vehicle. The projected increase in demand for hybrid/electric vehicles presents a more attractive case for investing in staff skills
- b. Concern about staff safety has been highlighted, mainly in the context of the increasing range of hybrid/ electric vehicles and challenges in accessing data about them from manufacturers
- c. The role of Modern Apprenticeships in increasing skills in hybrid/ electric vehicle repair and maintenance is limited. There is no requirement for this area to be covered in the Automotive MA Framework (as it is not a mandatory element of the National Occupational Standards) and this could be regarded as a missed opportunity to upskill new entrants. It was also noted that changing the National Occupational Standards has to be driven by industry and this can be a lengthy process
- d. There is a significant level of uncertainty within garages about what qualifications/ accreditations are required to safely work on hybrid/electric vehicles (with 32% of independent garages offering hybrid/electric vehicle repair services without any staff with recognised qualifications/ accreditations) and where to access it
- e. A limited (or no) training budget was highlighted as a barrier to developing skills by just over one-third of garages that do not currently offer hybrid/electric vehicle repair and maintenance services
- f. The limited availability of hybrid/ electric vehicles available to colleges is a barrier to them being able to offer practical training

Vehicle sales

20. A significant majority of vehicle retailers (68%) agree that hybrid/electric vehicle sales will be a necessary part of their business in the future
21. Of all vehicle retailers, 27% currently sell hybrid/ electric vehicles. There is a significant difference in the proportion of franchised dealers selling hybrid/ electric vehicles (64% of the total number of franchised dealers) and independent vehicle retailers selling hybrid/electric vehicles (11% of the total number of independent vehicle retailers)
22. Of those vehicle retailers that do not currently sell hybrid/ electric vehicles, 36% intend to do so in the future and 49% are unsure. A perceived lack of current customer demand is the main reason for this uncertainty
23. Within the group of vehicle retailers not currently selling hybrid/ electric vehicles, but plan to do so in the future, there is a significant difference in the proportion of independent vehicle retailers (28%) and franchised dealers (78%)
24. Of the vehicle retailers that do not currently sell hybrid/ electric vehicles but plan to do so in the future, 28% plan to make this change in the next 12 months and 38% plan to do so in the next 1 to 2 years

25. The importance of specific training is widely recognised by vehicle retailers, with 88% agreeing that it is important that their staff receive specific training if selling hybrids/ electric vehicles
26. Of all vehicle retailers, 26% have employees who have received specific training to help them sell hybrid/ electric vehicles. The majority of this training was provided by vehicle manufacturers, indicating that this is being carried out for franchised dealer staff. There are limited training options for independent vehicle retailers to provide hybrid/ electric vehicle training for sales staff
27. A significant minority (38%) of vehicle retailers are unsure or disagree that they have a good understanding of what training sales staff require and where to access relevant training. There is very strong support (92%) for online training being a practical way to improve knowledge for staff involved in selling hybrid/ electric vehicles
28. There is very strong support (87%) for an industry standard for garages to demonstrate competence to consumers in providing advice and selling hybrid/ electric vehicles. The Electric Vehicle Approved standard has been developed by the National Franchised Dealers Association and the Energy Saving Trust with support from the Office for Low Emission Vehicles. This is open to franchised dealers and independent vehicle retailers
29. The key barriers identified as influencing the development of hybrid/ electric vehicle sales skills include:
 - a. Relatively low current consumer demand for hybrid/ electric vehicles is limiting the immediate economic/commercial incentives for vehicle retailers to sell hybrid/electric vehicles and train staff to do so. However, the projected significant increase in the uptake of hybrid/electric vehicles means building skills for future demand is more attractive
 - b. There are limited training options for independent vehicle retailer sales staff to improve knowledge about hybrid/electric vehicles
 - c. Some garages identify that having limited/ no training budget to support vehicle sales training as a barrier, especially as many perceive there is a current lack of demand for hybrid/ electric vehicles
 - d. Vehicle retailer uncertainty about what training for vehicle sales staff is required (and where to access it) acts as a barrier to skills development

Emergency services

30. It is estimated that 22,000 emergency service personnel could require varying levels of training in how to safely work at the scene of a road traffic incident involving hybrid/ electric vehicles (including 2,400 paramedic/advanced paramedics, 13,200 police officers and 6,400 firefighters). In addition to this, there are a significant number of volunteer firefighters (particularly in rural areas) that would also require training
31. The key barriers identified as influencing the development of hybrid/ electric vehicle skills for emergency service personnel include:
 - a. The approach to addressing this issue is at an early stage across the emergency services and there has been some previous research into this area that suggests a national approach at a UK level is required. This is happening in the context of some bottom-up piloting of approaches at a Scottish level. Co-ordinating and aligning these developments will be required

- b. The task of training up to 22,000 employees is significant, and the time and financial resources required to plan and implement it is not currently budgeted for
- c. There is limited access to hybrid/electric vehicles for firefighters to develop rescue processes and carry out practical training on
- d. There is a lack of data available about the increasing range of hybrid/ electric vehicles (e.g. the location of the battery isolator switch) and this can cause operational challenges with health and safety implications

Roadside assistance and recovery

- 32. The roadside assistance and recovery sector can be regarded as facing similar issues to vehicle repair and maintenance garages. Whilst there is some evidence of best practice in training staff to a high level there are also many small operators that do not yet see sufficient demand to invest
- 33. There is sector specific training available for the vehicle assistance and recovery sector on hybrid/ electric vehicles, developed by the trade body, the Institute of Vehicle Recovery. This qualification is being used as a requirement in the procurement of recovery services by police authorities in England
- 34. In addition to the barriers noted for repair and maintenance garages, the key barriers identified as influencing the development of hybrid/ electric vehicle skills for roadside assistance and recovery operators include:
 - a. Vehicle recovery operators having a relatively high turnover of operatives and a significant proportion of these leave the sector. This acts as a barrier to investment in training
 - b. Vehicle recovery operators seeking to offer service for hybrid/electric vehicles will need to invest in recovery trucks capable of lifting rather than towing as towing can create a charge when the wheels rotate

Charging infrastructure repair and maintenance

- 35. There is support, at both a trade body and company level, for staff working on charging points to have a minimum level of qualification equating to a qualified electrician plus specific training on working on charging points
- 36. The key barriers identified as influencing the development of skills for repair and maintenance of charging points include:
 - a. The lack of formal recognition that those who install, repair and maintain charging points should be a qualified electrician plus have specific training
 - b. There is some evidence that warranties on charging points are limiting the options about who can work on them, with manufacturer training being required to keep the warranty valid. Accessing this training can be limited to approved installers
 - c. The accessibility of specific charging point training was highlighted as an issue (by a charging point installer based in the Highlands and Islands region)

Appendix A – Contributors to the research study

A total of **269 motor trade garages** provided input to the study via the survey of Scottish Motor Trade Association members.

A total of **ten companies involved in the repair and maintenance of electric vehicle charging points** also contributed to the study by responding to a separate survey.

In addition to the above, the following organisations participated in stakeholder interviews and/or attended a stakeholder workshop to discuss the key findings of the research:

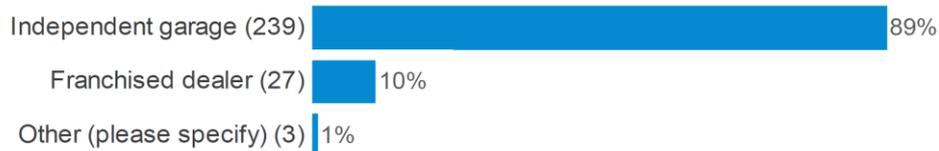
Aberdeen City Council	John Clark Motor Group
Adam Purves & Sons	Moray Firth Training Group
Aquatera (Orkney ReFLEX project)	National Franchised Dealers Association
Dingbro	New College Lanarkshire
Dumfries & Galloway College	Orkney Islands Council
Dundee and Angus College	People’s Ford
Edinburgh City Council	Police Scotland
Edinburgh College	Remit Training Scotland
Energy Saving Trust	Robert Lawson & Sons
ESP	Scotland Excel
Fife College	Scotland’s Electrical Trade Association
Glasgow City Council	Scottish Enterprise
GTG Training	Scottish Fire and Rescue Service
Halfords	Scottish Motor Trade Association
Highlands and Islands Enterprise	Solo Energy (Orkney ReFLEX project)
Institute of the Motor Industry	The Highlands and Islands Transport Partnership
Institute of Vehicle Recovery	Transport Scotland
Inverness College	West College Scotland
	West Lothian College

Appendix B - Profile of the SMTA member survey respondents

The profile of the 269 garages providing feedback through the SMTA member survey is summarised below.

Most respondents were independent garages and the balance between them and franchised dealers is broadly similar to the total population:

What type of business do you represent? *Tick one only*



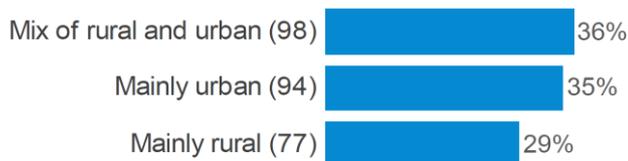
Most respondents operate from a single site:

Do you operate at a single site or multiple sites? *Tick one only*



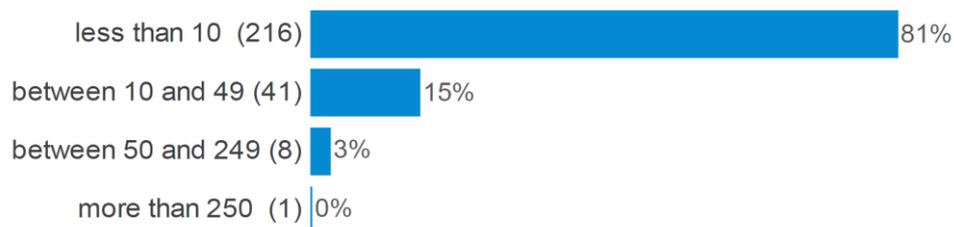
The sample contained representation from different types of garages in terms of the rural/urban location of the customers they service:

How would you best describe the area your business operates in? *Tick one only*



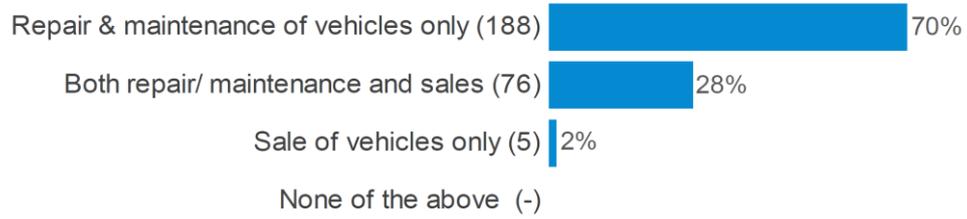
A significant majority of respondents had less than 10 employees:

How many staff do you have in total based in Scotland? *Tick one only*



The sample contained garages active in repair and maintenance and vehicle sales:

Which of the following activities is your business involved in? *Tick one only*





Business
Growth

Economic
Development

Technology
Commercialisation

Head Office:

Optimat Limited
Torus Building, Rankine Avenue,
Scottish Enterprise Technology Park,
East Kilbride
G75 0QF, United Kingdom

Tel: +44 (0)1355 272 800

Email: resource@optimat.co.uk

Web: www.optimat.co.uk