Automobile Training Board

Manpower Update Report
Automobile Industry
2022

ACKNOWLEDGEMENT

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Introduction

Background

The Automobile Training Board (AUTB) of the Vocational Training Council (VTC) is responsible for determining the manpower demand of the industry, assessing whether the manpower supply matches manpower demand, and recommending to the VTC the development of vocational and professional education and training (VPET) facilities to meet the assessed training needs.

A new approach to collect manpower information is adopted to enhance the effectiveness and better reflect the dynamics of the manpower situation in the various industries.

Under the new approach, one full manpower survey is conducted every four years, and this is supplemented by two Manpower Update Reports. The AUTB completed its

last manpower survey in 2019. This 2022 Manpower Update Report is the second manpower update of the industry following the last Mnapower Update Report published in 2021.

This 2022 Manpower Update Report comprises:

(a) focus group meetings collecting views from industry experts on the latest developments in the industry, manpower and training needs, recruitment difficulties, and measures to tackle the challenges which the industry is facing; and

(b) desk research analysing online job advertisements including salaries offered, qualifications, experience and skills required by the principal jobs in the automobile industry.

Objectives

The objectives of the manpower update are:

(i) to examine the latest trends and developments in the industry;

(ii) to explore the job market situation and training needs;

(iii) to identify the recruitment challenges; and

(iv) to recommend measures to meet the training needs and to ease the problem of manpower shortage.

Methodology

Overview

With reference to the 2019 full manpower survey of the automobile industry, this update report aims to provide qualitative descriptions of the recent development of the industry through focus group meetings, supplemented by referring to quantitative data of online recruitment advertisements obtained from desk research.

Focus Group Meeting

The focus group members are representatives from different industry sectors, including passenger and commercial vehicles dealers, bus company, garages, auto-parts suppliers, government departments and an education institute. All members are experienced and knowledgeable practitioners of the automobile industry.

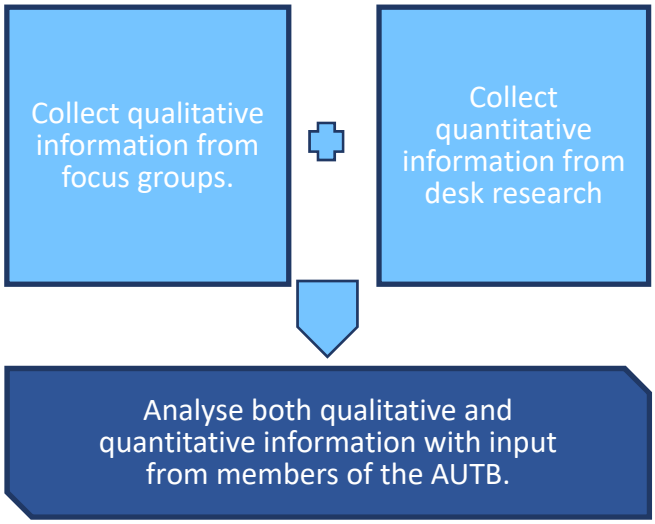
Two focus group meetings were conducted on 19 and 22 July 2022. A moderator led members to in-depth discussion on topics selected by the Working Party on Manpower Survey of the AUTB. The discussions at the meetings were recorded and transcribed to facilitate analysis.

Desk Research

Recruitment records covering the period between **Quarter 2 of 2021 and Quarter 1 of 2022** were collected through an employment information system specially developed to capture the relevant data from major online recruitment portals. Some **633** recruitment records relevant to the automobile industry were collected during the research period and served as indicative information of the job market trend. The list of related companies under the Hong Kong Standard Industrial Classification (HKSIC) was mapped to remove duplicated records.

Data Analysis

The analysis consists of the following three steps:



Limitations

As this is not a full manpower survey, the findings and recommendations of the focus group meetings are more qualitative in nature, and the report focuses mainly on manpower trends. The information on job advertisements was collected from major recruitment websites and the Labour Department. Other channels, such as head-hunting for managerial positions, were not covered. Since the data collected is a snapshot of a particular period without reference to any historical data, this can serve as reference information supplementary to the findings of focus group meetings.

Findings

Factors Affecting the Development of the Industry

Global Business Environment

A1. Green Economy and Electric Vehicles

According to the United Nations, the carbon emissions from transportation accounted for more than 25% of global greenhouse gas emissions[1]. Electric vehicles (EVs) are more environmentally friendly, and their energy efficiency can be three times[2] higher than those of Internal Combustion Engine (ICE) vehicles.

In recent years, governments have been emphasising the importance of developing a green economy worldwide, and the general public has begun to focus on environmental issues. However, considering the dominating global ICE car market, it is unlikely that everyone will switch to EVs in a short time. Moreover current EV technology cannot meet the operational needs of some commercial vehicles. Therefore, a full transition from ICE vehicles to EVs will take time.

A2. Growing EV Market

Global EV sales accounted for 17.9%[3] of the total vehicle sales market in 2021. In

[1] Second United Nations Global Sustainable Transport Conference, October 2021 https://news.un.org/zh/story/2021/10/1092792

[2] Electric vehicles: An efficient choice for transportation and the grid https://energyefficiencyday.org/electric-vehicles-an-efficient-choice-for-transportation-and-the-grid/

[3] EE Times, 電動車進入高速成長軌道 未來市場發展將面對三大挑戰, April 2022 https://www.eettaiwan.com/20220426nt21-ev-market-trend/

2022, the EV market will grow to around 20.9 million units, maintaining a high growth rate of over 40% from 2021. The EV market is expected to reach 51 million units by 2027. By then, the EV market would officially surpass that of ICE vehicles.

Despite the increasing demand for EVs in the global market, there has been a shortage of new vehicles in the market, due to delays, insufficient raw materials, factory shutdowns arising from the pandemic. Vehicle production relies heavily on the supply of spare parts. When the supply chain is affected and overall shipment decreased, this results in vehicles' production (either ICE vehicles or EVs) not catching up with the market demand.

A3. The Intelligence of Automobile Manufacturing

Reports indicated that the automotive industry was far ahead of others in applying smart production in factories. It had been expected that 44% of the factories would become intelligent within five years. Furthermore, the investment would increase by 60% over the next three years. The total market value is expected to reach US$167 billion (HK$1.3 trillion), and the industry's overall productivity to increase by 15.1% to 24.1%.

With the technological advancement, the automobile manufacturing industry has been accelerating to become intelligent. For example, automated assembly robots and integrated moulding are adopted in automobile manufacturing. These new technologies will enable more efficient automobile manufacturing, higher productivity and throughput. Besides, the new technologies and designs reduce the overall number of parts required for a vehicle, making it less difficult to repair, and thus shortening the time required for maintenance.

A4. Autonomous Driving in the Future

Autonomous driving is a significant trend of development, which will change the way people travel and the trend of urban planning. However, as the technology is still being tested and a recent survey report[4] showed most consumers remained sceptical about autonomous driving technology, it would take time to enhance its reliability, safety and adoptation, including related regulations and insurance issues that need to be addressed.

The trend toward electrification and intelligence has always been in the automobile industry, and the rise of EVs has accelerated the whole process. Electrification and intelligence requires the integration of peripheral equipment, and the changing needs of electronic components in

[4] AutoPacific, "Consumers aren't comfortable with fully autonomous vehicle technology; want proven track record", March 2022 https://www.autopacific.com/autopacific-insights/2022/3/8/consumers-arent-comfortable-with-fully-autonomous-vehicle-technology-want-proven-track-record

a vehicle would change the entire supply chain. The components used and the repair maintenance are also different from the past. Hence, the training of the servicing workforce needs to keep pace with the changes.

A5. Automobile Industry in the Post-Pandemic Future

Whenever there are new models to be introduced, vehicle manufacturers would provide relevant training and spare parts to support. Due to the pandemic outbreak and the respective isolation measures, there has been a lack of overseas training and research abroad opportunities, preventing relevant staff from effectively mastering the industry's most cutting-edge technologies.

The rise in the transportation costs, manufacturing and operating costs have affected the costs and supply of the raw materials, machines, components and repair parts. To a certain extent, it affected the strategy and policy of car manufacturers in launching new models. The increased costs might be directly reflected in the price of new vehicles which would adversely affect the sales of new cars.

Fuel vehicle spare parts remains in consistent demand as ICE vehicles continue to be the majority on the road. At this stage of change, vehicle manufacturers and parts suppliers are therefore required to attend to the development of both EV and ICE vehicles, and to find a balance and allocate resources in warehousing and logistics among the two markets.

Local Business Environment

According to the statistics published by the Transport Department HKSARG in March 2022[5], the number of EVs first registration in the year 2021 recorded a two-fold increase over last year, representating 24% of the total newly registered private cars in Hong Kong. In March 2022, the number of newly registered EVs surpassed petrol private cars for the first time, and amounted to 5% of the total private cars registered.

B1. Vehicle Servicing Industry

Although EVs have been emerging rapidly in the local market, its market share is lagging with the supply of new vehicles and parts being short to meet the demand. ICE vehicles hence will remain the mainstream in the future and continue to command most maintenance and repair services. Local vehicle repair merchants are thus eager to recruit vehicle mechanics and vehicle electricians to continue providing the necessary services to customers.

Most traditional vehicle repair merchants are not able to repair large-sized spare parts and replace batteries for EVs, as it is usually

[5] Transport Department, First Registration of Private Cars by Make, First Registration Vehicle Status, Fuel Type and Body Type, March 2022
https://www.td.gov.hk/filemanager/en/content_5149/table41e.pdf

not easy to find the appropriate parts for EVs, and that could be fairly expensive. Some garages also do not possess the necessary knowledge and competence in repairing electronic components, motors and batteries. Therefore, despite the cost, maintenance and repairs provided by the manufacturers are essential, especially for EVs.

In addition, the built of EVs and ICE vehicles are very different, which requires different knowledge and skill sets. The previous mechanical and electrical bifurcations are now required for both EV and ICE vehicle maintenance. In addition, the skilled workforce has to keep up with the times to be competent in repairing highly electronified models.

In the meantime, the automotive industry has begun to train electromechanical talents to enable the sustainable development of new energy vehicles locally. The upcoming trend is electromechanical integration, and the concerned skilled workforce, especially the front-line maintenance personnel, needs to be retrained. Therefore, training for existing and new practitioners to master the critical skills are both vital.

B2. Electric Commercial Vehicles

Apart from private cars, commercial vehicles were also moving towards using green energy, including electric vans, buses, taxis and goods vehicles. In terms of commercial vehicles, local franchised public bus companies are gradually introducing electric double-decker buses. To expedite the low carbon transformatioin in the transport sector, the Government plans to conduct trials of new generation electric taxis, hydrogen fuel cell electric double-deckers and heavy vehicles in 2023. A roadmap for the promotion of electric public transport and commercial vehicles will also be announced by 2025.

Government Policy

Hong Kong Roadmap on Popularisation of Electric Vehicles

To promote the adaptation and their associated supporting facilities of EVs, the HKSAR Government announced the Roadmap with clear timeline to achieve zero vehicular emissions by 2050. The key measures under the Roadmap cover various aspects on private cars, commercial vehicles, government fleet, charging network, maintenance services and battery recycling, Others like subisidies and tax concessions are also offered.

Cessation of New Registration of Fuel Vehicles by 2035

The HKSAR Government has been promoting the use of EVs by offering first registration tax concessions for EVs, including both commercial and private vehicles. On the other hand, the HKSAR Government has promulgated to cease new registrations of ICE private cars, including hybrid vehicles by 2035, and set a timeline for the public to

follow. The target will prompt stakeholders to prepare for better transition to EVs, for instance, to plan for charging facilities, more models of private cars of different price levels to be introduced to the market.

Fuel and maintenance costs and convenience are the key factors for consumers in choosing vehicles. As soon as support facilities like charging stations for EVs could catch up, the public would actively consider replacing their vehicles with EVs.

Voluntary Registration Schemes

The HKSAR Government introduced the Voluntary Registration Scheme for Vehicle Mechanics and the Voluntary Registration Scheme for Vehicle Maintenance Workshops in 2007 and 2015 respectively, which aims to facilitate the public to identify registered vehicle mechanics easily and uplift the professional image of the vehicle maintenance trade. As of July 2022, around 8 240 (about 80%) mechanics, and 2 064 (about 74%)[6] workshops were registered under the schemes.

Infrastructure

D1. Smart City and Charging Facilities

Increasing number of charging facilities, especially fast charging piles, would meet the growing needs of EV drivers and encourage the switch to EVs. It will also reduce the queues for charging EVs.

Hong Kong is moving towards a smart city. Intelligent infrastructure and new communication technologies would enable people to enjoy a more convenient and safe travel experience. Smart cities are a big topic for the future, and with new intelligent facilities and networks to come, it would benefit the EV development and drivers.

D2. Recycling of EV Batteries

In addition to actively promoting EVs, related facilities should keep pace with the development. Battery recycling is another key issue. Rechargeable batteries are available in both hybrid vehicles and EVs. The recycling sites, related equipment, staff training and the current regulations must be up to date to prepare for the arrival of green travel.

Batteries retired from EVs might not meet the specifications to be re-used in automobiles. However, there could be a second life in other less demanding applications, such as to power smart lampposts and smaller storage devices. In addition, implementation of a producer responsibility scheme could enhance a proper collection and disposal of retired EV batteries.

[6] Electrical and Mechanical Services Department, RVM Newsletter, Issue 38, August 2022 https://www.emsd.gov.hk/filemanager/tc/content_654/RVM_news-38_tc.pdf

D3. Viable Alternative – Hydrogen Fuel Cells

There are approximately 7,000 franchised public buses and 18,000 taxis in Hong Kong. Given land scarcity in Hong Kong and the long refueling time for the long-travelled vehicles, it is a challenge to locate sufficient and proper sites for charging facilities to support commercial vehicles if they are all EVs. In addition, the charging time for commercial vehicles could take very long, not to mention the short running distance after charging.

Hence, other energy source are being explored, such as hydrogen fuel cell technology, that a refill can be completed in minutes. Town gas contains 46-50% hydrogen in its chemical composition, and the existing pipelines network are widely distributed in Hong Kong. Further studies could explore upgrading the existing liquefied petroleum gas refiling stations to cater for the service need, providing a viable alternative to battery-powered electric vehicles.

Manpower Demand

Findings of Desk Research

Out of some **633 entries** of recruitment advertisement captured in desk research during the desk research period **(Q2 of 2021 to Q1 of 2022)**, the respective top five principal jobs with the highest number of recruitment advertisements for vehicle servicing and auto/parts retail sectors were identified. Since the use of online recruitment portals is just one of the recruitment channels, the number of recruitment advertisements captured during the desk research period (i.e., Q2 of 2021 to Q1 of 2022) is presented as supplementary information for reference only.

Vehicle Servicing Sector

	Top Five Principal Jobs with most job advertisements (2022 Desk Research)
1	Vehicle Mechanic (Craftsman Level) (29.1%)
2	Vehicle Body Repairer (Craftsman Level) (12.8%)
3	Service Manager (Managerial Level) (4.6%)
4	Car Detailing Worker (Craftsman Level) (2.5%)
5	Vehicle Electrician (Craftsman Level) (1.9%)

Auto / Parts Retail Sector

	Top Five Principal Jobs with most job advertisements (2022 Desk Research)
1	Customer Services Assistant (Operation/Clerical Support) (15.5%)
2	Marketing Officer (Supervisory Level) (6.5%)
3	Customer Services Supervisor (Supervisory Level) (5.8%)
4	Sales Manager (Managerial Level) (5.7%)
5	Marketing Manager (Managerial Level) (2.5%)

Trends

The number of ICE vehicles on the road would be gradually replaced by EVs. So, the vehicle servicing workers should be equipped with the new skill sets. Skills like troubleshooting and repairing the electrical system in EVs and hybrid vehicles will be in demand.

Meanwhile, the supply of new blood however cannot fully compensate for the natural wastage (e.g. retirement). Hence, there are vacancies available across different principal jobs in the industry, particularly Vehicle Mechanic, Vehicle Body Repairer and Customer Services Assistant.

Training Needs

At this stage of transition from fuel vehicles to EVs, in addition to the knowledge and skill sets of maintaining fuel vehicles, the automotive workforce should also develop skill sets to serve the growing new energy vehicles. It is expected that fuel vehicles will continue to be in service for the next decade, and the related maintenance needs will continue to exist.

Computer and English Literacy

Since EVs rely on computers for diagnosis, the maintenance workforce needs to be equipped with the necessary knowledge of using computers to facilitate their work, especially automotive maintenance software. In addition, most of the maintenance documents and files of new energy vehicles are written in English. Therefore, the upcoming skilled workforce requires a certain level of English

proficiency.

Maintenance/Repairing Services with high-voltage components

As there are high-voltage components in the electrical system of EVs and hybrid vehicles, most local garages only provide maintenance/ repairing services for the mechanical systems, e.g. brakes and suspension, etc. Nevertheless, they should also know how to identify the high voltage connections in EVs and hybrid vehicles; and to disconnect the battery and shut down the high voltage connections.

Until the volume for EV servicing reaches a certain level, few garages will invest in full the hardware and software to provide complete maintenance/ repairing services to EVs and hybrid vehicles. Hence, the training needs will continue to grow mildly in the coming few years.

Petrol and Diesel Vehicles

As the ICE vehicles are still dominant on the road, demand for its maintenance remains. There is also a trend of increasing use of electronics components in a vehicle. In order to provide effective services to customers, vehicle service workers should understand the underlying working principles of electronics components in conventional ICE vehicles and the more frequent use of computerised diagnostic tools.

EVs and Hybrid Vehicles

The built of EVs and conventional vehicles are very different. Most conventional vehicle parts are mechanical, while EVs are propelled by battery-powered electric motors and involve less mechanical parts but more power electronics and electrical systems. Hence, repair and maintenance of EVs require knowledge of power electronics and electrical engineering, which is a skill set completedly different from what the existing and convention vehicle mechanics possess.

Recruitment Challenges

Automobile employers are facing challenges in recruiting and attracting talents to alleviate the impact brought forth by an aging workforce. Focus Group Members shared their views on the possible factors causing the recruitment difficulties.

Limited Number of Young Talents

Parents prefer children to pursue higher education, and most are under no financial pressure to have them worked early to support the family. Occupation with more regular working hours, faster advancement opportunities and better pay and work conditions are preferred also. All these may discourage young talents from choosing the automobile industry as their

career.

Perception of the Industry

The automobile servicing industry gives people an impression of manual work. Young talents are reluctant to join, resulting in a shortage of new recruits. At the same time, the salary may not be as competitive as many industries, while every industry is striving for new blood. The rise in the popularity of EVs, however, may bring a change to this situation. The majority of the diagnoses of new energy vehicles and repair services are enabled by advanced technologies, providing a considerably more favourable working environment and professional image than the traditional rapair and maintenance industry. All these factors can change the public's view of the automotive servicing industry positively.

Keen Competition among Automobile Employers

Some Focus Group Members expressed that most VTC trainees prefer to work in government departments, dealers and bus companies because of the better working environment, remuneration packages and more structured training programmes. Hence, garages and vehicle workshops in recent years have become harder to recruit and retain trainees.

RECOMMENDATIONS

To attract talents and meet the future development of the industry, the following measures involving the joint efforts of training institutions, Government, employers, and graduates/employees are recommended:

Training Institution

- Keep abreast of the latest technological advancement and collaborate with automobile companies to design training programmes in support of the EV trend and development;
- Broaden course promotion to the different student populations and ethnic minorities;
- Cooperate with vehicle manufacturers to offer more in-service training courses on new vehicle technologies; and
- Strengthen the use of e-learning and AR/VR technologes for in-service training.

Government

- Help uplift the professionalism of the trade to attract more young people to join the automobile industry through promoting the current Voluntary Registration Scheme for Vehicle Mechanics and the Voluntary Registration Scheme for Vehicle maintenance Workshops towards a mandatory registration; and
- Enrich the existing voluntary vehicle maintenance registration system by adding a dedicated service category particularly for EV maintenance mechanics and workshops.

Employers

- Recognise the emerging needs for service and knowledge upgrade to meet the industry demand, and actively support employees' learning and training accordingly;
- Make use of government's subsidy scheme, e.g. Reindustrialisation and Technology Training Programme (RTTP), for staff training;
- Participate in the Earn & Learn Scheme to recruit and retain more apprentices;
- Support the Workplace Learning and Assessment (WLA) which aims at integrating learning and practice to gauge the practical skills of students and their ability to utilise professional knowledge; and

- Participate in the Pilot Incentive Scheme to Employers (PISE) so that employers could have a comprehensive understanding of trainees' competencies and performance through structured workplace assessment activities. While receiving subsidies upon the completion of the workplace assessment, training activities could also be fine-tuned based on trainees' assessment results to enhance performance.

Graduates and Employees

- Be prepared to equip news skills and knowledge in EVs and other new energy vehicles to cater for the rising demand and changing requirements for EV maintenance;
- Make use of the Vplus Engineering Subsidy Scheme to pursue a higher qualification in part-time mode;
- Embark a life-long learning journey throughout the career by attending skill upgrading courses, workshops, and seminars; and
- Attend relevant trade tests, if required, to gain recognition of the trade competencies and fullfil the registration requirements of the Voluntary Registration Scheme for Vehicle Mechanics.