Electrical and Mechanical Services Training Board

Manpower Update Report

Electrical and Mechanical Services Industry

2025

ACKNOWLEDGEMENT

The Electrical and Mechanical Services Training Board (EMTB) would like to express its gratitude to the focus group members for their valuable time and insights into the manpower situation in the Electrical and Mechanical (E&M) services industry. The views of focus group members and information from major recruitment portals such as JobsDB, Recruit and Interactive Employment Services of the Labour Department formed an integral part of this report.

Contents

Introduction

Background

The EMTB of the Vocational Training Council (VTC) is appointed by the Hong Kong Special Administrative Region (HKSAR) Government. According to its Terms of Reference, the EMTB is responsible for determining the manpower demand of the electrical and mechanical (E&M) Services industry, assessing whether the manpower supply matches the manpower demand, and recommending to the VTC the development of vocational and professional education and training (VPET) facilities to meet the assessed training needs.

Since 2017, VTC's Training Boards have adopted a four-year cycle approach for collecting manpower information, with a view to enhancing the effectiveness and better reflecting the dynamics of the manpower situation in industries.

Each four-year cycle consists of one full manpower survey and two manpower updates. The full manpower survey collects companies' manpower data through questionnaires, whereas the manpower updates rely on desk research and focus group meetings.

For the four-year cycle covering April 2021 to March 2025, the EMTB completed its full manpower survey in 2021 and conducted its manpower update in 2023. This report presents the findings of the manpower update conducted in 2024 and the EMTB's recommendations to the Government, employers and educational institutions.

The contents of this manpower update report are based on two information sources:

(i) focus group meetings to collect industry experts' views on the latest industry development, its manpower and training needs, recruitment and retention difficulties, and suggested solutions to the challenges; and

(ii) desk research to analyse recruitment advertisements, including the qualifications and experience required for principal jobs in the industry.

Objectives

The objectives of manpower update are:

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

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

(iii) to identify recruitment and retention challenges; and

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

Methodology

Overview

This manpower update report aims to provide qualitative descriptions of recent developments in the E&M services industry through focus group meetings, supplemented by quantitative findings from desk research.

Focus Group Meetings

Two focus group (FG) meetings were held in November 2024, with 15 representatives from various sectors, including E&M engineering, lift and escalator, gas, liquified petroleum gas, aircraft maintenance, electricity, and railway sectors. The participants included representatives from trade associations, employers, consulting firms, and workers' unions.

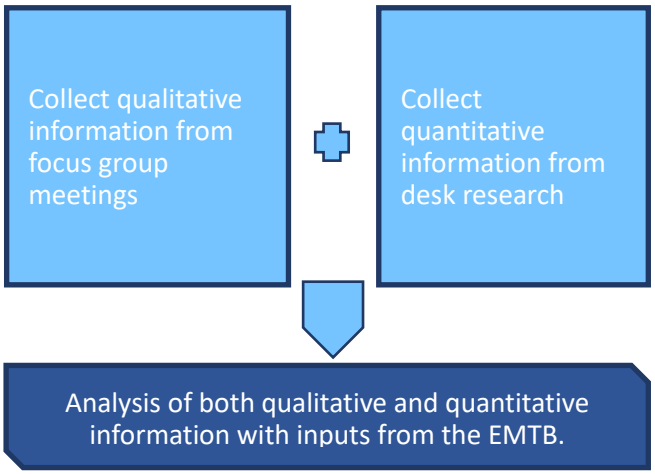
The EMTB Secretary led FG members through in-depth discussions on topics selected by the Working Party on Manpower Survey of the EMTB. The discussions were recorded and transcribed to facilitate analysis.

Desk Research

An employment information system was developed to capture recruitment advertisements from CPJobs, CTGoodJobs, JobsDB, Recruit and Interactive Employment Services of the Labour Department and other online recruitment portals, from January to December 2023 and January to December 2024. The collected records, after de-duplication[1] and a mapping process based on the company list under the Hong Kong Standard Industrial Classification, some 19,500 records relevant to the principal jobs in the E&M services industry were identified. These records were further grouped by skill levels including professional/technologist, technician, tradesman/craftsman, and semi-skilled/general worker to facilitate further analysis.

Data Analysis

The desk research analysis consists of the following three steps:



[1] Duplicate records are those advertisements with the same company, job title and contents within the past 30 days.

Limitations

Unlike traditional manpower surveys where quantitative data are collected through questionnaires, the findings of manpower updates rely on focus group meetings and desk research, which are more qualitative in nature. Hence, the manpower update reports focus mainly on manpower trends.

At present, desk research relies on job advertisements collected from recruitment portals. The coverage is definitely not exhaustive as other recruitment channels such as social media and referrals from friends are not included. As a result, a clear correlation between the number of recruitment advertisements found and the number of employees recorded in the full manpower survey could not be identified.

In addition, the data collected is a snapshot of a particular period without reference to historical data. Hence, the findings of desk research should be treated as a reference only. They should not be directly compared with the full manpower survey figures.

Findings

Factor Affecting the Development of the Electrical and Mechanical Services Industry

During the focus group meetings, participants engaged in in-depth discussions on various factors influencing the development of the E&M services industry. These discussions explored topics such as the benefits and challenges of adopting emerging technologies, the impact of government policies and the growing demand for skilled manpower. The key insights from these discussions are summarised in the ensuring paragraphs.

Latest Trends in the E&M Services Industry

The E&M Services Sector

Government mega-projects, such as the development of the third airport runway, the Hong Kong Kai Tak Sports Park, and various new hospital projects, have long been critical drivers for the E&M services and construction industries. However, with the completion of many of these large-scale projects and a noticeable slowdown in the launch of new government projects due to economic constraints, these industries are experiencing a shifting manpower landscape.

In parallel, private developers have scaled back land acquisitions, resulting in a significant reduction in the construction of new residential buildings. This downturn has prompted many E&M professionals, who previously specialised in on-site installations for large construction projects, to transition towards E&M maintenance work.

The Electricity, Gas and Liquified Petroleum Gas Sectors

During the COVID-19 pandemic, domestic electricity and gas consumption saw a significant increase as more people stayed home due to lockdowns and social distancing measures. Remote work, online schooling, and reduced dining out contributed to this surge in residential energy use.

Post-pandemic, consumption patterns shifted notably. Hong Kong residents have continued to dine at home more frequently and tend to return home earlier in the evening, even when dining out. This behavioural change has altered traditional peak-hour electricity and gas consumption patterns, reflecting broader lifestyle adjustments.

With the full reopening of borders, Hong Kong residents have increasingly travelled to mainland China or overseas for shopping and leisure, particularly on weekends and long holidays. This trend has led to a noticeable decline in domestic energy consumption, as fewer people remain at home during these periods.

In certain remote areas or housing estates not connected to the town gas network, residents have traditionally relied on liquefied petroleum (LP) gas for energy. Some estates even use centralised LP gas tanks to supply energy. However, latest trends indicate a shift in preferences, with a growing number of residents transitioning to electricity over LP gas due to factors such as convenience and cost. Additionally, in redeveloped housing estates, gas pipelines installed during reconstruction have enabled residents to access town gas. These developments have significantly reduced demand for LP gas.

This shift reflects broader changes in energy consumption patterns and infrastructure improvements, prompting LP gas providers to reassess their strategies and explore alternative approaches to remain relevant in an evolving energy landscape.

The Railway Sector

The railway sector is actively modernising and expanding its operations to address growing transportation needs. A key focus is the development of new rail lines in Hong Kong's northern districts, aimed at enhancing connectivity for residents and facilitating mobility within the Greater Bay Area.

At the same time, the sector is upgrading its existing network by renewing outdated infrastructure and integrating advanced technologies such as digitalisation and automation. These upgrades are designed to improve efficiency, enhance passenger services, and streamline operations. Leveraging E&M expertise, the sector is incorporating smart technologies to optimise train operations, enable predictive maintenance, and elevate the overall customer experience.

Beyond Hong Kong, the railway company manages rail systems in cities such as Beijing, Shenzhen, and Melbourne. This global presence allows it to adopt best practices and gather valuable insights, which contribute to enhancing local services and advancing the skills of professionals within Hong Kong's railway sector.

The Aircraft Maintenance Sector

The aircraft maintenance sector has seen substantial advancements, particularly with the launch of the three-runway system at Hong Kong International Airport. This major infrastructure project has solidified the airport's status as a leading global aviation hub, creating both opportunities and challenges for the maintenance sector.

With the third runway now operational, the airport's capacity for flight movements has increased significantly. This rise in air traffic has directly driven higher demand for maintenance, repair, and overhaul services, as airlines and operators require more frequent and comprehensive servicing for their fleets. In response, the aircraft maintenance sector is scaling up its operations by recruiting more skilled technicians and engineers to meet this growing demand.

Adopting Advanced Technology in the Industry

Building Information Modelling

Building Information Modelling (BIM) plays a pivotal role in the preliminary stages of construction, offering detailed visual representations and fostering improved collaboration across teams. However, a skills gap has emerged in the industry. While BIM designers excel at creating detailed drafts, they often lack a strong understanding of E&M systems, resulting in designs that may not align with the technical needs of projects. Conversely, experienced E&M professionals possess the technical expertise to ensure designs are practical and workable but may lack the skills to create BIM drafts.

This disconnect between technical knowledge and digital design capabilities has created a shortage of professionals proficient in both areas, as evidenced by the high salaries commanded by those with dual expertise in BIM and E&M. To address this shortage, some consulting firms have expanded their operations to Mainland China, where a larger pool of BIM talent is available. Small and medium-sized local firms, facing financial constraints and a lack of skilled professionals, have increasingly outsourced BIM design work to Mainland China to meet project demands.

Looking ahead, with a major project in the Lok Ma Chau Loop on the horizon, the sector is emphasising the design phase, particularly in E&M engineering. Proactive steps are being taken to cultivate BIM professionals to meet the needs of this project and future initiatives.

Modular Integrated Construction

The government has been actively promoting the Modular Integrated Construction (MiC) method due to its ability to shorten construction timelines, particularly for public housing projects with standardised designs that are well-suited to modular construction. In the early stages, the MiC approach was primarily adopted for smaller private building projects. However, in recent years, there has been a shift, with more and more private developments embracing the MiC method.

The adoption of MiC presents an exciting opportunity for developers to embrace a more efficient and innovative construction method. While there is currently a gap in the availability of local professionals skilled in this technology, this challenge also presents a chance for developers to lead the way in developing expertise and advancing the industry. As MiC requires specialised knowledge and coordination, stepping outside their traditional methods [2] and adopting this approach can position developers at the forefront of the market, offering them a competitive edge.

MiC brings significant benefits, including faster construction timelines through the prefabrication of components. Though it may reduce the demand for local E&M workers on-site and impact the traditional materials supply chain, it also creates opportunities for new industry growth and

[2] 13.3% of focus group members expressed that some developers rely on traditional construction methods, which offer more straightforward cost estimation and readily available expertise. Therefore, traditional construction methods still dominate.

innovation. The method may introduce some logistical complexities, but these challenges can be overcome with strategic planning and coordination. As more developers embrace MiC, these hurdles will become easier to navigate, ultimately contributing to the wider adoption and success of this forward-thinking approach in private developments.

Multi-trade integrated Mechanical, Electrical and Plumbing

The Multi-trade Integrated Mechanical, Electrical, and Plumbing (MiMEP) technology is gaining widespread adoption in new construction projects due to its innovative approach. By integrating all E&M facilities into a single pre-constructed unit manufactured in a factory, this method allows for significantly faster and more efficient on-site installation. Workers only need to install the complete unit, rather than assembling each system individually. This streamlined process reduces construction time and boosts overall efficiency, demonstrating great promise in improving construction performance.

Since MiMEP is still a relatively new technology, there are concerns regarding maintenance challenges, such as complicated troubleshooting and increased repair times[3]. However, it is important to note that these concerns may be premature. As the MIMEP technology continues to evolve, these issues are being actively reviewed and refined. Solutions are being developed to streamline maintenance processes and minimise downtime, which will ultimately enhance operational efficiency and reduce long-term costs through more effective maintenance strategies. The ongoing evolution of MiMEP holds the promise of even greater benefits in the future, making it a valuable and increasingly reliable solution for modern construction projects.

Due to the integrated nature of the system, maintenance workers may need knowledge across multiple trades, such as electrical, mechanical, and plumbing, etc. to address issues like a failure in a particular component. As a result, workers are encouraged to develop a diverse skill set. Another consideration is that the integrated units may require thoroughly considered and carefully planned to accommodate future expansion.

Emerging Technologies

Emerging technologies are profoundly enhancing maintenance and operational efficiency across various sectors. In the E&M engineering sector, digital transformation has streamlined traditionally cumbersome processes. The shift from paper-based records to digital solutions, such as tablet-based logbooks, has improved efficiency through real-time data entry and seamless record-keeping. Additionally, the adoption of Artificial Intelligence (AI) enables the analysis of performance data to forecast potential failures, identify wear-and-tear patterns, and recommend timely interventions. These advancements significantly reduce downtime and improve operational performance, boosting reliability and efficiency.

[3] 20% of focus group members, based on early-stage observations, speculated that the maintenance work of the MiMEP unit could be more complex and challenging when it comes to addressing individual component failures directly.

The lifts and escalators sector has similarly embraced Internet of Things (IoT) technology to enhance monitoring and maintenance. Continuous equipment tracking enables predictive maintenance, allowing for the early identification of faulty components and ensuring smoother, safer operations.

In the LP gas sector, Radio Frequency Identification technology has been adopted to track gas bottles. This innovation has revolutionised inventory management by enabling precise usage tracking and facilitating efficient replacement cycles, thereby reducing the risk of shortages.

Meanwhile, the gas sector has begun deploying drones for inspections, particularly in areas with insufficient airflow or ventilation. Drones provide highly accurate and cost-effective assessments, especially in large or hard-to-reach spaces. This technology is transforming inspection processes, improving both speed and accuracy while enhancing safety and operational efficiency.

Government Policy

Safety Regulation

The Labour Department (LD) published a revised Code of Practice for Safety and Health at Work in Confined Spaces (CoP) to enhance the safety and health in confined spaces work. The major revisions of the CoP include the enhancement of requirements for proprietors' or contractors' supervision on confined space work; highlighting the factors for assessing whether a particular job constitutes underground pipework; adding a detailed template of the risk assessment form and listing out the setting of an air-monitoring alarm; and the update on the Permit-to-work Certificate template. These revisions necessitate an increased workforce [4] to ensure compliance with the new safety measures, enhancing both the safety and efficiency of confined space operations.

Implementation of Smart Site Safety System

The government has been actively working to accelerate the adoption of safety technologies on construction sites, with a particular focus on promoting the widespread implementation of the Smart Site Safety System (4S). Currently, all government work contracts with a value exceeding HK$30 million are required to fully adopt 4S, while private projects can receive support through subsidies from the Construction Innovation and Technology Fund (CITF). Despite these efforts, the adoption of 4S remains relatively low on private worksites.

In response, the government is introducing new measures to promote broader adoption of 4S across the industry. The Buildings Department mandates that registered contractors involved in building works with estimated costs exceeding HK$30 million, and using mobile plants and tower cranes, must adopt 4S alert systems. Additionally, the 4S Labelling Scheme, jointly launched by the Development Bureau and the Construction Industry Council (CIC), allows

[4] 6.7% of focus group members speculated that under the new regulations, tasks performed in confined spaces, for example, cleaning or replacing a pump component inside a building's water tank, would require more workers to ensure compliance with the updated standards.

contractors to apply for labels through on-site inspections verifying the proper use of 4S technologies. To further encourage adoption, the CITF has increased funding for private projects from HK$6 million to HK$7.5 million per applicant. Furthermore, a range of 4S product packages has been introduced to cater to diverse types and scales of private works projects, making it easier for the industry to adopt the necessary technologies.

The government's push to accelerate 4S technology adoption is expected to create new job opportunities and drive the growth of companies providing 4S-related products and services. As more projects implement mandatory 4S systems, the demand for skilled professionals to manage and maintain these technologies will rise, 4S technology adoption is expected to create new job opportunities and drive the growth of companies providing 4S-related products and services. Additionally, the need for 4S equipment will stimulate the growth of companies that supply, install, and support these technologies, fostering economic growth within the sector.

Importation of Labour

To address the ongoing manpower shortage in the construction sector, the government launched the Labour Importation Scheme for the Construction Sector (the Scheme). This initiative allowed contractors involved in public sector construction projects valued at HK$1 billion or more to apply for the importation of skilled and semi-skilled workers, as well as technicians. However, with the recent completion of several major government initiatives and a noticeable slowdown in the launch of new projects, the scheme was temporary suspended in earlier September 2024 and reopened in early 2025.

The suspension of the Scheme has impacted the E&M engineering sector, particularly those involved in public sector construction projects[5]. In addition to the Scheme, the sector has been utilising other labour schemes to address workforce shortages. For instance, the Enhanced Supplementary Labour Scheme enables the importation of technicians and skilled workers, while the Top Talent Pass Scheme supports the recruitment of engineers and high-level professionals from outside the region.

Carbon Neutrality and Environmental Protection

Hong Kong's commitment to achieving carbon neutrality and its focus on environmental protection have driven significant changes across various industries, particularly the E&M engineering sector. These shifts are likely to increase the sector's manpower demands as innovative technologies and practices are adopted to meet sustainability goals.

Electric Vehicle

A targeted strategy to promote the adoption of electric vehicles (EVs) in Hong Kong has delivered significant benefits, including enhanced energy efficiency, environmental improvements, and the creation of new business opportunities. A key outcome of these initiatives has been the rapid increase

[5] 20% focus group members revealed that companies in the E&M engineering sector not involved in public sector projects experienced a lesser impact from the temporary suspension of the Scheme.

in the number of EVs on the city's roads, which has, in turn, created an urgent need for the widespread deployment of EV charging infrastructure. The installation of EV charging stations is a complex process that demands expertise in electrical systems, adherence to strict safety protocols, and compliance with stringent regulations. This has driven a surge in demand for skilled professionals in cabling, electrical installation, and maintenance. As a result, the E&M engineering sector is experiencing heightened demand for engineers, electricians, and technical personnel capable of handling these installations efficiently and safely.

Hydrogen Vehicle

The government is spearheading hydrogen energy initiatives, including testing hydrogen-powered buses. While hydrogen has significant potential for heavy-duty vehicles due to its fast-refueling times, its widespread adoption is hindered by high costs and dependence on subsidies. The future of hydrogen energy will largely depend on government investment and its feasibility for specific applications, with EVs currently leading in terms of infrastructure and technology. Nevertheless, hydrogen-powered vehicles are expected to become a growing trend in the near future, which will consequently drive up the demand for skilled personnel in this emerging field.

Low-global Warming Potential Refrigerant

The 2024 Protection of the Ozone Layer (Amendment) was gazetted to amend the Ozone Layer Protection Ordinance (Cap. 403), introducing a regulatory strategy to meet international commitments. The amendments aim to ban the production of 18 hydrofluorocarbons (HFCs) by the fourth quarter of 2025 and implement a licensing and quota system for HFC imports and exports. The government also encourages the adoption of low- global warming potential (GWP) refrigerants, such as R1233zd, and requires maintenance and repairs to be conducted by qualified agents or engineers. This transition underscores the need to train skilled talent to manage the specialised demands of low-GWP refrigerants, ensuring the industry's readiness to meet new regulatory and technical standards.

Solar Power

The advancement of renewable energy in Hong Kong has been significantly driven by the Feed-in Tariff scheme, which encourages residential property owners to install solar panels on their rooftops or other suitable spaces and sell the generated electricity to power companies at attractive rates. This financial incentive has spurred a notable increase in solar panel installations. Older solar technologies, particularly those installed in years, have experienced a decline in efficiency over time, resulting in reduced energy output. Additionally, homeowners face long-term maintenance and repair costs, which could reduce the financial benefits of their initial investment and raise concerns about the sustainability and affordability of residential solar energy. As a result, the demand for manpower in solar panel installation has decreased.

Manpower Demand

The E&M Services industry is experiencing a growing shortage of skilled technicians and workers, mainly due to an aging workforce and a decline in the number of young people entering the field. This shortage is further intensified by the rapid advancement of technology, which increases the demand for skilled personnel. Despite the current economic slowdown, the rising complexity of projects and fast-paced technological progress have led to a surge in demand for skilled labour. Notably, the industry faces a more significant shortage of frontline staff compared to engineers, a disparity driven by imbalances between demand and supply.

To mitigate the talent shortage, some E&M engineering companies have turned to importing engineers from Mainland China. However, this solution brings its own challenges. Imported engineers often face long working hours and the high living costs of Hong Kong, which make these positions unattractive in the long term. Many view their roles as temporary stepping stones and ultimately return to Mainland China or seek opportunities overseas where larger projects and better conditions are available. This creates a recurring cycle of talent loss, leaving the industry struggling to retain engineers needed to meet its growing demands.

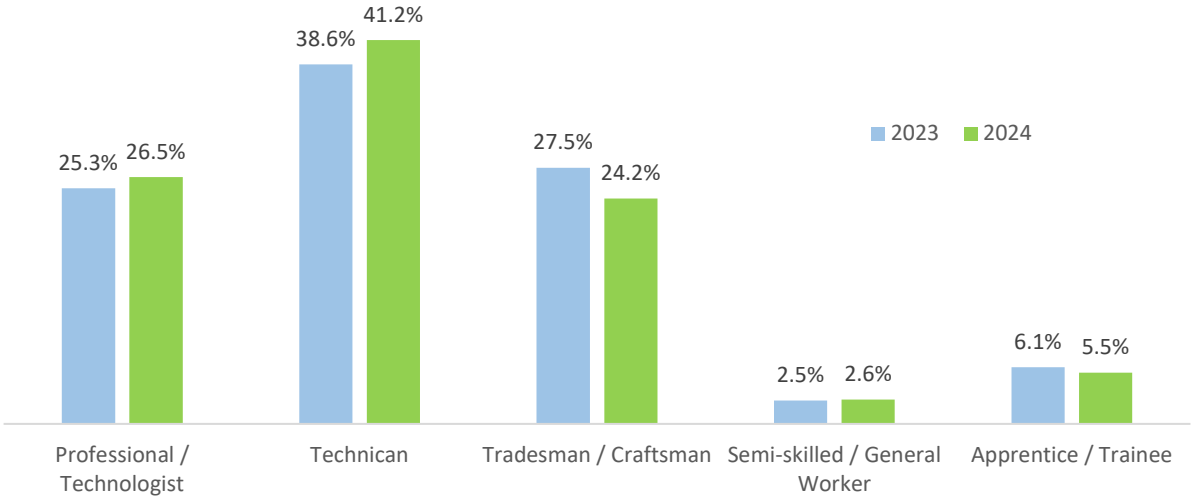
Statistics of Desk Research

The desk research collected some 14,000 and 19,500 job advertisements related to the E&M services industry from January to December 2023 and January to December 2024 respectively, accounting for a 39.3% increase.

The E&M engineering sector dominated approximately 97% of advertisements within the industry, while the gas sector and the aircraft maintenance sector each contributed 1.1% and 1.9%, respectively.

The distribution of job advertisements for skill levels of professional/technologist, technician, tradesman/craftsman, and semi-skilled/general workers in 2024 was 26.5%, 41.2%, 24.2%, and 2.6%, respectively. In contrast, the distribution of the same skill levels in 2023 was 25.3%, 38.6%, 27.5%, and 2.5%, respectively. In addition, advertisements for apprentices/trainees contributed 5.5% in 2024 and 6.1% in 2023. The distribution of job advertisements in 2023 and 2024, by skill level, is shown in **Figure 1**. It is important to note that this distribution does not indicate any increase or decrease in the total number of advertisements compared to 2023.

Figure 1 Distribution of Job Advertisements in 2023 and 2024, by Skill Level



The E&M services industry demonstrates significant workforce demands across various sectors, with skill levels ranging from professional/technologist to semi-skilled/general workers. Compared to 2023, recruitment advertisements for engineers and safety officers at the professional/technologist skill level surged by 74.0% and 51.5%, respectively. At the technician skill level, advertisements increased by 54.5% for technicians and 41.3% for supervisors. For assistant supervisors / technical assistants at the tradesman/craftsman skill level, recruitment rose by 54.5%. Additionally, the number of advertisements for apprentices spiked by 31.5%. **Table 1** highlights the top ten job categories with the most significant increase in advertisements between 2023 and 2024.

Table 1 The top ten job categories with the most significant increase in advertisements between 2023 and 2024

	Principal Job	Advertisements Increased in 2024 over 2023
1.	Engineer	74.0%
2.	Assistant Supervisor / Technical Assistant	54.5%
3.	Safety Officer	51.5%
4.	Technician	41.3%
5.	Linesman	35.5%
6.	Apprentice	31.5%
7.	Fitter	27.8%
8.	Graduate Engineer	25.0%
9.	Supervisor	21.9%
10.	Laborer	15.5%

Table 2 showcases the top five most in-demand jobs for 2024, reflecting the workforce dynamics within the E&M services industry. Notably, the role of engineer at the professional/technologist level ranks as the most sought-after position, requiring advanced qualifications, specialised knowledge, and technical expertise. The remaining roles predominantly fall within the technician skill level, highlighting a critical and growing demand for talents equipped with practical, hands-on skills. This distribution underscores the increasing reliance on technician-level professionals to support the operational and technical needs of the industry, reinforcing the importance of targeted training and recruitment efforts to bridge this gap and sustain the sector's growth. The detailed desk research results are shown in the **Annex**.

Table 2 The Top Five Most In-demand Jobs in 2024

Top	Principal Job	Skill Level
1.	Engineer	Professional / Technologist
2.	Technician	Technician
3.	Mechanic	Tradesman / Craftsman
4.	Assistant Engineer / Assistant Engineering Manager / Assistant Safety Officer	Technician
5.	Supervisory	Technician

Recruitment and Retention Challenges

Emigration Wave

The emigration wave has now stabilised, with the majority of those who left being mid-level managerial personnel or engineers. In contrast, the number of technicians and skilled workers who have emigrated remains relatively small. To address the resulting vacancies, companies have adjusted promotion cycle and promoted less experienced individuals with the provision of necessary training. While this strategy helps fill the manpower gaps in the short term, it creates a cascading effect: as promoted employees vacate their previous roles, new vacancies emerge that must also be filled, further stretching the workforce. This cycle of promotions, though necessary, increasingly challenges the industry's ability to maintain sufficient staffing levels and meet operational demands.

Ageing Workforce

The E&M services industry is grappling with significant challenges related to an ageing workforce and manpower shortage. According to statistics published by CIC in November 2024, the age distribution of registered E&M workers reveals a concerning trend. Only 3.4% of workers were aged between 20 and 29, while 25.6% were between 30 and 44. A sizeable portion of the workforce was aged between 45 and 54 (29.1%) and 55 to 65 years old (28%). Additionally, 13.85% of workers were over 65 years old. This results in an average age of 51.4 years across the sector, highlighting the industry's reliance on an ageing workforce.

To manage the manpower shortage, companies are retaining skilled workers who are over 65 or even 70 years old. While this approach temporarily alleviates the workforce gap, it is not a sustainable long-term solution. The reliance on older workers only postpones the problem by a few years, exacerbating the challenge of finding younger, skilled replacements for the future. Without significant efforts to attract and train younger talent, the sector risks facing an even more severe manpower crisis in the coming years.

Young Talent Reluctance to Join the Industry

Young talent in Hong Kong is increasingly reluctant to join the E&M services industry due to several interconnected factors. A significant concern is work-life balance. Unlike previous generations, who often prioritised financial rewards, many young professionals today place a higher value on personal time, preferring holidays and leisure over monetary compensation. However, the E&M maintenance sector often requires employees to be available for on-call duties, which conflicts with the younger generation's desire for a more predictable and flexible work schedule.

Another contributing factor is the perception of the industry among parents, who play a pivotal role in shaping career choices. Many parents hold outdated views about the

industry, believing it involves excessively hard, physically demanding work in a dirty environment. This misconception creates a barrier for young people who might otherwise consider a career in the field, as parental approval and support are often essential.

Additionally, high-profile accidents in the industry have further discouraged young individuals from pursuing careers in this field. These incidents have raised concerns about safety, making the industry seem riskier than it is in reality. Combined, the challenges related to work-life balance, parental misconceptions, and safety concerns have created a negative image of the industry, making it increasingly difficult to attract the next generation of skilled professionals.

Imbalance Demand and Supply of Apprentices

The E&M services industry relies heavily on apprentices to support workforce succession and long-term manpower planning. Apprenticeship programmes are viewed as a vital pipeline for developing skilled professionals who will sustain the industry in the future. However, a significant challenge arises from both the shortage and uneven distribution of talent, as large organisations attract the majority of apprentices. These well-established companies offer structured training programmes, career stability, and attractive benefits, making them the top choice for most apprentices. This trend leads to an imbalance in the availability of apprentices across the industry.

Small and medium-sized enterprises (SMEs), which urgently need apprentices to address their manpower shortages, struggle to compete with larger firms. Despite their pressing need for skilled workers, SMEs face challenges in attracting and retaining young professionals. As a result, the demand for apprentices in these smaller companies remains unmet, further exacerbating the difficulties in maintaining a skilled and sustainable workforce.

New Regulations in the Air-Conditioning and Refrigeration Sector

An informal survey has revealed a clear preference among young people entering the E&M services industry to pursue careers in the electrical trade over air-conditioning and refrigeration. This preference is largely driven by the perception that obtaining a professional license in electricity not only offers job security but also enhances career prospects. The licensing system is seen as formal recognition of skill and expertise, providing a stable and promising pathway for young workers.

In contrast, the air-conditioning and refrigeration trade has traditionally not required workers to hold licenses, which has affected its appeal among younger generations. However, the introduction of new HFC regulations requiring workers to obtain licenses aims to elevate professional standards and improve the trade's standing. While these changes may initially exacerbate the existing manpower shortage by creating additional entry barriers, they have the potential, in the long term, to attract more talent by positioning the trade as a more professional, secure, and respected career choice.

Training Needs

Building Information Modeling

Employers increasingly view proficiency in BIM as a fundamental skill for students in E&M engineering-related programmes. However, they emphasise that expertise in BIM alone is insufficient; a strong foundation in E&M skills is equally essential. The integration of advanced BIM knowledge with practical E&M competencies is critical for engineers to succeed in the field. This dual focus underscores the industry's commitment to cultivating a workforce that not only masters cutting-edge digital tools but also possesses the technical expertise needed to tackle complex challenges in the E&M engineering sector.

Manufacture and Assembly, Multi-trade integrated Mechanical, Electrical & Plumbing

The MiMEP approach represents a groundbreaking shift in the construction industry. It involves the factory assembly of building components, followed by efficient on-site installation, which significantly accelerates the construction process. This innovative technology transforms the traditional workflow of E&M installation by integrating multiple trades into a streamlined system. Employers are increasingly focusing on specialists within individual trades but recognise the need for these professionals to be familiar with other trades within the MiMEP framework. To keep pace with these advancements, current E&M practitioners and future talent must be trained to understand and adapt to these multi-disciplinary technologies. Therefore, it is essential for E&M-related pre-employment and post-employment training programmes to incorporate knowledge across different trades, preparing the workforce for the demands of modern construction practices.

Emerging Technologies

The E&M services industry is increasingly adopting emerging technologies such as AI, digitisation, drone, and IoT to drive innovation and improve efficiency. These technologies are transforming traditional workflows, requiring workers to acquire new skills to stay competitive in the evolving industry. As AI is integrated into predictive maintenance systems and IoT connects devices for real-time monitoring, workers must be trained in data analysis, smart systems integration, and automation. Additionally, digitisation is reshaping project management, requiring E&M professionals to be proficient in digital tools and software for design, simulation, and collaboration. Drones contribute to the low-altitude economy by opening up innovative solutions. In E&M engineering industry, they assist with site surveys, inspections, and mapping, saving time and resources. To meet these demands, comprehensive training programmes are essential to equip E&M professionals with the technical knowledge needed to effectively leverage these advanced technologies. Ongoing development in these areas will ensure that

the E&M workforce can adapt to the industry's future and remain competitive.

Skilled Craftsmanship

Focus group members have reported a noticeable decline in skilled craftsmanship within the E&M services industry in recent years. This shift has been driven by educational institutions focusing more on newer technologies and advanced methodologies, such as automation, digitalisation, and AI. As a result, foundational skills that underpin skilled craftsmanship are being overlooked, with institutions prioritising high-tech solutions and theoretical knowledge over hands-on training and practical expertise.

Traditional skills, such as manual wiring, mechanical assembly, and troubleshooting, have long been essential to the smooth operation of electrical and mechanical systems. However, these fundamental skills are at risk of becoming obsolete, as training programmes fail to emphasise their importance. This gap in training needs urgent attention, as the industry faces an aging workforce and a shortage of new talent with practical, hands-on experience.

Workplace Safety

Recently, there has been a concerning increase in severe industrial accidents, raising growing concerns about workplace safety. The pressures of meeting tight deadlines and the pursuit of convenience have led construction and E&M professionals to inadvertently bypass essential safety protocols. This not only jeopardises the well-being of personnel but also creates an unsettling environment for newcomers to the industry, reducing their enthusiasm and overall job satisfaction.

The consequences of these safety oversights go beyond immediate physical harm, damaging the industry's reputation and potentially undermining its long-term viability. It is crucial to recognise that prioritising industrial safety not only protects lives but also boosts productivity and the success of construction projects. Therefore, fostering a strong safety culture and providing comprehensive safety training to the workforce are essential steps in safeguarding both employee well-being and the sustained growth of the industry.

Skilled Aircraft Maintenance Personnel

With the implementation of the third runway at Hong Kong International Airport, the demand for skilled aircraft maintenance personnel has surged. As the airport expands its capacity to manage more flights, maintaining and servicing a larger fleet of aircraft will require a highly trained and specialised workforce. Advanced training in aircraft maintenance is crucial to ensure safety, efficiency, and reliability within the aviation sector. Technicians must be proficient not only in traditional maintenance tasks but also in modern technologies such as digital diagnostics, AI-powered tools, and automation systems. Moreover, with the increasing complexity of modern aircraft, there is an urgent need for specialised training programmes to equip personnel with

the skills required to maintain and repair the latest models.

Rapid Response and Reporting Skills

As information transparency has evolved, the utility sector now requires quick reporting and response to safety concerns, emergencies, and incidents, both to the public and government authorities. The need for rapid reporting and immediate action, often within tight timeframes, has led to a growing demand for employees with specialised coordination and communication skills. These skills are crucial for gathering and submitting accurate, detailed information swiftly, while also ensuring effective responses in high-pressure situations..

RECOMMENDATIONS

To support the future growth of the E&M services industry, it is crucial for the government, employers, and educational institutions to collaborate in boosting the sector's appeal to younger generations. A collective effort is needed to promote career opportunities while ensuring the availability of relevant training for both students and current professionals, helping them stay aligned with industry advancements. To achieve these goals, the following measures are recommended:

The Government

Enhancing the Image and Promoting of the E&M Services Industry to Attract Young Talent

The perception of an industry plays a crucial role in its ability to attract young professionals. Many young people, along with their parents, often view the E&M services industry as predominantly blue-collar, associating it with poor working conditions and inadequate safety standards, especially when compared to white-collar professions. This negative perception causes hesitation and reluctance to pursue careers within the sector. However, the government has an essential role in transforming the industry's image to make it more appealing to younger generations. For example, the E&M Services Department has taken proactive steps to improve its public perception, resulting in a notable increase in young individuals joining the organisation. While the government has made significant strides in promoting entrepreneurship and innovation among the younger generation, much of its focus has been on emerging fields, leaving traditional yet vital industries, like E&M services, somewhat overlooked. To ensure a balanced and sustainable approach to industry development, the government must extend its support to these foundational sectors. Through targeted initiatives and improved communication, the industry can be redefined as a dynamic, skilled, and safe career path, attracting a diverse and enthusiastic workforce and fostering the long-

term success of both new and established industries.

Strengthening the Vocational and Professional Education and Training Promotion

The government should place greater emphasis on promoting Vocational and Professional Education and Training (VPET) as a strategic response to the growing manpower demands across various industries. VPET equips individuals with hands-on, practical skills that are directly aligned with industry needs, ensuring the workforce is prepared to meet the evolving demands of the economy. Furthermore, VPET provides a valuable alternative to traditional academic pathways, offering individuals who may not thrive in conventional education systems the opportunity to pursue fulfilling careers. By catering to diverse talents and aspirations, VPET enhances social mobility and nurtures a more inclusive workforce. Ultimately, strengthening VPET contributes to building a resilient, adaptable, and dynamic society capable of addressing future challenges and fostering sustainable growth.

The Employers

Leveraging AI, IoT, and Digitisation to Streamline Workflows and Attract Younger Generation to the E&M Industry

In today's rapidly evolving technological landscape, employers must leverage cutting-edge technologies like AI, IoT, and digitisation to streamline workflows and improve operational efficiency, ultimately reducing the burden on employees. For younger generations who are tech-savvy and eager to work in innovative environments, these advancements offer an exciting opportunity to engage with industries that are embracing the future. By incorporating these transformative technologies, the industry can attract more young talent, who seek dynamic, forward-thinking workplaces that utilise the latest digital tools. This progressive approach will not only improve efficiency but also ensure that the workforce is equipped with the skills necessary for the future of work.

Leveraging Government Funding Schemes

Investing in employee training offers numerous benefits, including skill enhancement, increased productivity, and improved adaptability to change, while also providing a competitive edge. Employers should proactively promote and support continuous learning for their workforce. Additionally, they can leverage government initiatives like the Engineering Graduate Training Scheme, New Industrialisation and Technology Training Programme, Vplus Subsidy Scheme, and Skills Upgrade Scheme Plus to offer valuable training opportunities. This proactive investment not only enhances individual employees' capabilities but also fortifies the organisation's competitiveness in an increasingly dynamic market.

Enhancing Workplace Safety

Employers in the E&M services industry must prioritise enhancing safety measures to create a safer and more supportive working

environment for employees. Prioritising safety is crucial not only for protecting workers from harm but also for fostering a culture of care, accountability, and professionalism within the organisation. By adopting stringent safety protocols, offering regular training, and leveraging advanced safety technologies, employers can significantly reduce the risk of workplace incidents. These efforts not only boost workforce morale but also enhance the industry's overall reputation. A strong commitment to safety signals to young talent that the industry values their well-being and provides a secure, professional environment, making it a more appealing career choice. Such measures help attract a broader talent pool, including those who might have previously been deterred by safety concerns. Ultimately, prioritising safety not only protects employees but also plays a critical role in addressing the industry's long-term challenges by attracting fresh talent.

Offering Industrial Attachments for Students

Participating in industrial attachments offers students a valuable opportunity to gain practical, hands-on experience that goes beyond traditional classroom learning. It immerses them in the operational aspects of the E&M Services industry, helping to bridge the gap between theoretical knowledge and real-world application. For employers, this period serves as an ideal chance to spot emerging talent; individuals who not only possess the technical skills required but also demonstrate the adaptability needed to thrive in a rapidly evolving workforce. Recognising the benefits of this exchange, employers should offer more industrial attachment opportunities to strengthen the connection between academic education and industry practice.

The Educational Institutions

Training Programmes for Imported E&M Professionals

In response to the manpower shortage in the E&M services industry, some companies have begun importing engineers, technicians, and workers from Mainland China to meet the increasing demand for skilled labour. To ensure these workers are well-prepared to integrate into the local industry and align with its standards, educational institutions have stepped in to offer tailored training programmes. These programmes focus on equipping imported professionals with the necessary skills and knowledge specific to the Hong Kong market, including local regulations, safety standards, and technological advancements. By providing these training opportunities, educational institutions help facilitate a smoother transition for Mainland workers, enabling them to contribute effectively to the industry's growth and meet its evolving needs.

Comprehensive Training for the Multi-Trade Integrated E&M Engineering Sectors

Educational institutions play a crucial role in preparing the workforce for the demands of modern construction practices, particularly in the context of the MiMEP approach. Given the shift towards factory assembly and

streamlined on-site installation, educational programmes must evolve to provide all-round training that covers multiple trades within the MiMEP framework. These programmes should equip students with a comprehensive understanding of not only their specific trade but also related disciplines, enabling them to operate effectively in a collaborative, multi-disciplinary environment. By incorporating a broad range of technical knowledge, educational institutions can ensure that both current E&M practitioners and future talent are well-prepared to meet the challenges of the evolving of the industry.

Revitalising Skilled Craftsmanship in the E&M Services Industry

To address the decline in skilled craftsmanship within the E&M services industry, educational institutions must recalibrate their training programmes to incorporate both traditional and craftsmanship skills. While technological advancements like automation, digitalisation, and AI are essential to the future of the industry, it is equally crucial to preserve and nurture the core craftsmanship skills that have historically supported the industry's functionality. Training programmes should offer a balanced curriculum that blends foundational craftsmanship techniques with modern technology.

Increasing the Number of Apprentices

To meet the growing demand for skilled workers in the E&M services industry, educational institutions must place a stronger emphasis on recruiting more apprentices. The rapid expansion and evolution of the industry have led to a significant shortage of skilled technicians and workers, with many employers struggling to fill essential roles. By increasing the number of apprentices, educational institutions can play a pivotal role in addressing this gap. Furthermore, the inclusion of more apprenticeships will help meet the specific needs of the industry, where there is a growing demand for a diverse range of skills across various sectors, such as electrical, mechanical, lift and escalator, gas and plumbing.

Equipping E&M Professionals with Advanced Construction Technologies

Embracing the evolution of construction methodologies, the E&M services industry is progressively adopting advanced technologies such as BIM, Design for Manufacture and Assembly, and MiC. This shift represents a significant transformation in how projects are planned and executed. To adequately prepare future professionals for this rapidly evolving landscape, educational institutions must ensure that students are equipped not only with theoretical knowledge but also with hands-on experience and practical skills. By incorporating the latest construction technologies into their curricula, institutions can empower students to effectively navigate and apply these advanced practices in real-world scenarios.

Changing Parents' Perception of E&M Services Industry

It is clear that parental influence plays a significant role in shaping students' study

and career choices. Therefore, it is essential to promote the industry to parents, helping them develop a deeper understanding of its promising potential, while dispelling common misconceptions. This will encourage them to support their children in pursuing engineering programs and entering the industry. To accomplish this, educational institutions will collaborate closely with trade associations and employers, organising events such as school talks, parent sessions, and site visits. These initiatives aim to provide both students and parents with a clearer insight into the opportunities and benefits the industry offers.

Desk Research Results

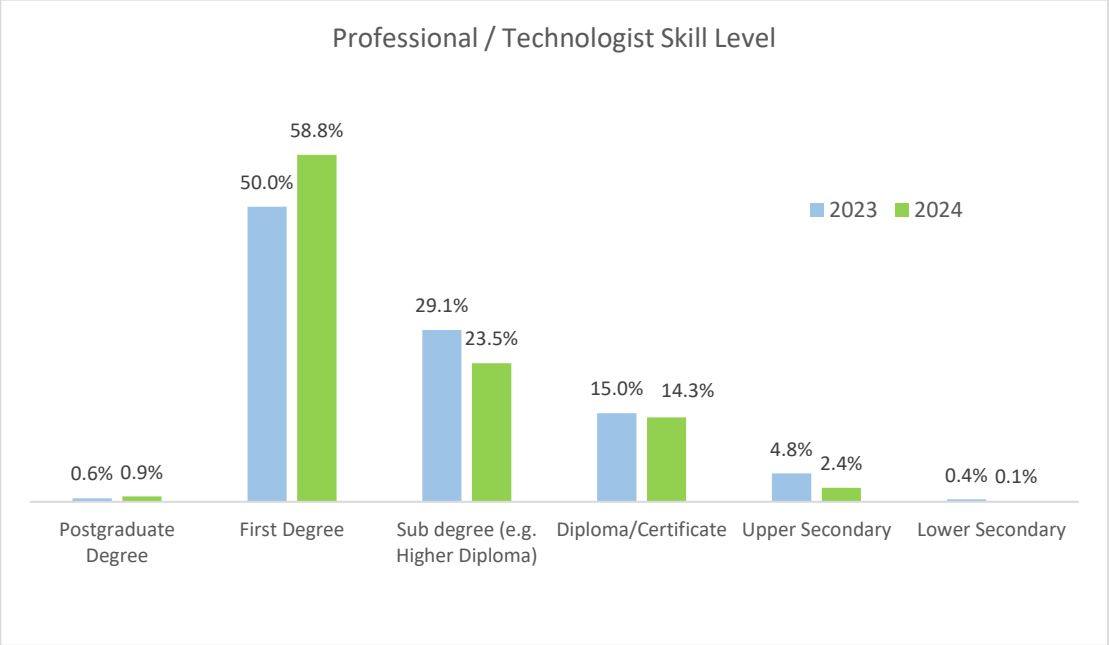
1. The Distribution of Job Advertisements in 2023 and 2024, by Skill Level and Principal Job

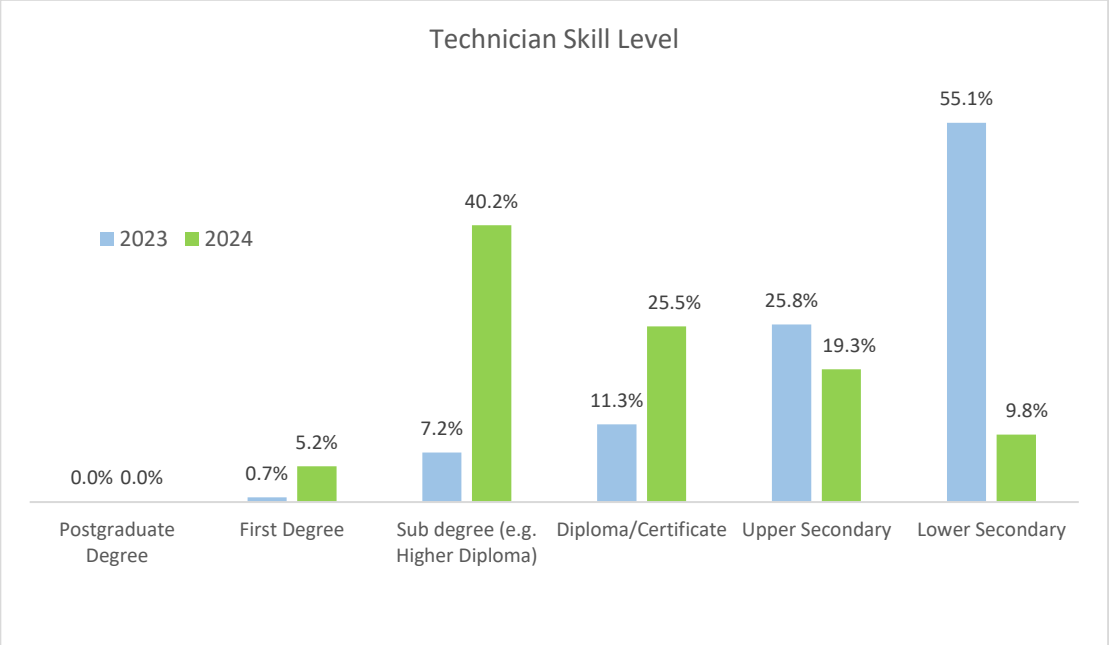
Skill Level/Principal Job	2022	2023
Professional/Technologist Level		
Engineer	22.6%	24.4%
Safety Officer	1.5%	1.6%
Engineering Manager	0.9%	0.2%
Technologist	0.3%	0.3%
Technician Skill Level		
Technician	19.9%	21.1%
Assistant Engineer / Assistant Engineering Manager / Assistant Safety Officer	13.3%	14.1%
Supervisor	4.6%	5.1%
Graduate Engineer	0.8%	0.9%
Tradesman/Craftsman Level		
Mechanic	18.4%	14.5%
Fitter	3.5%	4.1%
Artisan	2.1%	2.4%
Foreman/Chargehand	1.1%	0.7%
Assistant Supervisor / Technical Assistant	0.8%	1.3%
Carpenter	0.6%	0.4%
Painter	0.4%	0.2%
Welder	0.3%	0.2%
Linesman	0.2%	0.3%
Craftsman	0.1%	0.1%
Semi-skilled/General Worker Level		
General Worker	1.8%	2.0%
Laborer	0.4%	0.5%
Semi-skilled Worker	0.3%	0.1%
Apprentice/Trainee Level		
Apprentice	2.8%	3.1%
Trainee	3.3%	2.4%
Total	100%	100%

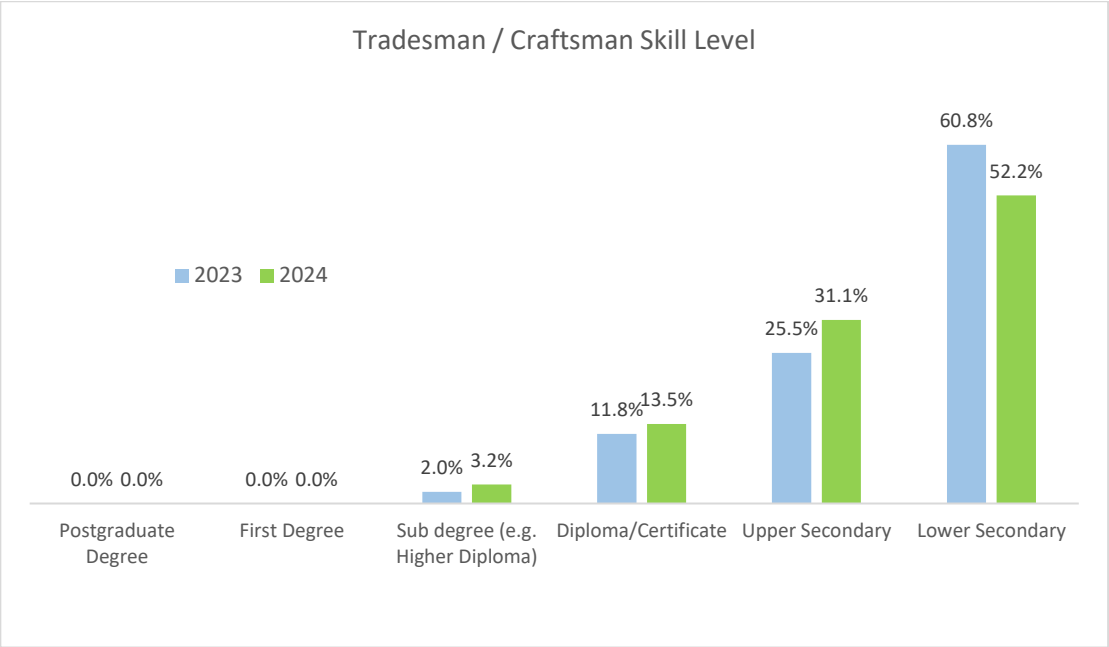
2. The Increase/Decrease of Job Advertisements in 2024 over 2023, by Skill Level and Principal Job

Skill Level/Principal Job	Increase/Decreased of recruitment ads in 2024 over 2023
Professional/Technologist Level	
Engineer	+74%
Safety Officer	+51.5%
Engineering Manager	-67.2%
Technician Level	
Technician	+41.3%
Assistant Engineer / Assistant Engineering Manager / Assistant Safety Officer	+8.2%
Supervisor	+21.9%
Graduate Engineer	+25%
Tradesman/Craftsman Level	
Mechanic	-3.5%
Fitter	+27.8%
Artisan	+1.7%
Assistant Supervisor / Technical Assistant	+54.5%
Painter	-33.9%
Foreman / Chargehand	-13.4%
Carpenter	-21.2%
Linesman	+35.5%
Welder	-14.9%
Craftsman	-26.3%
Semi-skilled/General Worker Level	
General Worker	+12.8%
Laborer	+15.5%
Semi-skilled Worker	-54.3%
Apprentice/Trainee Level	
Apprentice	+31.5%
Trainee	-14.4%
Total	**+39.3%**

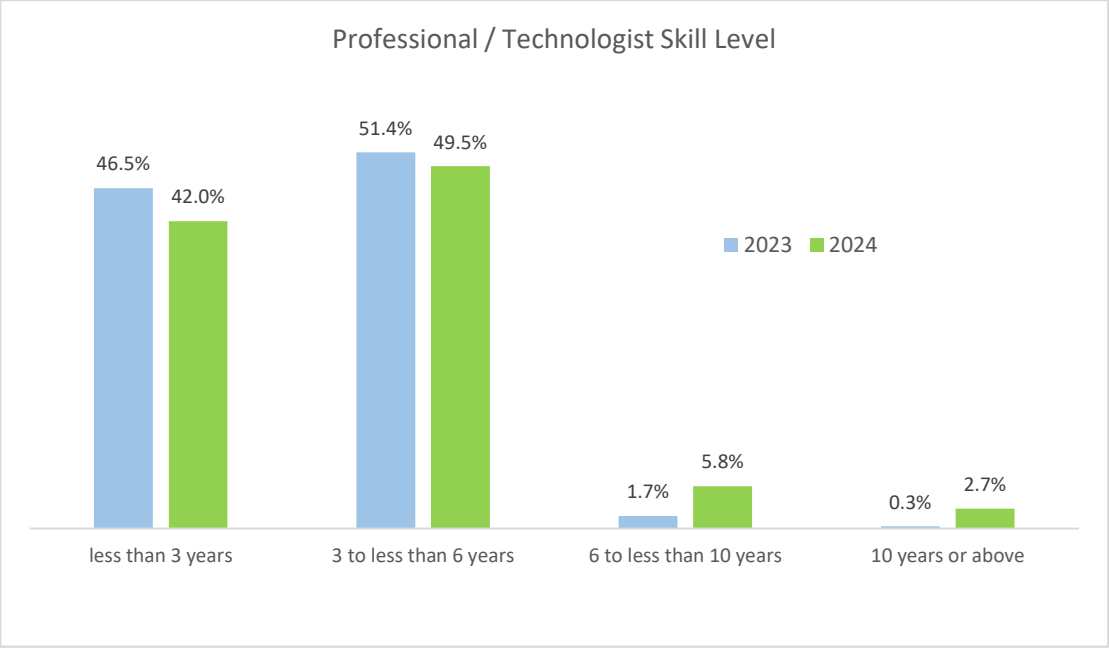
3. Preferred Education Level in Job Advertisements in 2023 and 2024, by Skill Level

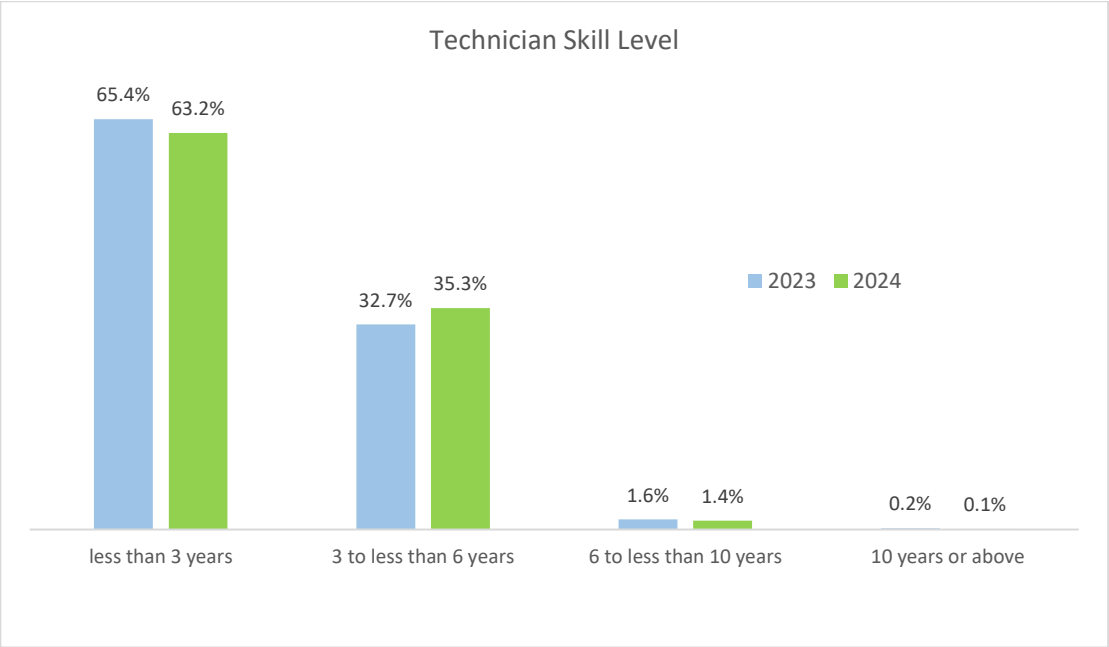


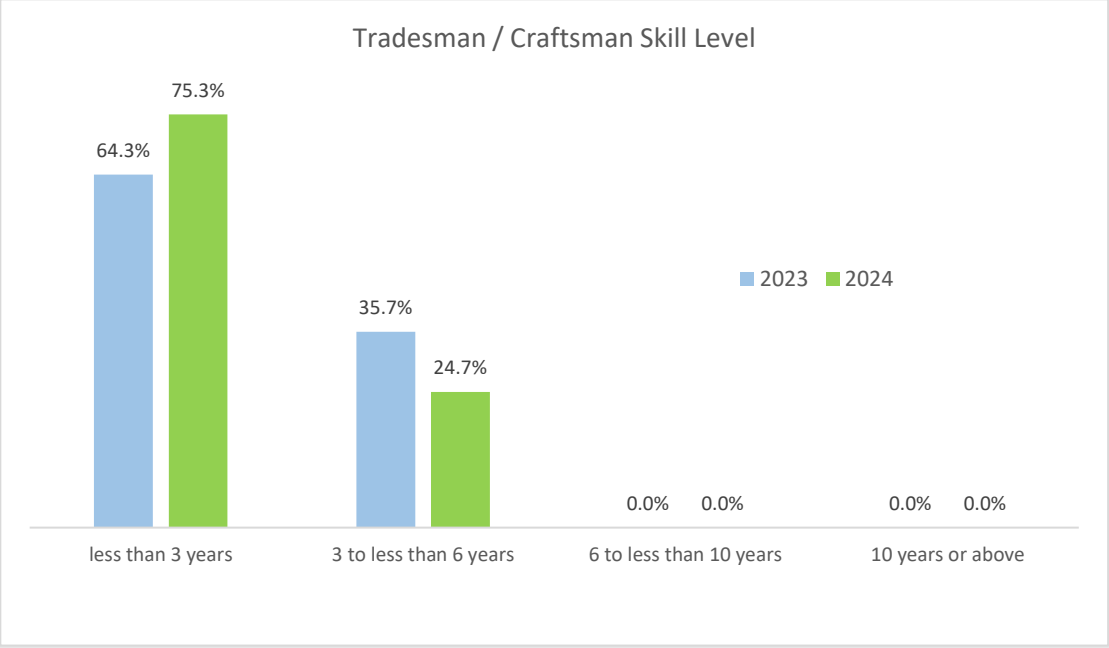




4. Preferred Work Experience in Job Advertisements in 2023 and 2024, by Skill Level




Technician Skill Level
65.4%
63.2%
32.7%
35.3%
1.6%
1.4%
0.2%
0.1%
2023
2024
less than 3 years
3 to less than 6 years
6 to less than 10 years
10 years or above


Tradesman / Craftsman Skill Level
64.3%
75.3%
35.7%
24.7%
0.0%
0.0%
0.0%
0.0%
2023
2024
less than 3 years
3 to less than 6 years
6 to less than 10 years
10 years or above