Deloitte.

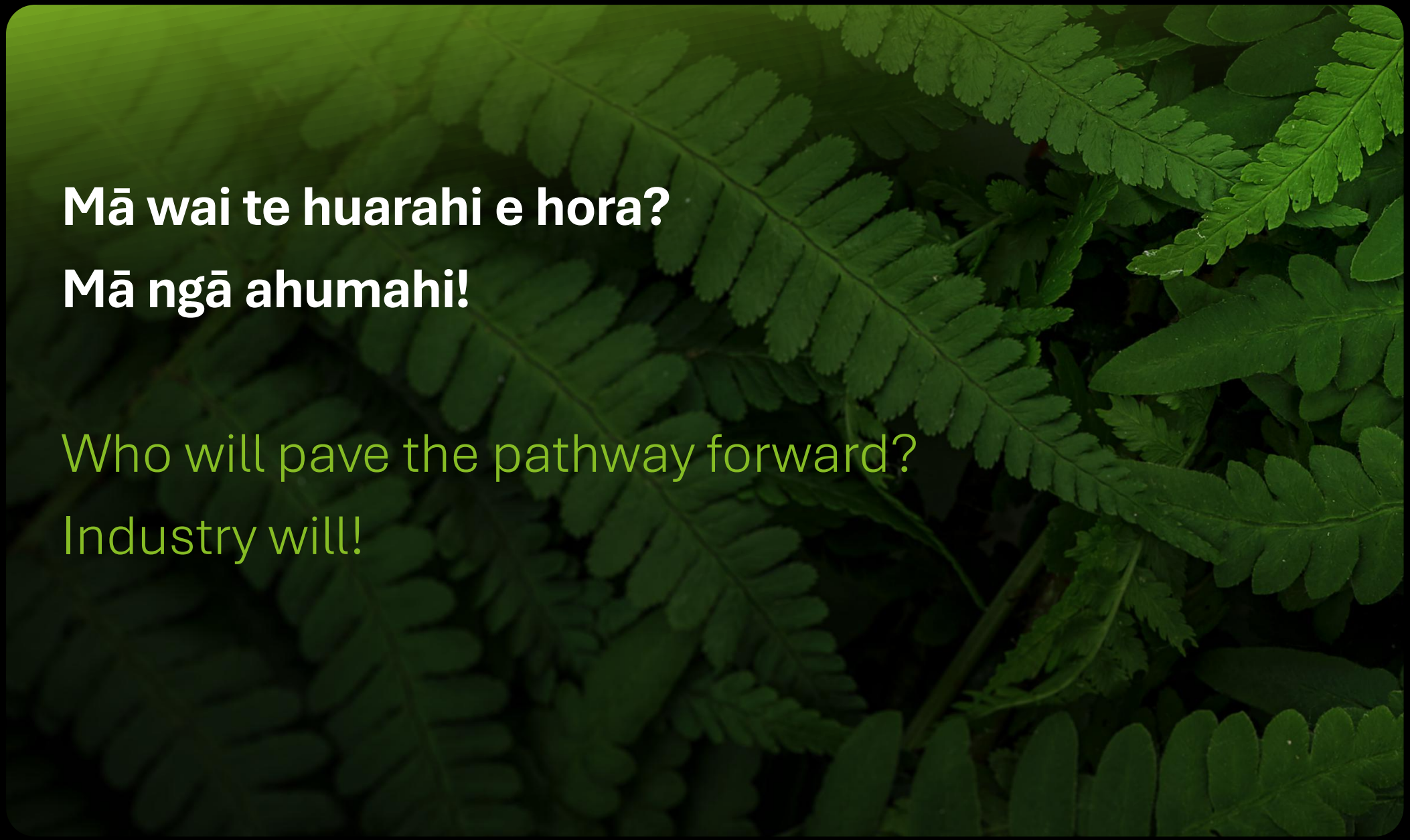
HANGA-ARO-RAU
Manufacturing, Engineering and Logistics
Workforce Development Council

Future skills and industry implications

Manufacturing, engineering, automotive, logistics, mining, and oil and gas extraction in Aotearoa New Zealand

December 2025

Whakatauki | Proverb



Ihirangi | Contents

Renata Hakiwai
Chair of Hanga-Aro-Rau

He Kupu Takamua nā Te Heamana
Chair foreword

We are pleased to share this research, which is intended to help industry, the VET system and the labour market to better understand upcoming workforce development opportunities and challenges through to 2030. Growing our economy is critical, and these insights will help do that.

Our research highlights anticipated workforce gaps and what actions are critical to address them.

It has been an honour to guide Hanga-Aro-Rau from its inception through its development over the past four years. As it transitions and passes its functions to the new Industry Skills Boards, we encourage the wider ecosystem to use the knowledge gained to actively support industry training and build capability, working towards a more resilient, people-focused, and AI-ready workforce.

Ko tā Ngā Tumu Whakahaere
Executive remarks

New Zealand's economy needs stability and growth. We present this research to industry stakeholders, central government, Industry Skills Boards, and the wider sector. This report represents the culmination of global and national research conducted by Deloitte, with the support of our skilled and knowledgeable kaimahi (workers), offering comprehensive insights into the future of work across various industry sectors.

It is essential to identify and understand existing workforce gaps within the training and education system to better align efforts toward building a resilient talent pipeline. Additionally, this understanding must be contextualised within New Zealand, with particular consideration for the growing Māori economy, Māori and Pacific Peoples workforce, and the untapped potential within our disabled communities.

This analysis examines worldwide challenges, workforce shortages, and the essential elements needed for a future-oriented workforce. It also considers how artificial intelligence is changing the landscape, from automating tasks to supporting human-focused solutions.

The guidance provided aims to help New Zealand navigate issues such as an ageing population, the migration of skilled professionals abroad, and increasing demands on infrastructure and supply chains throughout the next decade.

While specialised skills will continue to be in demand, it is equally important to foster human-centred capabilities that enable workers to transition effectively across sectors and adapt to changing requirements in an increasingly automated and IoT-connected environment.

As this marks the final report from Hanga-Aro-Rau as a WDC, we convey it with both a sense of closure and pride. We hope it will serve as a valuable resource for Industry Skills Boards (ISBs), training providers, and government agencies supporting their mission to prepare today's learners to become the skilled workforce of tomorrow.

Philip Alexander-Crawford
Chief Executive Officer

Samantha McNaughton
Deputy Chief Executive Officer

Ngā Kōrero Ikeike
Executive summary

Executive summary | The research

Each year, over 240,000 learners engage with New Zealand's VET system.

The VET policy environment and system is undergoing significant reform.

This presents an opportunity to modernise the system to focus on human-centric skills, and engagement with industry and learners.

About 31,600 (~13%) of the learners are enrolled in qualifications within Hanga-Aro-Rau industry coverage in 2024.

In-scope sector coverage

This research marks a key milestone in the transition of Hanga-Aro-Rau into the new ISBs. It builds on previous sector studies, including Deloitte's workforce development needs in New Zealand's manufacturing, engineering, and logistics sectors in 2022 and 2023.

This research covers six targeted sectors: manufacturing, engineering, logistics, automotive, mining and quarrying, and oil and gas extraction. As Hanga-Aro-Rau transitions into the new ISBs, its current coverage will align with the following boards:

- **Manufacturing and Engineering ISB**
- **Automotive, Transport and Logistics ISB** – including supply chain, aviation, warehousing, and distribution
- **Infrastructure ISB** – including energy, oil and gas extraction, and mining and quarrying.
- **Electrotechnology and Information Technology ISB** – including refrigeration, heating, ventilation, and air-conditioning (RHVA).

Key research themes

In the context of a rapidly changing landscape and to ensure the VET system remains relevant, resilient, and future ready, this research focuses on four strategic themes:

- Change
- Disruptions
- Opportunities and impact
- Enablement.

These themes provide a framework for understanding the challenges and opportunities facing the sectors, and for guiding coordinated responses that will enable all New Zealanders to thrive in a rapidly changing world.

Photo: Kowtow Clothing, New Zealand

Executive summary | Global context

By 2030, 22% of current jobs are projected to be disrupted globally, with 170 million new roles created and 92 million displaced – resulting in a net gain of 78 million jobs.

(World Economic Forum, Future of Jobs Report 2025)

Our research examines the predicted shift in global workforce skill priorities in 2030 across the in-scope sectors, based on research undertaken by the World Economic Forum. We have applied an Aotearoa specific economic, policy settings and workforce context.

A transformation is underway across global labour markets, reshaping how industries operate and how work is defined. This shift is not speculative, it is driven by accelerating technological innovation and global economic shifts. By 2030, 22% of current jobs are projected to be disrupted globally.

Technology Transformation

Technological innovation is the most significant driver of workforce evolution. Artificial intelligence (AI), automation, and robotics are redefining job roles, workflows, and organisational structures.

AI is rapidly reshaping the global workforce. While often perceived as a threat to entry level roles, particularly for graduates, the reality is more complex.

Workforce development and VET systems will need to adapt, not only by equipping individuals with technical and digital skills, but also by fostering adaptability, entrepreneurial thinking, and AI literacy.

Our desktop research of global workforce and skills trends identifies the top 10 key skills that will be most important in 2025 and by 2030. These are:

In-demand and important skills by 2030 globally:	
Rank in 2030	**Skill (Rank in 2025, in brackets)**
1	Resilience, flexibility and agility (1)
2	AI and big data (↑ 14)
3	Technological literacy (↑ 6)
4	Creative thinking (4)
5	Analytical thinking (↓ 2)
6	Leadership and social influence (↓ 3)
7	Talent management (↑ 9)
8	Motivation and self-awareness (↓ 5)
9	Curiosity and lifelong learning (↓ 8)
10	Systems thinking (↑ 11)
NZ	Environmental stewardship (↑ 16)
NZ	Cultural competency

Two additional skills have been prioritised which are important in a New Zealand context:

- **Environmental stewardship –** With an economy heavily reliant on resource based industries and access to global trade, New Zealand faces heightened exposure to climate risks, regulatory changes and market expectations.
- **Cultural competency –** Cultural competency introduces a distinctly New Zealand dimension. It includes engagement with Te Ao Māori principles, is critical for inclusive workplaces and aligns with the country's bicultural foundation and multicultural workforce.

Resilience, flexibility and agility top the list of future skills globally and we expect that these skills will also be core competencies in a New Zealand context. The need for workers who can navigate uncertainty, and pivot quickly will be critical.

Human-centric and cognitive skills remain central despite automation trends. Creative thinking, analytical thinking, and leadership and social influence capabilities are ranked highly, reinforcing their role in innovation and collaboration.

Routine cognitive skills like reading, writing, mathematics, and quality control rank lower globally, but this decline is relative, not absolute. These skills remain critical in New Zealand, where literacy and numeracy lag OECD averages. Employers expect these foundations before entry, so they are not globally highlighted as transformational.

There is a high degree of commonality of in demand skills across the in-scope sectors in this research. For a small country like New Zealand, having a consistent set of forward looking skills across the sectors provides a key advantage. This consistency allows employees to transfer skills more easily and pursue opportunities beyond their current industry. Such flexibility strengthens the resilience of the overall workforce and helps industries respond to economic shifts, technological change and global market pressures.

Executive summary | New Zealand workforce

Workforce profile

New Zealand's workforce included approximately 2.88 million people in employment as of the June 2025 quarter (estimate), according to Stats NZ. The labour force participation rate was 70.5%, the employment rate stood at 66.8%, and the unemployment rate was 5.2%.

Over the past decade, the workforce has grown significantly, from 2.0 million in 2013 to 2.62 million in 2023, driven by sustained labour market expansion. However, sector level trends show diverging trajectories. The Engineering workforce has grown consistently, offset by declines in workforce for Manufacturing, Logistics, Automotive and Mining and Quarrying.

Gen Z	Millennial	Gen X	Baby Boomers	Silent
Born 1997-2012	Born 1981-1996	Born 1965-1980	Born 1946-1964	Born 1928-1945

NZ Employment Count (000s) (7 March 2023)

Gen Z	Millennial	Gen X	Baby Boomers	Silent
474	896	801	432	21

Demographic shifts

Demographic shifts are creating labour shortages. VET will need to adapt to upskill younger workers and reskill older workers. By 2034, Millennials, Gen Z and the first Gen Alphas will make up 80% of the workforce in advanced economies.

Māori and Pacific communities have a higher proportion of younger people, with 54% and 72% under 30 respectively. However, rates of youth not in employment, education or training remain high at 21% for Māori and Pacific youth and 46% for disabled youth. Approaches should be culturally informed and disability inclusive.

In a small economy, losing this talent pipeline would deepen skill shortages. Education and employment systems are required to be culturally competent to keep these young people engaged.

Across targeted industry sectors – employment share by sector

Sectors*	2013	2018	2023
Manufacturing	10.6%	10.7%	9.3%
Logistics	4.1%	4.2%	3.7%
Engineering	2.1%	2.4%	2.6%
Automotive	2.1%	2.2%	1.9%
Mining and quarrying	0.2%	0.2%	0.1%
Oil and gas extraction and wholesaling	0.1%	0.1%	0.1%
Other sectors	80.8%	80.3%	82.4%
New Zealand Total	**100%**	**100%**	**100%**

Across targeted industry sectors – number of employees by sector and % changes

Sectors	2013	2018	2023	2013 to 2018	2018 to 2023
Manufacturing	211,920	260,990	242,760	23.2%	-7.0%
Logistics	81,260	102,240	96,460	25.8%	-5.7%
Engineering	42,640	58,010	67,130	36.0%	15.7%
Automotive	42,200	54,160	49,910	28.3%	-7.8%
Mining and quarrying	4,360	4,080	3,470	-6.4%	-15.0%
Oil and gas extraction and wholesaling	2,150	2,450	2,660	14.0%	8.6%
Other sectors	1,616,490	1,963,220	2,160,340	21.4%	10.0%
New Zealand Total	**2,001,010**	**2,445,140**	**2,622,720**	**22.2%**	**7.3%**

** Note that sectors are defined based on Hanga-Aro-Rau definitions*

Executive summary | Industry occupations and skills

Workforce trends by occupation

While there has been growth in professional, high skilled and human-centric skilled occupations within the six in-scope sectors, there has been a decline in roles associated with lower skilled tasks, particularly labourers and sales workers. Professionals increased by 24.5% since 2018, and Community and Personal Service Workers rose by 7.3%, in the context of a declining workforce for the six target sectors between 2018 to 2023.

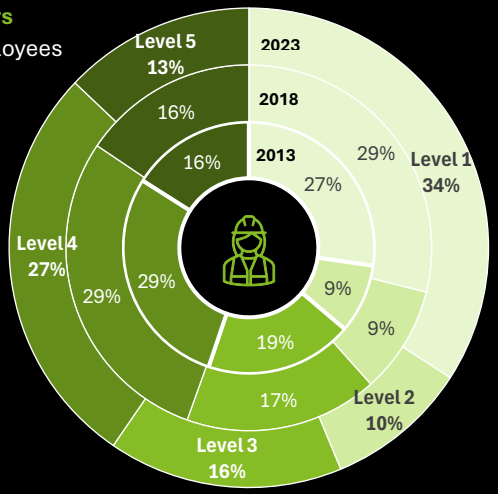
A decisive shift to higher skills roles

Australian and New Zealand Standard Classification of Occupations (ANZSCO) classifies occupations into five skill levels based on the range and complexity of tasks typically required. Level 1 represents the most skilled roles, requiring extensive qualifications and experience, while Level 5 covers roles with limited formal training. These levels do not measure an individual's ability but indicate the skill usually needed to perform an occupation competently.

The skills composition of the workforce has shifted between the 2013 and 2023 census years decisively in favour of higher skilled roles. The sustained shift towards higher skill levels will require vocational education to focus on pathways to advanced qualifications and work-based learning.

Industry sectors

% share of employees by skill level (2013 to 2023)



Across targeted industry sectors – employment share by occupation type

Occupation type	2013	2018	2023
Technicians and Trades Workers	19.5%	18.1%	17.8%
Managers	17.1%	16.8%	17.7%
Professionals	11.6%	13.3%	17.2%
Machinery Operators and Drivers	14.9%	15.9%	15.5%
Clerical and Administrative Workers	13.0%	11.8%	11.8%
Labourers	14.8%	15.1%	11.5%
Sales Workers	7.4%	7.3%	6.5%
Community and Personal Service Workers	1.8%	1.7%	1.9%
All Occupations combined	**100.0%**	**100.0%**	**100.0%**

Across targeted industry sectors – number of employees by occupation type and % changes

Occupation type	2013	2018	2023	2013 to 2018	2018 to 2023
Technicians and Trades Workers	75,015	87,342	82,257	16.4%	-5.8%
Managers	65,604	80,964	81,897	23.4%	1.2%
Professionals	44,529	64,005	79,671	43.7%	24.5%
Machinery Operators and Drivers	57,174	76,698	71,805	34.1%	-6.4%
Clerical and Administrative Workers	50,142	56,664	54,558	13.0%	-3.7%
Labourers	56,730	72,795	53,178	28.3%	-26.9%
Sales Workers	28,287	35,022	30,003	23.8%	-14.3%
Community and Personal Service Workers	6,846	8,265	8,865	20.7%	7.3%
All Occupations combined	**384,519**	**481,923**	**462,387**	**25.3%**	**-4.1%**

Executive summary | Entry pathways and talent management

Common entry points into sector pathways

Across all target sectors, individuals typically begin their career journey from one of four typical entry points:

1. Secondary school leavers
2. Tertiary and vocation – vocational education, apprenticeships, university graduates
3. Career change or upskilling
4. Reskilling.

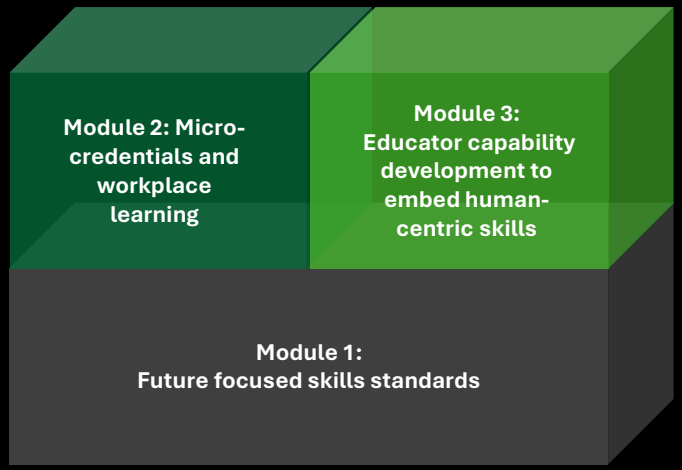
Each of them is accessible at different points depending on prior experience and skill level. The initial entry point influences the "building blocks" i.e. capability enablers, and core skills required for progression.

Career development within these sectors is not linear. Pathways are shaped by factors such as sector trends, organisational capacity, and access to training. Individual journeys are dynamic, often influenced by previous experience and the ability to navigate transitions.

The four common entry points represent the most frequent pathways, some sectors may offer additional, unique entry options not captured here.

The building blocks

The three building block modules provide an integrated approach to strengthening vocational pathways and overcoming key challenges in New Zealand's workforce development system. They are intended to work together to ensure that learners at all entry points can access relevant, future focused training and progress into high demand roles.



- **Future focused skills standards –** Embed both technical and human-centric skills into all qualifications, ensuring consistency and relevance across pathways, and enabling rapid updates to meet changing industry needs.
- **Micro-credentials and workplace learning –** Offer flexible, targeted learning options that address specific skill gaps, support modular and stackable learning, and make upskilling or reskilling accessible at any career stage.
- **Educator capability development to embed human-centric skills –** Equip educators to deliver practical, industry aligned training, integrate evolving skills like AI literacy, and foster inclusive, learner centred environments that support diverse cohorts.

This approach is designed so that the system can grow and adapt, as a robust platform for future workforce development.

Unlocking workforce potential

As a small economy, New Zealand must maximise workforce participation and skills development to maintain productivity. Inclusive strategies and cultural competency are essential to address sector shortages and build a resilient workforce.

The new VET system is designed to create clearer and more culturally affirming pathways from school to employment and aim to address qualification gaps and improve the "fit" of training for Māori and non-Māori learners, recognising that "you can't be what you can't see".

Beyond structural and skill based barriers, cultural competence and social integration play a critical role in workforce success.

Talent management

Retaining, retraining and upskilling existing talent is critical to building a sustainable workforce. This involves ensuring individuals remain engaged, productive, and committed to the workforce over time.

A unified approach includes:

- Aligning talent strategies with long term organisational goals.
- Focusing on developing and strengthening key capabilities.
- Embedding cultural responsiveness throughout all practices.
- Prioritising retention to keep people engaged in education and employment.
- Using data driven insights to guide decision making and build a resilient, future ready workforce in Aotearoa.

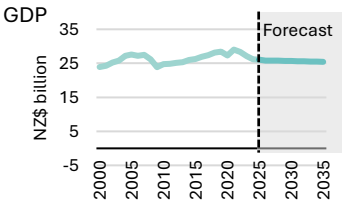
Key insights for the Manufacturing and Engineering Industry Skills Board (ISB)

Manufacturing

Economic and workforce outlook

Sector GDP: $26.1 billion (2025)*
Employed: 259,800 (2025)

- Manufacturing is a mature sector with flat GDP growth.
- Projected workforce gap will increase from ~19,000 in 2026 to ~ 29,000 by 2030, i.e. a 52% rise over five years.



Demographic and diversity trends

Age 45+: 46% (2025)
Māori: 15.4% Pacific: 7.1%

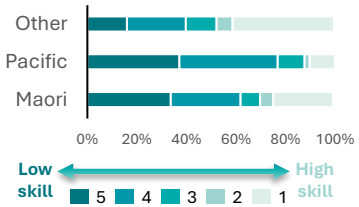
- An ageing workforce with many nearing retirement.
- Fewer young entrants into the sector (9.6% reduction from 2020-2025).

Age	2025	% of total	2020 to 2025
15-24	28,200	10.9%	-9.6%
25-44	112,000	43.1%	-0.7%
45-64	104,300	40.1%	-7.8%
65+	15,400	5.9%	2.0%
Total	259,900		-4.5%

Key skill needs and gaps

#1: Resilience, flexibility & agility
#2: Analytical thinking

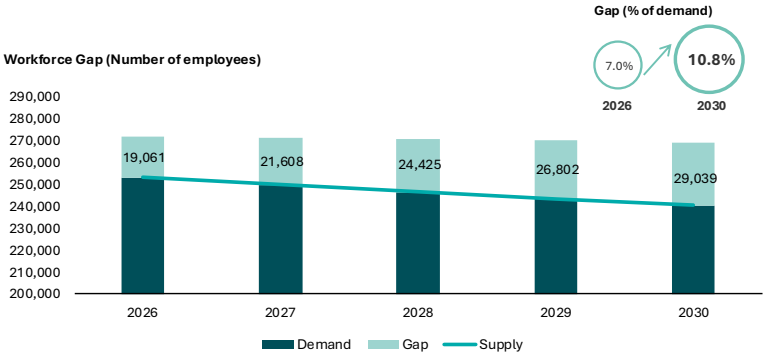
- Strong shift towards higher skill levels, particularly for Māori.
- Both Māori and Pacific groups have a larger proportion of their workforce in Skill Levels 4 and 5 (the lowest skill bands).



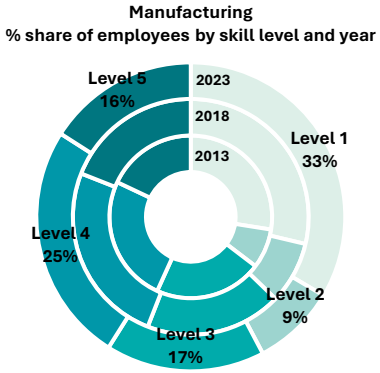
Strategic implications and opportunities

- **Widening workforce gap:** Faces a growing shortage of skilled workers, projected to reach nearly 30,000 by 2030. There is an opportunity to design qualifications and programmes with targeted upskilling, micro-credentials, and rapid training to close the gap and ensure a suitable number of skilled workers are available.
- **Ageing workforce:** High proportion of older workers increases risk of skill loss and succession challenges. It is important to develop succession planning, mentorship, and knowledge transfer programmes to retain critical skills and prepare younger workers for advanced roles.
- **AI and automation increase demand for human-centric skills**: As routine tasks are automated, skills such as resilience, flexibility and agility, analytical thinking, creative thinking become more important for workers to adapt. There is a need to embed these skills in the design of qualifications and programmes to upskill both the educators and learners. Having these skills will also support career mobility, enabling workers to adapt to new roles and technologies, supporting lifelong learning and sector resilience.
- **Equity:** There is opportunity to tap into the underrepresented groups and create targeted pathways to support Māori, Pacific, women, and disabled workers to move into the sector, into higher skilled, higher paid roles, building a more resilient and diverse workforce.

Workforce gaps



Skill diversity trend



Most important skills

2025 Top Skills	2030 Top Skills
Resilience, flexibility and agility	Resilience, flexibility and agility
Analytical thinking	Analytical thinking
Motivation and self-awareness	Creative thinking
Creative thinking	Technological literacy
Curiosity and lifelong learning	AI and big data
Technological literacy	Motivation and self-awareness
Resource management and operations	Curiosity and lifelong learning
Empathy and active listening	Systems thinking
Leadership and social influence	Leadership and social influence
Talent management	Talent management

Cultural competency and environmental stewardship are specific to NZ

*Note: Gross Domestic Product (GDP) figures are real and presented in 2009/10 prices. GDP figures may not match publicly available figures, as the sector definitions outlined in the Hanga-Aro-Rau legislation differ from ANZSIC definitions.

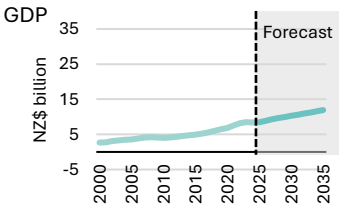
Key insights for the Manufacturing and Engineering Industry Skills Board (ISB)

Engineering

Economic and workforce outlook

Sector GDP: 8.5 billion (2025)*
Employed: 129,800 (2025)

- Engineering is a key growth area for the NZ economy.
- The projected workforce gap to increase from ~ 6,600 in 2026 to over 10,000 by 2030, i.e. a 55% rise in five years.



Demographic and diversity trends

Age 45+: 41% (2025)
Māori: 11.5% Pacific: 3.6%

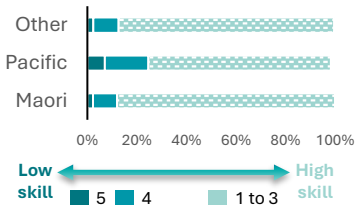
- Mid-career (aged 25–44) makes up nearly half of all employees.
- Young entrants into the sector has dropped significantly (-11.5%)

Age	2025	% of total	2020 to 2025
15-24	12,300	9.5%	-11.5%
25-44	64,700	49.9%	19.6%
45-64	43,800	33.8%	3.5%
65+	8,900	6.9%	85.4%
Total	129,700		12.7%

Key skill needs and gaps

#1: Resilience, flexibility & agility
#2: Analytical thinking

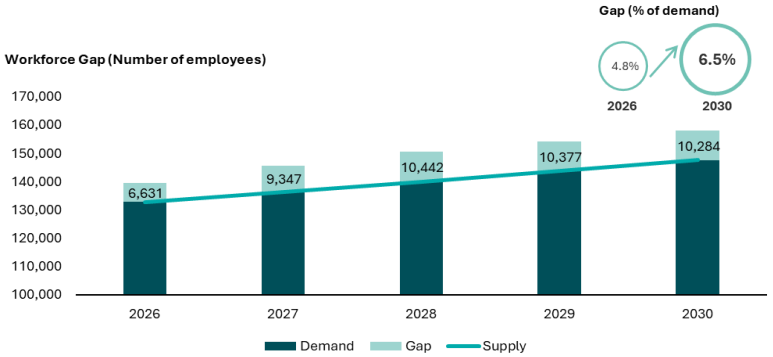
- High concentration of level 1 advanced skills, 60% of roles.
- Māori representation in skill level 1 has doubled since 2020, while Pacific workers remain in lower skill roles.



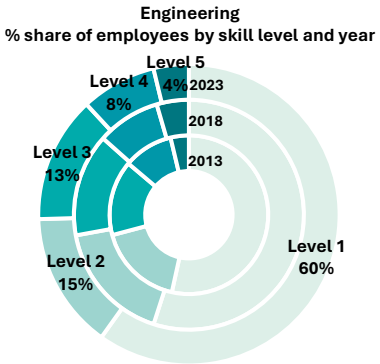
Strategic implications and opportunities

- **Widening workforce gap:** Faces a growing shortage of skilled engineers, with the gap projected to rise from about 6,600 in 2026 to over 10,000 by 2030, a 55% increase in five years.
- **Declining participation of young workers:** The share of young adults (15–24 years) in engineering is small and falling, reflecting persistent challenges in attracting and retaining young talent. Limited entry level roles, apprenticeships, and practical placements mean young people struggle to find clear pathways into engineering, restricting their ability to gain experience and transition smoothly from education to employment.
- **Filling the gaps:** With the workforce gap, declining young entrants and ageing workforce, there is a risk of skill loss and succession gaps as older professionals retire. This creates a strong incentive for the sector to expand and modernise training, attract and retain diverse talent, and leverage technology and digital transformation to boost productivity and create new high value roles.
- **Critical human-centric skills:** Resilience, flexibility, agility, analytical thinking, and creative thinking are increasingly important in engineering as automation and AI embrace the future of the sector. Embedding these human-centric skills into training and qualifications is essential for supporting career mobility, enabling engineers to adapt to new roles and technologies.

Workforce gaps



Skill diversity trend



Most important skills

2025 Top Skills	2030 Top Skills
Resilience, flexibility and agility	Resilience, flexibility and agility
Analytical thinking	Analytical thinking
Motivation and self-awareness	Creative thinking
Creative thinking	Technological literacy
Curiosity and lifelong learning	AI and big data
Technological literacy	Motivation and self-awareness
Resource management and operations	Curiosity and lifelong learning
Empathy and active listening	Systems thinking
Leadership and social influence	Leadership and social influence
Talent management	Talent management

Cultural competency and environmental stewardship are specific to NZ

*Note: The Engineering sector GDP has been estimated using only engineering related ANZSIC codes, though the Hanga-Aro-Rau legislation defines it using both ANZSIC and ANZSCO codes, meaning some occupations may be missing in our estimation.

** GDP figures are real and presented in 2009/10 prices. GDP figures may not match publicly available figures, as the sector definitions outlined in the Hanga-Aro-Rau legislation differ from ANZSIC definitions.

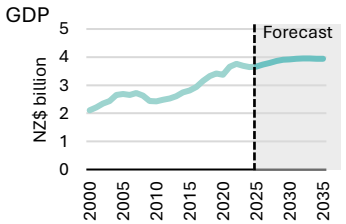
Key insights for the Automotive, Transport and Logistics Industry Skills Board (ISB)

Automotive

Economic and workforce outlook

Sector GDP: 3.7 billion (2025)*
Employed: 62,600 (2025)

- Automotive has grown steadily but expected to plateau.
- The projected workforce gap will rise from ~2,800 in 2026 to ~ 4,800 by 2030, i.e. a 70% rise over five years.



Demographic and diversity trends

Age 45+: 42% (2025)
Māori: 16.9% Pacific: 3.0%

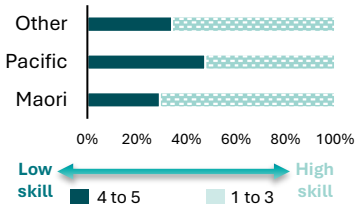
- Aged 65+ remains small but has grown by 13.3% 2020, indicating future challenges.
- Māori numbers have increased while Pacific declined.

Age	2025	% of total	2020 to 2025
15-24	8,900	14.2%	-4.3%
25-44	27,600	44.1%	-3.5%
45-64	22,700	36.3%	-0.9%
65+	3,400	5.4%	13.3%
Total	62,600		-1.9%

Key skill needs and gaps

#1: AI and big data
#2: Technological literacy

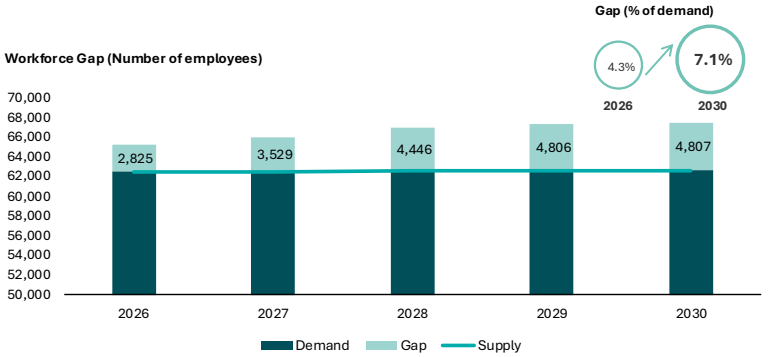
- Notable shift towards higher skill levels.
- Barriers to progression to higher level skills as evidenced in the concentrated mid and lower skill roles, particularly for Pacific peoples.



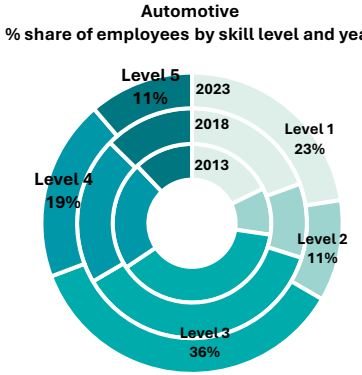
Strategic implications and opportunities

- **Widening workforce gap:** The automotive sector faces a growing shortage of skilled workers, with the gap projected to rise from about 2,800 in 2026 to nearly 4,800 by 2030, i.e. a 70% increase in five years.
- **Ageing workforce:** A high proportion of older workers (42% aged 45+) and a declining share of young adults (15–24 years) in automotive highlight persistent challenges in attracting and retaining young talent. This increases the risk of skill loss and succession issues, making it essential to develop succession planning, mentorship, and knowledge transfer initiatives to retain critical expertise and prepare younger workers for advanced roles.
- **Declining participation of young workers:** This is a challenge as rapid technological change, such as electrification and digital diagnostics is reshaping skill requirements. Aligning training and qualifications with these emerging technologies is essential to ensure the workforce is prepared for future needs.
- **Human-centric skills** are becoming increasingly important as automation, electrification, and digital diagnostics reshape roles. Embedding these human-centric skills into training and qualifications is essential for supporting career mobility, enabling workers to adapt to new roles and technologies.

Workforce gaps



Skill diversity trend



Most important skills

2025 Top Skills	2030 Top Skills
Analytical thinking	AI and big data
Creative thinking	Technological literacy
Resilience, flexibility and agility	Resilience, flexibility and agility
Motivation and self-awareness	Analytical thinking
Leadership and social influence	Creative thinking
Talent management	Talent management
Technological literacy	Leadership and social influence
Curiosity and lifelong learning	Curiosity and lifelong learning
Empathy and active listening	Motivation and self-awareness
AI and big data	Empathy and active listening

Cultural competency and environmental stewardship are specific to NZ

* *Note: Gross Domestic Product (GDP) figures are in real terms and presented in 2009/10 prices. GDP figures may not match publicly available figures, as the sector definitions outlined in the Hanga-Aro-Rau legislation differ from ANZSIC definitions.

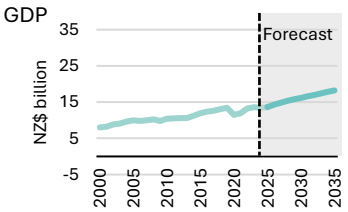
Key insights for the Automotive, Transport and Logistics Industry Skills Board (ISB)

Logistics

Economic and workforce outlook

Sector GDP: 13.6 billion (2025)*
Employed: 123,500 (2025)

- Logistics is a key contributor to NZ's economy and strong growth is expected to continue.
- Projected workforce gap will rise significantly from ~5,000 in 2026 to ~ 19,000 by 2030.



Demographic and diversity trends

Age 45+: 46% (2025)
Māori: 16.3% Pacific: 9.7%

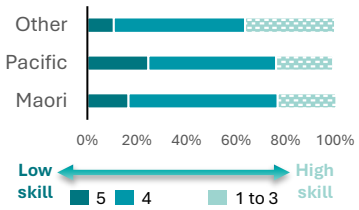
- An ageing workforce, 46% age 45+ working in the sector.
- Share of young adults (15-24 years) has been declining.

Age	2025	% of total	2020 to 2025
15-24	11,600	9.4%	-9.4%
25-44	54,500	44.1%	10.3%
45-64	44,800	36.3%	-15.6%
65+	12,600	10.2%	32.6%
Total	123,500		-1.0%

Key skill needs and gaps

#1: Analytical thinking
#2: AI and big data

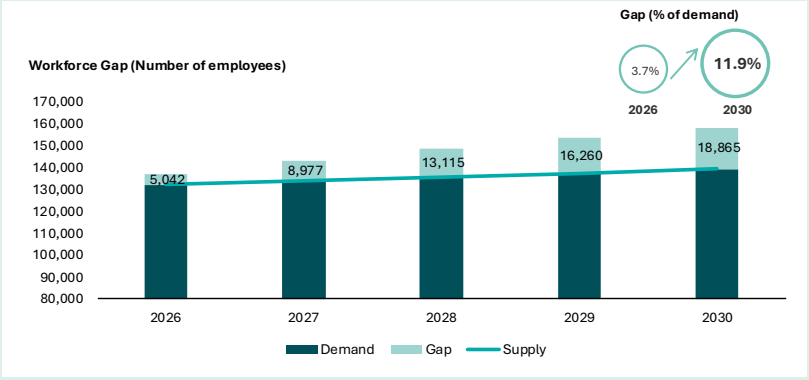
- Dominance of low to mid skilled operational roles. Level 4 roles make up over half of the sector in 2023.
- Emerging demand for digital and analytical skills alongside human-centric skills.



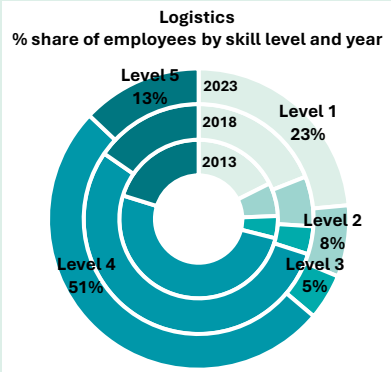
Strategic implications and opportunities

- **Widening workforce gap:** The logistics sector faces a rapidly growing workforce gap, projected to increase from 3.7% in 2026 to 11.9% by 2030. This shortage could constrain supply chain efficiency, service delivery, and the sector's ability to support New Zealand's economic growth.
- **Changing workforce:** Relies heavily on mid career and older workers, with 46% of the workforce aged 45 and over. Participation among younger workers is low and declining, raising concerns about succession planning and long term sustainability. At the same time, the sector is likely to see increased reliance on gig (digital labour platform work) workers and flexible labour, as the industry adapts to changing workforce preferences and operational demands.
- **Cultural competency skills:** Given the large representation of Māori and Pacific peoples in the logistics workforce, it is important to upskill on cultural competency to foster inclusive workplaces, improve communication, and support career progression for these groups. This helps organisations attract, retain, and empower diverse talent, building a more resilient workforce.
- **Qualification and programme design:** Training should align with emerging technologies and industry needs, embedding both technical and human-centric skills, supporting flexible and modular learning pathways, and ensuring accessible, inclusive opportunities for underrepresented groups.

Workforce gaps



Skill diversity trend



Most important skills

2025 Top Skills	2030 Top Skills
Analytical thinking	Analytical thinking
Resilience, flexibility and agility	AI and big data
Leadership and social influence	Technological literacy
Resource management and operations	Resilience, flexibility and agility
Motivation and self-awareness	Creative thinking
Technological literacy	Talent management
Service orientation and customer service	Networks and cybersecurity
Dependability and attention to detail	Leadership and social influence
Talent management	Motivation and self-awareness
Creative thinking	Service orientation and customer service

Cultural competency and environmental stewardship are specific to NZ

*Note: GDP figures are real and presented in 2009/10 prices. GDP figures may not match publicly available figures, as the sector definitions outlined in the Hanga-Aro-Rau legislation differ from ANZSIC definitions.

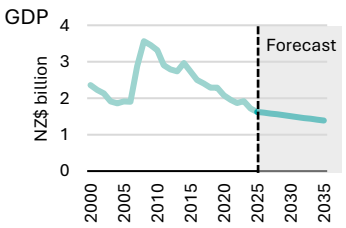
Key insights for the Infrastructure Industry Skills Board (ISB)

Mining and quarrying

Economic and workforce outlook

Sector GDP: 1.6 billion (2025)*
Employed: 6,100 (2025)

- Mining and quarrying has been in decline, but with growth ambitions.
- Under current conditions, the workforce gap is modest (~700 by 2030).



Demographic and diversity trends

Age 45+: 48% (2025)
Māori: 22.4% Pacific: n.a.

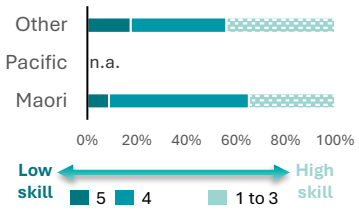
- Heavily reliant on mid career and older workers.
- Women make up less than one quarter of the workforce.

Age	2025	% of total	2020 to 2025
15-24	-	-	-
25-44	2,400	52.2%	14.3%
45-64	2,200	47.8%	4.8%
65+	-	-	-
Total	4,600+		9.5%

Key skill needs and gaps

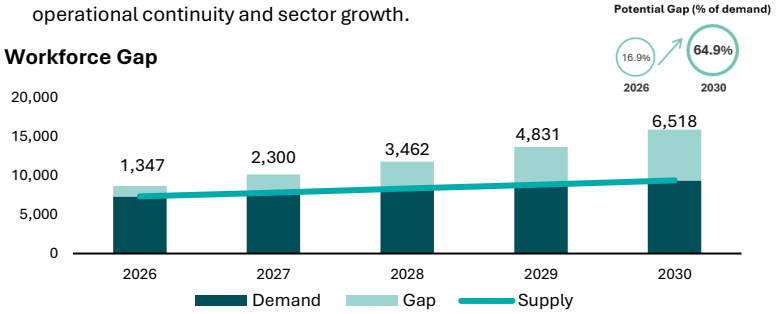
#1: Systems thinking
#2: Environmental stewardship

- Dominated by mid skilled operational roles (46% level 4 in 2023).
- Roles in the mining and quarrying sector are increasingly shifting toward higher skill levels.

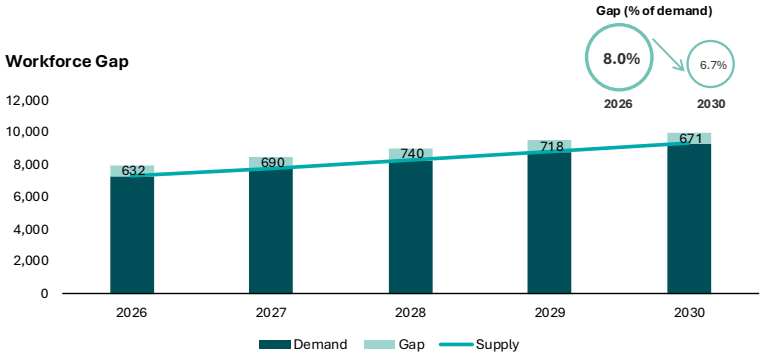


Strategic implications and opportunities

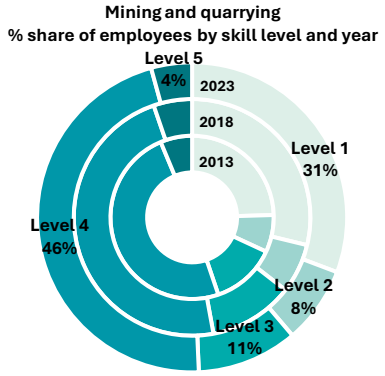
- **Ambition to grow:** Given the government's ambition to double mineral export value by 2035, it would require a major expansion of the workforce and rapid upskilling. If this target is pursued, the workforce gap could grow from about 700 to over 6,500 by 2030, highlighting the urgent need for targeted attraction, training, and retention strategies.
- **Modernise training:** There is an opportunity to modernise training, attract younger and more diverse talent, and leverage partnerships (including with Australia) to build a future ready, highly skilled workforce that can support both operational continuity and sector growth.



Workforce gaps



Skill diversity trend



Most important skills

2025 Top Skills	2030 Top Skills
Creative thinking	Systems thinking
Systems thinking	Environmental stewardship
Curiosity and lifelong learning	Creative thinking
Resilience, flexibility and agility	Technological literacy
Leadership and social influence	AI and big data
Technological literacy	Resilience, flexibility and agility
Environmental stewardship	Curiosity and lifelong learning
Analytical thinking	Talent management
Quality control	Motivation and self-awareness
Resource management and operations	Analytical thinking

Cultural competency and environmental stewardship are specific to NZ

*Note: Gross Domestic Product (GDP) figures are real and presented in 2009/10 prices. GDP figures may not match publicly available figures, as the sector definitions outlined in the Hanga-Aro-Rau legislation differ from ANZSIC definitions.

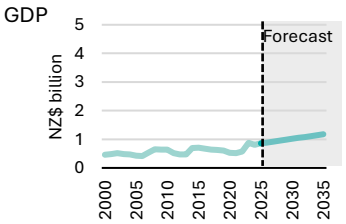
Key insights for the Infrastructure Industry Skills Board (ISB)

Oil and gas extraction

Economic and workforce outlook

Sector GDP: 0.9 billion (2025)*
Employed: 2,300 (2025)

- Oil and gas extraction is relatively small and operates in an uncertain policy environment.
- The projected oil and gas extraction workforce surplus in is small.



Demographic and diversity trends

Age 45+: Possibly ~100% (2025)
Māori: n.a. Pacific: n.a.

- There is limited data available for detailed analysis, but the workforce appears to be concentrated in mid career and older workers.

Age	2025	% of total	2020 to 2025
15-24	-	-	-
25-44	-	-	-
45-64	1,100	100%	0.0%
65+	-	-	-
Total	1,100+		

Key skill needs and gaps

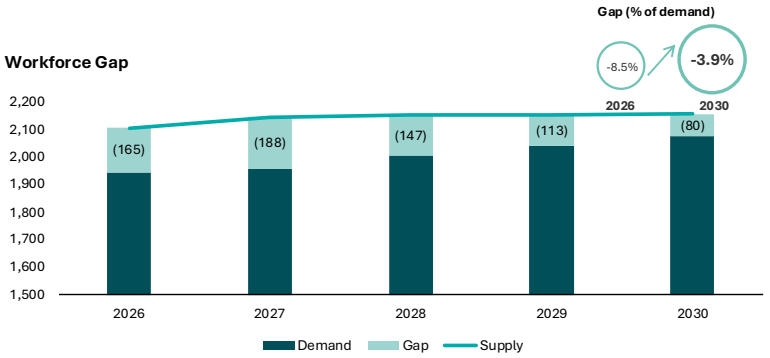
#1: Resilience, flexibility and agility
#2: Leadership and social influence

- This workforce is highly concentrated in advanced roles, with Level 1 (highly skilled) roles increasing from 39% in 2013 to 44% in 2023.
- Level 4 (mid-skilled) roles remain significant at 38% of the oil and gas workforce in 2023, while Level 5 (low skilled) roles have declined to 6%, reflecting a shift toward greater technical and managerial expertise.

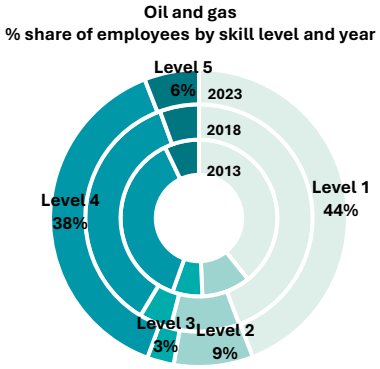
Strategic implications and opportunities

- **Skills evolving:** The sector's most important skills are shifting from traditional operational strengths (such as resource management and operations) towards advanced capabilities such as AI and big data, technological literacy, and environmental stewardship by 2030.
- **Important human-centric skills:** Non-technical skills remain critical, including:
  - Resilience
  - Flexibility and agility
  - Leadership and social influence
  - Creative thinking
  - Motivation and self-awareness
- However, there is a growing gap in digital skills (AI and big data) and analytical skills as technology and sustainability become more central to future workforce needs. Embedding human-centric skills in training is key to career mobility and adaptability.

Workforce gaps



Skill diversity trend



Most important skills

2025 Top Skills	2030 Top Skills
Resilience, flexibility and agility	Resilience, flexibility and agility
Leadership and social influence	Leadership and social influence
Motivation and self-awareness	AI and big data
Analytical thinking	Technological literacy
Creative thinking	Creative thinking
Resource management and operations	Motivation and self-awareness
Talent management	Talent management
Empathy and active listening	Environmental stewardship
Curiosity and lifelong learning	Curiosity and lifelong learning
Technological literacy	Analytical thinking

Cultural competency and environmental stewardship are specific to NZ

*Note: GDP figures are real and presented in 2009/10 prices. GDP figures may not match publicly available figures, as the sector definitions outlined in the Hanga-Aro-Rau legislation differ from ANZSIC definitions.

Executive summary | Impact of AI

AI adoption is not just a technology upgrade. It's a cultural shift.

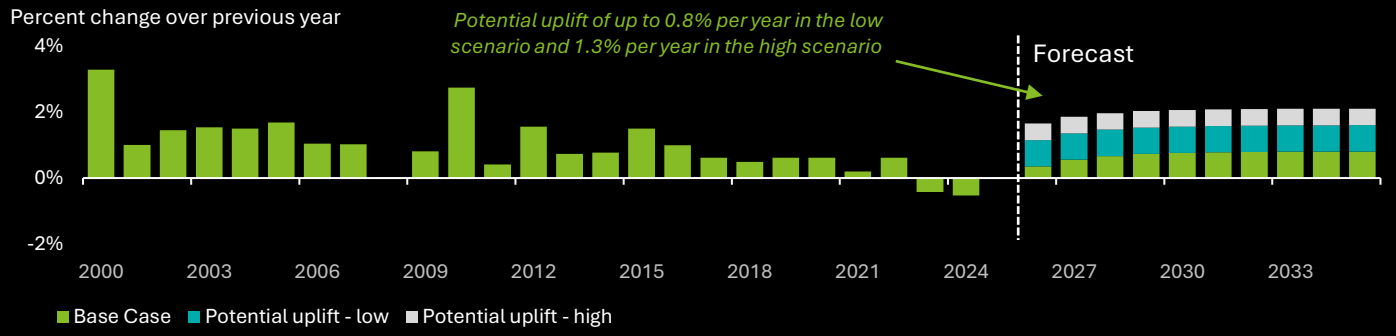
Artificial intelligence (AI) is no longer a futuristic concept. It is actively reshaping how work is done across industries. While AI has existed for decades, breakthroughs in the past five years, particularly in generative AI (GenAI) and agentic AI, are transforming the future of work in profound ways. GenAI can now produce text, images, code and documents, while agentic AI can make decisions and take actions independently. These technologies are being compared to past game changers such as microprocessors, personal computers, mobile phones and the internet.

As emerging technologies converge, AI remains one of the most talked about and transformative areas in technology today. It is redefining roles, shifting tasks and creating new opportunities across industries. Routine and repetitive tasks are increasingly automated, allowing people to focus on creativity, strategy and collaboration.

From automation to augmentation

The rise of the AI augmented workforce marks a shift from automation replacing jobs to AI enhancing human capabilities. This transformation is being felt globally, with varying strategies and outcomes depending on regional readiness, industry maturity and workforce adaptability. As with previous innovations, there is considerable uncertainty around how quickly and deeply AI will impact the workforce.

New Zealand labour productivity growth and the potential uplift from AI



Productivity uplift from AI

OECD analysis across the G7 economies shows that countries with strong AI strategies could see annual labour productivity growth of 0.4% to 1.3%, compared to 0.2% to 0.8% in slower adopting economies.

Deloitte Access Economics estimates that New Zealand's labour productivity trend and potential uplift from AI, with forecasts showing gains of up to 0.8% in the low scenario and 1.3% in the high scenario, which is almost doubling base case growth from 2027 onwards.

The early 2000s provides a comparable reference period in which significant productivity growth occurred due to technological change, where advancements in computers and the internet drove significant increases in labour productivity.

Skills required to operate with AI

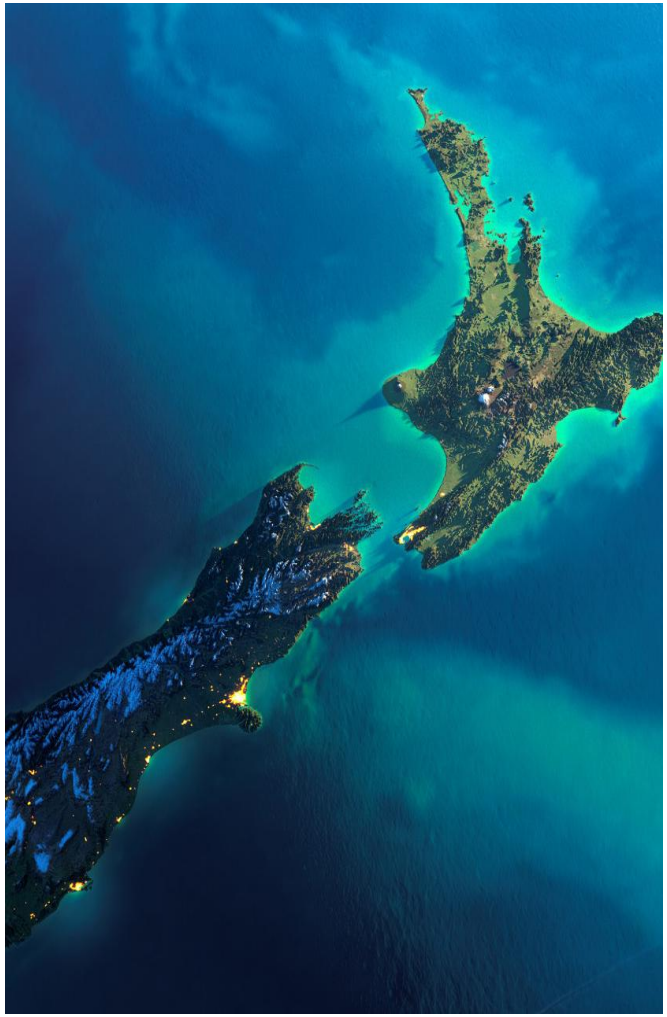
Bridging the AI skills gap is essential as AI and automation become embedded across all industries, not just in technical roles. Most of the workforce will need to interact with AI tools, interpret AI generated insights, and adapt to new workflows. Upskilling non technical workers is critical to ensure they can confidently use, manage, and collaborate with AI systems, rather than being left behind by technological change.

There are an extensive list of skills required to successfully operate with AI. This research selects 28 important skills targeting non-technical workers. The 28 non-technical AI and tech-specific skills are designed to:

- Empower non-technical staff to work effectively with AI tools, from prompt engineering and data literacy to ethical awareness and collaboration with tech teams.
- Support workforce adaptability by embedding foundational cognitive, digital, and interpersonal skills that are relevant across a wide range of roles.
- Reduce risk and maximise value by ensuring workers can critically assess AI outputs, maintain data security, and apply AI-driven insights responsibly.
- Enable inclusive transformation so that all employees, not just IT specialists, can participate in and benefit from AI driven change, supporting organisational resilience and innovation.
- Upskilling non technical workers in these areas is vital for building a future ready workforce that can thrive alongside AI, drive productivity, and ensure equitable access to new opportunities.

Ngā mihi | Acknowledgements

This research was commissioned by Hanga-Aro-Rau and conducted by Deloitte. Deloitte and Hanga-Aro-Rau acknowledge the contribution by experts and individuals who shared their views over the course of this research, including the following people.



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01

Ō Tātou Rangahau
Our Research

Photo: D&H Steel, New Zealand

About this report

This is the third of a series of research on Aotearoa workforce development needs, change, disruption, opportunity, impact and enablement.

This research marks a key milestone in the transition of Hanga-Aro-Rau into the new Industry Skills Board (ISB). It builds on previous sector studies, *Post COVID-19 workforce development needs in New Zealand's manufacturing (2022)* and *Workforce development needs in New Zealand's logistics sector (2023)*. Further, it supports the continued evolution of vocational education across the manufacturing, engineering, automotive, logistics, mining and quarrying, and oil and gas extraction and wholesaling sectors.

The operating environment for these industries is rapidly changing. Businesses are navigating change and disruption, shifting workforce dynamics, and accelerating technological transformation. At the same time, there is growing momentum to build a more inclusive and future ready workforce that reflects the diversity and aspirations of Aotearoa New Zealand (NZ).

This next phase of research will provide ISBs a strong platform to lead the next era of vocational education. It will provide the intelligence, tools, and frameworks they need, along with a deeper understanding of sector trends, workforce and skills needs, and future opportunities. The research will help maintain the momentum created by Hanga-Aro-Rau and its partners, ensuring ISB are well informed and equipped to respond to challenges and deliver meaningful outcomes for learners, employers, and communities.

The research will focus on three aspects of the industry sectors:

1. **Economic context –** Revisiting economic projections and analysing sectoral shifts in workforce in light of recent VET system changes.
2. **Skills requirements and workforce pipeline –** understanding the evolving skills landscape and workforce pipeline to support entry into the industry, improve retention, and enable progression into higher skilled roles.
3. **The impact of AI and automation –** Identifying the key skills required to enhance future workforce readiness and competitiveness.

The purpose and targeted audience for this research is wide ranging. It is designed to inform and support key stakeholders across the vocational education ecosystem, including ISBs, employers, industry associations, education providers, government agencies, and workforce development organisations.

For the ISB, the research provides a strong evidence base to guide strategic decisions, shape qualifications, and prioritise investment in skills development.

For employers and industry associations, it offers insights into workforce trends, emerging skills, and technology impacts, helping them plan recruitment, retention, and training strategies.

For education providers, it highlights evolving skill requirements and pipeline needs, enabling curriculum updates and responsive programme design.

For government and policy makers, it delivers intelligence to inform funding, policy settings, and initiatives that strengthen workforce resilience and inclusivity.

For learners and communities, it ensures vocational pathways remain relevant, accessible, and aligned with future opportunities.

Photo: Juken New Zealand

Our approach and report structure

This research applies a New Zealand economic, policy settings, and workforce context and builds upon trends identified from global research. It covers both technical and human-centric skills, the latter is becoming increasingly important.

This research will cover six targeted sectors, **manufacturing**, **engineering**, **logistics**, **automotive**, **mining and quarrying**, and oil and gas extraction and wholesaling. As Hanga-Aro-Rau transitions into the new ISBs, its current coverage will align with the following boards:

1. **Manufacturing and Engineering**
2. **Automotive, Transport and Logistics –** including supply chain, aviation, warehousing, and distribution.
3. **Infrastructure –** including energy, oil and gas extraction, and mining and quarrying.
4. **Electrotechnology and Information Technology –** including refrigeration, heating, ventilation, and air conditioning (RHVA).

Economic context

Building on previous analysis of the manufacturing, engineering, and logistics sectors, this research updates findings to reflect current economic conditions and expands the scope to include mining and quarrying, oil and gas extraction, and automotive. Key objectives include:

- Update insights on current economic conditions and workforce impacts since 2023, considering policy changes and technological disruption.
- Forecast workforce supply and demand across key sectors and estimating workforce gaps over the next five years.
- Model workforce impacts under a future scenario for the mining and quarrying sector.

Skills requirements and workforce pipeline

Focus is also placed on researching for future and emerging skills that would shape the industry sectors. Insights from the research helps inform workforce development and talent management opportunities. Objectives include:

- Identifying top important and emerging skills
- Identifying barriers to entry into the industry sectors
- Discussing potential building blocks and capability enablers to help narrow some of the skills gaps.

Report structure

This report is organised into six main sections that set the context, outline current challenges, and highlight implications for the industry sectors. The report is designed so each section can be read independently. This structure provides flexibility for readers and ensures key insights are accessible within each section, even if that means some intentional repetition. The sections are as follows:

Section 1: Our research

Understanding the continued evolution of vocational education

Section 2: Our world

This section covers global workforce insights, the top 10 future and emerging skills, and global vocational education trends.

Section 3: Our place, our people

This includes New Zealand's economic outlook and policy transformation, covering macroeconomic trends, unemployment, migration, labour market dynamics, and an overview of VET sector reform, skills standards, and system changes.

Section 4: Our industry sectors

This examines workforce profiles, supply and demand analysis, skills gaps, and lessons from global trends relevant to New Zealand by 2030. It also discusses workforce pipeline and strategic enablers, including entry pathways, barriers to entry, skills-based approaches to closing gaps, and talent management strategies for Aotearoa.

Section 5: Our skills boards

This section provides workforce and skills outlook for sub-sectors under the future ISBs: manufacturing and engineering, automotive and logistics, and mining and quarrying and oil and gas extraction. It includes key statistics around specific top skills, skill levels changes, employment and occupation trends.

Section 6: Our future with AI

This establishes a starting point for industry discussion on AI and emerging technology disruption. Identifies critical skills for transitioning workers into an AI-enabled environment.

Limitations and assumptions

While this research provides valuable insights, we note the following limitations:

- **Hanga-Aro-Rau definition of industries** – The six broad sectors including manufacturing, engineering, automotive, logistics, mining and quarrying, and extracts are collectively referred to as "the industry sectors" in this report. Because data comes from both public sources and custom extraction, some analyses may not align fully with the exact Australian and New Zealand Standard Industrial Classification (ANZSIC) 4-digit code definitions used by Hanga-Aro-Rau.
- **Time and resource constraints –** Full engagement with industry stakeholders was not possible. Future skills insights from the *World Economic Forum (WEF) Future of Jobs Report 2025*, combined with other research and Hanga-Aro-Rau extensive industry engagement over the past five years, have been adapted to inform the New Zealand context.
- **Access to underlying WEF data –** The underlying dataset from the *Future of Jobs Report* was not accessible. Deloitte has therefore used published results from the report combined with additional research to derive the most important skills for New Zealand by 2030.
- **Human-centric skills –** There are multiple ways of defining non-technical skills. For this research, a broader definition is taken that are usually described by others as human skills, interpersonal skills, people skills, cognitive skills, socio-emotional skills and transferable skills.
- **Cultural competency skill –** The definition of this New Zealand specific skill is adopted from the Ministry of Education, "Cultural competency is the acceptance and respect for difference, a continuous self-assessment regarding culture, an attention to the dynamics of difference, the ongoing development of cultural knowledge, and the resources and flexibility within service models to meet the needs of minority populations".
- **Electrotechnology and Information Technology ISB –** Due to data suppression, a separate chapter for this ISB for RHVA information is not possible. RHVA under this ISB has been included in the broader manufacturing and engineering analysis.

Data and information sources

This report draws on a range of data and insights, including:

- Specially requested data provided by Stats NZ.
- Deloitte Access Economics in-house data and projections.
- Subscription-only sources from various industry publications.
- Publicly available data from credible web sources.
- Insights from subject matter specialists, particularly from Hanga-Aro-Rau and Deloitte.

Data limitations and suppression – Statistics New Zealand (Stats NZ) applies suppression rules to small counts, which means the analysis only reflects non-suppressed results. As a result, detailed data for some sub industries and occupations is unavailable.

Data differences – Both New Zealand Census data and Household Labour Force Survey (HLFS) data have been used. There may be discrepancies between these sources for estimates covering the same period. Where differences occur, Census data should be treated as the primary reference.

Referencing and citations

For this industry report, a simple, practical and professional approach to referencing has been applied:

- Where a direct reference has been made, it is noted in speech marks and cited in the text.
- Where insights have been synthesised from multiple sources or adapted rather than quoted, the original sources are acknowledged in the bibliography.
- A full bibliography list is included at the end of the report, formatted for consistency and clarity.

Strategic themes for the research

Photo: Penske Trucks New Zealand

In the context of a rapidly changing landscape and to ensure the VET system remains relevant, resilient, and future ready, four strategic themes have emerged as priorities for action and research:

1. **Change**
2. **Disruption**
3. **Opportunities and impact**
4. **Enablement.**

These themes provide a framework for understanding the challenges and opportunities facing the sectors, and for guiding coordinated responses that will enable all New Zealanders to thrive in a rapidly changing world.

The first theme, **change**, recognises the scale and speed of change affecting New Zealand's VET system. Broader shifts in policy, sector transformation and global context are reshaping the environment in which VET operates. Key drivers include policy transitions, system restructuring, government priorities, and global context.

Disruption is now a constant feature of the global and local landscape. Rapid shifts in capability and workforce demand. These are driven by technology acceleration, operational transformation, workforce volatility,

Amidst change and disruption, significant **opportunities and impact** arise for the productivity uplift, regional revitalisation and inclusive growth. The VET system can play a pivotal role in unlocking innovation, driving productivity, revitalise regional and social impact, and strengthening export potential.

To realise these opportunities, the VET system should focus on **enablement**, ensuring that systems, policies and practices are responsive to emerging needs and support all learners. These include skill alignment, system redesign, equity and access, and digital readiness.

Understanding the interplay across these strategic themes will help build a more innovative, inclusive and resilient workforce for Aotearoa New Zealand's future.

The four strategic themes that emerged for this research along with the key strategic questions are outlined as follows.

1. Change

Broader shifts in policy, sector transformation and global context

Observations

- **Policy transitions –** The move from Workforce Development Councils (WDCs) to ISBs is reshaping workforce governance, creating disruption and opportunity to refresh frameworks and strengthen industry leadership.
- **System restructuring –** The disestablishment of Te Pūkenga and proposed National Certificate of Educational Achievement (NCEA) changes are prompting a rethink of provider roles, learner pathways, and system coherence.
- **Government priorities –** A renewed focus on exports and oil and gas extraction signals a shift in economic direction with direct workforce implications.
- **Global context –** Post-COVID inflation, weak economic recovery, cost pressures and tighter immigration are reinforcing the need for domestic skills and productivity.

Strategic research questions

1. **Understanding the impact of reforms –** How might recent policy and system reforms reshape the role of vocational education in preparing for future workforce needs?
2. **Identifying local influences –** Are there New Zealand specific factors that may impact the pace of change or rate of disruption to the workforce?

2. Disruption

Rapid shifts in capability and workforce demand

Observations

- **Technology acceleration** – AI, automation, and digital systems are rapidly reshaping work, redefining capabilities and challenging traditional roles.
- **Operational transformation** – Smart technologies are improving efficiency but displacing legacy roles, increasing demand for hybrid technical-digital skills.
- **Workforce volatility –** As automation scales, some roles decline while others emerge, pressuring training systems to adapt quickly.
- **New Zealand specific impact –** The unique composition of New Zealand's agri-export focussed economy, multicultural workforce means our workforce characteristics differ from global trends.

Strategic research questions

3. **Assessing risk and opportunity –** Which skills and roles, particularly those supported by the VET system, are most at risk of disruption, and what new or evolving roles and skillsets are emerging in response?
4. **Linking innovation to workforce gaps –** What is the impact of innovation on workforce gaps in New Zealand, and how can vocational education respond to address these gaps?

3. Opportunities and Impact

Broader shifts in policy, sector transformation and global context

Observations

- **Strategic implications –** Disruption intersects with broader shifts, requiring coordinated responses. Exploring AI disruption scenarios is key to future planning.
- **Innovation potential –** AI and digital tech, sustainability, and global shifts are opening new value opportunities.
- **Export and productivity uplift –** Disruption can drive growth through productivity, smart supply chains, and niche manufacturing, if common cross-sector skills are developed.
- **Regional and social impact –** Transformation can revitalise regions and create inclusive employment, but requires investment in workforce transition and collaborative innovation networks.

Strategic research questions

5. **Exploring AI-driven change –** What AI disruption scenarios could reshape skills demand across in-scope sectors, and how can the VET system prepare tradespeople and technical workers with relevant AI and digital capabilities?
6. **Identifying cross sector future skills –** What future skills are likely to be common across in-scope sectors, and how can these be embedded into vocational pathways to support adaptability and progression?
7. **Designing effective career pathways –** What must future skills pathways include to effectively support career progression in a reshaped system with new and evolving providers?

4. Enablement

Rapid shifts in capability and workforce demand

Observations

- **Skills alignment –** Training must align with emerging needs, automation, systems integration, and sustainability, through agile, modular/building block pathways.
- **System redesign –** Policy and structural changes offer a chance to reshape the education system to better meet future workforce needs and reduce disruption.
- **System responsiveness –** Education reform allows for more responsive, regionally attuned, and industry-led workforce development.
- **Equity and access –** Māori, Pacific peoples, and disabled learners need targeted support to access high value roles, reinforcing the need for inclusive design.

Strategic research questions

8. **Ensuring digital readiness and equity –** How can providers ensure their programmes incorporate the digital tools and platforms needed to support equitable access, learner achievement, and workforce relevance?
9. **Embedding AI literacy across the workforce –** How can AI literacy and fluency be embedded across all levels of the workforce, from foundational to advanced roles?

02

Tō Tātou Ao
Our World

Global insights

Workforce, skills trends, and the VET systems

Global workforce and skills trends

This research examines the predicted shift in global workforce skill priorities by 2030 across the targeted sectors, drawing on analysis from the World Economic Forum and applying an Aotearoa New Zealand specific economic, policy, and workforce context.

By 2030, 22% of current jobs are projected to be disrupted globally, with 170 million new roles created and 92 million displaced – resulting in a net gain of 78 million jobs.

(World Economic Forum, Future of Jobs Report 2025)

Global workforce outlook

A transformation is underway across global labour markets, reshaping how industries operate and how work is defined. This shift is not speculative, it is driven by accelerating technological innovation and global economic shifts. By 2030, 22% of current jobs are projected to be disrupted globally.

Labour markets are evolving rapidly as organisations respond to technological innovation, demographic changes, and shifting workforce expectations. To remain competitive, resilient, and future ready, employers are rethinking talent strategies and redesigning workforce models.

The Future of Jobs Report 2025 identifies four key forces driving this change:

- Technological advancement
- Demographic transitions
- Climate mitigation
- Geoeconomic fragmentation.

Among these, 86% of employers expect AI and digital technologies to significantly reshape their operations.

At the same time, evolving business models are creating demand for new roles and skill sets.

The Chief People Officers Outlook 2025 reinforces this view, highlighting how ongoing disruption is prompting organisations to redesign jobs, invest in talent development, and adopt more agile workforce strategies.

Industry analysis supports this, noting that macroeconomic shifts, automation, and policy changes are accelerating the need for reskilling and innovation in workforce design.

Technology transformation

Technological innovation is the most significant driver of workforce evolution. Artificial intelligence (AI), automation, and robotics are redefining job roles, workflows, and organisational structures.

AI is rapidly reshaping the global workforce. While often perceived as a threat to entry level roles, particularly for graduates, the reality is more complex. Economic uncertainty, offshoring, and post-pandemic adjustments are also contributing to the decline in traditional job openings. This transformation highlights the urgent need for workforce development and VET systems to adapt, not only by equipping individuals with technical and digital skills, but also by fostering adaptability, entrepreneurial thinking, and AI literacy. As career pathways become less linear and more fluid, future skill sets must prepare learners to thrive in a landscape defined by automation, remote collaboration, and platform-based work.

AI adoption is widespread, with 86% of businesses surveyed are integrating AI into operations, recruitment, and customer service. In a global survey of more than 11,000 executives across over 1,000 companies, spanning 22 industries and 55 economies and representing more than 14 million workers, employers assessed the impact of macrotrends on their operations and workforce strategies. Among technology related trends, AI and information processing technologies were identified as the most transformative, with 86% of respondents indicating these technologies would significantly reshape their organisations by 2030.

Vocational education must integrate human-centric skills and a digital first mindset alongside core technical competencies. In an era of rapid change and disruption, this approach will equip learners with a broad, resilient skill set that remains relevant across multiple industries. To support future workforce strategies, industry, VET providers, and learners must embrace a culture of continuous and lifelong learning.

Digital infrastructure is also considered a major force, influencing how work is accessed, delivered, and monitored. The Future of Jobs Report 2025 found that 60% of employers expect broadening digital access to be the most transformative macrotrend shaping industries by 2030. This includes the expansion of connectivity, cloud platforms, and digital tools that enable remote work, real time collaboration, and decentralised operations. These technologies are redefining how organisations structure their workforce and deliver services.

Automation is shifting demand from manual labour to technical and analytical roles, particularly in manufacturing, logistics, and services. For example, automation technologies are being adopted to speed up manufacturing processes and stretch scarce talent, especially in response to global labour shortages. It is estimated that by 2025, automation and related technologies will create at least 12 million more jobs than they eliminate, with many of these new roles requiring technical and analytical skills.

Skills evolution and lifelong learning

The pace of change has reduced relative demand for many traditional skill sets. Employers are prioritising upskilling and reskilling to bridge talent gaps and future-proof their workforce. Skill instability is high, with 39% of current skills projected to be disrupted or outdated by 2030. It underscores the urgency for reskilling and upskilling initiatives to keep pace with shifting skill relevance.

Global findings highlight a marked shift in employer priorities, with growing emphasis on digital, cognitive, and interpersonal capabilities over manual or routine tasks. Skills such as AI and big data, cybersecurity, and creative thinking are becoming increasingly valued, while physical dexterity and repetitive functions are declining in relevance. At the same time, sustainability and adaptability are emerging as critical skills, reflecting broader changes in technology adoption, workplace models, and climate conscious business strategies.

Key implications for organisations include:

- **Digital first mindset –** AI, data literacy, and cybersecurity are no longer niche, they are core capabilities across roles.
- **Human-centric skills matter –** Creative thinking, leadership, and adaptability remain critical, especially as technology amplifies the need for problem solving and collaboration.
- **Sustainability as a skill –** The rise of environmental stewardship are becoming mainstream business priorities.
- **Continuous learning culture –** With nearly 40% of skills in flux, organisations are advised to embed lifelong learning into their workforce strategies.

Photo: Saturn V Rocket, Johnson Space Centre, Houston, Texas

Shifting skill priorities

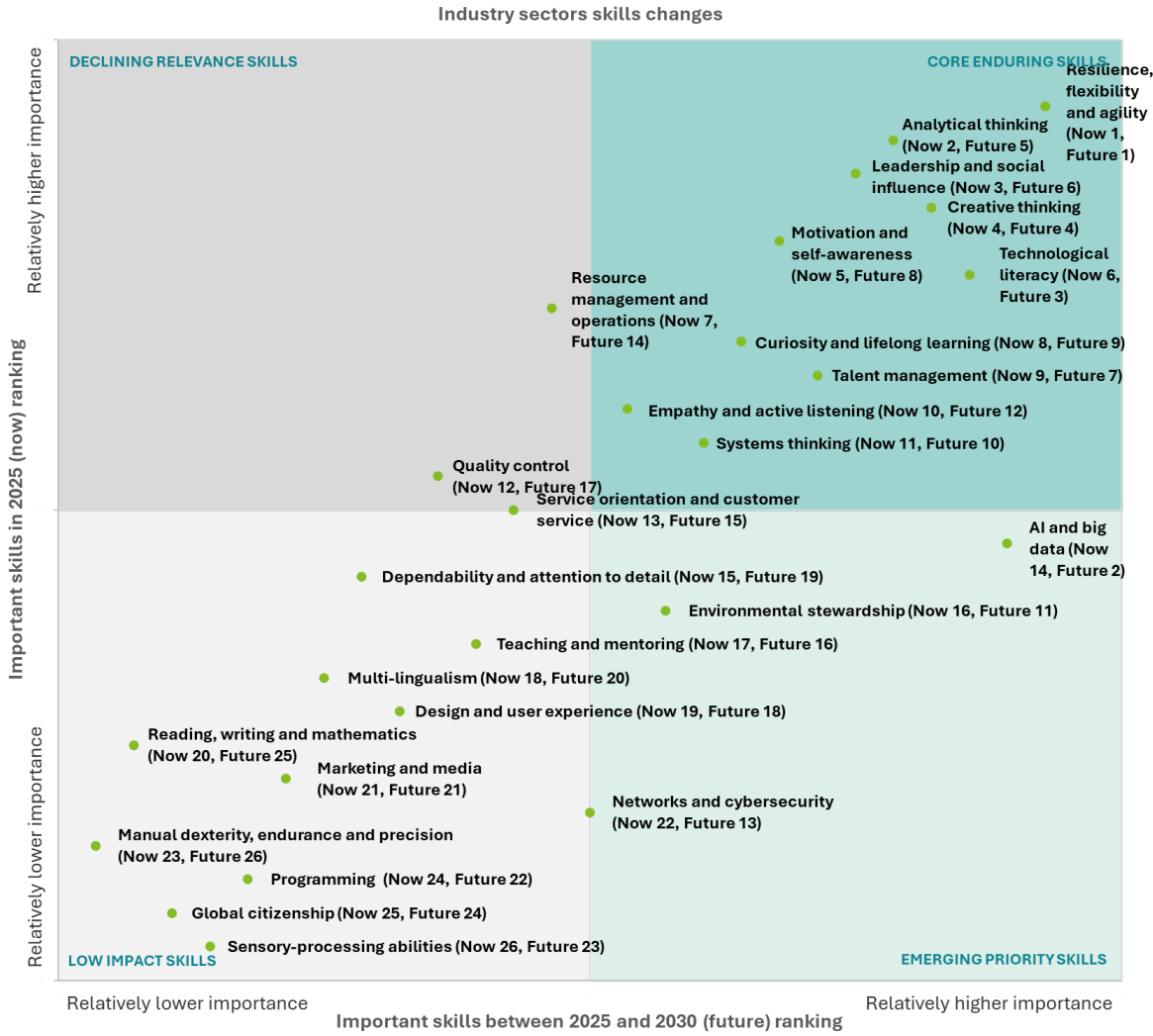
Core skills expected to remain highly important include resilience, flexibility and agility, analytical thinking, creative thinking, technological literacy, and leadership and social influence. These underpin adaptability and innovation across sectors.

Shifting skill priorities in the industry sectors

Global industries such as advanced manufacturing, consumer goods production, automotive and aerospace, supply chain and transportation, mining and quarrying, and oil and gas extraction are undergoing a significant reshaping of skill priorities between 2025 and 2030. While some capabilities maintain their dominance, others rise sharply or decline as technology, sustainability and new operating models transform these sectors.

Four key dynamics emerge:

- **Core enduring skills (top right) –** Skills that remain highly important now and in the future. These include resilience, flexibility and agility, analytical thinking, creative thinking, technological literacy, and leadership and social influence. These capabilities underpin adaptability and innovation across all sectors.
- **Declining relevance skills (top left) –** These are skills that are important today but are expected to lose prominence by 2030. Only resource management and operations, and quality control skills fall into this category.
- **Emerging priority skills (bottom right) –** Skills that rise sharply in importance by 2030. These include AI and big data, networks and cybersecurity, and environmental stewardship, likely driven by digital transformation and sustainability imperatives.
- **Low impact skills (bottom left) –** Skills that remain relatively lower in importance, such as global citizenship, multilingualism, and marketing and media. While relevant in niche contexts, they are unlikely going to drive workforce transformation at scale.



Source: WEF, Deloitte Analysis

Human-centric skills will become increasingly important. Demand for AI and big data skills are expected to exhibit the fastest growth to 2030. It is expected that analytic skills to remain important to interface with and validate AI supported outputs.

Critical skills between 2025 and 2030

Resilience, flexibility and agility remains the top priority in both periods, underscoring the need for adaptability. However, **AI and big data** will be the second priority within the top 10 skills by 2030, signalling its critical role in future operations. **Technological literacy** will be the third priority, while **systems thinking** will emerge as a top 10 priority by 2030.

Three skills show the sharpest rise in importance:

- AI and big data
- Networks and cybersecurity
- Environmental stewardship.

Conversely, the skills that are relatively less relevant are:

- Resource management and operations
- Quality control
- Reading, writing and mathematics.

These shifts reflect global trends, driven by the twin imperatives of digital transformation and sustainability, as well as the impact of automation on routine and operational tasks. However, from a New Zealand perspective, these skills remain important and continue to play a vital role in the workforce.

Understanding these changes is about anticipating, not reacting. **Lifelong learning** will be central to preparing for emerging technologies, sustainability goals and new operating models. By embedding continuous learning into workforce strategies, New Zealand can shape a resilient, future ready workforce rather than respond to disruption.

Human-centric skills endure. AI and big data accelerate.

Top 10 in-demand and important skills in 2025 globally:

Ranking	Skill
1	Resilience, flexibility and agility
2	Analytical thinking
3	Leadership and social influence
4	Creative thinking
5	Motivation and self-awareness
6	Technological literacy
7	Resource management and operations
8	Curiosity and lifelong learning
9	Talent management
10	Empathy and active listening

Source: Deloitte derived analysis

Top 10 in-demand and important skills by 2030 globally:

Ranking	Skill
1	Resilience, flexibility and agility (1)
2	AI and big data (14)
3	Technological literacy (6)
4	Creative thinking (4)
5	Analytical thinking (2)
6	Leadership and social influence (3)
7	Talent management (9)
8	Motivation and self-awareness (5)
9	Curiosity and lifelong learning (8)
10	Systems thinking (11)

Source: Deloitte derived analysis

Top 3 skills that are rising in demand and importance between 2025 and 2030 globally:

Ranking	Skill
1	AI and big data
2	Networks and cybersecurity
3	Environmental stewardship

Top 3 skills that may have relatively lower impact between 2025 and 2030 globally:

Ranking	Skill
1	Resource management and operations
2	Quality control
3	Reading, writing and mathematics

Source: Deloitte derived analysis

Skills based hiring

Organisations are moving away from qualification centric recruitment towards skills based hiring. This approach prioritises competencies over degree based, formal qualifications, or years of experience, enabling employers to build agile, adaptable workforces and support internal mobility. Candidates are increasingly assessed through skills tests, micro-credentials and experiential learning rather than formal qualification.

Workforce structure becomes fluid and decentralised

Work is shifting towards more adaptive, distributed models. Decentralised offices and remote work have become the norm, dismantling rigid hierarchies in favour of autonomous structures that enable faster decision making and greater engagement.

Implications for VET include:

- Embedding self management, digital collaboration and remote communication into curricula.
- Prioritising critical thinking, problem solving and adaptive learning for autonomy.
- Ensuring proficiency in cloud tools, cybersecurity and AI platforms.
- Supporting flexible learning pathways such as micro-credentials and recognition of prior learning.
- Fostering resilience and lifelong learning as core competencies.

Hybrid work becomes the new standard

Hybrid work is now common for design, planning and research and development (R&D) roles, with 80% of remote-capable employees expecting long term flexibility.

While core operational roles in manufacturing, mining and quarrying, and oil and gas extraction require on-site presence for safety and production, hybrid models are increasingly relevant for knowledge-based and technical functions across these sectors:

- **Manufacturing –** Hybrid work could apply to roles in product design, process engineering and supply chain planning, supported by digital collaboration tools and virtual simulation platforms.
- **Engineering –** Design and analysis tasks can potentially be performed remotely using computer aided design (CAD) software and cloud-based project management systems, enabling global collaboration.
- **Automotive –** Research and development, Fleet Data Managers and Simulation and Virtual Testing Engineer roles could operate in hybrid models, especially as vehicles become more digitally integrated.
- **Logistics –** Planning, scheduling and inventory management functions are better suited to hybrid arrangements, leveraging real time data and digital dashboards.
- **Mining and quarrying, and oil and gas extraction and wholesaling –** While field operations remain site dependent, hybrid work is feasible for geospatial analysis, environmental compliance and project planning teams using remote sensing and digital modelling tools.

Implications for VET and workforce development

Hybrid work requires proficiency in digital communication, collaboration platforms and self-management. Training frameworks should integrate these competencies alongside technical skills to prepare learners for distributed work environments. Flexible learning pathways such as micro-credentials and blended delivery models could be effective to support upskilling without disrupting employment.

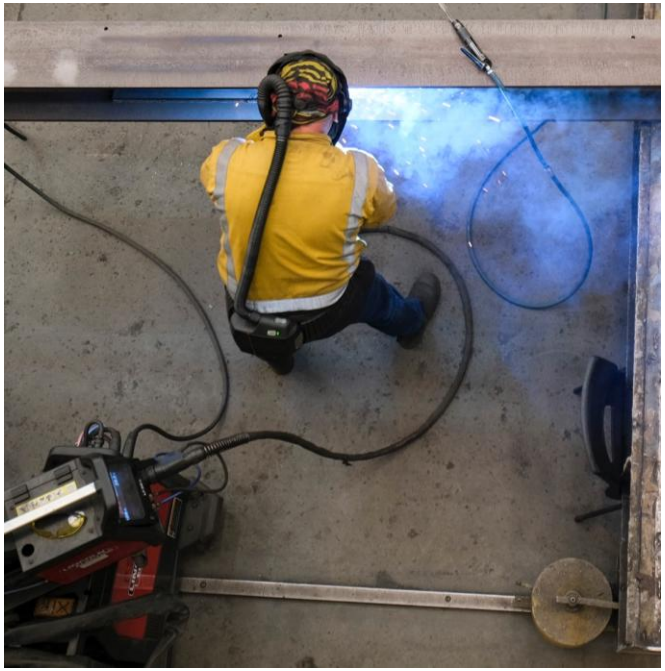


Photo: D&H Steel, New Zealand

Gig and freelance work reshape employment models

The rise of gig and freelance work is significantly transforming workforce structures and employment models worldwide, and and it may only be a matter of time before New Zealand experiences this shift at scale. Organisations are increasingly adopting “liquid workforce” strategies that blend full time employees with freelancers and contractors, particularly in tech, logistics and creative sectors.

In New Zealand, this trend is emerging through the growing use of digital contracting platforms (such as DocuSign and Adobe Acrobat Sign), the reliance on gig workers in transport and delivery services, and the increasing engagement of contractors in IT and professional services.

This shift demands new approaches to VET that:

- Equip workers for project based careers and specialised skills.
- Provide flexible learning pathways such as micro credentials and short courses.
- Ensure fair working conditions and platform equity to mitigate precarity.

Flexible work arrangements make it possible for individuals to adjust their schedules around learning commitments, highlighting the need for modular, on demand education formats that allow workers to upskill without interrupting income.

Project based careers and specialised skills

Traditional full time employment is no longer the default. Increasingly, individuals engage in multiple projects across various clients and platforms, requiring workforce development strategies that emphasise:

- High value, specialised capabilities in digital, logistics and creative sectors.
- Technical expertise, problem solving and innovation as essential attributes for success in dynamic, project driven environments.

In New Zealand, this is particularly relevant for retrofit projects and large scale logistics operations, where contractors and project specialists are engaged for short term, highly skilled tasks.

Flexible learning pathways

Micro-credentials, short courses and recognition of prior learning are critical for supporting on-demand workers. These modular formats enable individuals to build targeted expertise aligned with evolving industry needs. Industry research shows micro-credentials enhance employability, reduce training costs and support continuous development, particularly valuable in fast changing labour markets where traditional education models struggle to keep pace.

Distributed teams and global collaboration

Digital disruption has made it easier for teams to work across locations and time zones. Tools such as video conferencing, shared online documents and digital project boards enable seamless collaboration. This shift requires new skill sets, digital collaboration, cross-cultural communication and remote project management, which should be integrated into VET programmes to prepare individuals for globally connected, tech-enabled work environments.

Demographic shifts are driving labour shortages. VET will need to adapt to upskill younger workers and reskill older ones. By 2034, Millennials, Gen Z and the first Gen Alphas will make up 80% of the workforce in advanced economies.

Economic and demographic pressures

Macroeconomic factors such as inflation, high interest rates and market volatility are influencing workforce strategies, with 50% of employers expecting these conditions to transform their business. Global economic fragmentation is prompting reshoring and offshoring strategies, affecting global talent mobility and trade.

At the same time, demographic shifts are creating labour shortages. Lower birth rates, longer life expectancy and retirement of older workers are reducing the working age population, particularly in industrial sectors such as manufacturing, engineering, automotive, logistics, mining and quarrying, and oil and gas extraction. This intensifies competition for skilled labour and increases reliance on automation and digital technologies to maintain productivity. VET systems will be required to respond by accelerating upskilling for younger workers and reskilling older ones.

Generational influences reshape workforce development

Generation Z (Gen Z) is overtaking Baby Boomers in workforce numbers. By 2034, Millennials, Gen Z and the first Gen Alphas will make up 80% of the workforce in advanced economies.

Gen Z brings distinct expectations around flexibility, purpose and continuous development. They value authentic leadership, inclusive culture and meaningful work, and are less willing to compromise on these values than previous generations.

This shift is prompting organisations to redesign workforce development strategies to include:

Gen Z	Millennial	Gen X	Baby Boomers	Silent
Born 1997-2012	Born 1981-1996	Born 1965-1980	Born 1946-1964	Born 1928-1945

NZ Employment Count (000s) (7 March 2023)

Gen Z	Millennial	Gen X	Baby Boomers	Silent
474	896	801	432	21

*Source: Deloitte estimates from Stats NZ employment data and 2023 Census Data; *silent includes those born before 1928*

- Personalised learning pathways tailored to individual career goals.
- Tech-enabled environments that support digital collaboration and innovation.
- Multi-generational collaboration to leverage diverse perspectives.

Employers that adapt to these expectations are more likely to attract and retain top talent, foster innovation and build resilient, future ready teams.

Sustainability and green transition

Climate change mitigation and adaptation are among the most transformative trends. 47% of employers expect climate mitigation to reshape their business within five years.

Gen Z and Millennials make up over half of the workforce in New Zealand and are driving workforce design.

New skills and roles are emerging in areas such as sustainable engineering, green logistics, low emissions manufacturing and environmental compliance. To meet these demands, companies are investing heavily in reskilling and upskilling employees to:

- Work with green technologies
- Adopt circular economy practices
- Contribute to climate-resilient infrastructure.

VET systems are adapting with updated curricula that include climate literacy, energy transition skills and sustainability focused certifications. In sectors such as mining and quarrying, oil and gas extraction, climate adaptation strategies are driving investment in renewable energy education.

Sustainability is of relatively greater importance in a New Zealand context, given our economy's reliance on the agricultural sector, access to international markets, and importance of renewal energy mix and infrastructure.

Photo: DNA 1st Solution, New Zealand

Workplace culture and opportunity

Organisations are increasingly prioritising workplace culture as a strategic imperative. Companies that intentionally leverage culture see measurable benefits. A workplace cultural trend analysis suggests an engaged workforce leads to significant advantages, including:

- 84% lower likelihood of burnout
- 30% less chance of resigning
- 7 times more likely to deliver good work.

Gallup's *State of the Global Workplace* 2025 reports that 77% of employees in Australia and New Zealand are not engaged or actively disengaged, and 42% of employees are intending to leave their current job. The challenge is urgent, and fostering a positive workplace culture can help address these issues by improving engagement, retention, and productivity.

Globally, workplace culture is being reshaped by technology adoption, demographic shifts, and sustainability pressures. Organisations are embedding culture into strategies for talent attraction and retention, recognising that culture is no longer a soft metric but a competitive advantage. For example, manufacturers are facing a critical skills gap as automation and advanced technologies accelerate. Deloitte and the Manufacturing Institute in the United States estimate that 3.8 million new manufacturing jobs will be needed by 2033, and nearly half could go unfilled without significant reskilling and workforce development initiatives. Organisations are investing in upskilling and partnerships with education providers to attract diverse workforce such as younger talent to fill gaps.

Similar trends are evident across world, with McKinsey noting that the top 25% of companies with the highest diversity in leadership are 35% more likely to financially outperform companies in the bottom 25%. Mining companies are reporting measurable gains in safety and productivity through strong cultural frameworks, while Indigenous engagement programmes strengthen trust and deliver economic benefits.

The common trend across sectors is clear. Workplace culture drives innovation, resilience, and long term performance. Organisations that align culture with technology, sustainability, and workforce development are better positioned to navigate talent shortages and global disruption.

Employee wellbeing

Mental health and wellbeing are now core to talent attraction and retention, with 64% of employers prioritising wellbeing strategies. Poor working environments, including excessive workloads, low job control and job insecurity, pose significant risks to mental health, especially in physically demanding sectors such as manufacturing, logistics and mining and quarrying.

The Word Health Organisation estimates that 12 billion working days are lost annually due to depression and anxiety, costing the global economy US$1 trillion per year (~NZ$1.75 trillion). OECD data shows mental illness significantly reduces labour supply and contributes to high rates of sickness absence, with over 70% of new disability claims among young adults linked to ill mental health. Gallup (2025) reported that 43% of New Zealand employees are feeling stressed with this problem being even more prominent at 50% in Australia.

Industry specific mental health strategies are essential to improve retention and productivity.

Global VET sectors

Globally, VET systems are evolving to incorporate industry partnerships, work-based learning, technology integration, green skills training, equity and inclusion, transnational alignment, and flexible pathways as strategies to address talent shortages and industry demand.

Global VET sector trends

Vocational education and educational systems worldwide are adapting to meet the demands of rapidly changing labour markets. This transformation is characterised by deeper industry collaboration, technology driven learning, sustainability focused training, and inclusive policies that expand access for diverse learners. Countries are also introducing flexible pathways and aligning qualifications internationally to support mobility and lifelong learning.

Based on a quick scan of the literature, the table below illustrates key trends shaping global VET or Technical and VET (TVET) systems, with examples of how different countries are implementing these strategies to build future ready workforces.

Trend	Country examples (not an exhaustive list)	Key highlights
Industry partnerships Strong collaboration between education providers and employers ensures curricula remain aligned with real world job requirements	• **Germany** – Dual system with chambers of commerce • **Switzerland** – Employers co-develop curriculum • **Australia** – Industry Reference Committees shape training packages • **India –** Public-private partnerships in skill development • **Philippines –** Industry boards guide TVET curriculum under Technical Education and Skills Development Authority	Employers are directly involved in curriculum design and delivery to ensure alignment with labour market needs.
Work-based learning Apprenticeships and co-op placements are increasingly embedded in vocational programmes to provide practical experience.	• **Austria** – Apprenticeships integrated into upper secondary • **England** – Apprenticeships in healthcare and finance • **USA** – Sector specific apprenticeships in Maryland and South Carolina • **China –** School enterprise cooperation models • **South Africa –** Learnerships combining work experience and education	Combines classroom learning with structured workplace learning, often leading to recognised qualifications.
Technology integration Virtual reality, AI driven platforms, and digital simulations are being used to enhance learning.	• **Finland** – AI powered adaptive learning • **Korea** – Virtual reality (VR) simulations in technical training • **Netherlands** – AI early warning systems for withdrawal prevention • **Singapore –** Smart classrooms using IoT technologies • **Sri Lanka –** National e-learning portal for TVET	Use of digital tools such as AI and VR to personalise learning and enhance engagement in VET.
Green skills training Sustainability is a growing focus, with many programmes incorporating skills relevant to the green economy.	• **France** – ENEDIS trains in renewable energy • **Sweden** – Green building certifications • **Slovakia** – Green digital skills via Digital Coalition • **Kenya –** Solar energy technician training programs • **Vietnam –** Green construction and energy efficiency training	VET programmes are embedding sustainability and green economy skills to support climate goals.
Flexible pathways Online, hybrid, and modular formats are expanding access and supporting lifelong learning.	• **Ireland** – Modular VET with micro-credentials • **Norway** – Recognition of prior learning • **Australia** – Online/hybrid delivery for remote learners • **Norway –** Recognition of prior learning • **Australia –** Online/hybrid delivery for remote learners	Learners can access VET through modular, online, or hybrid formats, supporting lifelong learning and upskilling.
Equity and inclusion Many countries are implementing policies to improve access for disadvantaged groups, including scholarships and gender-focused initiatives.	• **Canada** – Scholarships for Indigenous learners • **Mexico** – Inclusive curriculum for learners with disabilities • **South Africa –** VET access programmes for disadvantaged youth	Policies and programmes aim to improve access and outcomes for underrepresented groups in VET.
Transnational alignment Institutions are aligning with global standards through accreditation, curriculum updates, and international networking opportunities	• **Germany** – EU wide credential recognition • **France –** Alignment with European Qualifications Framework • **Thailand –** ASEAN Mutual Recognition Arrangements in VET	VET systems are aligning with international frameworks to support mobility and global workforce readiness.

03

Tō Tātou Tūranga, Ō Tātou Tāngata

Our Place, Our People

Photo: Kowtow Clothing, New Zealand

New Zealand market context

Macroeconomic, unemployment, migration, and labour market

Economic and labour market outlook

The labour market in Aotearoa is affected by global forces such as technology disruption, demographic shifts, in the context of a slow post-COVID economic recovery. The New Zealand policy environment is also undergoing significant change.

Photo: Auckland city, New Zealand

Labour markets and VET systems are transforming worldwide, setting new benchmarks for flexibility, industry alignment and inclusivity. These changes are not abstract. They have direct implications for New Zealand. Global forces such as technological disruption, sustainability imperatives and demographic shifts are reshaping the way work is organised and the skills employers need.

New Zealand faces similar pressures, but within its own economic and policy environment. The country is navigating a complex mix of challenges and opportunities. Economic growth has slowed, and labour market conditions are softening. At the same time, headline inflation has eased and remains within the Reserve Bank's target band, although close to the upper end. These dynamics create uncertainty for businesses, workers and policymakers, reinforcing the need for a skills and education system that can respond quickly and effectively.

This is particularly important for sectors such as manufacturing, engineering, automotive, logistics, mining and quarrying, oil and gas extraction, which are central to New Zealand's economy. These industries do not operate in isolation, they are deeply interconnected through supply chains, shared technologies, and workforce requirements. For example, advances in manufacturing automation influence logistics operations, while engineering expertise underpins both automotive innovation and infrastructure project.

These industries are experiencing structural shifts driven by automation, sustainability requirements and global supply chain changes. Ensuring that vocational education aligns with these sectors' evolving needs will be critical for maintaining competitiveness and supporting future growth.

This section examines New Zealand's economic performance, labour market trends and migration patterns to provide essential context for the VET reforms that follow.

Monetary policy and inflation

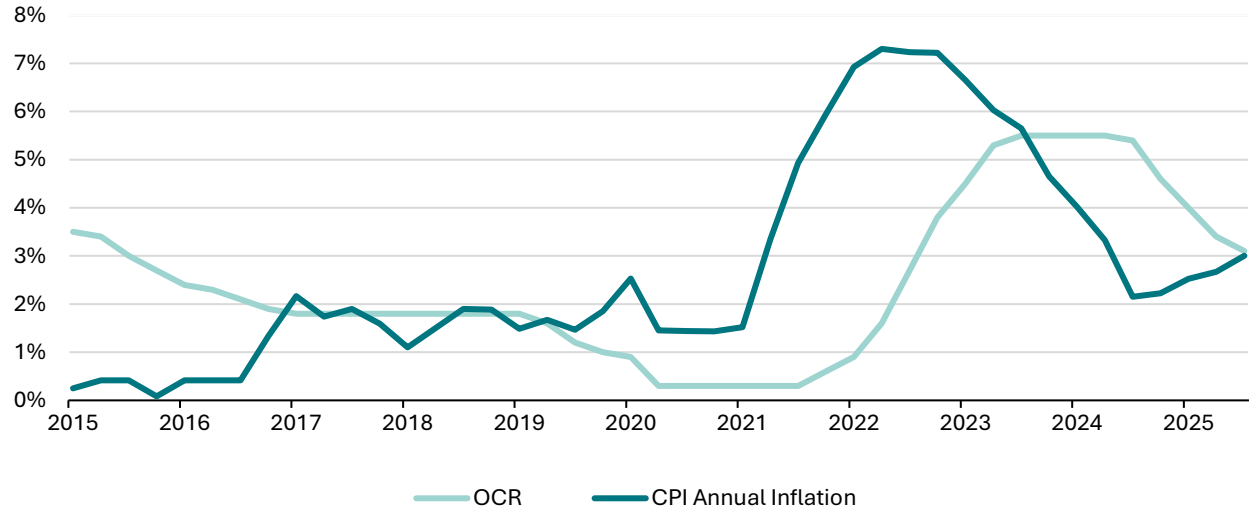
Following a period of contractionary monetary policy aimed at curbing inflation after the COVID-19 recovery, the Reserve Bank has cut the Official Cash Rate (OCR) in almost every Monetary Policy Statement since August 2024. These cuts take 12 to 18 months to flow through the economy, partly because most mortgages are fixed rather than floating.

Inflation has returned to the Reserve Bank's 1% to 3% target band after peaking at 7.3% during the pandemic, paving the way for further interest rate cuts. The adjacent chart shows inflation broadly stable within the target band until the pandemic, followed by a sharp spike and subsequent decline. OCR adjustments have been significant, with a 525-basis point rise to curb inflation and a 300-basis point cut between July 2024 and October 2025.

Although inflation is under control, it remains near the upper limit of the target band. Non-tradeable price growth continues to be sticky, and global trade uncertainty, may put pressure on tradeable inflation. Utilities, especially electricity, have contributed significantly to cost-of-living pressures, with prices up 11.3% year-on-year. Since 2021, CPI has increased 22%, while the Labour Cost Index has grown only 16%, squeezing household budgets.

The inflation outlook is broadly positive, with spare capacity expected to bring inflation closer to the mid point of the target band by 2026.

Official Cash Rate and Annual CPI Inflation



Source: Stats NZ, Deloitte Access Economics

The trajectory of New Zealand's economic recovery

Overall, New Zealand's economic recovery post-pandemic has proven slower than hoped, although green shoots are emerging. Continued monetary easing could provide further stimulus, supported by relatively stable inflation within the Reserve Bank's target range. However, a quick recovery is far from guaranteed. As domestic conditions gradually improve, offshore uncertainties continue to pose downside risks.

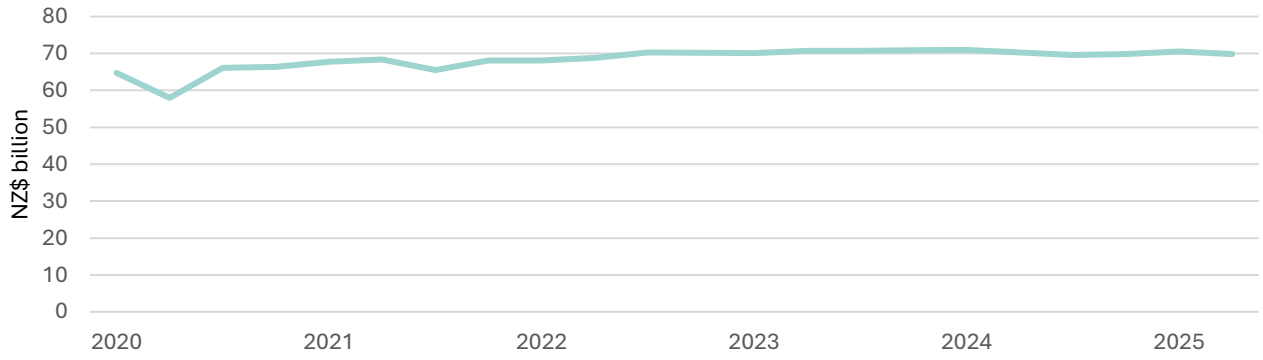
New Zealand economic growth

Despite cuts to the OCR, New Zealand's economic recovery has been muted. Gross Domestic Product (GDP) contracted by 0.9% in quarter 2 of 2025, marking three consecutive quarters of negative annualised growth. Manufacturing output fell 3.5%, mining and quarrying 4.1%, continuing its retreat from earlier highs.

Flat and slow economic growth and geopolitical risks create an unfriendly backdrop for monetary policy, and New Zealand continues to lag other small developed economies. The bottom chart uses Stats NZ data to show the economy losing momentum gained immediately after the pandemic.

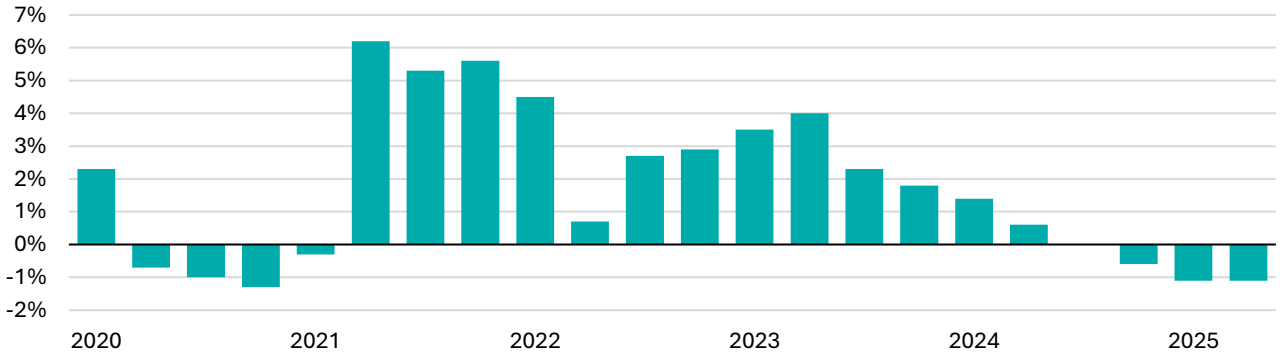
Consistent OCR cuts have not yet delivered relief for sectors such as mining and quarrying, and manufacturing. Whether continued easing, enabled by stable inflation, will stimulate these sectors remains uncertain.

Quarterly GDP
(GDP ($ billions) Chain-volume series expressed in 2009/10 prices)



Source: Stats NZ, Deloitte Access Economics

New Zealand economic growth
(percent change in GDP over the previous year)

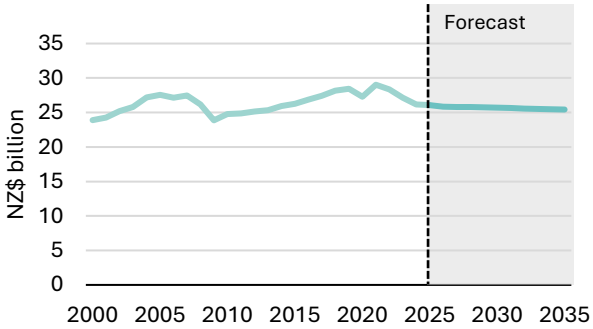


Source: Stats NZ, Deloitte Access Economics

Rates of GDP growth have varied significantly across the six targeted sectors.

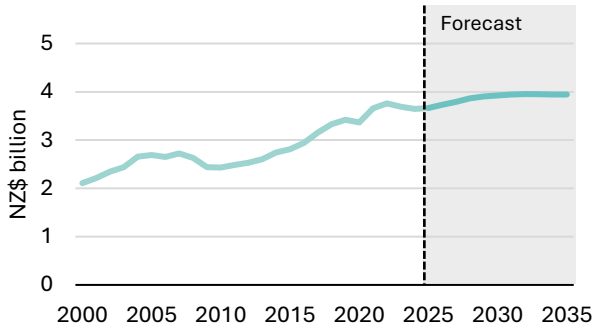
While overall GDP has contracted, the impact varies across industries. The following charts illustrate historical trends and forecasts for key sectors as the focus for this research, highlighting where recovery may occur and where structural challenges persist.

Manufacturing GDP



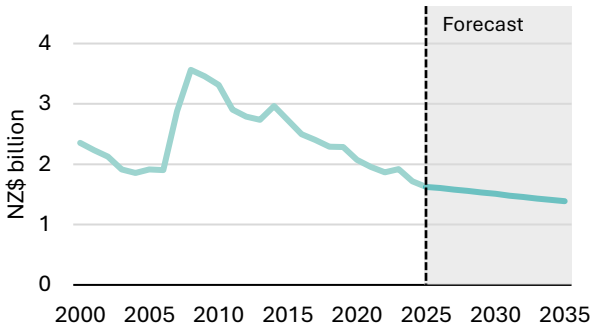
Source: Stats NZ, Deloitte Access Economics

Automotive GDP



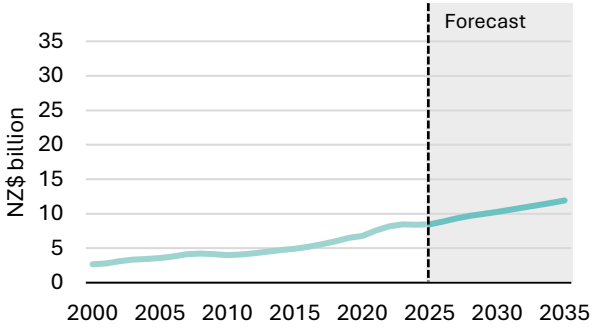
Source: Stats NZ, Deloitte Access Economics

Mining and Quarrying GDP



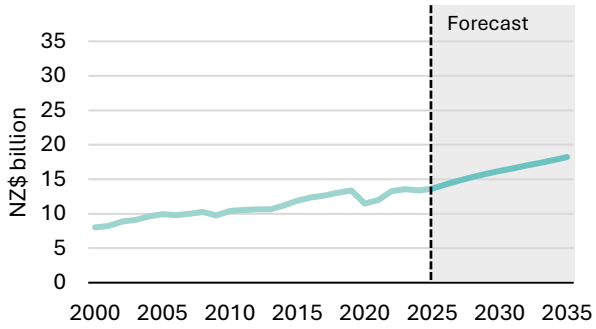
Source: Stats NZ, Deloitte Access Economics

Engineering GDP



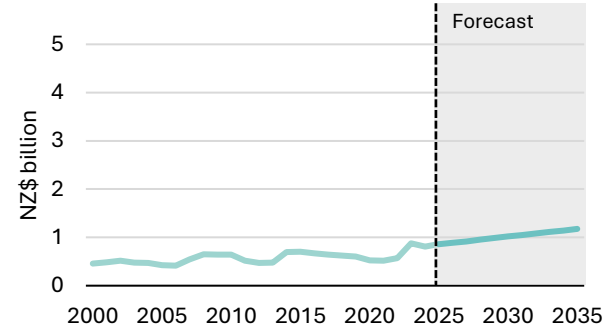
Source: Stats NZ, Deloitte Access Economics

Logistics GDP



Source: Stats NZ, Deloitte Access Economics

Oil and Gas Extraction and Wholesaling GDP



Source: Stats NZ, Deloitte Access Economics

Note: Each forecast has been formed using a sector-derived regression equation, and has been projected using Deloitte's in-house Macroeconomic forecasting model DAE-MACRO. The GDP figures presented are in real terms and are in 2009/10 prices.

The sectoral definitions are aligned with those outlined within the Hanga-Aro-Rau legislation, so the GDP figures presented may not align with publicly available GDP figures for sectors under the ANZSIC06 sectoral definition. The Engineering sector GDP has been estimated using only engineering related New Zealand Standard Industrial Classification (ANZSIC) codes, though the Hanga-Aro-Rau legislation defines it using both Australian and ANZSIC and Australian and New Zealand Standard Classification of Occupations (ANZSCO) codes, meaning some occupations may be not be included in our estimation.

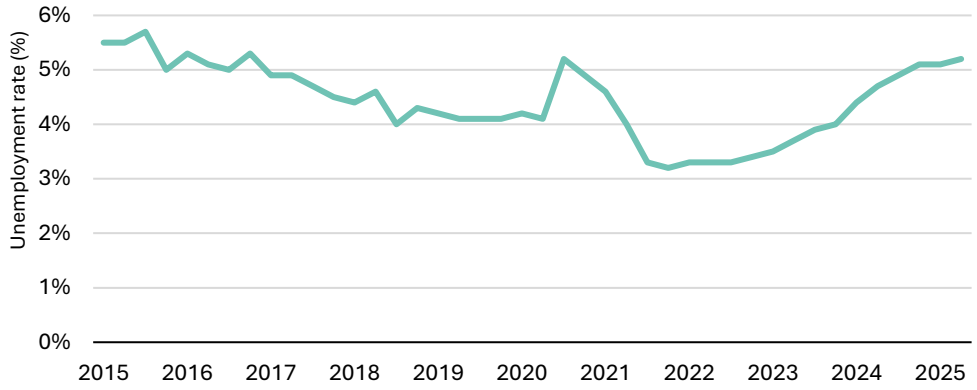
Labour market conditions

New Zealand's labour market has weakened notably since the post-COVID recovery. Unemployment has climbed steadily from its pandemic low of 3.2% to the current 5.2%. This trend is mirrored in other measures of employment, including the underutilisation rate, which captures both unemployment and underemployment (people working fewer hours than they are willing and able to). Underutilisation has risen from 9.0% in September 2022 to 12.8% in June 2025.

Job market trends and hiring activity

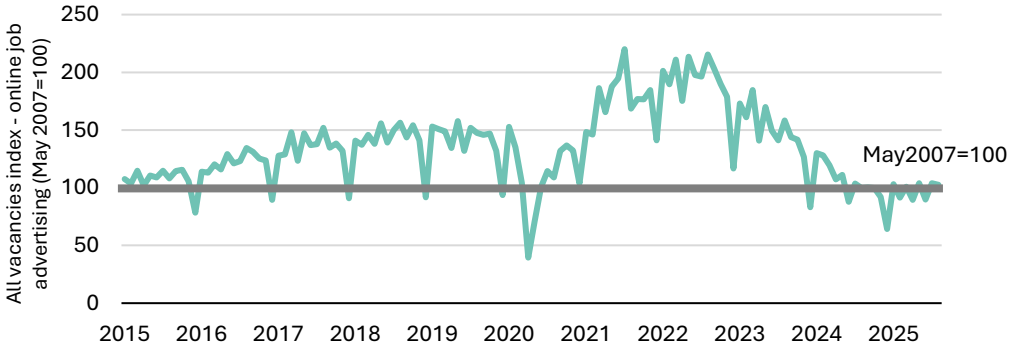
Online job advertisements have dropped from their 2021 peak, reflecting subdued hiring activity across key industries such as manufacturing and construction. While there are signs of recent stabilisation, job seekers are facing tougher conditions.

Unemployment rate



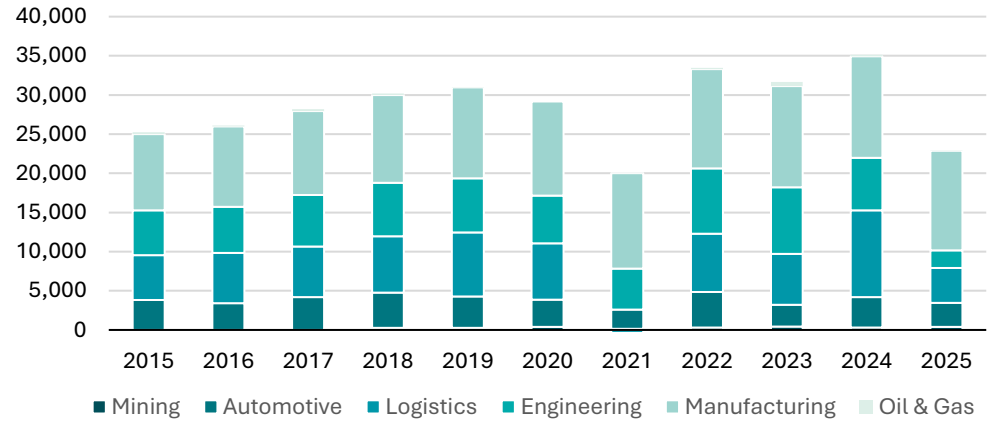
Source: Stats NZ, Deloitte Access Economics

Online job advertising index



Source: Stats NZ, Deloitte Access Economics

Job openings by sector



Source: Hanga-Aro-Rau

The pace of net migration has slowed from its post-COVID peak and the upward trend seen between 2015 and 2020.

Migration and arrivals trends

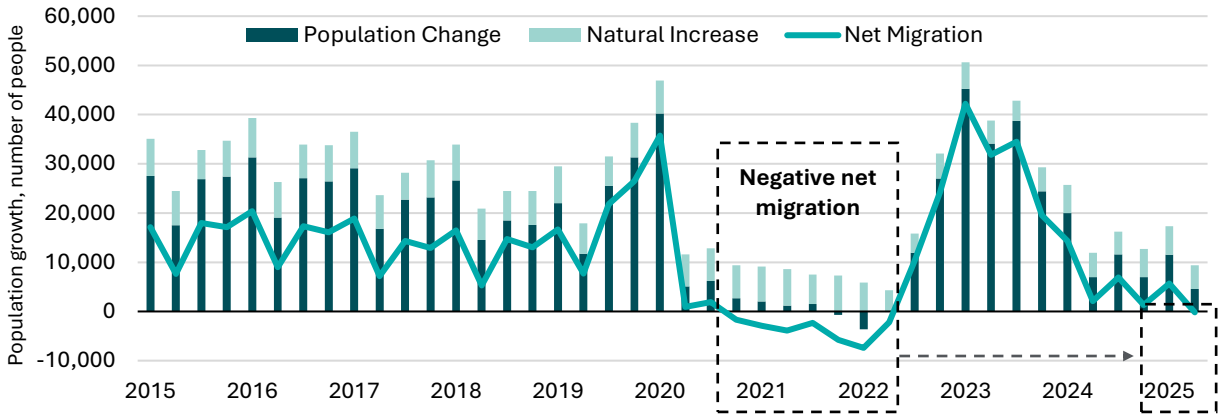
Net migration into New Zealand has slowed in recent months (first chart), driven by a decline in permanent and long term arrivals (second chart). The pace of net migration has eased from the highs seen in early 2023 and early 2024, with recent data showing a noticeable drop in arrivals across key visa categories. This is demonstrated in the first chart, with the net migration line trending at lower levels compared with the five years prior to the pandemic. While net migration remains positive, it is no longer providing the same boost to population growth, domestic demand, or housing activity.

After a sharp rebound in migration following COVID-19, New Zealand is now experiencing a slowdown in permanent and long term arrivals. As demonstrated in the second chart, arrivals for key visa categories ease, population growth is moderating, with implications for labour supply and economic activity across key sectors.

New Zealand has also seen a growing outflow of New Zealanders to Australia, where economic conditions are comparatively more favourable. Australia's stronger labour market, higher wages, and lower cost of living are a key driver of trans-Tasman migration.

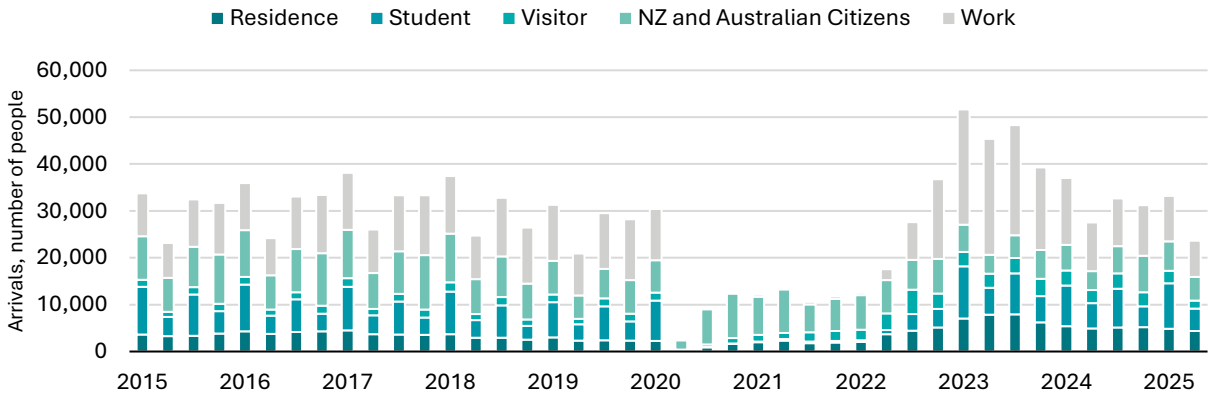
This trend is particularly significant given the historical role of net migration in supporting New Zealand's workforce and consumer base. As permanent and long term arrivals decline and departures rise, the implications for labour supply and economic growth may become more pronounced, especially in sectors that rely heavily on migrant workers.

New Zealand migration and population growth



Source: Stats NZ, Deloitte Access Economics

Permanent and long term arrivals



Source: Stats NZ, Deloitte Access Economics

Labour market outlook

Labour market pressures are unfolding alongside global trends and local challenges. The New Zealand economy recently entered a technical recession, with output contracting and unemployment continuing to rise. Employers and educators are responding to post-pandemic realities, climate imperatives and rapid technological change, while also navigating domestic challenges such as system reforms, demographic shifts and evolving government priorities.

Employers and educators are rethinking talent strategies to ensure the workforce remains competitive, resilient and inclusive. This aligns with the Government's focus on developing a world class skills and education system, one that equips individuals with strong foundations in literacy, numeracy and learning skills, supports diverse pathways into employment and responds to the needs of business and the wider economy.

The *Going for Growth: Developing Talent Update (2025)* report by The Ministry of Business, Innovation and Employment (MBIE) outlines key actions to address:

- Engaging with business to **align education and training** with workforce needs.
- **Creating a more responsive VET system**, including the reestablishing of polytechnics, and the new ISBs.
- **Adjusting immigration settings** to attract and retain skilled migrants.
- Supporting employment through **targeted initiatives for job seekers**.
- Returning vocational education **decision making to regions** to better serve local needs.

These measures reflect the Government's commitment to building a future focused skills and education system that supports long term economic resilience. Aligning education with business needs and investing in inclusive, high quality training opportunities, aims to attract, retain and grow the talent needed for sustained growth and national prosperity.

Photo: Prolife Foods, New Zealand

New Zealand policy context

VET sector reform and skill standards

Policy and system transformation

Each year, over 240,000 learners participate in New Zealand's VET system. The VET policy environment and system are undergoing significant reform, creating an opportunity to modernise and focus on human-centric skills while strengthening engagement with both industry and learners.

New Zealand VET system

Each year, over 240,000 learners engage with New Zealand's vocational education and education system. This system is continually evolving, shaped by a complex mix of global forces and shifting national priorities. The pace of technological advancement, climate imperatives, demographic shifts and changing workforce expectations are fundamentally altering the skills landscape, the structure of work, and the way education is delivered and valued. At the same time, New Zealand's policy environment is undergoing significant transformation, with system reforms, new government priorities and sector restructuring all influencing the direction of VET.

Policy and system transformation

The New Zealand's VET system is undergoing major changes as part of a broader policy and system overhaul. Te Pūkenga and the Workforce Development Councils are in the process of being disestablished. In their place, ten regional polytechnics and eight new ISBs will be established. These changes aim to:

- Restore regional decision making
- Strengthen industry leadership
- Improve alignment between training and workforce needs.

The reforms are part of the Government's broader "Going for Growth" strategy and are taking place amid economic uncertainty, inflationary pressures, and tighter immigration settings.

Industry-led education. Better career outcomes.

egislative and structural changes

The Education and Training (VET System) Amendment Act 2025, which was introduced in May 2025 and enacted on 20 October 2025, underpins the reforms. It includes:

- Disestablishment of Te Pūkenga and the six WDCs. Re-establishment of institutes of technology and polytechnics (ITPs).
- Creation of ISBs to lead standards setting, programme endorsement and assessment moderation.
- Temporary oversight of work-based learning by ISBs during a two year transition (2026 to 2027).The Act passed its third reading on 15 October 2025 and received Royal Assent on 20 October 2025.

Work-based learning transition

Tertiary Education Commission (TEC) confirms that from 2026, work-based learning divisions of Te Pūkenga will transfer to ISBs for up to two years. During this period, ISBs will manage standards setting and quality assurance while delivery gradually moves to providers such as polytechnics, wānanga and private training establishments (PTEs).

The Ministry of Education states that this transition is part of the Education and Training (VET System) Amendment Act 2025, which supports continuity for apprenticeships and traineeships while the new system structure is implemented.

TEC guidance confirms that ISBs will temporarily manage work-based learning functions, including programme endorsement and quality assurance, before handing responsibility back to providers by 2028. This occurs on the back of a major reform, signalling widescale change and continued disruption across the VET system.

Source (screenshot): Rocket Lab, New Zealand

Industry Skills Boards

The eight ISBs being established in Aotearoa New Zealand from 1 January 2026 will each represent a major sector of the economy. Their role is to ensure VET is aligned with industry needs, particularly in work-based learning.

The eight ISBs and their coverage areas are:

1. Automotive, transport and logistics
2. Construction and specialist trades
3. Food and fibre (including aquaculture)
4. Infrastructure
5. Manufacturing and engineering
6. Services
7. Health and community
8. Electrotechnology and information technology.

The transition will begin in 2026 and continue until the end of 2027. These boards will:

- Set vocational education standards
- Endorse programmes
- Temporarily manage work-based training (transitioning from Te Pūkenga) until 2028
- Be funded through public funding, optional industry levies and quality assurance fees.

Each ISB is supported by an Establishment Advisory Group (EAG) responsible for ensuring operational readiness by January 2026.

Regional polytechnics

From 1 January 2026, the New Zealand Government is re-establishing ten regional institutes of technology and polytechnics as independent institutions, reversing the previous centralisation under Te Pūkenga. These ten polytechnics are:

1. Ara Institute of Canterbury (Ara)
2. Eastern Institute of Technology (EIT)
3. Nelson Marlborough Institute of Technology (NMIT)
4. Southern Institute of Technology (SIT)
5. Toi Ohomai Institute of Technology
6. Waikato Institute of Technology (Wintec)
7. Unitec Institute of Technology and Manukau Institute of Technology (MIT) – merging into a single entity
8. Otago Polytechnic – to stand alone within the new federation
9. Universal College of Learning (UCOL) – also to stand alone within the federation
10. The Open Polytechnic of New Zealand – to serve as the anchor polytechnic of the new federation.

Four ITPs – NorthTec, Western Institute of Technology Taranaki, Whitireia/WelTec and Tai Poutini Polytechnic – will remain as part of Te Pūkenga, and decisions on their future viability are expected in the first half of 2026.

Source: Buckley Systems, New Zealand

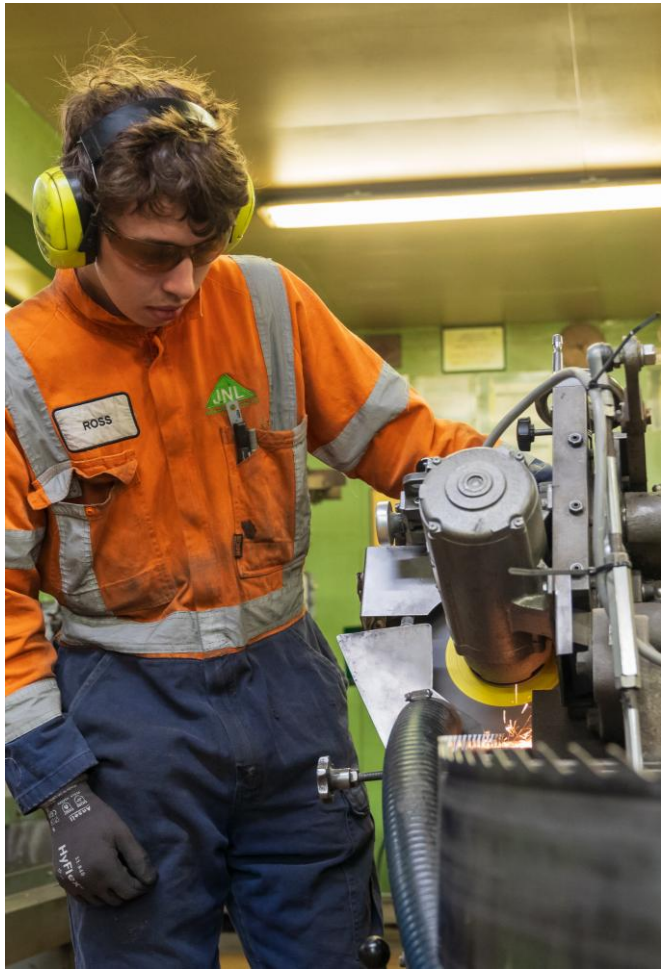


Photo: Juken New Zealand

Skill standards replace unit standards

Since April 2025, WDCs have began transitioning from unit standards to skill standards as the foundation of VET. This change is designed to modernise qualifications and ensure they reflect the practical skills and transferable competencies employers need.

Skill standards will:

- Form the building blocks of qualifications, micro-credentials and provider programmes.
- Embed transferable competencies (including emerging human-centric skills) within practical tasks rather than listing them as standalone standards.
- Include clear learning outcomes with action verbs, content and context to ensure clarity and consistency.
- Provide assessment criteria written in plain language to describe the required level of performance.

Design principles for standards

Standards will reflect inclusivity, equity, and cultural values such as Rangatiratanga (empowerment), Manaakitanga (collaboration), and Whanaungatanga (belonging), while promoting diversity in language and culture. The Digital Assessment Standards System (DASS) will guide the development of skill standards, embedding these principles to ensure equity, cultural inclusion, and learner success.

How skill standards will be embedded in DASS

To ensure skill standards are effectively embedded and managed within the DASS, the following elements will guide the process:

- **Embedding skills in the database –** Skill standards will be stored in the DASS to make them visible and accessible across all sectors. This ensures transferable skills and emerging competencies are integrated into qualifications rather than treated as separate units.
- **Transferable competencies –** The framework will allow human-centric skills (e.g. communication, teamwork) to be embedded within practical tasks, not as standalone standards.
- **Assessment criteria –** Each skill standard will include clear, plain language assessment criteria aligned with performance expectations.
- **Governance and process –** ISBs will lead the development and endorsement of standards, supported by NZQA for quality assurance.

New qualification structure for schools

The Government has proposed a major overhaul of New Zealand's secondary school qualification system, replacing NCEA Levels 1 to 3 with a new structure designed to provide clearer pathways and stronger foundational skills.

The new structure includes:

- **Year 11: Foundational skills award –** Students will take English and Mathematics and sit a new assessment that recognises achievement in literacy and numeracy (or te reo matatini and pāngarau). This replaces NCEA Level 1.
- **Year 12: New Zealand Certificate of Education (NZCE) –** Replaces NCEA Level 2. Students will take five subjects and must pass at least four to attain the certificate.
- **Year 13: New Zealand Advanced Certificate of Education (NZACE) –** Replaces NCEA Level 3. Students will also take five subjects and pass at least four to qualify.

Other key changes:

- Assessment will shift from "Achieved, Merit, Excellence" to letter grades (A to E) and clear marks out of 100.
- A new national curriculum for Years 9 to 13 will provide consistency in what students learn and when.
- Stronger links to vocational pathways will be developed in partnership with industry to ensure students gain skills relevant to future careers.

The changes will be phased in from 2026, with the Foundational Skills Award introduced first, followed by NZCE in 2029 and NZACE in 2030.

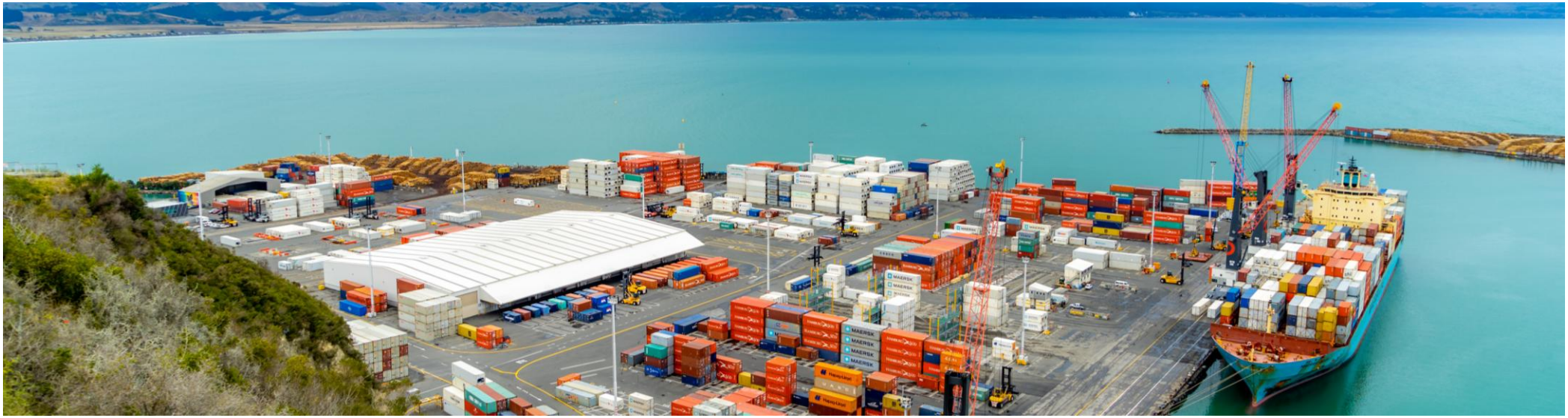


Photo: Napier Port, New Zealand

Policy implications for the industries

The VET reforms represent a significant shift in how training is governed, delivered and aligned with workforce needs. These changes create opportunities to influence training design, address emerging skill gaps and ensure vocational pathways reflect the realities of modern work.

What the reforms mean for industry

The VET reforms represent a significant shift in how training is governed, delivered and aligned with workforce needs. For industries such as manufacturing, engineering, logistics, automotive, mining and quarrying, and oil and gas extraction, these changes are designed to create opportunities to influence training design, address emerging skill gaps and ensure vocational pathways reflect the realities of modern work.

The introduction of ISBs and the move to regional polytechnics is designed to create a more agile and responsive training system. Qualifications could better reflect sector specific needs while maintaining national consistency. For employers and providers, this is expected to open opportunities to collaborate on programme development, shape standards and strengthen the pipeline of skilled workers.

Clearer pathways from school to employment should improve training relevance and enable more coordinated planning across regions and sectors. Active industry participation during the transition would be key to ensuring practical, high quality outcomes that support productivity, innovation and long term growth.

Manufacturing

The manufacturing sector is expected to benefit from more targeted and responsive training programmes under the reforms. The establishment of a dedicated **Manufacturing and Engineering ISB** is designed to give industry a stronger voice in vocational education and work-based learning, ensuring qualifications remain aligned with evolving technologies and regulatory requirements. Regional polytechnics will continue to deliver training that meets local needs, while national coordination through the ISB will help maintain consistency in standards. Employers may have opportunities to contribute to qualifications and programme endorsement processes, particularly in areas such as advanced manufacturing, lean systems, and sustainability. Work-based learning continuity remains critical for manufacturing apprenticeships and other VET, and providers will need to manage smooth transitions throughout the reform period.

Engineering

Engineering, as a broad and technically demanding field, will gain from the reforms' emphasis on industry led standards and programme endorsement. The **Manufacturing and Engineering ISB** will ensure that qualifications remain aligned with evolving technologies and regulatory requirements. This includes areas such as mechanical and environmental engineering. The shift to regional delivery may allow for more specialised programmes tailored to local infrastructure and large scale or specialised projects, while national oversight will help maintain professional standards. Work-based learning continuity is especially important for engineering apprenticeships, and providers will need to ensure smooth transitions during the reform period.

Photo: New Zealand Parliament, Wellington, New Zealand

Logistics

The logistics sector, which includes warehousing, freight, supply chain management, and transport operations, will be covered by the **Automotive, Transport and Logistics ISB**. This sector has expressed a need for consistent national standards due to its cross-regional nature. The reforms offer a chance to modernise training to reflect digital supply chain systems, automation, and compliance requirements. Employers should engage with the ISB to ensure qualifications reflect real operational needs, and work with regional polytechnics to support local workforce pipelines. Hybrid learning models, combining classroom and on-the-job training, will be particularly valuable in logistics and should be supported during the transition.

Automotive

Automotive trades, including light and heavy vehicle servicing, diagnostics, and electric vehicle technologies, should benefit from more industry-aligned training. The reforms should allow employers to influence the development of qualifications that reflect the shift toward electrification, digital diagnostics, and sustainability. Regional polytechnics should be able to complement and tailor delivery to local workshop and dealership needs, while the **Automotive, Transport and Logistics ISB** will ensure national consistency. Apprenticeships will continue during the transition, and employers should work closely with providers to maintain continuity and support learners through evolving training models.

Mining and quarrying

The mining and quarrying sector has distinct operational, safety, and environmental requirements that demand specialised training. Under the VET reforms, mining is represented within the **Infrastructure ISB**, providing a clear and dedicated representation to ensure qualifications reflect the realities of modern mining and quarrying operations. The reforms offer an opportunity to update training to include automation, remote operations, and advanced safety protocols. Regional polytechnics will play a key role in supporting training delivery in mining-intensive areas, while national coordination will help maintain consistency in standards across different sites and regions. Employers are encouraged to engage early with ISBs to ensure their workforce needs are reflected in qualification design and standards setting.

Oil and gas extraction

The oil and gas extraction also requires tailored vocational education that reflects its regulatory environment and operational practices. Similar to mining and quarrying, oil and gas extraction is grouped under the **Infrastructure ISB**, and will need distinct consideration due to differences in scale, location, and workforce composition. The reforms provide an opportunity to modernise training to include environmental compliance, machinery operation, and site management. Regional delivery will be important for supporting remote and rural operations, while ISBs will help ensure qualifications are consistent and aligned with industry expectations.

Photo: Precision Autowerk, New Zealand

04

Ō Tātou Rāngai Ahumahi
Our Industry Sectors

Photo: Precision Autowerk, New Zealand

Knowing our workforce

Industry workforce overview, and skill level trends

New Zealand industry sectors workforce overview

New Zealand's workforce includes approximately 2.88 million people in employment. Between 2018 and 2023, the engineering, and oil and gas extraction and wholesaling sectors experienced growth, while manufacturing, logistics, automotive, and mining and quarrying saw declines.

Industry workforce sizes

New Zealand's workforce included approximately 2.88 million people in employment as of the June 2025 quarter (HLFS estimate), according to Stats NZ Labour Market Statistics. The labour force participation rate was 70.5%, the employment rate stood at 66.8%, and the unemployment rate was 5.2%, reflecting a slight increase compared to earlier in the year.

Over the past decade, the workforce has grown significantly, from 2.0 million in 2013 to 2.62 million in 2023 (Census), driven by sustained labour market expansion. However, sector level trends show diverging trajectories shaped by technology adoption, global market dynamics, and evolving skill requirements.

Based on New Zealand Census data:

- **Engineering** is a growth leader, with employment up 57% since 2013 (42,640 to 67,130), reflecting rising demand for technical expertise in the industry sectors.
- **Logistics** grew strongly between 2013 and 2018 but dipped slightly by 2023, suggesting efficiency gains from automation and digital supply chains.
- **Manufacturing** remains a major employer but peaked in 2018 and contracted 7%, driven by structural shifts and productivity improvements.
- **Automotive** employment fell after 2018, potentially due to technological disruption, electrification, and sector consolidation.
- Resource-based industries show mixed results: **mining and quarrying** declined steadily, while **oil and gas extraction and wholesaling** posted modest growth despite global energy transition pressures. These trends highlight the vulnerability of oil and gas extraction and wholesaling sectors to commodity cycles and decarbonisation strategies.

Overall, sectors tied to advanced technology and engineering are expanding, while traditional manufacturing and resource extraction face challenges in New Zealand. For policymakers and industry leaders, this signals the need for targeted workforce planning, upskilling, and strategic investment to align labour supply with emerging industry demands.

The table below shows the industry employment trends for the focus sectors of this research.

Across targeted industry sectors – employment share by sector

Sectors	2013	2018	2023
Manufacturing	10.6%	10.7%	9.3%
Logistics	4.1%	4.2%	3.7%
Engineering	2.1%	2.4%	2.6%
Automotive	2.1%	2.2%	1.9%
Mining and quarrying	0.2%	0.2%	0.1%
Oil and gas extraction and wholesaling	0.1%	0.1%	0.1%
Other sectors	80.8%	80.3%	82.4%
New Zealand Total	**100%**	**100%**	**100%**

Across targeted industry sectors – number of employees by sector and % changes

Sectors	2013	2018	2023	2013 to 2018	2018 to 2023
Manufacturing	211,920	260,990	242,760	23.2%	-7.0%
Logistics	81,260	102,240	96,460	25.8%	-5.7%
Engineering	42,640	58,010	67,130	36.0%	15.7%
Automotive	42,200	54,160	49,910	28.3%	-7.8%
Mining and quarrying	4,360	4,080	3,470	-6.4%	-15.0%
Oil and gas extraction and wholesaling	2,150	2,450	2,660	14.0%	8.6%
Other sectors	1,616,490	1,963,220	2,160,340	21.4%	10.0%
New Zealand Total	**2,001,010**	**2,445,140**	**2,622,720**	**22.2%**	**7.3%**

*Source: Stats NZ; * Suppressed counts have not been included in the individual sector counts; Figures are rounded to the nearest 10; Total has been summed independently to the sector sums to minimise suppression*

While there has been growth in professionals, managers and community and personal services workers within the six in-scope sectors, there has been a decline in roles associated with lower skilled tasks, particularly labourers and sales workers.

Occupational trends across the six sectors

The occupation type data, defined using ANZSCO level 3, provides another lens to assess the composition of the sectors. Combined employment across the six Hanga-Aro-Rau sectors fell from 481,923 in 2018 to 462,387 in 2023, a decline of 4.1%, after strong growth of 25.3% between 2013 and 2018. This shift potentially reflects sector adjustments driven by automation, digitalisation and efficiency gains, which aligns with the skills outlook predicting reduced reliance on manual and routine roles observed globally. It could also be influenced by the economic impact experienced in New Zealand over the last few years.

Roles associated with low skill tasks contracted sharply. Labourers declined by 26.9% since 2018, and Sales Workers fell by 14.3%, illustrating that manual dexterity and routine service skills are becoming less relevant. Technicians and Trades Workers, historically a large share of the workforce, dropped by 5.8%, consistent with the skill composition analysis showing a gradual reduction in level 3 and level 4 roles as robotics and digital systems replace traditional trade functions. This suggests that traditional trade roles are being redefined.

Conversely, occupations requiring higher order capabilities have grown. Professionals increased by 24.5% since 2018, and Community and Personal Service Workers rose by 7.3%, suggesting rising demand for technical expertise and customer focused roles in digitally enabled environments. Managers remained relatively stable, while Clerical and Administrative Workers declined slightly, potentially reflecting the automation of routine cognitive tasks.

New Zealand is in line with global trends:

- Decline in labourers and routine roles supports the expectation that manual skills are losing relevance.
- Growth in professionals aligns with the shift toward knowledge intensive roles requiring digital and analytical capabilities.

Operational and service functions remain critical in New Zealand. Workforce planning and vocational education strategies should combine advanced technical training with skills for compliance, customer interaction and adaptive leadership.

Across targeted industry sectors – employment share by occupation type

Occupation type	2013	2018	2023
Technicians and Trades Workers	19.5%	18.1%	17.8%
Managers	17.1%	16.8%	17.7%
Professionals	11.6%	13.3%	17.2%
Machinery Operators and Drivers	14.9%	15.9%	15.5%
Clerical and Administrative Workers	13.0%	11.8%	11.8%
Labourers	14.8%	15.1%	11.5%
Sales Workers	7.4%	7.3%	6.5%
Community and Personal Service Workers	1.8%	1.7%	1.9%
All Occupations combined	**100.0%**	**100.0%**	**100.0%**

Across targeted industry sectors – number of employees by occupation type and % changes

Occupation type	2013	2018	2023	2013 to 2018	2018 to 2023
Technicians and Trades Workers	75,015	87,342	82,257	16.4%	-5.8%
Managers	65,604	80,964	81,897	23.4%	1.2%
Professionals	44,529	64,005	79,671	43.7%	24.5%
Machinery Operators and Drivers	57,174	76,698	71,805	34.1%	-6.4%
Clerical and Administrative Workers	50,142	56,664	54,558	13.0%	-3.7%
Labourers	56,730	72,795	53,178	28.3%	-26.9%
Sales Workers	28,287	35,022	30,003	23.8%	-14.3%
Community and Personal Service Workers	6,846	8,265	8,865	20.7%	7.3%
All Occupations combined	**384,519**	**481,923**	**462,387**	**25.3%**	**-4.1%**

*Source: Stats NZ; * Suppressed counts have not been included in the individual sector counts; Figures are rounded to the nearest 10; Total has been summed independently to the sector sums to minimise suppression*

Change in earnings between 2018 and 2025

Industries differ in their earnings due to a range of factors including skill requirements, capital intensity, market demand, and regulatory environments. Sectors that rely heavily on specialised skills or advanced technology, such as engineering or mining and quarrying, tend to offer higher hourly earnings to attract and retain qualified workers. This is supported by research from the Australian Productivity Commission, which found that sectors such as **mining and quarrying** exhibits wage decoupling, where productivity growth outpaces wage growth, due to high capital intensity and export-driven output.

In contrast, industries with lower barriers to entry or a higher proportion of casual and part-time roles, such as **logistics**, often report lower average earnings. These sectors typically have more elastic labour supply and lower skill requirements, which can suppress wage levels. The *Jobs and Skills Australia Occupation Shortage* Report highlights that skill level 3 occupations, which often include lower paid roles, have persistently low vacancy fill rates, indicating ongoing labour market mismatches.

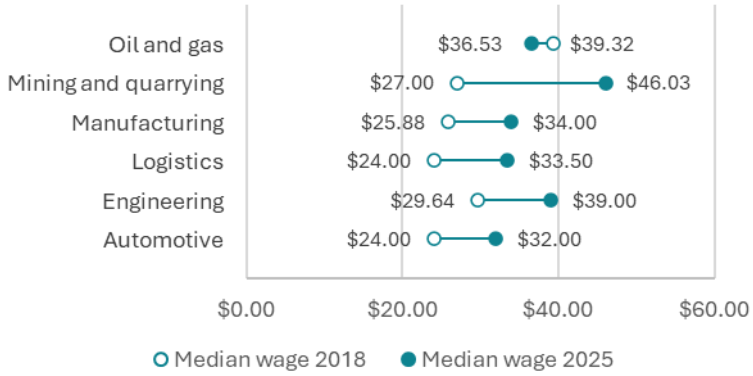
Economic cycles and commodity price fluctuations also influence wage growth differently across sectors. Resource-based industries, such as **manufacturing**, **mining and quarrying** and **oil and gas extraction** are particularly sensitive to global demand shocks, which can lead to wage volatility. At the same time, broader structural forces such as technological change and globalisation continue to reshape the labour market.

In New Zealand, skill shortages are driven by demographic shifts, migration, and technological disruption, are common factors that can create wage pressure in sectors where demand for skilled workers exceeds supply.

Based on data from Stats NZ's Household Labour Force Survey (HLFS), hourly earnings across Hanga-Aro-Rau sectors between 2018 and 2025 followed varied trajectories, reflecting differences in industry growth, labour demand, and economic conditions. **Mining and quarrying** recorded the most significant increase in median and earnings, rising by $19.03 between 2018 and 2025. This growth likely reflects rising global commodity prices, increased investment in extraction technologies, and a tightening labour market for skilled workers in remote or specialised roles.

In contrast, **oil and gas extraction and wholesaling** was the only sector to experience a decline in median earnings. The drop in median earnings by $2.79 from 2018 to 2025 can be attributed to the ban on new oil and gas exploration permits by the government through the Crown Minerals (Petroleum) Amendment Act 2018. More recently New Zealand's total energy supply decreased in 2024 due to a depletion of gas supplies. This downward trend may also indicate broader structural changes, such as the depletion of gas supplies and the sector's transition away from traditional fossil fuel operations toward more sustainable energy sources.

Change in median hourly wage between 2018 and 2025



Source: Stats NZ
** Suppressed figures have not been included in the individual sector estimates*

Technical and resource intensive sectors can pay up to three times more than less specialised sectors.

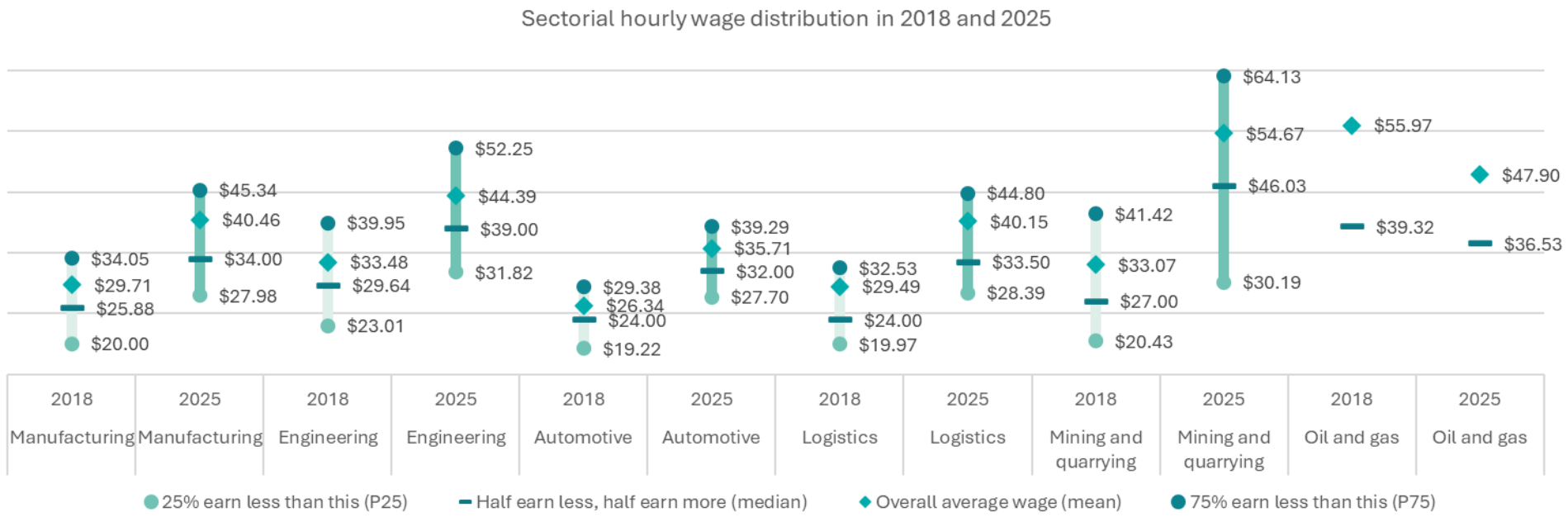
Sectorial earnings distribution

In 2025, hourly wages across New Zealand's industry sectors show notable variation, reflecting differences in skill requirements, market demand, and operational complexity. Mining and quarrying is shown as the highest paying sector, while automotive remains at the lower end of the scale. This distribution highlights the ongoing trend where resource-intensive and specialised industries offer premium wages compared to sectors with broader labour pools.

The table shows significant variation in hourly wages across industry sectors in 2025. Key observations:

- **Mining and quarrying** observed the highest wages, where the median hourly rate is $46.03, and the top quartile (P75) is $64.13, but also a significant interquartile range variation.
- **Engineering** also demonstrates strong wages, $39.00 median wage per hour, with the upper quartile at $52.25.
- **Oil and gas extraction and wholesaling** is in the high mid range with a median of $36.53, but its average is higher at $47.90, suggesting a wide pay gap within the sector.
- **Logistics** and **manufacturing** fall in the mid range, median of $33.50 and $34.00 respectively, with lower quartile wages dipping below $30.00.
- **Automotive** remains the lowest paying sector, with a median wage of $32.00 and an average of $35.71, highlighting a relatively narrow wage band compared to other industries. This may be due to a higher proportion of roles in the automotive sector not requiring specialised or advanced qualifications.

Sectors with technical expertise or resource extraction tend to pay more, while automotive and manufacturing remain lower. This provides important context for shaping skills strategies and addressing equity in pay.



*Source: Stats NZ; * Suppressed counts have not been included*

New Zealand industry sectors skills trends

This research focuses on the top 10 projected most in demand skills by 2030, based on global research, with the addition of two skills which are important for the New Zealand context. Human-centric and technological literacy will be increasingly important skills.

New Zealand's future workforce skills

Global research highlights a profound shift in workforce priorities, with employers increasingly valuing adaptability, and digital fluency, alongside human-centric capabilities. New Zealand's skills landscape is expected to reflect these global patterns, but with nuances shaped by local context and timing.

Be human-centric

Resilience, flexibility, and agility top the list of future skills globally and we expect that these skills will also be core competencies in a New Zealand context. The need for workers who can navigate uncertainty and pivot quickly will be critical.

Human-centric and cognitive skills remain central despite automation trends. Creative thinking, analytical thinking, and leadership and social influence capabilities are ranked highly, reinforcing their role in innovation and collaboration. Globally, these skills are seen as essential complements to technology, and New Zealand faces the same imperative. Motivation and self-awareness, and curiosity and lifelong learning further underscore the importance of emotional intelligence and adaptivity in a dynamic labour market.

Be technologically savvy

AI and big data and technological literacy are the other areas where global and New Zealand local priorities converge. New Zealand is expected to follow closely the growth in skills for AI and big data, and networks and cybersecurity observed worldwide, consistent with global digital first strategies. However, adoption rates may vary across industries, requiring tailored approaches to workforce development. Technological literacy will become a baseline expectation, not just for technical roles but across all job categories.

New Zealand specific skills

This research adopts the top 10 projected most in demand skills by 2030, based on global research, with the addition of two additional skills, reflecting the New Zealand context:

- Environmental stewardship
- Cultural competency.

Be stewards of the environment

Environmental stewardship is one the fastest rising skills projected to be in most demand by 2030. New Zealand is no exception. With an economy heavily reliant on resource based industries and access to global trade, New Zealand faces heightened exposure to climate risks, regulatory changes and market expectations.

Embedding sustainability and systems thinking into vocational education is essential to maintain export competitiveness, meet international obligations and build a resilient, future ready workforce.

Be culturally competent

Cultural competency introduces a distinctly New Zealand dimension. It includes engagement with Te Ao Māori principles, is critical for inclusive workplaces and aligns with the country's bicultural foundation and multicultural workforce. While global organisations emphasise diversity and inclusion broadly, New Zealand's approach requires a deeper integration of cultural values into workforce strategies.

Top projected important skills by 2030 in New Zealand for the six Hanga-Aro-Rau sectors:

Ranking	Skills
1	Resilience, flexibility and agility
2	AI and big data
3	Technological literacy
4	Creative thinking
5	Analytical thinking
6	Leadership and social influence
7	Talent management
8	Motivation and self-awareness
9	Curiosity and lifelong learning
10	Systems thinking
NZ	Environmental stewardship (fast growing)
NZ	Cultural competency (NZ specific)

Source: WEF, Deloitte derived analysis

For a small country like New Zealand, having a consistent set of forward-looking skills across the industry sectors provides a key advantage. This consistency allows employees to transfer skills more easily and pursue opportunities beyond their current industry. Such flexibility strengthens the resilience of the overall workforce and helps industries respond to economic shifts, technological change and global market pressures.

Consistency of skills across industries

The twelve core skills form a consistent foundation across all of the manufacturing, engineering, automotive, logistics, mining and quarrying, and oil and gas extraction sectors. This alignment shows that future workforce capability is built on a shared set of priorities in addition to sector specific needs. It signals to industry sectors that workforce development strategies should focus on this common skill set to prepare employees for interconnected, technology driven and culturally diverse environments.

Implications for New Zealand

For a small country like New Zealand, having a consistent set of forward looking skills across the industry sectors provides a key advantage. This consistency promotes workforce mobility across sectors, allowing employees to transfer skills more easily and pursue opportunities beyond their current industry. Such flexibility strengthens the resilience of the overall workforce and helps industries respond to economic shifts, technological change and global market pressures. A mobile and adaptable workforce reduces skill shortages, supports innovation and ensures that talent can be deployed where it is most needed.

The table below shows how the top 12 skills are represented across each industry. A dot indicates that the skill is expected to rank among the top 12 skills by 2030 in the respective sectors.

Photo: SCG Print, New Zealand

Most important and emerging skills by 2030 for the New Zealand industry sectors

Rank	Skills	Manufacturing	Engineering	Automotive	Logistics	Mining	Oil and gas
1	Resilience, flexibility and agility	●	●	●	●	●	●
2	AI and big data	●	●	●	●	●	●
3	Technological literacy	●	●	●	●	●	●
4	Creative thinking	●	●	●	●	●	●
5	Analytical thinking	●	●	●	●	●	●
6	Leadership and social influence	●	●	●	●		●
7	Talent management	●	●	●	●	●	●
8	Motivation and self-awareness	●	●	●	●	●	●
9	Curiosity and lifelong learning	●	●	●		●	●
10	Systems thinking	●	●			●	
11	Environmental stewardship (NZ)					●	●
12	Cultural competency (NZ)						

Source: WEF, Deloitte analysis

Photo: SCG Print, New Zealand

In 2024, 241,300 people participated in the VET system in Aotearoa New Zealand.

Type	2020	2021	2022	2023	2024
Te Pūkenga subsidiaries	189,675	215,315	214,955	170,455	157,380
Non-transferred industry training organisations	5,560	7,080	4,145	0	0
Wānanga	22,705	24,785	22,035	22,035	21,890
Universities	6,005	6,320	5,935	5,850	6,530
Public providers	221,785	250,590	244,805	196,845	184,320
Private training establishments	32,505	37,845	50,695	56,865	61,725
Total	**251,695**	**283,930**	**280,775**	**249,310**	**241,300**

Source: Education Counts; Data includes workplace based and provider based learning.

Approximately 43,170 learners are in the broader Engineering and Related Technologies field of study as shown below:

Field of study	2020	2021	2022	2023	2024
Manufacturing, Engineering and Technology	2,870	4,005	5,640	3,520	1,510
Process and Resources Engineering	4,535	4,660	4,405	3,695	3,195
Automotive Engineering and Technology	7,985	9,500	9,640	9,535	9,460
Mechanical and Industrial Engineering and Technology	4,970	6,315	6,700	5,750	5,775
Civil Engineering	3,410	4,800	5,405	4,020	3,765
Geomatic Engineering	155	220	240	170	145
Electrical and Electronic Engineering and Technology	10,820	12,710	14,350	13,090	12,630
Aerospace Engineering and Technology	2,440	1,730	1,920	2,200	2,465
Maritime Engineering and Technology	2,215	1,900	1,885	1,640	1,485
Other Engineering and Related Technologies	3,540	3,935	4,070	3,285	3,080
Total	**42,420**	**49,180**	**53,385**	**46,425**	**43,170**

Source: Education Counts; Data includes workplace based and provider based learning.

The skills composition of the workforce has shifted between the 2013 and 2023 census years decisively in favour of higher skilled roles. The sustained shift towards higher skill levels will require vocational education to focus on pathways to advanced qualifications and work-based learning.

The sustained shift towards higher skill levels. Requires vocational education to focus on pathways to advanced qualifications and work-based learning.

Participation in industry sectors qualifications

In 2024, 13.1% of VET learners (31,625) participated in qualifications covered under Hanga-Aro-Rau sectors:

Sector	2020	2021	2022	2023	2024
Automotive	11,510	13,440	13,795	13,775	13,245
Engineering	5,740	6,865	7,120	6,685	7,380
Logistics	2,935	2,455	2,175	1,845	1,850
Manufacturing	12,150	14,885	16,580	12,565	8,835
Mining and quarrying	335	350	370	340	315
Total	**32,670**	**37,995**	**40,040**	**35,210**	**31,625**

Source: Hanga-Aro-Rau; Note this data only includes enrolments for qualifications within Hanga-Aro-Rau coverage, and there is some, e.g. engineering diplomas, which sit outside of this.

Skill level classification

ANZSCO classifies occupations into five skill levels based on the range and complexity of tasks typically required. Level 1 represents the most skilled roles, requiring extensive qualifications and experience, while Level 5 covers roles with limited formal training. These levels do not measure an individual's ability but indicate the skill usually needed to perform an occupation competently. For this research, the National Occupation List (NOL) skill levels are applied, considering formal qualifications, years of experience, work-based learning and the nature of goods or services produced.

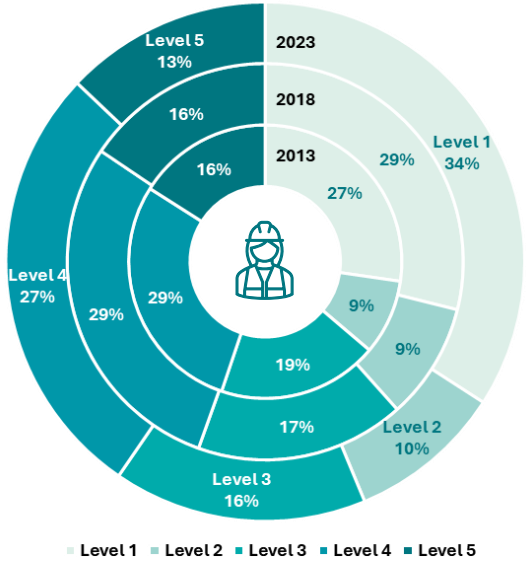
Skill composition of the industry sectors workforce

The chart to the right shows how the skill composition of the workforce has shifted from 2013 to 2023 census years for industry sectors.

- **Level 1 roles (highly skilled)** increased from 27% in 2013 to 34% in 2023, reflecting growing demand for advanced technical and professional expertise.
- **Levels 2 roles** have increased slightly from 9% to 10%.
- **Level 3 roles** have contracted, suggesting a gradual move away from mid skilled roles toward higher skill occupations.
- **Level 4** roles have contracted from 29% to 27%.
- **Level 5** roles declined from 16% to 13%, indicating fewer low skill positions.

This trend reinforces the earlier discussion on future workforce priorities. As industries adopt advanced technologies and sustainability practices, the need for highly skilled workers is accelerating. For vocational education, this means focusing on pathways that lead to Level 1 and Level 2 roles through advanced qualifications and work-based learning. For employers and SMEs, the challenge is to attract and retain talent for these roles while reskilling workers from declining skill levels.

Industry sectors
% share of employees by skill level (2013 to 2023)

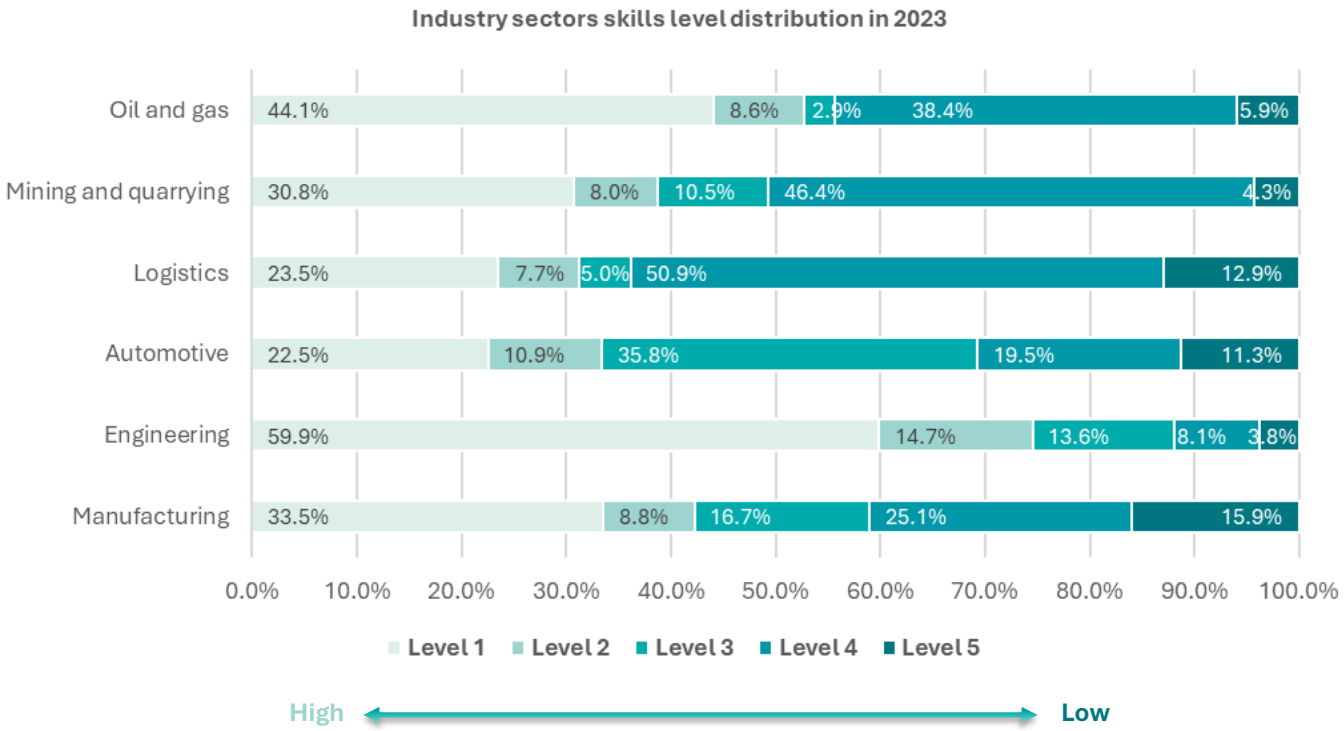


*Source: Stats NZ, Deloitte Access Economics; * Suppressed counts have not been included*
Note: The skill levels shown do not correspond to NZQF levels. NZQF levels describe the complexity of qualifications (e.g. Level 1–2 for foundation certificates, Level 7+ for degree-level). The chart's Level 1 indicates highly skilled roles and Level 5 indicates low skilled roles.

Skill level profile across industry sectors

The distribution of skill levels varies significantly across industries according to census 2023 data, highlighting different workforce profiles and training needs:

- **Manufacturing** has a third highly skilled roles (Level 1 33.5%), with a notable presence of mid skilled roles (Level 4: 25.1%) and low skill roles (Level 5: 15.9%), suggesting a mixed workforce requiring both technical and operational training.
- **Engineering** has the highest proportion of highly skilled roles (Level 1: 59.9%), reflecting strong reliance on advanced technical and professional expertise.
- **Automotive** shows the highest concentration of mid-skilled roles (Level 3: 35.8%) and relatively low highly skilled roles (22.5% Level 1), suggesting vocational pathways remain critical.
- **Logistics** is heavily weighted toward operational roles (Level 4: 50.9%) with only a quarter highly skilled roles (Level 1: 23.5%), indicating limited demand for advanced qualifications but there could a strong need for operational training.
- **Mining and quarrying** is dominated by operational roles (Level 4: 46.4%) but still maintains good proportion of highly skilled roles (Level 1: 30.8%), indicating a need for supervisory and technical expertise alongside practical skills.
- **Oil and gas extraction and wholesaling** also show a high share of highly skilled roles (Level 1: 44.1%), indicating demand for specialised knowledge and regulated qualifications.



Source: Stats NZ

There is a skills shift toward technology driven and knowledge intensive work. For vocational education, this means prioritising digital skills, advanced technical training and human-centric skills. For employers and SMEs, the challenge is attracting talent for emerging roles while reskilling workers from declining occupations.

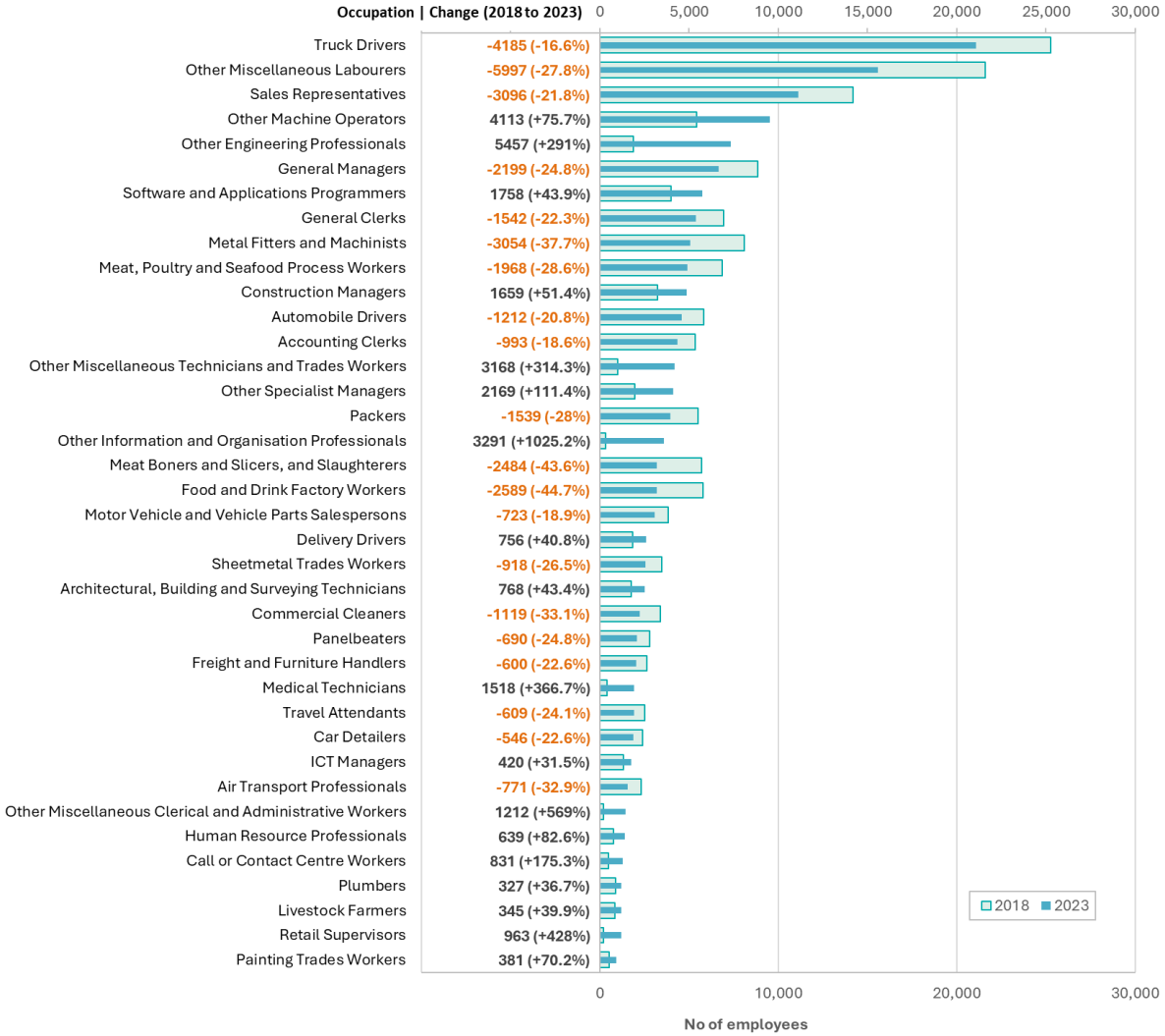
Occupational shifts across industry sectors

Based on Stats NZ census data, the largest growth between 2018 and 2023 occurred in **knowledge based and technical roles**. This trend was seen across the six Hanga-Aro-Rau industry sectors (manufacturing, engineering, automotive, logistics, mining and quarrying, and oil and gas extraction and wholesaling). Other Information and Organisation Professionals grew by 1,025%, and Miscellaneous Clerical and Administrative Workers by 528%, reflecting demand for data management and compliance. Technical roles such as Medical Technicians (366.7%), Other Engineering Professionals (291%) and Software and Applications Programmers (43.9%) also expanded, driven by digital transformation and infrastructure investment. Growth in Human Resource Professionals (82.6%) and Specialist Managers (111.4%) highlights the need for workforce planning and organisational capability.

In contrast, **traditional roles declined**. Truck Drivers fell by 16.6%, General Clerks by 22.3%, and Food and Drink Factory Workers by 44.7%, showing the impact of **automation**, **efficiency gains** and **structural shifts** away from manual tasks. **Manual production roles** such as Meat and Seafood Process Workers (-28.6%) and Sheetmetal Trades Workers (-26.8%) also contracted sharply.

These changes, at an industry sectors aggregated level, confirm the shift toward technology driven and knowledge intensive work. For vocational education, this means prioritising **digital skills**, **advanced technical training** and **human-centric skills**. For employers and SMEs, the challenge is attracting talent for emerging roles while reskilling workers from declining occupations.

Occupations with the largest workforce and notable growth or decline across industry sectors (2018 to 2023)



Source: Stats NZ, Deloitte Analysis
** The occupations shown in the chart were selected from the top 100 occupations with the highest number of employees and the top 100 fastest growing roles within the sector*

Implications for the industry sectors

New Zealand's labour market is undergoing a profound transformation driven by automation, digitalisation and demographic change. These developments carry significant implications for all stakeholders, particularly in the context of ongoing system reform.

Implications of changing workforce and skills landscapes

The transformation of New Zealand's labour market, driven by automation, digitalisation, and demographic shifts, has far reaching implications for all stakeholders. Organisations and employers must adapt to changing skill demands and workforce structures, while SMEs face unique challenges in resourcing and technology adoption. The VET system is under pressure to redesign curricula and create flexible pathways that align with emerging roles. At the same time, government agencies, industry bodies, unions, and technology providers play a critical role in shaping policy, funding, and collaborative solutions to ensure a resilient, future ready workforce. These changes demand coordinated action to address skill gaps, support lifelong learning, and embed cultural competence across all sectors.

Implications for organisations and employers

Employers are at the forefront of adapting to structural changes in the labour market, requiring proactive strategies to remain competitive:

- **Strategic workforce planning –** Organisations need to anticipate skill shortages and align recruitment with emerging roles in engineering, digital systems, and sustainability.
- **Upskilling and reskilling –** Transitioning workers from declining manual roles to knowledge intensive positions is critical.
- **Retention strategies –** Competitive wages, flexible work arrangements, and career development pathways will be essential to attract Level 1 and Level 2 talent.
- **Cultural competence –** Embedding Te Ao Māori principles and diversity practices will strengthen inclusive workplaces and extend the talent cohorts.
- **Technology integration –** Employers should invest in automation and digital tools while supporting staff through change management.

Implications for SMEs

SMEs face unique challenges due to limited resources and capacity, making collaboration and innovation essential:

- **Collaborative training models –** Collaborative work based learning and industry partnerships can reduce costs and improve access to skilled labour.
- **Digital adoption support –** SMEs need tailored assistance to implement automation and data driven tools without disrupting operations.
- **Succession planning –** Leadership development is vital for continuity in competitive markets.
- **Access to financial support –** SMEs may require strategic investment or grants to invest in technology and workforce development, especially for initiatives that align with public policies.

Implications for the VET system

The VET system must evolve rapidly to prepare graduates for future roles and industry expectations. This requires moving beyond technical proficiency to embed adaptive cognitive skills and human-centric capabilities such as critical thinking, creativity, emotional intelligence, and leadership. These skills complement technical expertise and enable workers to thrive in dynamic, technology driven environments. Key priorities could include:

- **Curriculum redesign –** Integrate digital literacy, sustainability, systems thinking, and adaptive cognitive skills across all programmes.
- **Human-centric skills development –** Embed training in communication, collaboration, resilience, and problem solving to strengthen adaptability and interpersonal effectiveness.
- **Flexible pathways –** Combine formal qualifications with work-based learning to accelerate transitions into high skilled roles.
- **Industry engagement –** Deepen collaboration with employers to ensure training reflects emerging technologies, compliance requirements, and evolving workplace models.
- **Micro-credentials –** Expand short, stackable courses for rapid upskilling in areas such as AI, cybersecurity, sustainability, and interpersonal skills.
- **Cultural integration –** Incorporate Te Ao Māori principles and cultural competence into vocational education to support inclusive and diverse workplaces.

Sustainable workforce

Entry pathways and building blocks

Workforce gaps across entry points and pathways

Closing skill gaps across entry points requires coordinated action. Key strategies include promoting awareness of high demand skills, investing in micro-credentials for targeted upskilling, strengthening industry education partnerships and creating learning pathways to support lifelong learning.

Future skills and workforce resilience

Both technical and human-centric skills are critical for workforce resilience and adaptability in New Zealand. According to the *Hays 2025 Skills Report*, 84% of employers rank teamwork and communication as top priorities, along with critical thinking, problem solving, and adaptability and flexibility. At the same time, demand for digital capabilities such as AI, data analytics, and cloud computing is accelerating, alongside emerging areas like environmental stewardship and sustainability. These trends are already evident, with skill shortages contributing to rising vacancies and productivity constraints across multiple sectors.

System wide action to address skill gaps

Closing skill gaps across entry points requires coordinated action. Key strategies include promoting awareness of high demand skills, investing in micro-credentials for targeted upskilling, strengthening industry education partnerships and embedding technical and human-centric skills throughout learning pathways to support lifelong learning.

Workplace-based trainers and assessors are critical to this system. Their expertise must span the entire pathway, from entry level onboarding through advanced technical training, to ensure learners acquire the most in demand capabilities and progress effectively.

While sector branding plays an important role in attracting talent and shaping perceptions, this analysis focuses on education and training interventions that directly support skill development and workforce readiness.

Skills focus

Education and training gaps exist across cohorts of the entry pathways, limiting the ability to acquire the most important and in-demand skills projected by 2030 in New Zealand.

Top technical skills:

- AI and big data
- Technological literacy

Top human-centric skills:

- Resilience, flexibility and agility
- Creative thinking
- Analytical thinking
- Leadership and social influence
- Talent management
- Motivation and self-awareness
- Curiosity and lifelong learning
- Systems thinking
- Environmental stewardship
- Cultural competency

Key education and training gaps

The following gap themes highlight how specific challenges influence the ability to acquire high demand skills and progress through sector pathways:

1. **Curriculum and qualifications –** Training content is often outdated or misaligned with industry needs.
2. **Educator and trainer capability –** Educators may lack current industry knowledge or teaching support.
3. **Modes of teaching and education –** Limited use of flexible, blended or practical learning approaches.
4. **Policy and system barriers –** Regulatory and funding constraints slow innovation and responsiveness.
5. **Bias and perception issues –** Stereotypes and undervaluing of certain roles limit participation and diversity.

Understanding gaps across entry pathways

Gaps occur at different stages of the workforce pipeline and influence progression toward high demand roles. Understanding where these gaps exist within entry points and pathways is essential for designing targeted interventions that close skill shortages and build a future ready workforce.

Photo: Precision Autowerk, New Zealand

Entry points into the industry

Entry points into the industries can occur across four distinct entry pathways, which may be accessed by learners at different career stages.

Common entry points into sector pathways

Across all six Hanga-Aro-Rau sectors, a set of common entry points provides a high level view of where individuals typically begin their career journey. These entry points form the foundation for analysing current pathways and identifying opportunities to develop high demand skills.

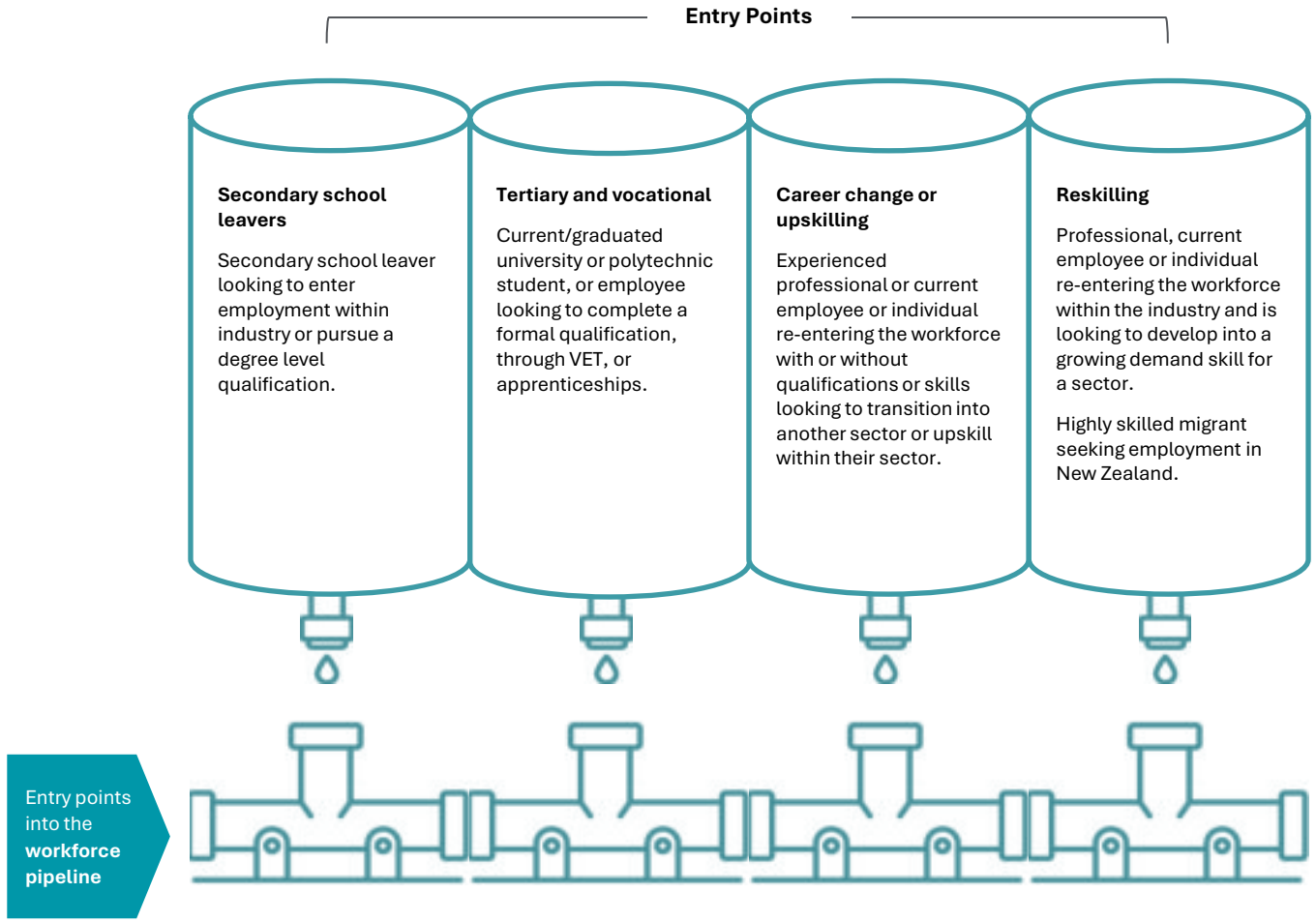
Entry into these sectors generally occurs through four distinct **"entry points"** i.e. entry cohorts:

1. Secondary school leavers
2. Tertiary and vocational – vocational education, apprenticeships, university graduates
3. Career change or upskilling
4. Reskilling.

Each of them is accessible at different points depending on prior experience and skill level. There is some crossover between vocational education and career change or reskilling, as vocational pathways often provide a formal route for upskilling while in work. The initial entry point influences the **"building blocks"** i.e. capability enablers, and core skills required for progression.

Career development within these sectors is not linear. Pathways are shaped by factors such as sector trends, organisational capacity, and access to training. Individual journeys are dynamic, often influenced by previous experience and the ability to navigate transitions.

The accompanying diagram outlines these common entry points and provides a high level description of each. While these represent the most frequent pathways, some sectors may offer additional, unique entry options not captured here.



Sector entrants

Industry changers dominate sector entry, over 50% of new entrants in automotive and more than 70% in logistics, manufacturing, and extractives.

Photo: Chocolatier Thomas Netana Wright of Ao Cacao, New Zealand

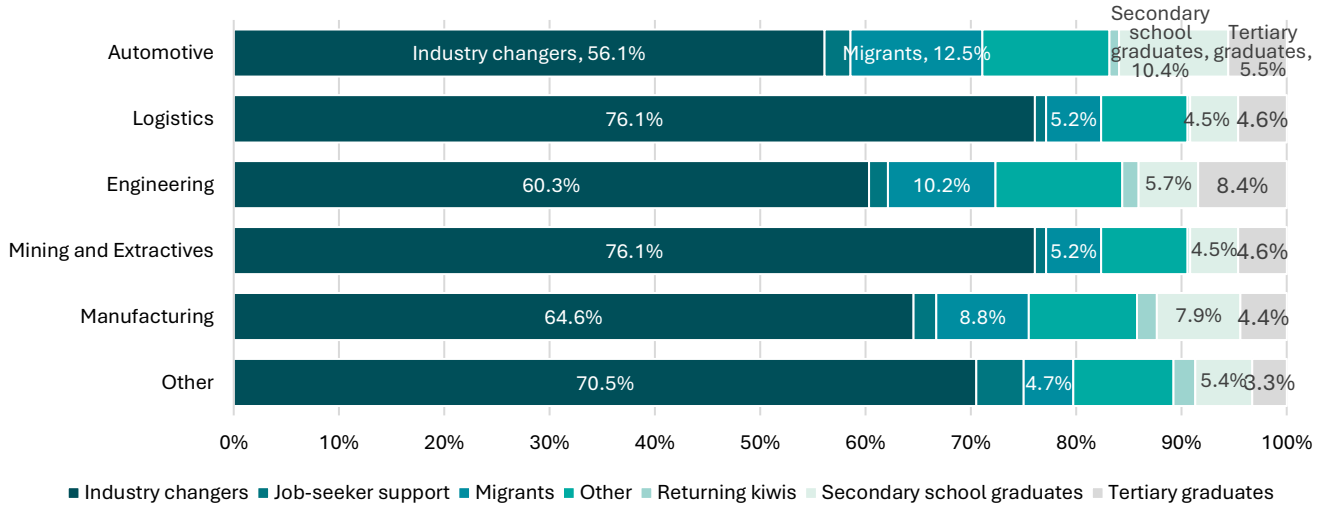
Beyond these four entry points, actual workforce patterns show seven distinct pathways, including domestic and international movement. The most common is industry changers, making up over half of entrants in every sector and up to 76% in logistics and mining. Migrants also play a notable role, particularly in automotive (12.5%) and engineering (10.2%).

Secondary school and tertiary graduates remain important cohorts, with engineering showing the highest share of tertiary graduates (8.4%) due to its high skill roles, and there are significant opportunities to attract more of these two groups into industry sectors.

This reinforces that career development is dynamic, shaped by mobility and prior capability. Workforce strategies should consider deliberate bridging programmes for industry changers, credential recognition for migrants, and flexible upskilling pathways to support transitions.

It is also hugely important to create targeted programmes that attract secondary school leavers and tertiary graduates, ensuring these cohorts see clear, appealing pathways into industry sectors.

Sector entrants by origin (2023)



Source: Hanga-Aro-Rau

Gaps and challenges by entry points

	Secondary school leavers	Tertiary and vocational
Curriculum and qualifications	• Limited integration of AI into the curriculum, as well as qualifications with AI as a stand alone skill. • Uncertainty around embedding behavioural, human-centric skills into training curricula and qualifications in a measurable and transferable way.	• Tertiary courses often do not teach the human-centric skills employers value, which creates gaps in employability. • There is limited integration of AI into qualifications and trainings.
Educator and trainer capability	• AI adoption in New Zealand secondary schools is progressing slowly, with low AI literacy among educators and school leaders.	• While apprentices interact with digital tools, training often focuses on operational tasks, with less emphasis on using data to drive performance improvements.
Modes of teaching and education	• While general digital literacy is taught, there is a gap in equipping teachers and students with the advanced technological literacy needed, which creates a persistent barrier to meeting sector specific demands in a tech-integrated workplace.	• Some advanced manufacturers use automation, but most traditional trade apprenticeships still do not include training in AI or robotics. • International students indicated many tertiary courses do not teach human-centric skills employers want, making it harder to find jobs.
Policy and system barriers	• Employers and providers believe NZQA qualification processes are complicated, as a result this time spent on administrative tasks inhibits other workflows.	• Past reforms prioritised structural changes. There is no strong evidence that these reforms systematically embedded human-centric skills or provided clear guidance and resources for VET developers. • The NZQA process for adding new skills and courses can sometimes be overly complex.
Bias and perception issues	A long standing cultural bias towards university education often creates a perception that trade qualifications are less intellectually rigorous. • This perception can deter individuals with strong analytical or creative thinking skills from pursuing vocational pathways. • Such bias limits the pool of talent entering these sectors, reducing cognitive diversity and constraining the workforce's capacity for innovation. • Fragmented and outdated training pathways create confusion and limit access to relevant skills, slowing workforce readiness and sector growth. As an example, in the automotive sector, basic mechanic training still excludes electronic vehicle (EV) competencies despite rapid growth in electric vehicle sales. The manufacturing sector has been slow to update curricula to include robotics, AI and digital supply chain management. • School-to-trade pathways undervalued.	

	Career change or upskilling	Reskilling
Curriculum and qualifications	• Limited integration of AI into the curriculum, as well as qualifications with AI as a stand alone skill. • Uncertainty around embedding behavioural, human-centric skills into training curricula and qualifications in a measurable and transferrable way.	• Qualifications need more frequent reviews to keep up with rapid technology changes and should combine human-centric skills with technical skills to support effective reskilling.
Educator and trainer capability	• New Zealand has too few qualified trainers for technical and specialised skills, and current immigration rules limiting skilled migrant workers have made the shortage worse. • There are not enough training resources to help people quickly update their human-centric skills.	• Many older or long serving workers in traditional roles do not have the basic digital skills needed to use modern automated and data driven systems. • Older workers need targeted training in adaptability, curiosity, resilience, and lifelong learning to keep up with technology.
Modes of teaching and education	• Many workers may not have clear or easy ways to learn how to use AI. • Employer investment in AI upskilling can be inconsistent. • Accessible, flexible training options for mid career workers to gain data and analytics skills are limited across all sectors, and many companies do not invest enough in this area.	• There are few opportunities for SMEs and industry projects that allow workers to refresh or update their skills. • Many experienced workers do not have clear or accessible pathways to reskill in AI and human-centric skills.
Policy and system barriers	• NZQA approvals can sometimes be slow and the process can often seem complex. • Small firms often struggle to fund and deliver training for these important skills.	• NZQA approvals can sometimes be slow and the process can often seem complex.
Bias and perception issues	• Human-centric skills are often treated as something to learn later in tertiary education, rather than being introduced earlier. • Skills such as AI and big data, and technological literacy need strong foundations in areas such as numeracy and digital literacy to allow effective upskilling later in the education pathway. The 2023 decline in literacy and numeracy is a challenge.	

Essential building blocks for closing education and skills gaps

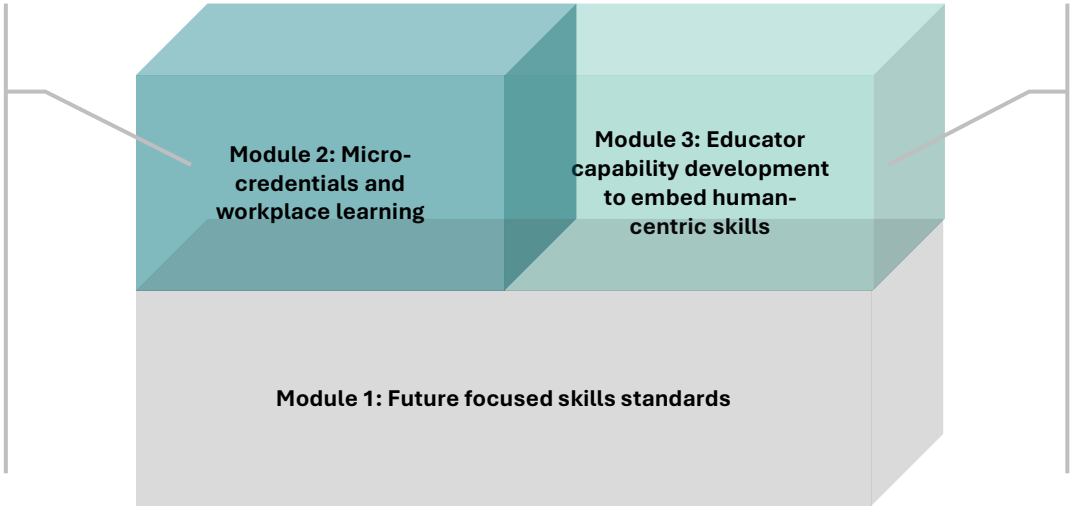
A framework to close skills gaps could involve a combination of future focussed skills standards, pathways based on micro-credentials, and developing VET educator capability around human-centric skills

The three interdependent essential building blocks
As understanding of the education and skills gaps becomes clearer, it is evident that a structured solution is required to address these challenges. The following three building block modules provide a framework for:

1. Embedding high demand skills into standards, i.e**. future focused skills standards.**
2. Integrating them into micro-credentials and work-based training at every entry point, i.e. **micro-credentials and workplace learning.**
3. Developing effective methods for teaching human-centric skills, i.e. **educator capability development to embed human-centric skills.**

Together, these building blocks form a cohesive approach to closing gaps and enabling a future ready workforce.

This building block module recommends prioritising micro-credentials and work-based training to address key educational gaps related to the twelve high demand and essential skills identified in this report. It is important that these micro-credentials and work-based learning opportunities are either tailored to specific pathways or are applicable across all entry pathways and their respective learner groups.



Supporting educators to focus on embedding human-centric skills will be important to upskilling learners across the high demand and important skills. This building block proposes targeted development of educators.

Skill standards will replace unit standards in 2025, presenting an opportunity to reshape the education landscape. All new qualifications will be developed using these new skill standards as foundational elements. It is therefore essential to ensure that the twelve high demand and important future skills are incorporated into the skill standards.

Future focused skills standards

Skill standards are a foundation for a future ready and inclusive VET system. They embed practical and transferable skills into qualifications, helping address key gaps across learner pathways.

Why skill standards are a key building block module

Skill standards are a foundation for a future ready and inclusive VET system. They embed practical and transferable skills into qualifications, helping address key gaps across learner pathways. By embedding practical, transferable, and future relevant skills into qualifications, skill standards directly address several systemic gaps across learner pathways, from school leavers to those reskilling later in life.

Key enabling functions include (related to the previously mentioned gap themes):

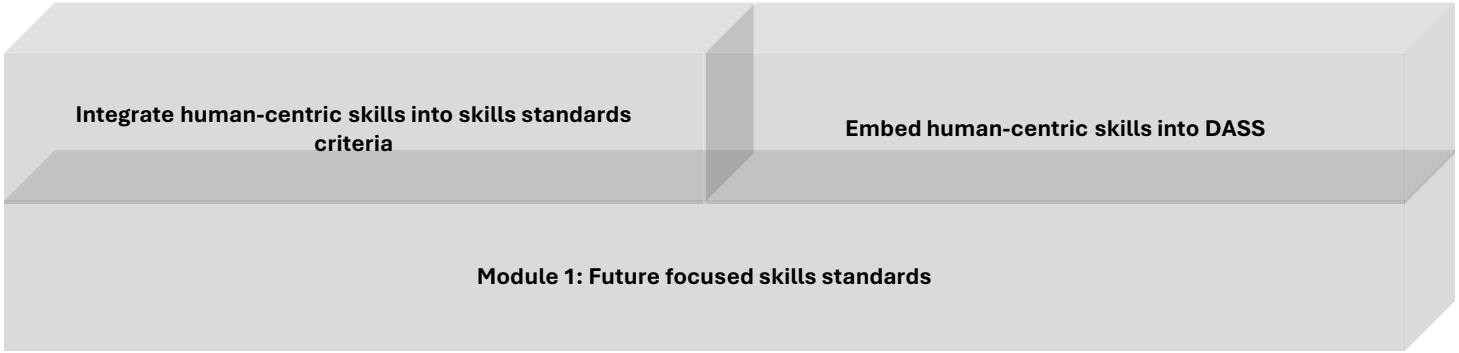
- **Curriculum and qualifications** – They could integrate technical and human-centric skills such as communication, adaptability, and AI literacy into core learning, ensuring these are taught and assessed as essential.
- **Educator and trainer capability –** Clear outcomes and criteria give educators a consistent framework to teach evolving skills across all levels.
- **Modes of teaching and education –** Skill standards support flexible, modular learning, making it easier for learners to upskill or reskill as needed.
- **Policy and system barriers -** They streamline qualification development, allowing faster integration of important skills and reducing administrative burden.
- **Bias and perception issues –** By embedding high value skills into vocational learning, they help shift outdated views and attract a more diverse range of learners.

Key considerations for integrating human-centric skills

Current DASS guidelines state that skill standards should include transferable competencies where appropriate. This implies that human-centric skills are not listed as standalone standards and are expected to be embedded within the practical application of a skill. Unlike technical skills, human-centric skills are not yet easily measurable on their own, which limits their ability to stand as independent standards.

However, during the development of a skill standard, it is possible to specify how a human-centric skill be demonstrated in practice to meet the standard. Over time, industries should place greater emphasis on these skills, as demand for them is growing across all sectors. Making them more visible and concrete within skill standards will support their inclusion in qualifications, training, and micro-credentials.

Potential building blocks ideas and relevant frameworks are as follows.



Related frameworks

Directory of Assessment and Skill Standards (DASS)

Ngā Kaupapa guiding principles

Micro-credentials and workplace learning

Micro-credentials and work-based learning offer flexible, skills focused options that complement traditional qualifications. They enable rapid skill development and create stackable pathways, making vocational education more responsive to industry and learner needs.

Why micro-credentials and workplace learning are a key building block module

Micro-credentials provide flexible, skills focused learning that complements traditional qualifications. They allow rapid development of high demand skills and create stackable pathways for learners, making education more responsive to industry and individual's needs.

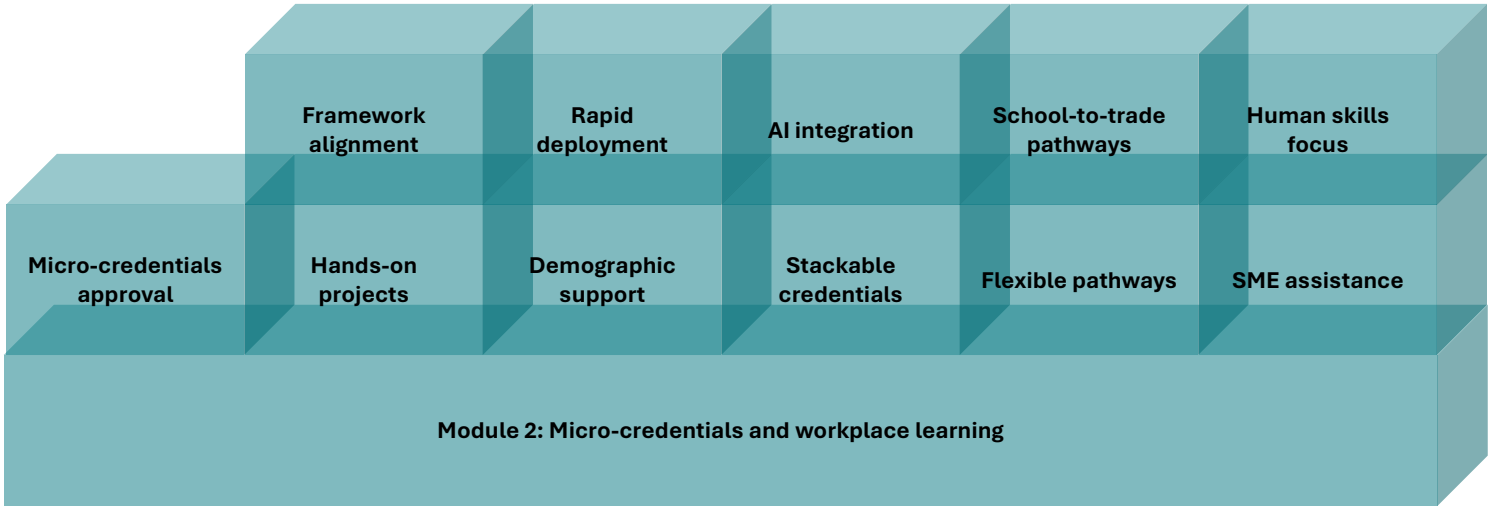
The concept of micro-credentials is already understood by industry and is seen as critical for future skill training. To maintain a relevant and fit-for-purpose system that supports workforce development, further evolution of micro-credentials will be needed. This includes designing them to meet industry needs for flexible, adaptable ways to build skills quickly and address gaps where full qualifications are not practical, and integrating work-based training as a core delivery approach to ensure applied learning in real world contexts.

Key enabling functions include (related to the previously mentioned gap themes):

- **Curriculum and qualifications –** Traditional systems cannot keep pace with emerging technologies such as AI and automation. Micro-credentials can enable faster integration of these skills. deliver targeted, practical solutions, especially when combined with work-based training to reinforce practical experience alongside theoretical learning.
- **Modes of teaching and education –** Many learners need part-time, distance, or blended options to balance work and family commitments. Micro-credentials offer this flexibility.
- **Educator and trainer capability –** They provide opportunities to embed resilience, adaptability, and other human-centric skills alongside technical training.
- **Policy and system barriers –** They support smoother transitions from school to trades and enable reskilling for mid career workers in evolving industries.

Micro-credentials can help address skill shortages in fast growing areas such as AI, big data, and human-centric skills like resilience and adaptability. They offer targeted, stackable learning that responds quickly to industry needs but complement rather than replace full qualifications for regulated professions. Designed for rapid skill uplift, they lack the depth of comprehensive programmes and must be carefully mapped into existing pathways to avoid complexity.

The following diagram sets out illustrative examples of potential building block ideas.



Educator capability development to embed human-centric skills

Without strong educator capability, efforts to integrate human-centric skills, leadership, and advanced technological literacy into training pathways will fall short.

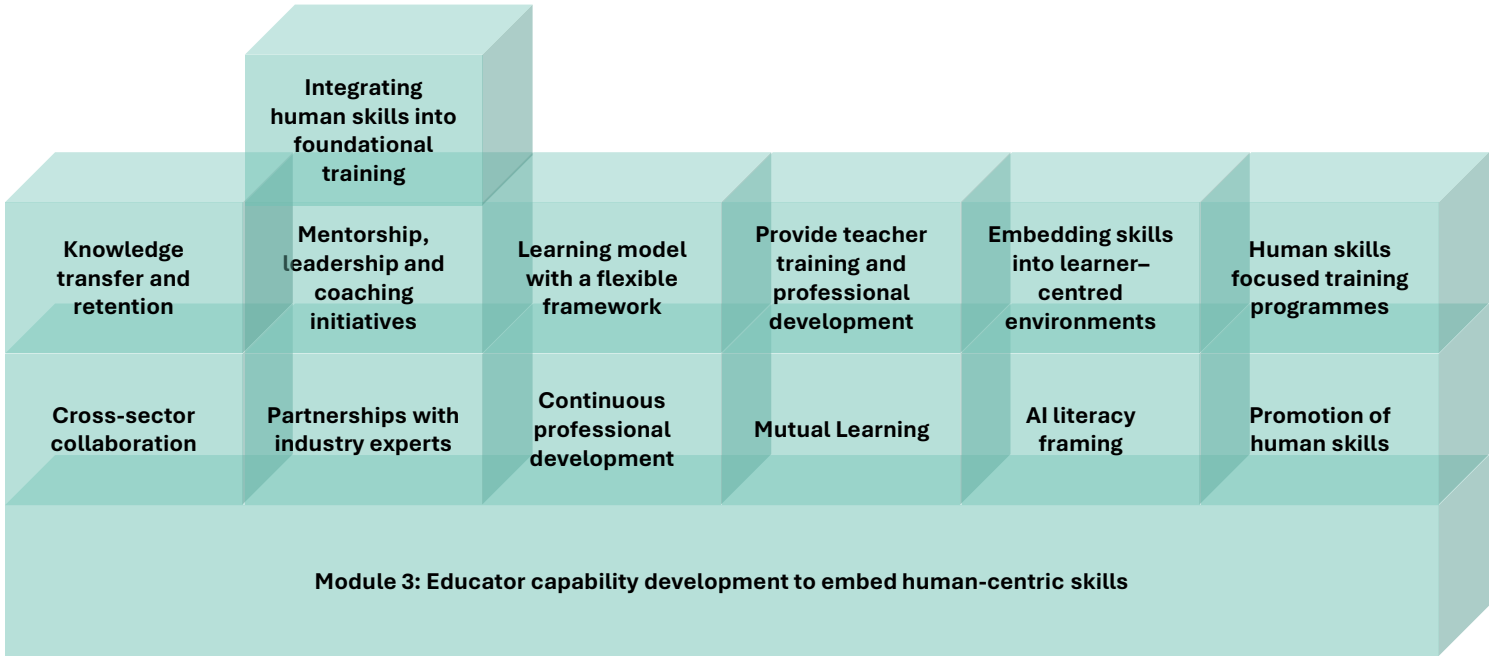
Why educator capabilities are a key building block module

Teachers and trainers are critical to embedding future focused skills in vocational education. Without strong educator capability, efforts to integrate human-centric skills, leadership, and advanced technological literacy into training pathways will fall short. This building block module ensures educators can deliver practical, industry aligned learning that prepares workers for rapid technological and economic change.

Key enabling functions include (related to the previously mentioned gap themes):

- **Educator and trainer capability –** Many educators lack training and resources to teach complex, evolving skills including AI and data literacy. Building educator capability ensures learners gain practical, future ready skills and prevents gaps in workforce readiness.
- **Access to relevant educators –** A persistent challenge is ensuring learners are taught by trainers who has industry experience. Work-based learning models and industry secondments for educators could help bridge this gap and balance human-centric skills with practical application.
- **Modes of teaching and education –** Skills such as AI and digital collaboration are often taught as academic concepts rather than practical, trade relevant capabilities. Educator capability ensures training reflects real world applications, making learning directly relevant to industry needs.
- Limited opportunities for continuous upskilling and mentorship pipelines for educators and trainers hinder their ability to keep pace with technological change. Ongoing professional development is critical to maintain teaching quality and adaptability.
- **Modes of teaching and education –** Current curricula struggle to embed resilience, adaptability, and collaboration in measurable ways. Educators need tools and frameworks to integrate these skills effectively, ensuring learners develop the human-centric skills employers increasingly demand.

The following diagram sets out illustrative examples of potential building block ideas.



How building blocks align with entry points

While each entry cohort faces unique challenges and skills gaps, some building blocks are common enablers across multiple entry points.

How building blocks connect to entry cohorts

Each building block is designed to meet the unique needs of learners entering vocational and trade sectors through different pathways. Whether starting straight from school, progressing through tertiary education, shifting careers, or reskilling for new roles, these building blocks are aim to provide targeted solutions. They offer future focused skill standards underpin all qualifications, micro-credentials offer rapid and flexible upskilling options, and educator capability development supports consistent delivery of both technical and human-centric skills across every stage.

Each entry cohort faces unique challenges and skill gaps, and the three sets of building blocks address these in different ways. The table below maps which building blocks are most relevant to each entry point and how they help close those gaps.

Key	Building block / capability enabler	Module	Secondary school leavers	Tertiary and vocation	Career change or upskilling	Reskilling
1	**Integrate human-centric skills into skills standards criteria –** Making the practical application of human-centric skills explicit in the performance criteria for each standard to ensure these skills are taught, assessed, and recognised as integral to achieving competency.	1	●	●	●	●
2	**Embed human-centric skills into DASS –** Change the DASS acceptance criteria to include human-centric skills as standalone skills standard.	1	●	●	●	●
3	**Micro-credentials approval –** Develop NZQA recognised micro-credentials for high demand skills, and streamline and speed up the approval process for new qualifications.	2	●	●	●	●
4	**Framework alignment –** Align AI initiatives for micro-credentials with national frameworks, including ethics, data sovereignty, and vocational assessment.	2	●	●	●	●
5	**Stackable credentials –** Develop micro-credentials to address "just-in-time, skills-focused education". These smaller, stackable credentials can be developed quickly to uplift growing skills.	2	●	●	●	●
6	**Learning model with a flexible framework –** A framework that ISBs can adapt to enhance vocational education in New Zealand e.g. adopting the 70-20-10 rule through the Development Pathways Tool (DPT).	2		●	●	●
7	**Human-centric training programmes –** Develop a strategy to implement comprehensive training programmes and development opportunities that focus on the promotion of human-centric skills e.g. Educate 360.	2		●	●	●
8	**Demographic support –** Encourage workers from specific demographics that face unique challenges getting into vocational education trainings and. E.g. “Mana in Mahi” Programme and flexible and tailored learning pathways by age.	2		●	●	●
9	**Rapid deployment –** Implement skills focused micro-credentials and streamlined administrative processes to allow rapid deployment of skills training.	2		●	●	●
10	**AI integration –** Introduce AI 101 and embed AI-related courses in secondary curricula and tertiary as part of Science, Technology, Engineering, and Mathematics (STEM) subject areas.	2	●	●		

Key	Building block / capability enabler	Module	Secondary school leavers	Tertiary and vocation	Career change or upskilling	Reskilling
11	**Hands-on projects –** Update curricula with hands-on projects: robots, CAD/CAM, data analysis.	2	●	●		
12	**School-to-trade pathways –** Emphasise pathways from school to trade, highlighting tech as central to modern manufacturing and engineering.	2	●	●		
13	**Provide teacher training and professional development –** to deliver advanced technological literacy and AI. Place the training knowledge in the hands of the educator.	3	●	●		
14	**Embedding skills into learner centred environments –** e.g. using The Wintec framework.	3	●	●		
15	**Cross-sector collaboration –** Facilitating knowledge sharing and best practice regarding digital upskilling strategies and curriculum development.	3	●	●		
16	**Mutual Learning –** Encouraging mutual learning between teachers and students, collaboratively peer learning to leverage human skills e.g. Ako Aotearoa model.	3	●	●		
17	**AI literacy framing –** Position AI and data literacy as practical trade relevant skills rather than purely academic.	3	●	●		
18	**Integrating human skills into foundational training –** To strengthen pre-apprenticeship education for school leavers. This is a critical entry point to embed human skills.	3	●			
19	**Flexible pathways –** Flexible learning and tailored learning pathways, including part-time, distance, and blended learning options, cater to those balancing education with work or family commitments.	2			●	●
20	**SME assistance –** Provide support to SMEs to overcome funding and resource constraints for tech based training.	2			●	●
21	**Human skills focus –** Emphasise the importance of non-technical (human-centric) skills relevance for pathways to reskill or upskill, specifically, resilience being a highly transferrable skill.	2			●	●
22	**Mentorship, leadership and coaching initiatives –** Such as pairing less experienced employees with seasoned mentors, e.g. New Zealand's "Mentor Me" programme and New Zealand Institute of Management and Leadership (NZIM).	3			●	●
23	**Continuous professional development –** This is prioritised for existing workers, with initiatives supporting industry-led training, digital literacy, and sustainability skills to help workers adapt to industry changes.	3			●	●
24	**Knowledge transfer and retention –** The "tuakana-teina" (Elder-younger) approach, leveraging the knowledge of older generations to upskill younger workers, offers a practical framework for mentorship in these skills.	3			●	●
25	**Partnerships with industry experts –** to enable upskilling pathways.	3			●	
26	**Promotion of human skills –** Promoting practical human-centric skills development and on the job collaborative training e.g. Icehouse Leadership Development Program.	3			●	

Unlocking workforce potential

Māori, Pacific, and disabled talent as drivers of growth

Why cultural competency matters in the workforce of Aotearoa

Unlocking the Māori, Pacific and disabled workforces are important to building a sustainable workforce.

Building sustainable workforce

As a small economy, New Zealand must maximise workforce participation and skills development to maintain productivity. Inclusive strategies and cultural competency are essential to address sector shortages and build a resilient workforce.

Youth engagement – Māori and Pacific peoples are disproportionately young, with 54% and 72% under 30 respectively, yet Not in Education, Employment, or Training (NEET) rates are high at 21% for Māori and Pacific youth and 46% for disabled youth. In a small economy, losing this talent pipeline would deepen skill shortages. Education and employment systems are required to be culturally competent to keep these young people engaged.

Qualification gaps – 34% of Māori and 27% of Pacific peoples hold a tertiary qualification, and 32% of disabled people have no qualification at all. This could limit access to high demand roles in the industry sectors. Expanding modular, flexible learning and embedding cultural relevance in programme design could improve uptake and completion.

Underutilised groups – Workforce participation among disabled people is just 44%, with underutilisation at 24%. Māori and Pacific participation is lower than the national average, and underutilisation is around 21%. Removing barriers to entry and tailored training could help fill shortages.

Income and sector concentration – Māori and Pacific workers earn significantly less (median $36,600 and $35,200 compared to $41,500 nationally) and are concentrated in lower growth sectors such as manufacturing and logistics. Strategic investment in pathways to higher value sectors, with culturally competent career guidance and employer engagement, could improve equity and resilience.

Category	Māori	Pacific	New Zealand	Disabled
Population and demographics	978k people (2023) 19.6% of NZ Median age: 27.2 yrs Youthful: 54.2% under 30 Since 2018: +12.5%	443k people (2023) 8.9% of NZ Median age: 24.9 yrs Youthful: 72.7% under 30 Since 2018: +16%	5.0m people (2023) Median age: 38.1 years Youthful: 37.6% under 30 Since 2018: +6.3%	851k people across NZ* Male disability rate: 15% Female disability rate: 18%
Workforce participation	Unemployment: 6% Labour force participation rate: 66% Underutilisation rate: 21%	Unemployment: 10% Labour force participation rate: 68.5% Underutilisation rate: 20.3%	Unemployment rate: 5% Labour force participation rate: 70% Underutilisation rate: 13%	Unemployment: 14% Labour force participation rate: 44% Underutilisation: 24%
Youth engagement	NEET (15–24 yrs): 21%	NEET (15–24 yrs): 21%	NEET (15-24 yrs): 14%	NEET (15–24 yrs): 46%
Education	34% have a tertiary qualification	27% have a tertiary qualification	Adults with a post-school qualification: 54%	Bachelor's or higher: 16% No qualifications: 32%
Income	Median: $36,600	Median: $35,200	Median: $41,500	Median weekly income was $625 lower than a non-disabled person.
Cultural Context	1 in 3 New Zealanders under 25 identify as Māori	73.4% of Pacific peoples under 30 born in New Zealand	European: 67.8%, Māori: 17.8% Asian: 17.3% Pacific: 8.9% MELAA: 1.9%.	The main reason for 55.5% of disabled people leaving work is due to sickness, illness, or injury.
Sector Representation: (HAR definition)	Manufacturing: 9.5% Engineering: 3.2% Mining and quarrying and oil and gas extraction: 0.5% Automotive: 1.6% Logistics: 4.9%	Manufacturing: 10% Engineering: 3% Automotive: 1% Logistics: 7%	Manufacturing: 9% Engineering: 3% Automotive: 2%: Logistics (Supply Chain and Distribution): 4%	Manufacturing: 9% Engineering: 2% Automotive: 2% Logistics (Supply Chain and Distribution): 4%

Source: Stats NZ; The estimates of the disabled population are self reported from the 2023 census.

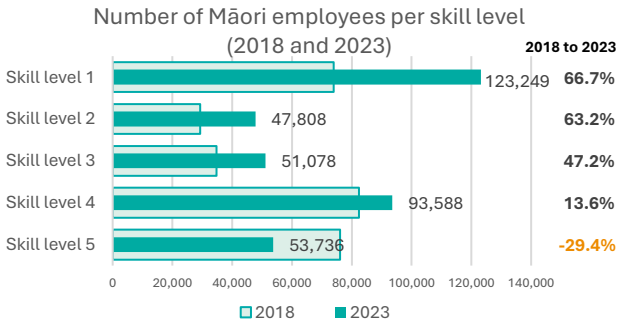
Māori employees are becoming more skilled and better positioned for future opportunities. For the first time since 2006, Māori employees hold more high skilled jobs than low skilled jobs.

Growth of the Māori Economy

The Māori economy has experienced substantial growth over the past five years. The total value add to New Zealand's GDP from the Māori economy was $32 billion in 2023, an increase from $17 billion in 2018. The total asset base of the Māori economy grew 83% from $69 billion in 2018 to $126 billion in 2023. This expansion reflects the growing influence of Māori enterprises and assets within Aotearoa New Zealand's economic landscape. Of the asset base, $66 billion are in businesses of Māori employers, and $19 billion are in businesses of Māori self employed. Notably the nearly doubling of assets managed by Māori collectives over this 5-year period from $21 billion to $41 billion helped collectives distribute $96 million in scholarships and grants to whānau (kinship).

Skill levels in the Māori workforce is growing

Māori employees are becoming more skilled and better positioned for future opportunities. For the first time since 2006, Māori employees hold more high skilled jobs than low skilled jobs as illustrated in the chart below:



Source: Ministry of Business, Innovation & Employment

This shift suggests improved access to education and training, as well as greater participation in industries requiring advanced skills. It also signals a growing capacity for innovation and productivity within Māori communities, which is essential for meeting the demands of the future economy.

Impact on the Māori economy

The VET reforms present a significant opportunity to strengthen the Māori economy by improving access to culturally responsive training, increasing Māori representation in decision making, and aligning qualifications with the aspirations of Māori communities and businesses.

Unlocking Māori potential through workforce development

The redesigned system aims to better support Māori learners (ākonga Māori) and Māori-led enterprises by embedding kaupapa Māori values into vocational education. This includes recognising the importance of whānau centric approaches, te reo Māori, and tikanga Māori in both programme design and delivery. ISBs will play a key role in ensuring that training standards reflect the needs of Māori businesses, particularly in sectors such as logistics and supply chain, wood manufacturing, and services where Māori participation is high.

Māori representation and partnership

The reforms support the development of Māori workforce development plans, such as those led by Hanga-Aro-Rau and Waihanga Ara Rau, which outline strategies for improving Māori participation, progression, and productivity in key industries.

Building culturally responsive pathways

The new VET system is designed to create clearer and more culturally affirming pathways from school to employment. This includes better integration of vocational pathways in secondary education, more visible role models in trades and technical careers, and qualifications that reflect Māori ways of working. The reforms also aim to address qualification gaps and improve the "fit" of training for Māori and non-Māori learners, recognising that "**you can't be what you can't see**".

Historically, there has been entrenched stereotypes and deficit thinking that may have shaped perceptions of Māori learners, and how these perceptions can limit aspirations and outcomes. Dismantling these myths and increasing visibility of Māori success in education is important to transforming the system and enabling equitable participation.

Talent development and economic resilience for Māori

By aligning vocational education with the needs of the Māori economy, the reforms support more strategic talent development. This includes preparing rangatahi Māori for future focused roles in sectors undergoing transformation, such as digital technology, sustainable infrastructure, and advanced manufacturing. The reforms also strengthen the building blocks for economic resilience by supporting Māori businesses to recruit, train and retain skilled workers in culturally safe environments.

Barriers to workforce participation

Despite ongoing efforts to improve equity in employment, significant barriers continue to prevent Māori, Pacific peoples, and disabled individuals from fully participating in Aotearoa New Zealand's workforce.

Employment access challenges

Despite ongoing efforts to improve equity in employment, significant barriers continue to prevent Māori, Pacific peoples, and disabled individuals from fully participating in Aotearoa New Zealand's workforce. These challenges are documented across government reports, Hanga-Aro-Rau workforce development strategies, and national statistics.

For Māori

Māori experience systemic inequities that begin in education and extend into employment. MBIE's Māori Employment Action Plan (2022) states the education, employment, and training system "not providing adequate support for ākonga Māori, kaimahi (workers) Māori and Māori businesses", leading to poor labour market outcomes. Hanga-Aro-Rau Māori Workforce Development Plan highlights persistent gaps in awareness, workplace diversity, and skills development, which impede Māori accessing higher skilled and better paid roles.

Workplace environments also pose cultural barriers. MBIE's report on *Inclusive workplaces for kaimahi Māori: e Mahere Whai Mahi Māori (Māori Employment Action Plan) (2023)* describes many workplaces as culturally unsafe, often lacking tikanga Māori, cultural competence, and anti-bias measures.

For Pacific peoples

Pacific peoples face structural challenges in employment. According to the Ministry for Pacific Peoples and MBIE's Employment Strategy, Pacific peoples earn noticeably less than Pākehā (people of European descent) and experience higher unemployment rates. The Pacific Employment Action Plan emphasises barriers for Pacific youth in accessing vocational training and career pathways.

For disabled people (tāngata whaikaha)

Disabled individuals face some of the most significant barriers to entering and remaining in the workforce. According to Stats NZ labour force participation rates, disabled people are 1.9 times less likely to be employed than non-disabled people, demonstrating a stark participation gap. Employment service support is often inadequate. Treasury's 2013 report noted that nearly one-third of disabled respondents could not access the support needed to find or retain work, citing lack of services for training, accommodation, and individualised support. Disabled individuals often face extra costs for assistive technology, transport, and workplace accommodations, which are not always funded. The Ministry of Social Development noted the disability support services cost pressures and the need to forecast funding to support demand and inflationary pressures.

Photo: Juken New Zealand

Growing a diverse workforce is not just a matter of fairness.
It is essential for building a resilient, future ready workforce.

Current systems are reactive, not proactive, leaving learners without foundational support early enough. Pathways to high skilled, high demand roles need to start in high school or earlier.

Additional barriers and opportunities for workforce development

While financial and systemic challenges are significant, insights from Hanga-Aro-Rau engagement with industry sectors reveal deeper structural and cultural issues that influence workforce participation. These include misaligned education pathways, regional disparities, cultural factors, and emerging skill gaps. At the same time, there are opportunities to leverage community networks, lifelong learning, and sector specific innovation to create inclusive, future ready employment strategies. Below are some of the key observations.

Education and skills alignment

- **Disconnect between education and employment pathways –** Current systems are reactive, not proactive, leaving learners without foundational support early enough. Pathways to high skilled, high income roles need to start in high school or earlier.
- **Barriers to emerging skills and digital literacy –** Unequal access to critical future skills (AI, CAD/CAM, digital systems) due to language barriers, limited foundational education and basic skills, and low digital literacy. micro-credentials help but require layered support.

Cultural and behavioural factors

- **Behavioural and cultural influences on participation –** Recognising that some communities may not respond to mainstream approaches. Aspirations shaped by values including collective wellbeing and contentment, plus lack of visible role models. Strategies should expect to be culturally grounded and community led.
- **Intergenerational and cultural models of support –** Workplace structures rarely reflect norms of intergenerational support. Opportunities exist to design mentorship and pastoral care roles that embrace cultural strengths.

Regional and contextual challenges

- **Regional disparities and access to training –** Distance and lack of local training force rangatahi (young people) to leave regions despite economic opportunities. Place-based education and employment pathways are important.
- **Regional definitions of success –** Income and success are perceived differently across regions. National one-size-fits-all approaches risk disengagement.

Workforce engagement and support systems

- **Role of workforce intermediaries and community networks –** Organisations such as Tupu Toa and Social Labour Supply are important connectors as they understand cultural contexts and can help design recruitment and retention strategies that work.
- **Cultural networks could improve recruitment and retention –** For Māori and Pacific peoples, leveraging collective structures such as iwi, churches and community groups is essential. Public services are currently underutilising these networks, missing opportunities to engage effectively.

Timing and lifelong learning

- **Timing matters –** Early intervention in high school builds aspiration and readiness. Adults need flexible, supportive retraining options to overcome negative past experiences.

Economic and sector opportunities

- **Māori as global citizens and economic contributor –** Māori are not confined to local labour markets, they are global participants. Many seek higher incomes and opportunities overseas, particularly in sectors such as mining and quarrying where training is more accessible abroad. This raises questions about how New Zealand can remain competitive and attractive to Māori talent.
- **Untapped workforce potential and economic risk –** Failure to upskill Māori, Pacific, and disabled communities could hinder economic growth, especially with an ageing population and a younger, diverse demographic.
- **Sector specific opportunities and innovation –** Emerging sectors such as renewable energy, food sovereignty (kai - food and wai - water), and infrastructure offer promise, but strategies would require alignment with personal aspirations and economic potential through co-design.

Cultural competency in workforce development

Beyond structural and skill-based barriers, cultural competence and social integration play a critical role in workforce success. Insights from Hanga-Aro-Rau and related research show that effective strategies must go beyond technical training to include human-centric skills, cultural orientation, mentorship, and community engagement. Models such as Canadian Immigrant Integration Programme (CIIP) framework and Aotearoa's Te Ako Tiketike approach demonstrate how holistic, culturally grounded practices can improve outcomes for migrant workers and Māori learners. These approaches emphasise cross-cultural understanding, psychosocial support, and mentoring relationships that foster belonging and confidence in workplace settings.

Te Ako Tiketike model

This is a Māori focused workplace training model developed through qualitative research (focus groups and interviews). It identifies enablers and barriers for Māori learners in industry training and recommends strengthening cross-cultural awareness and using tuakana-teina (mentoring relationships based on whānau practices) to foster belonging and support.

Core principles include:

- **Connectedness and whānau support** to create a sense of belonging
- **Tuakana-teina mentoring relationships** to provide guidance and cultural affirmation
- **Strong foundations** for workplace learning combined with **personal commitment and motivation**

Workforce success starts with connection. Cultural competence and mentorship turn training into belonging.

This approach shows that culturally grounded strategies such as mentorship and community based support are essential for improving outcomes for Māori learners.

CIIP-inspired approach for migrant workers

The CIIP offers a framework that could be adapted for New Zealand. It focuses on preparing skilled migrants before arrival and supporting integration post-arrival. Key elements include:

- **Pre-arrival cultural orientation** to set expectations
- **Workplace mentorship programs** to ease transition
- **Cultural training** embedded in accredited employer programs
- Strong **community connections** for social integration
- **Psychosocial support** to address challenges and promote wellbeing

This approach recognises that successful workforce participation depends on both technical readiness and cultural adaptation.

Positive outcomes

Both the CIIP inspired approach and Te Ako Tiketike model address critical gaps identified in earlier sections including cultural competence and holistic support for workforce integration. They go beyond technical training by embedding cultural orientation, mentorship, and community engagement, which are essential for diverse learners and workers.

Positive outcomes from these models include improved employment readiness and faster integration for migrants through the CIIP approach, along with stronger cultural adaptation and reduced settlement stress. Mentorship and psychosocial support have also led to higher retention and productivity. Similarly, Te Ako Tiketike has enhanced Māori learners' sense of belonging in workplace training, increased completion rates for industry qualifications, and strengthened engagement through whānau support and tuakana-teina mentoring. Both models align training with cultural values and learner aspirations, demonstrating the importance of culturally grounded strategies for workforce success.

For New Zealand, considering similar models to these could help build culturally grounded training and career pathways, and improve retention and progression.

Growing our people

Talent management and strategic levers

Retaining talent through strategic workforce management

Retaining, retraining and upskilling existing talent is critical to building a sustainable workforce.

Workforce planning and development

Retaining, retraining and upskilling existing talent is critical to building a sustainable workforce. This involves ensuring individuals remain engaged, productive, and committed to the workforce over time.

Talent management is a strategic and integrated process that supports the attraction, development, retention and deployment of individuals with the skills required to meet current and future organisational needs.

Culturally responsive approaches in Aotearoa

In Aotearoa New Zealand, talent management practices are increasingly diverse and shaped by people centred, culturally responsive approaches. Organisations such as Te Pou, Le Va, Whāraurau and Blueprint for Learning illustrate how workforce planning frameworks can prioritise equity and use data to guide strategic decisions, particularly in support of Māori and Pacific peoples. Embedding cultural values and community aspirations into workforce development helps create inclusive environments that strengthen long term engagement.

Retention strategies may include clear career progression pathways, targeted professional development, wellbeing initiatives and inclusive leadership practices. These approaches support alignment between organisational goals and individual aspirations across the entire workforce pipeline.

Employer-led retention strategies

Retention strategies, such as those outlined by recruitment and career services providers, are critical to maintaining engagement across the employment pipeline. Their emphasis on onboarding, career development and wellbeing initiatives highlights the importance of the employee experience. When individuals feel valued and supported, they are more likely to stay engaged in their roles and pursue further development, contributing to workforce stability across sectors and helping to reduce “workforce leakage”.

Practical tools for workforce planning

Workforce planning tools, such as those offered by organisations that develops workforce skills, provide practical and accessible solutions for identifying workforce capability, forecasting future needs and developing targeted strategies. These types of tools are particularly valuable for SMEs and community providers, as they offer structured templates and frameworks that simplify the planning process. Designed to be adaptable, they support vocational education providers and employers in maintaining continuity across training and employment pathways. Examples include Skills Leadership Plans developed by Workforce Development Councils, workforce pipeline planning frameworks from Hanga-Aro-Rau, and TEC guidance tools for aligning training with industry needs. Similar tools are also available from other organisations, helping to build workforce resilience and support strategic development across sectors.

Strategic alignment and scalability

Effective workforce planning requires strategic alignment, data informed decision making and responsiveness to changing conditions. These principles support scalable approaches across industries and help ensure that talent strategies remain relevant and future focused.

Taken together, current methodologies point to a unified approach:

- Align talent strategies with long term organisational goals.
- Focus on developing and strengthening key capabilities.
- Embed cultural responsiveness throughout all practices.
- Prioritise retention to keep people engaged in education and employment.
- Use data driven insights to guide decision making and build a resilient, future ready workforce in Aotearoa.

Workforce leakage causes and strategies for retention

Preventing workforce leakage by addressing early attrition, succession gaps and regional inequities to strengthen talent pipeline.

Workforce leakage causes and impacts

A key challenge in talent management is understanding where and why individuals leave the workforce pipeline, particularly during the critical transition from training to employment and in the early years of their careers. Workforce leakage refers to the preventable loss of talent, which is different from natural turnover. By identifying what is preventable, organisations can design targeted strategies to retain talent and strengthen the pipeline. Addressing leakage is essential for smarter, more responsive talent management, ensuring organisations not only attract talent but also retain it.

Across six sectors in New Zealand, i.e. manufacturing, engineering, automotive, logistics, mining and quarrying, and oil and gas extraction, several common issues contribute to workforce leakage. Two major themes stand out: high attrition rates and limited progression planning.

High dropout and attrition rates

The transition from training to employment is the most critical leakage point.

- **Engineering –** faces significant leakage, with many graduates leaving the profession within two years due to mismatched expectations and limited early career support, according to Engineering New Zealand.
- **Manufacturing –** International evidence, highlights high turnover in early career stages, often linked to poor onboarding, actively involving employees and lack of structured mentoring.
- **Automotive –** only 44% of 2018 entrants remained in the industry after five years, with poor workplace culture and limited advancement opportunities cited as key reasons.
- **Logistics –** The logistics workforce gap is widening at a faster pace than in the manufacturing and engineering sectors. More than 4,600 workers have exited the industry, with 50% moving into entirely different sectors and 23% pursuing higher paying opportunities overseas.
- **Oil and gas extraction –** of the estimated 1268 job openings between 2024 and 2029 in mining, over 1000 are expected to be from replacing workers, while the remaining being the new creation of jobs.

Limited progression and succession planning

Career progression is limited in many roles, and succession planning is often neglected, particularly in sectors with ageing workforces.

- **Engineering –** Engineering degree and diploma students can face challenges in securing work placements, limiting practical experience and workforce readiness upon graduation. The problem solving capabilities of engineers are readily applicable to other sectors. As a result New Zealand relies heavily on overseas trained engineers to fill shortages.
- **Manufacturing –** Technological tools are enhancing efficiency through automation. This shift is reshaping skill requirements, meaning some roles are becoming redundant, while others demand increasingly advanced technical expertise.
- **Logistics –** the average age of truck drivers is 46.5, and health related attrition is rising. The number of young drivers has been impacted heavily by better opportunities in Australia.
- **Mining and quarrying –** the current workforce ageing with fewer young people being attracted to the sector. Only 15% of the workforce is under 30.

Hanga-Aro-Rau (2023) recommends developing internal talent pipelines and leadership programmes, and an example from Business Canterbury (2025) shows that 65% of employers improved retention when offering structured upskilling and internal mobility pathways.

Regional disparities in trainings and support

Geographic inequities exacerbate workforce leakage, particularly in rural and resource rich regions. Areas such as Waikato, West Coast, Otago and Northland have high Māori populations and significant infrastructure needs but limited access to training and support services. Reports from Hanga-Aro-Rau (2023) and MBIE (2024) highlight these gaps, which create barriers to skill development and retention. An example from Ako Aotearoa (2022) stresses the importance of iwi-led and community-based training, mobile delivery models and wraparound support. Both local initiatives, such as Waikato Regional Skills Leadership Group (2023) show that regional training hubs and localised delivery can reduce leakage and improve retention.

Driving systemic change for sustainable talent pipelines

Reducing workforce leakage and improving retention requires more than isolated interventions, it calls for a strategic approach that addresses structural barriers and future workforce needs.

Photo: Koru Freight and Logistics, New Zealand

Driving systemic change to strengthen talent pipelines

Reducing workforce leakage and improving retention requires more than isolated interventions, it calls for a strategic approach that addresses structural barriers and future workforce needs. The following strategic levers represent high impact actions for talent management:

- **Modernising vocational qualifications** ensures that training remains relevant in a rapidly evolving labour market, improving job readiness and reducing early career attrition.
- **Responding to an ageing workforce** through succession planning and intergenerational knowledge transfer mitigates the risk of losing critical skills and institutional knowledge.
- **Tackling regional disparities** in access and participation helps close gaps for underserved communities, particularly in rural and resource-rich areas, where limited training infrastructure contributes to leakage.
- **Leveraging AI and predictive analytics** enables data driven talent strategies, improving transitions from education to employment and supporting proactive retention planning.

These priorities combine strategic policy direction with practical implementation pathways, such as flexible delivery models, mobile training hubs, and targeted upskilling, creating a cohesive framework for sustainable workforce development.

Exploring logic models to address workforce leakage

For this research, the **modernisation of vocational qualifications**, strategies for an **ageing workforce** and approaches to address **regional disparities** are examined through a series of logic models. These models provide a structured way to connect situations, inputs and activities to outputs and outcomes, leading to long term impacts. They help us understand talent management and retention by:

- **Clarifying root causes of leakage** such as outdated qualifications, poor portability, and lack of succession planning.
- **Mapping practical interventions** including qualification reform, flexible delivery, mentoring, and targeted recruitment to measurable outcomes.
- Adding value by **connecting policy to practice**, ensuring that strategic reforms such as updating standards and introducing funding incentives lead to real improvements in job readiness, retention and equity.
- **Providing a starting point for reducing leakage** by aligning education and workforce systems, supporting underrepresented groups, and preparing for technological change.

Strategic lever 1: Modernisation of vocational qualifications

Long term impact

- A cohesive, learner-centred vocational system with seamless education-to-employment pathways
- Sustainable workforce pipelines in priority sectors
- Greater equity and inclusion in vocational careers
- Stronger regional economies supported by responsive skills ecosystems
- A culturally grounded and adaptive system that evolves with learner aspirations and labour market shifts

Situation

- Fragmented qualifications introduce inconsistent skills, poor portability and misalignment with industry needs, leading to trade shortages.
- Complex unit standards and provider specific programmes create barriers to transitions and increase compliance burdens.
- Underrepresented groups such as Māori, Pacific peoples, disabled or rural learners and women face reduced access and completion rates.
- Modernisation of qualifications is essential to support economic growth, equity and keep pace with technological advances in industry.

Inputs and activities

Qualification and skills standards reform (already underway)
Replace outdated unit standards with skill-based standards, national programmes, micro-credentials and work-based learning options

Standards and assurance
ISBs lead qualification design while NZQA streamlines processes to reduce fragmentation, simplify standards and improve portability and equity

Funding and incentives
Provide mode-based funding and targeted financial support to improve access and equity for underrepresented groups

Industry collaboration
Strengthen co-design between industry, NZQA, ISBs and Māori, Pacific or disabled people stakeholders to align qualifications with workforce needs and improve equity

Qualification identification
Identify gaps and develop new qualifications for emerging technical and human-centric skills.

Outputs and short term outcomes

Modernised skill standards published
Increase the number of national skill standards replacing legacy unit standards, ensuring inclusion of emerging technical and human-centric skills, quality assured by NZQA

Simplified qualifications
Increase the number of streamlined qualifications to reduce complexity and improve consistency and portability across sectors

Flexible delivery modes expanded
Increase the number of programmes delivered through work integrated learning and micro-credentials supported by clear rules and funding

Human-centric skills embedded
Increase the number of qualifications and training programmes that integrate resilience, problem solving, leadership and other human-centric skills alongside technical competencies

Performance framework implemented
Develop and publish sector specific performance indicators (e.g. completion rates, skill acquisition, labour shortages) and monitoring systems to track progress and inform continuous improvement

Medium term outcomes

Higher rates of successful transitions from VET to employment, measured by learner placement within six months

Improved job readiness and employment outcomes for graduates, reflected in employer satisfaction and reduced onboarding time

Stronger regional economies demonstrated by growth in local employment and reduced reliance on migrant labour

Improved proportion of Māori, Pacific peoples, and disabled stakeholders actively engaged in qualification development

Strategic lever 2: Addressing the ageing workforce

Long term impact

- A cohesive, learner-centred vocational system with seamless education-to-employment pathways
- Sustainable workforce pipelines in priority sectors
- Greater equity and inclusion in vocational careers
- Stronger regional economies supported by responsive skills ecosystems
- A culturally grounded and adaptive system that evolves with learner aspirations and labour market shifts

Situation

- Skills gap for older workers in a rapidly evolving technological environment.
- Lack of transition support for retraining the older workforce in Hanga Aro Rau Industries
- Lack of proven tailored planning to manage ageing workforce and realise benefits.
- Māori and Pacific and underserved ageing workforce impacted significantly by health issues disproportionately to others.

Inputs and activities

Knowledge transfer
Establish mentoring, career pathways and succession planning to transfer critical skills and enable movement into less physically demanding, leadership and training roles

Targeted recruitment campaigns
Enhance recruitment and talent management campaigns to attract youth, Māori, Pacific or disabled people into vocational pathways

Data and research
Provide industries with up-to-date, quantifiable data and research on the ageing workforce to enable informed responses and planning

Training and upskilling
Develop training programmes, apprenticeships, e-learning and micro-credentials in emerging technical skills, human-centric capabilities and sector specific competencies

Retention and flexibility
Implement job crafting, flexible hours, transition to retirement options and health support initiatives to retain older workers

Outputs and short term outcomes

New training and improved qualifications
Increase the number of new training options introduced, including micro-credentials and e-learning modules targeting emerging skills

Higher participation of youth, Māori and Pacific
Achieve a measurable uplift in the number of youth, Māori and Pacific learners enrolling in training and engaging in targeted pathways

Mentoring and succession planning
Increase the number of mentorship frameworks implemented and digital knowledge repositories created to preserve tacit knowledge and build leadership

Retention and flexibility initiatives implemented
Increase the number of workplaces adopting flexible hours, transition to retirement options and health support programmes for older workers

Research and development
Increase the number of sector specific ageing workforce reports and research insights published annually

Medium term outcomes

- **Older workers complete targeted training and upskilling to adapt to new technologies and evolving processes**
- **Adoption of flexible work arrangements such as advisory, mentoring and educational roles leads to higher retention of experienced staff**
- **Structured knowledge transfer programmes are in place to preserve institutional expertise and enable succession planning**
- **Participation and retention of older workers increase through culturally appropriate pathways and support systems**

Strategic lever 3: Approaches to address regional disparities

Long term impact

- A cohesive, learner-centred vocational system with seamless education-to-employment pathways
- Sustainable workforce pipelines in priority sectors
- Greater equity and inclusion in vocational careers
- Stronger regional economies supported by responsive skills ecosystems
- A culturally grounded and adaptive system that evolves with learner aspirations and labour market shifts

Situation

- Learners in rural and remote regions have limited access to courses, support services and work-based learning opportunities
- Regional industries face persistent skill shortages driven by limited course availability, low training uptake and poor retention
- Gaps in infrastructure, digital connectivity and provider capability undermine learner success
- Māori, Pacific and other underrepresented people in regions facing disproportionate impacts

Inputs and activities

Regional workforce planning
Develop regional workforce plans that align training provision with local employer needs and labour market demand

Targeted support services
Expand mentoring, pastoral care and financial assistance to improve learner success in regional areas

Work-based learning access
Partner with employers, iwi and hapū, local government agencies such as Te Puni Kōkiri to increase cadetships, internships, apprenticeships and training placements in local communities

Industry collaboration
Strengthen programme co-design with industry and ensure Māori, Pacific or disabled people engagement for workforce alignment

Digital inclusion and micro-credentials
Use mobile training units and digital platforms to reach rural learners, supported by stackable micro-credentials

Outputs and short term outcomes

Programme expansion
Increase the number of vocational programmes introduced in regional areas and achieve a measurable percentage increase in regional enrolments

Local work-based learning
Increase the number of internships and apprenticeships created and the percentage of learners engaged in work-integrated learning

Digital access
Increase the number of rural learners participating in online courses and deploy additional mobile training units

Community partnerships
Increase the number of formal partnerships with regional employers, iwi and hapū and the frequency of co-designed programmes

Regional data insights
Increase the number of regional dashboards developed and reports generated to track enrolment, completion and employment outcomes

Medium term outcomes

Increased enrolment and completion in regional vocational programmes to reduce skill gaps

Increased learner retention through internships and apprenticeships for smooth education-to-employment transitions

Greater uptake of online and mobile learning options, improved access for rural learners

Co-designed programmes and collaborative initiatives result in more regionally aligned job opportunities

05

Ō Tātou Pōari Pūkenga
Our Skills Boards

Manufacturing and Engineering ISB

A closer look at manufacturing and engineering

Manufacturing contribution to GDP and employment has been flat to declining. The Engineering sector has shown strong and consistent growth. Regulatory and training changes are reshaping compliance and operational standards while redefining the skills mix, qualifications, and career pathways in manufacturing and engineering.

Economic outlook

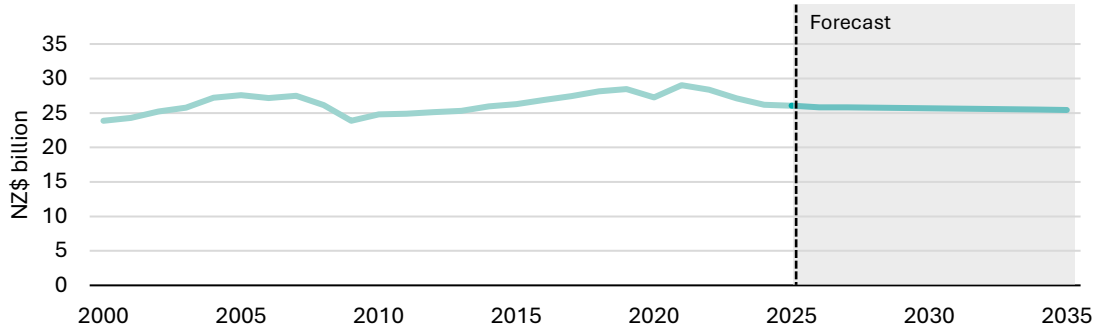
New Zealand's manufacturing sector has shown little growth over the past 25 years, staying largely between NZ$25 and NZ$30 billion. While there were small fluctuations, such as a dip around 2009 and a peak near 2019, the overall trend has been flat.

In contrast, the engineering sector has shown strong and consistent growth in New Zealand over the past 25 years, rising from around NZ$3 billion in 2000 to nearly NZ$9 billion in 2025. This sector is forecast to keep expanding, reaching about NZ$12 billion by 2035. This steady upward trend highlights engineering as a key growth area for the economy, driven by ongoing infrastructure development, technology adoption, and demand for specialised skills.

Workforce system changes shaping workforce outlook

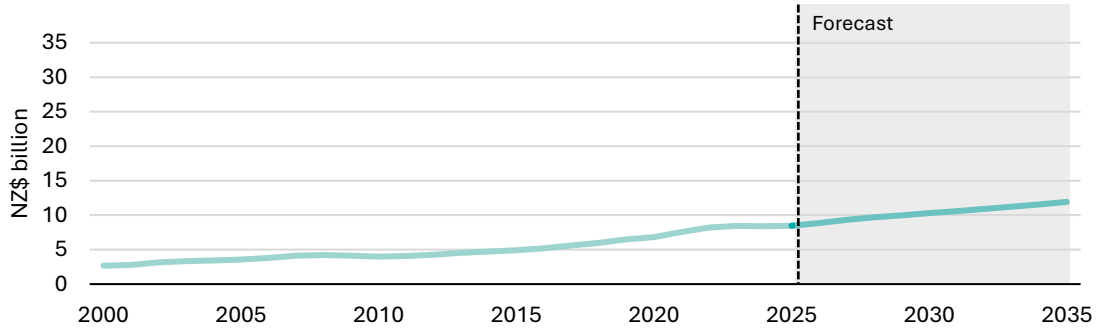
While GDP trends show where growth or decline is expected, system level changes in legislation, training, and regulation are reshaping the workforce to match these economic realities.

Manufacturing GDP



Source: Stats NZ, Deloitte Access Economics

Engineering GDP



Source: Stats NZ, Deloitte Access Economics

Note: Each forecast has been formed using a sector-derived regression equation, and has been projected using Deloitte's in-house Macroeconomic forecasting model DAE-MACRO. The GDP figures presented are in real terms and are in 2009/10 prices.

The sectoral definitions are aligned with those outlined within the Hanga-Aro-Rau legislation, so the GDP figures presented may not align with publicly available GDP figures for sectors under the ANZSIC06 sectoral definition. The Engineering sector GDP has been estimated using only engineering related ANZSIC codes, though the Hanga-Aro-Rau legislation defines it using both Australian and New Zealand Standard Industrial Classification (ANZSIC) and Australian and New Zealand Standard Classification of Occupations (ANZSCO) codes, meaning some occupations may be not be included in our estimation.

Common factors to both manufacturing and engineering

- **Manufacturing and engineering ISB (2026) –** Industry-led boards to set qualifications and ensure training relevance for advanced technologies.
- **Immigration system updates (2024 – 2025) –** From October 2024, the Accredited Employer Work Visa (AEWV) reforms include open work rights for partners of migrant workers, and taking effect 2025, easier visa processes support engineering firms in talent retention. tighten employer obligations, streamline processes, and enhance protections for migrant workers.
- **Vocational Education & Training Amendment Bill (effective 2026) –** Creates industry-specific Skills Boards to align training with sector needs.

Manufacturing specific

- **Hanga-Aro-Rau Manufacturing Workforce Development Plan (2025) –** Focus on attracting younger and diverse talent, improving career pathways, and promoting sector image.
- **WorkSafe cultural safety strategy (2024 – 2026) –** Emphasises culturally responsive training and supervision for Māori, Pacific, and migrant workers.

Engineering specific

- **Mandatory registration and licensing reform (2024 –2026) –** CPEng Amendment Rules (from 1 January 2025) and enhanced regulatory frameworks mandate registration, Continuing Professional Development (CPD), and licensing for high risk engineering roles.
- **Infrastructure asset management standards (2025) –** A May 2025 Cabinet paper initiated an all-of-government programme to improve planning and asset management practices across public infrastructure, increasing demand for skilled professionals.

These regulatory and training changes are reshaping compliance and operational standards while redefining the skills mix, qualifications, and career pathways in manufacturing and engineering.

This shift is influencing the current workforce profile, with manufacturing focusing on diversity, cultural safety, and technical upskilling to sustain capability in a mature sector, while engineering is moving toward higher professional standards through mandatory registrations, licensing, and continuous learning.

Together, these changes are driving demand for certified professionals, advanced technical expertise, and structured career pathways across both sectors.

The following analysis examines the current workforce profile in detail.

Photo: Precision Autowerk, New Zealand

Manufacturing and Engineering ISB

Manufacturing and engineering workforce profiles

The manufacturing workforce is ageing with declining participation from young workers. The engineering workforce demonstrates even more pronounced trends of both an ageing workforce and declining participation from young workers

Career stages of the workforce

Employment trends in manufacturing and engineering show an ageing workforce, reliance on mid career professionals, and declining participation among younger workers. These have implications for future skills and succession planning and workforce sustainability.

Young adults (15–24) – This group remains the smallest and most volatile cohort in both sectors. Manufacturing saw a step decline since 2020, falling 9.6% from 31,200 in March 2020 to 28,200 in June 2025. Engineering has consistently had low participation averaging 9.5% to 12.1%, with 12,300 employed in June 2025. The sustained low participation in this cohort suggests systemic challenges in attracting younger workers, This is likely due to competition from other industries, shifting career preferences, or limited entry level opportunities. Without targeted pathways and training, both sectors risk long term capability gaps.

Early to mid career (25–44) – This group forms the backbone of both workforces, accounting for over 40% of the workforce since 2020. Manufacturing saw a slight decline in number employed since 2020, falling 0.7% from 112,800 in June 2020 to 112,000 in June 2025, while engineering grew steadily from 54,100 in June 2020 to 64,700 in June 2025. Their stability underpins technical expertise and leadership, but heavy reliance on this cohort creates vulnerability as any decline would have an outsized impact on productivity and succession planning.

Experienced workforce (45–64) – This experienced group remain critical but are starting to contract. Manufacturing fell 7.8% from 113,100 in June 2020 to 104,300 in June 2025. Engineering was at 42,300 in June 2020, rising 3.5% to 43,800 in June 2025. These shifts signal looming retirements and potential skills shortages. Retention and knowledge transfer strategies will be essential to maintain continuity.

Retirement age (65 and over) – This older working group are staying longer in both manufacturing and engineering sectors, offsetting immediate shortages but highlighting succession risks. Manufacturing cohort grew 2% from 15,100 in June 2020 to 15,400 in June 2025, while engineering nearly doubled from 4,800 to 8,900 over the same period. This trend reflects delayed retirement and extended participation, underscoring the need for flexible work options, and succession planning.

Implications for the workforce

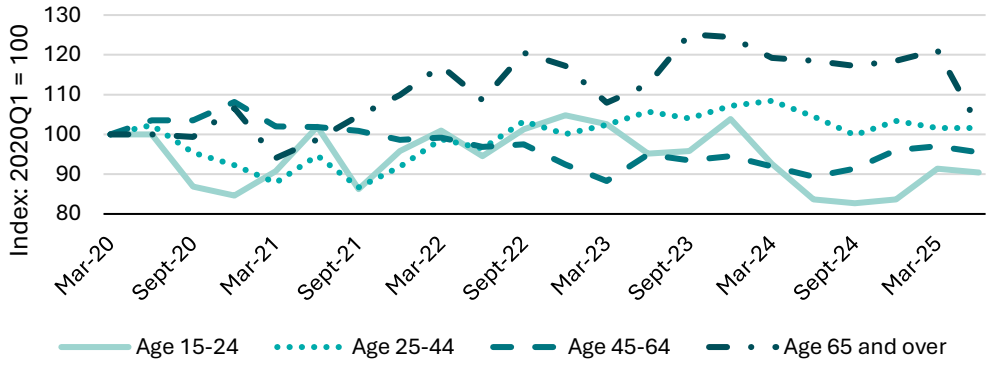
- Both sectors are ageing, with fewer young entrants and more older workers staying longer.
- Risk of skill gaps as experienced workers retire.
- Need to attract younger talent and invest in training and mentoring.
- Retention strategies for older workers will help maintain capacity in the short term, but succession planning is equally important.

Photo: Precision Autowerk, New Zealand

Manufacturing workforce age profile, annual average June 2020 to June 2025							
# employed	2020	% of total	2023	% of total	2025	% of total	% change 2020 to 2025
Age 15-24	31,200	11.5%	29,700	11.1%	28,200	10.9%	-9.6%
Age 25-44	112,800	41.4%	116,500	43.6%	112,000	43.1%	-0.7%
Age 45-64	113,100	41.6%	103,700	38.9%	104,300	40.1%	-7.8%
Age 65+	15,100	5.5%	17,000	6.4%	15,400	5.9%	2.0%
Total	272,200		266,900		259,900		-4.5%

Source: Stats NZ HLFS estimates, Suppressed data is not displayed ; Figures are rounded to the nearest 100

Relative change in age cohort size within Manufacturing

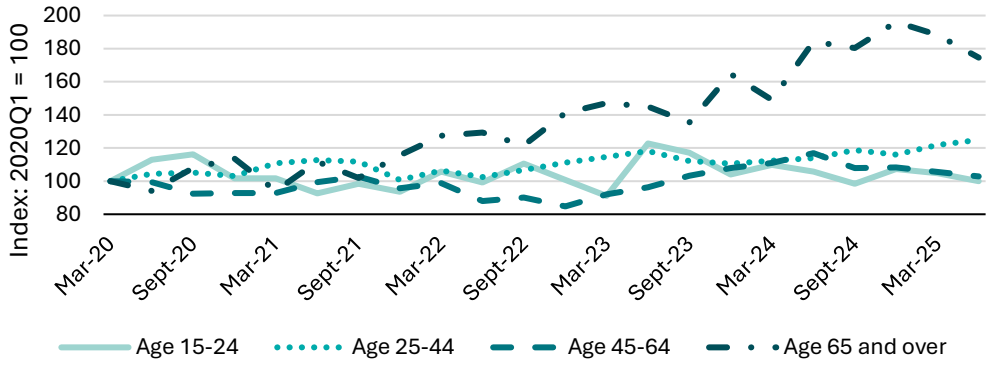


Source: Stats NZ HLFS estimates, Deloitte Access Economics, Suppressed data is not displayed

Engineering workforce age profile, annual average June 2023 to June 2025							
# employed	2020	% of total	2023	% of total	2025	% of total	% change 2020 to 2025
Age 15-24	13,900	12.1%	15,100	12.1%	12,300	9.5%	-11.5%
Age 25-44	54,100	47.0%	61,200	49.1%	64,700	49.9%	19.6%
Age 45-64	42,300	36.8%	41,000	32.9%	43,800	33.8%	3.5%
Age 65+	4,800	4.2%	7,400	5.9%	8,900	6.9%	85.4%
Total	115,100		124,700		129,700		12.7%

Source: Stats NZ HLFS estimates, Suppressed data is not displayed ; Figures are rounded to the nearest 100

Relative change in age cohort size within Engineering



Source: Stats NZ HLFS estimates, Deloitte Access Economics, Suppressed data is not displayed

Manufacturing and engineering workforce diversity

Targeted strategies to attract and retain Māori and Pacific workers, through training, career pathways, and inclusive practices, will help maintain capability and capacity, especially given the favourable demographics of the Māori and Pacific peoples.

Diversity in workforce

Employment trends in manufacturing and engineering show uneven progress toward cultural diversity. Māori and Pacific peoples represent a critical talent pool that could help address ageing demographics and skill shortages, yet participation patterns reveal contrasting trajectories between the two sectors.

Māori participation

Māori representation in manufacturing remains significant but is trending downward, averaging 15.4% to 16.7% since 2020. Employment fell 11.7% from 45,400 in June 2020 to 40,100 in June 2025.

In engineering, Māori participation is smaller but improving, averaging 9.9% to 11.5%. Employment grew 5.7% from 11,400 in June 2020 to 14,900 in June 2025, showing positive progress but still well below the overall population share

Pacific peoples participation

Pacific workers face persistent challenges in both sectors, with sharper declines in engineering. Manufacturing participation averages 6.8% to 7.1%, with numbers dropping 1.1% from 18,600 in June 2020 to 18,400 in June 2025. Engineering saw a 4.1% fall from 4,900 in June 2020 to 4,700 in June 2025, highlighting retention issues and the need for targeted support.

Other ethnic groups

European, Asian, and other non-Māori, non-Pacific employees dominate both sectors. In manufacturing, this group accounts for 76.5% to 77.5% of the workforce, with employment falling 3.3% from 208,300 in June 2020 to 201,400 in June 2025, showing relative stability. In engineering, representation is even higher at 85.8% to 84.9%, with employment rising 4.3% from 98,700 to 110,200 over the same period.

Implications for the workforce

Engaging with the Māori and Pacific peoples are critical to building a sustainable pipeline of workers, especially as the sector faces ageing demographics and skill shortages.

Targeted strategies to attract and retain Māori and Pacific workers, through training, career pathways, and inclusive practices, will help maintain capability and capacity, especially given the favourable demographics of the Māori and Pacific peoples.

Manufacturing workforce ethnicity profile, annual average June 2020 to June 2025

# employed	2020	% of total	2023	% of total	2025	% of total	% change 2020 to 2025
Māori	45,400	16.7%	41,400	15.5%	40,100	15.4%	-11.7%
Pacific	18,600	6.8%	18,900	7.1%	18,400	7.1%	-1.1%
Other	208,300	76.5%	206,600	77.4%	201,400	77.5%	-3.3%
Total	272,300		266,900		259,900		-4.6%

Source: Stats NZ HLFS estimates, Suppressed data is not displayed ; Figures are rounded to the nearest 100

Engineering workforce ethnicity profile, annual average June 2023 to June 2025

# employed	2020	% of total	2023	% of total	2025	% of total	% change 2020 to 2025
Māori	11,400	9.9%	14,100	11.3%	14,900	11.5%	5.7%
Pacific	4,900	4.3%	4,900	3.9%	4,700	3.6%	-4.1%
Other	98,700	85.8%	105,700	84.8%	110,200	84.9%	4.3%
Total	115,000		124,700		129,800		4.1%

Source: Stats NZ HLFS estimates, Suppressed data is not displayed ; Figures are rounded to the nearest 100

Gender and disability representation

Women make up about 51% of New Zealand's adult population (15+) in 2025, yet remain underrepresented in both sectors.

In manufacturing, male employment declined from 187,633 in 2016 to 174,850 in 2025, while female employment rose from 79,400 to 87,500. Despite this progress, men still account for nearly two-thirds of the workforce.

In engineering, male employment grew from 73,700 to 99,200, while female employment increased from 18,667 to 31,000, leaving men at over three-quarters of the workforce.

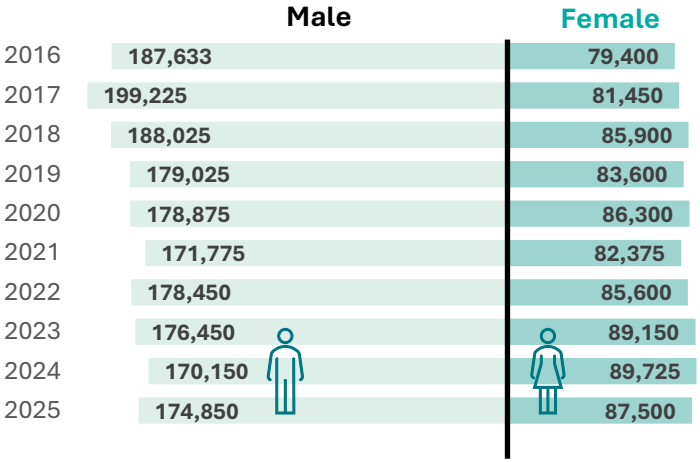
Around 18% of adults identify as disabled, yet representation is very low. In manufacturing, disabled workers made up 3.3% of the workforce (8,331 employees) in 2018, rising to 4.0% (7,137 employees) in 2023 despite overall contraction. In engineering, representation increased from 2.2% (1,800 employees) to 3.0% (1,140 employees) over the same period. These figures highlight persistent barriers to inclusion in sectors where accessibility and adaptive technologies are critical.

Implications for the workforce

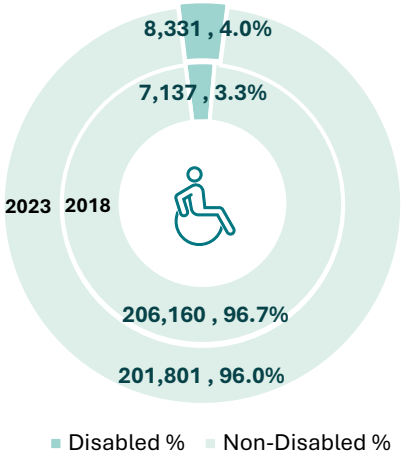
These patterns highlighted an opportunity for inclusive strategies. For gender equity, initiatives should focus on attracting women into technical and leadership roles through flexible work arrangements, mentorship, and career pathways.

For disabled workers, investment in accessible technologies, adaptive equipment, and inclusive recruitment practices could be required. Collaboration between industry and vocational education providers can be beneficial to ensure training systems support participation and progression for underrepresented groups.

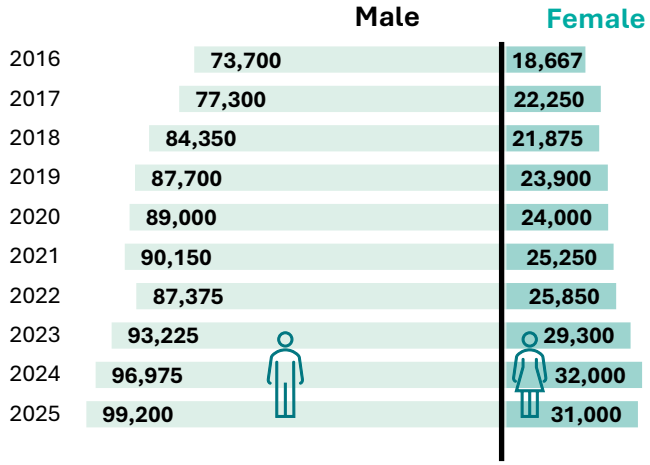
Manufacturing gender composition



Disabled people in Manufacturing - employee counts, % share

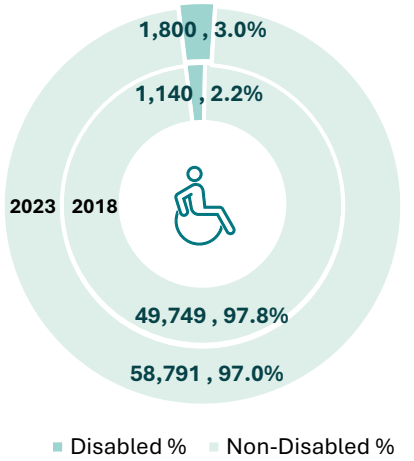


Engineering gender composition



Source: Stats NZ HLFS estimates, Deloitte Access Economics, Suppressed data is not displayed

Disabled people in Engineering - employee counts, % share



Source: Stats NZ, Deloitte Access Economics

Manufacturing and Engineering ISB

Manufacturing workforce gap

The manufacturing workforce gap is forecast to grow to nearly 30,000 by 2030.

Workforce gap in manufacturing

The manufacturing sector faces a widening workforce gap when measured against demand. Supply is projected to decline from 253,090 in 2026 to 240,401 in 2030, while demand remains constant at 272,150 in 2026 and 269,440 in 2030. This creates a gap that grows from 19,061 in 2026 to 29,039 in 2030, an increase of 52% over five years.

The widening gap in manufacturing is likely driven by an ageing workforce with many nearing retirement, fewer young entrants, shifting career preferences toward technology and service sectors, skill mismatches due to automation and advanced technologies, and slower population growth combined with reduced migration inflows would likely be influencing the labour pool.

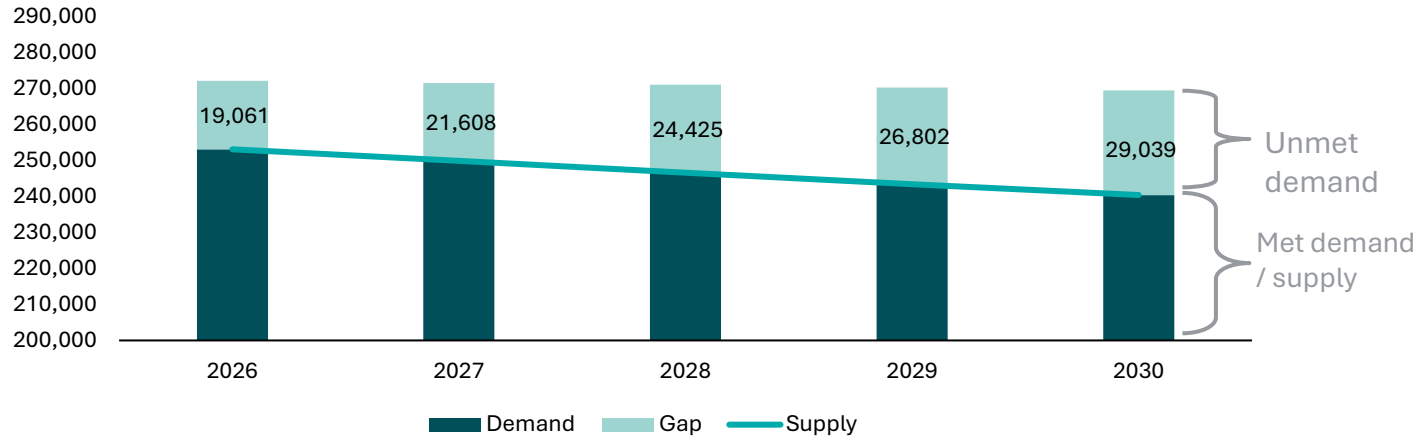
Implications for the manufacturing sector

- Persistent shortages could potentially constrain production capacity and innovation if investment in new technology and workforce development are not balanced well.
- Competition for skilled workers will intensify, which could potentially drive wage pressures and retention challenges.

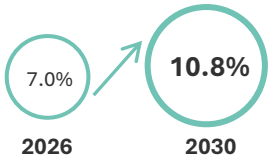
Implications for VET

- Training capacity should expand to meet demand for technical and advanced manufacturing skills.
- Stronger alignment between education providers and industry is needed to ensure graduates are job ready.
- Targeted programmes for underrepresented groups (Māori, Pacific, women) can help build a sustainable talent pipeline.
- Upskilling and reskilling initiatives for existing workers will be necessary to adapt to technology driven roles.

Workforce Gap (Number of employees)



Gap (% of demand)



Source: Stats NZ, Deloitte Access Economics
** The forecasted workforce gap is presented such that it displays both the met and unmet demand if there is a positive workforce gap, and met and unmet supply otherwise.*
***While the trend in and magnitude of the gap size is largely aligned with our previous analysis, the overall direction of the manufacturing sector has changed. This is namely due to revised manufacturing GDP and employment to population ratio forecasts, which now suggests both shrinking labour demand and supply.*

Engineering workforce gap

The engineering workforce gap is forecast to be greater than 10,000 by 2028.

Workforce gap in engineering

The engineering sector faces a widening workforce gap when measured against demand. Supply is projected to increase slightly from 132,794 in 2026 to 147,617 in 2030, while demand rises from 139,425 in 2026 to 157,901 in 2030. This creates a gap that grows from 6,631 in 2026 to 10,284 in 2030, an increase of 55% over five years.

Due to its link to manufacturing, It shares drivers of fewer young entrants, an ageing workforce with many nearing retirement, shifting career preferences toward technology and service sectors, skill mismatches due to rapid adoption of automation and advanced technologies, and slower population growth combined with reduced migration inflows influencing the labour pool.

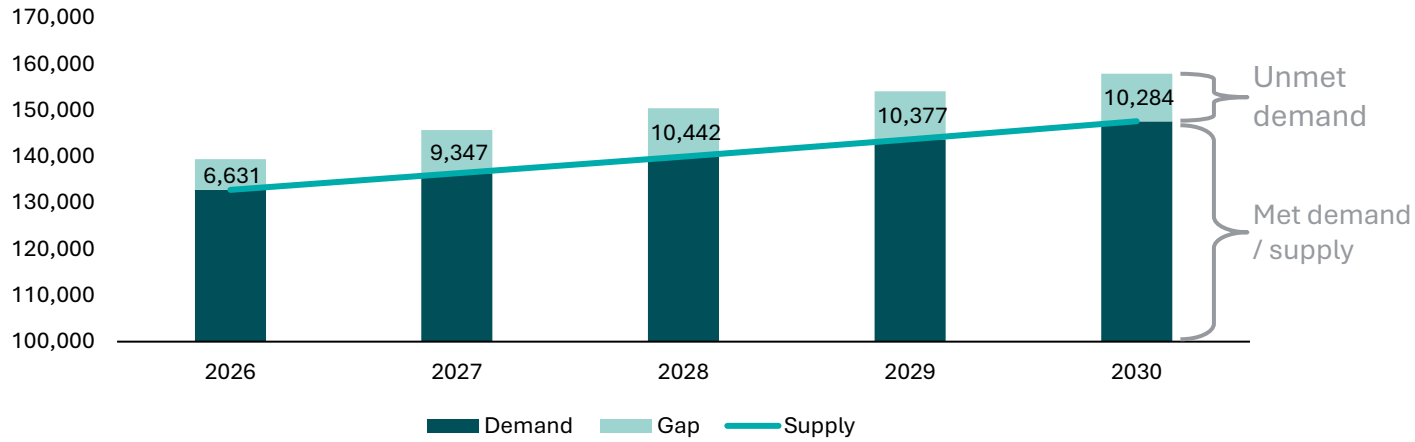
Implications for the engineering sector

- Persistent shortages could constrain project delivery and innovation if investment in technology and workforce development are not balanced well.
- Competition for skilled engineers will intensify, potentially driving wage pressures and retention challenges.

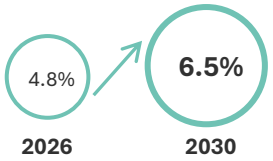
Implications for VET

- Training capacity should expand to meet demand for advanced engineering and technology skills.
- Stronger alignment between education providers and industry is needed to ensure graduates are job ready.
- Targeted programmes for underrepresented groups (Māori, Pacific, women) can help build a sustainable talent pipeline.
- Upskilling and reskilling initiatives for existing workers will be necessary to adapt to technology driven roles.

Workforce Gap (Number of employees)



Gap (% of demand)



Source: Stats NZ, Deloitte Access Economics
** The forecasted workforce gap is presented such that it displays both the met and unmet demand if there is a positive workforce gap, and met and unmet supply otherwise.*

Manufacturing and engineering skill levels

The Manufacturing and Engineering workforces show a shift towards higher skill levels

Skill composition of the manufacturing workforce

Between 2013 and 2023, the manufacturing sector shows a gradual shift toward higher skill levels.

- Level 1 roles (most skilled) increased from 28% in 2013 to 33% in 2023, reflecting growing demand for advanced technical and managerial expertise.
- Levels 2 and 3 declined slightly, suggesting a move away from mid skilled roles toward more specialised positions.
- Level 4 roles remained stable at 25%.
- Level 5 roles (least skilled) declined from 18% to 16%, indicating fewer low skilled positions.

This trend aligns with the sector's adoption of advanced manufacturing technologies and sustainability practices, which require deeper technical knowledge and problem solving skills.

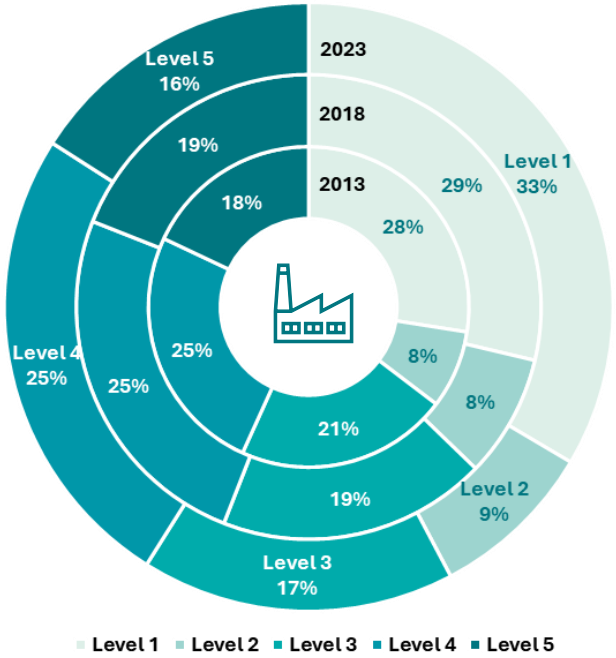
Skill composition of the engineering workforce

Engineering is even more concentrated at the top skill level.

- Level 1 roles dominate, rising from 54% in 2013 to 60% in 2023, underscoring the sector's reliance on highly qualified professionals.
- Levels 2 and 3 have declined modestly.
- Level 4 and Level 5 roles remain minimal at 8% and 4%.

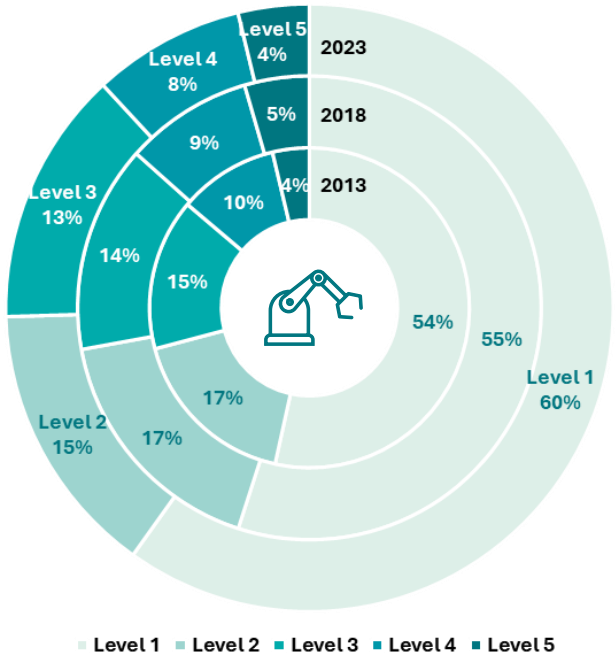
This pattern reflects the complexity of engineering tasks and the growing need for expertise in areas such as infrastructure development, energy transition and advanced systems design. The shift reinforces the importance of vocational education pathways that lead to higher level qualifications and work-based learning for technical specialisations.

Manufacturing
% share of employees by skill level (2013 to 2023)



Source: Stats NZ, Deloitte Access Economics

Engineering
% share of employees by skill level (2013 to 2023)



Source: Stats NZ, Deloitte Access Economics

In Manufacturing, Māori representation in Skill Level 1 doubled from 12% to 24% between 2020 and 2025. In Engineering, Pacific representation of skill levels 1-3 has grown from 67% to 74% over the same period.

Skill levels by ethnicity in manufacturing and engineering

Both sectors show progress toward higher skill levels, but persistent equity gaps remain across ethnic groups.

In **manufacturing**, Māori representation in Skill Level 1 doubles from 12% to 24%, indicating strong upward mobility, though Skill Level 5 remains high at 34%. Pacific workers remain concentrated in lower skill roles, with Skill Level 4 at 40% and Skill Level 5 at 37%, and minimal progress into top roles (9% to 10%).

In **engineering**, Skill Levels 1–3 account for 87% to 88% for Māori and other ethnicities. Māori maintain strong representation in top roles, while Pacific workers improve from 67% to 74% in Skill Levels 1–3 but remain overrepresented in lower skill roles (Skill Level 4 at 18%, Skill Level 5 at 7%).

Overall, Māori show significant progress in manufacturing and maintain strong representation in engineering's higher skill roles, but lower skill roles persist. Pacific workers remain disproportionately concentrated in lower skill roles, particularly in manufacturing, despite some improvement in engineering. Other ethnicities continue to dominate higher skill positions in both sectors.

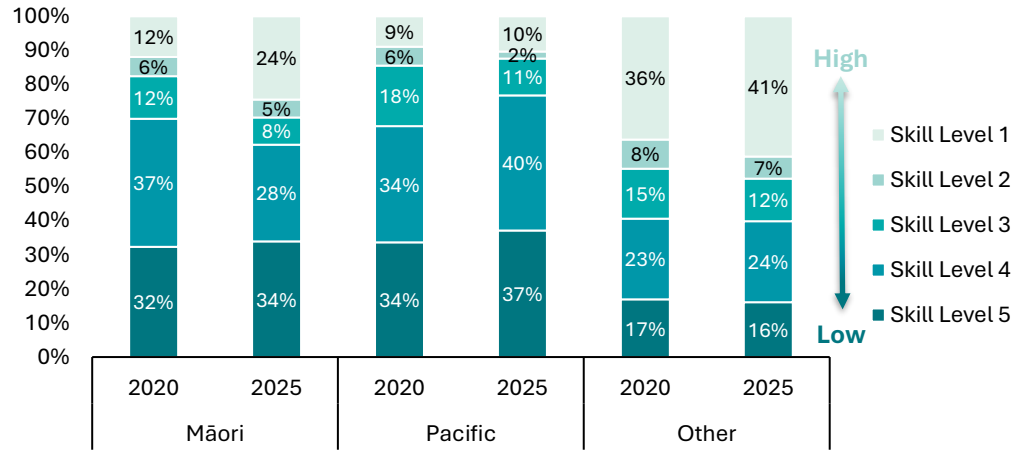
Implications for VET

These patterns underscore the need for targeted vocational education pathways that enable Māori and Pacific learners to access higher level qualifications and technical specialisations.

Work-based learning, micro-credentials, and modular training could be possible options for supporting career progression and addressing equity gaps.

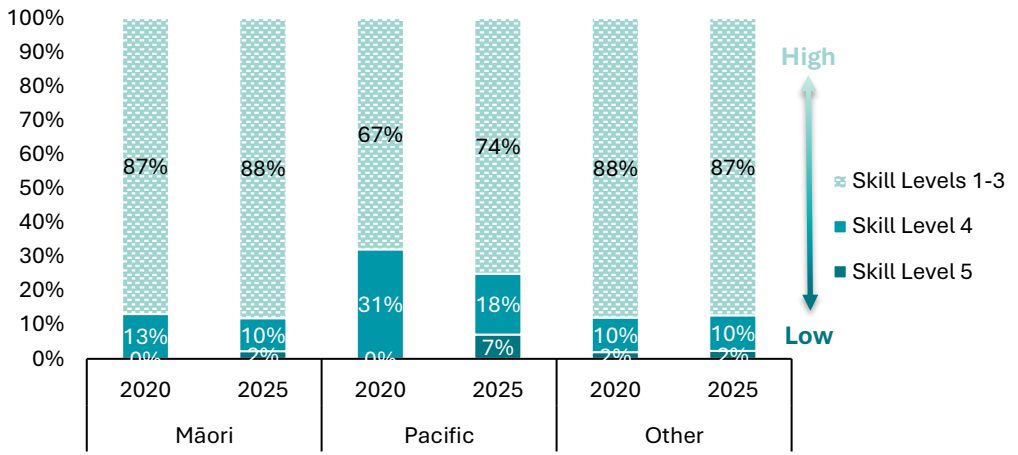
Industry and education providers should collaborate to ensure inclusive strategies, focusing on digital and sustainability skills while strengthening foundational literacy and numeracy to support advancement.

Manufacturing skills level by ethnicity



Source: Stats NZ HLFS estimates, Suppressed data is not displayed

Engineering skills level by ethnicity



Source: Stats NZ HLFS estimates, Suppressed data is not displayed

Bridging workforce gaps and future skills needs

To prepare for the future, it is essential to identify the skills that matter today, those that are emerging, and those that will be critical by 2030.

Photo: Air New Zealand, Wellington Airport, New Zealand

Preparing our people for the roles of tomorrow. Not just the jobs of today.

Understanding current and emerging skills for 2030

Understanding the current workforce profile and its gaps is only the starting point. To prepare for the future, it is essential to identify the skills that matter today, those that are emerging, and those that will be critical by 2030. Global experience offers valuable lessons, particularly through the World Economic Forum's Future of Jobs Report 2025 and other international studies. These insights highlight how technological disruption, automation, and sustainability imperatives are reshaping skill requirements across industries worldwide.

Applying these findings to the New Zealand context is vital. By mapping Hanga-Aro-Rau sectors to WEF's studied industries, we can leverage global foresight to inform local strategies. This alignment enables us to anticipate future skill demands, design responsive vocational pathways, and ensure our workforce remains competitive and inclusive.

Indicative alignment of Hanga-Aro-Rau sectors with WEF Industries

Hanga-Aro-Rau sector	WEF industry
Manufacturing	Advanced Manufacturing; Production of Consumer Goods
Engineering	Advanced Manufacturing;

Understanding these skills is not just important, it is strategic. It underpins workforce resilience, supports innovation, and ensures that learners and employers are equipped for a rapidly changing operating environment.

The next section explores current critical skills, emerging capabilities, and those projected to be most important by 2030, providing a starting point for action.

Shifting skill priorities for advanced manufacturing

The core enduring skills that are important now and expected to remain highly important in the future for Manufacturing include resilience, flexibility and agility; analytical thinking, creative thinking, technological literacy, AI and big data.

Skills outlook for advanced manufacturing by 2030

Advanced manufacturing is shifting toward digital integration and adaptive capabilities, requiring both enduring and emerging skills.

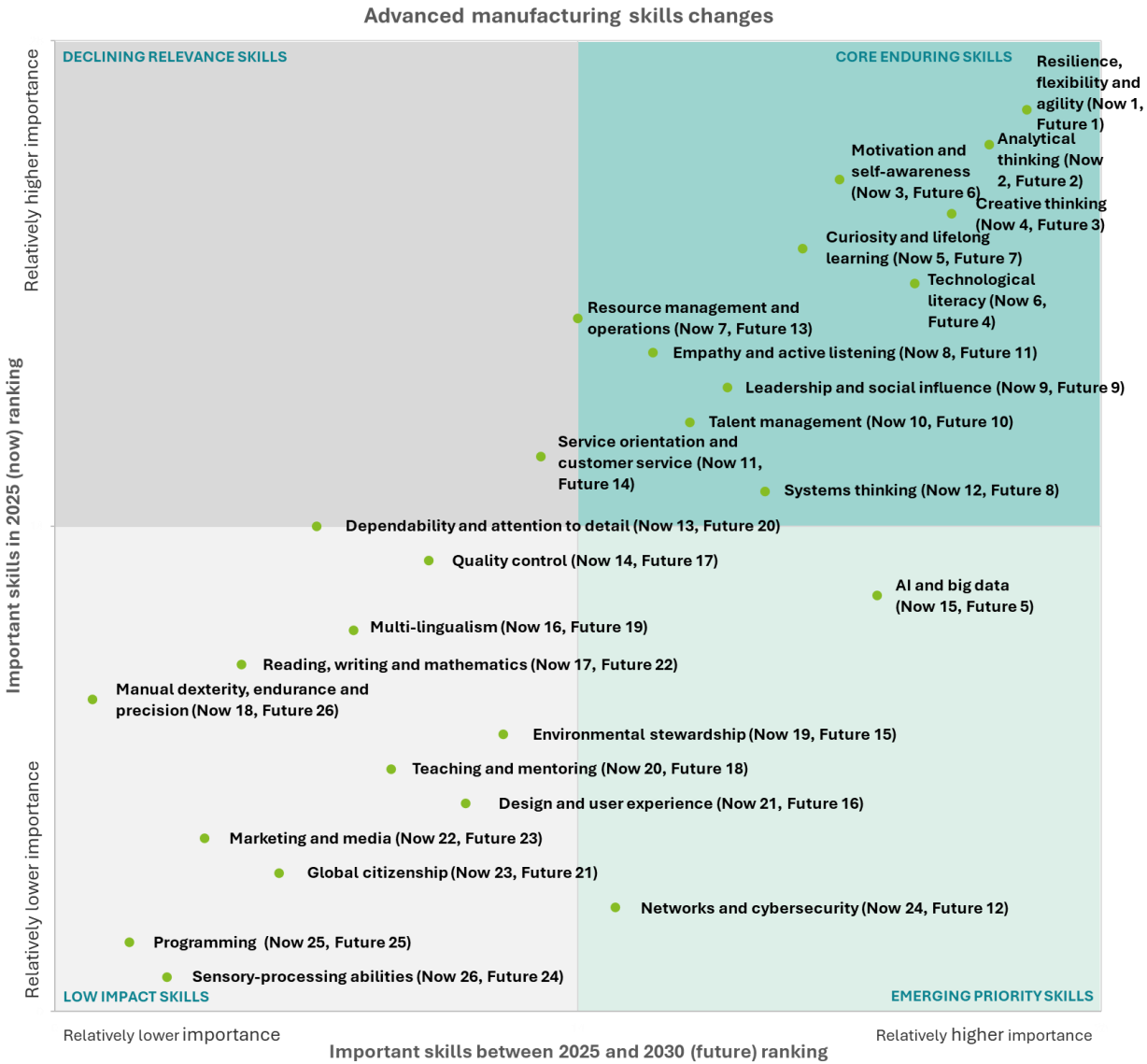
The skills landscape for advanced manufacturing is shifting toward a more dynamic and technology driven future.

Core enduring skills (top-left), are those that underpin adaptability, problem-solving, and innovation, will remain central to workforce capability. These skills form the foundation for navigating complexity and sustaining competitiveness as digitalisation accelerates.

In parallel, **emerging priority skills (bottom-right)**, highlight the growing importance of data, connectivity, and advanced technologies. These capabilities will enable organisations to harness automation, optimise processes, and build resilience in an increasingly interconnected environment.

By contrast, **low impact skills (bottom-left)**, which are largely routine, manual, or narrowly technical, are declining in strategic relevance as automation and smart systems take over repetitive tasks. While these skills will not disappear entirely, their role will diminish, requiring a shift in workforce planning and training investment.

The following analysis will explore how these changes are reshaping roles and what this means for capability development across the sector.



Source: WEF, Deloitte analysis

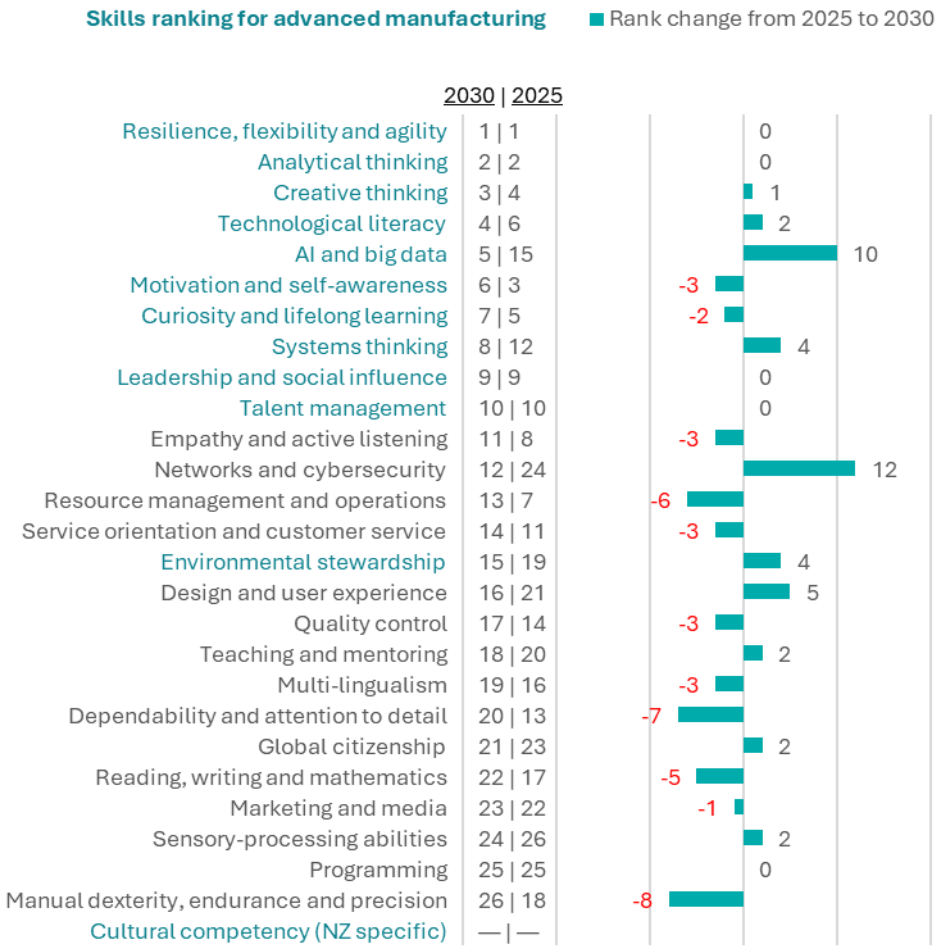
Skills changes for manufacturing and engineering

By 2030, demand for manufacturing (and expect applicable to engineering) skills will shift toward AI and big data, networks and cybersecurity, and environmental stewardship, alongside enduring capabilities such as resilience, flexibility and agility and technological literacy. Skills such as systems thinking and leadership and social influence will also gain importance as industries adopt advanced automation and sustainability practices. In contrast, manual dexterity, sensory processing abilities and routine quality control tasks will decline as robotics and digital systems replace repetitive work.

Routine cognitive skills like reading, writing, mathematics, and quality control rank lower globally, but this decline is relative, not absolute. These skills remain critical in New Zealand, where literacy and numeracy lag OECD averages. Employers expect these foundations before entry, so they are not globally highlighted as transformational. While unlikely to drive major industry change, they remain relevant for niche roles and as prerequisites for technical work. Strengthening them should be a priority and enablers for progression into advanced role.

The following chart illustrate the top skills shaping this skills transition. They show which capabilities are most in demand today and which are expected to grow by 2030. This snapshot provides a starting point for workforce planning, vocational education design and organisational strategies to ensure readiness for the future of work.

Note that the top 12 in demand, important and evolving skills for the industry sectors illustrated are assumed to be applicable for the engineering sector. There is no data specific to the engineering sector from the WEF report to help with additional analysis.



Source: WEF, Deloitte analysis

Shifting skill priorities for production of consumer goods

The core enduring skills that are important now and expected to remain highly important in the future for production of consumer goods include resilience, flexibility and agility; AI and big data, technological literacy, analytical thinking, and creative thinking.

Skills outlook for production of consumer goods by 2030

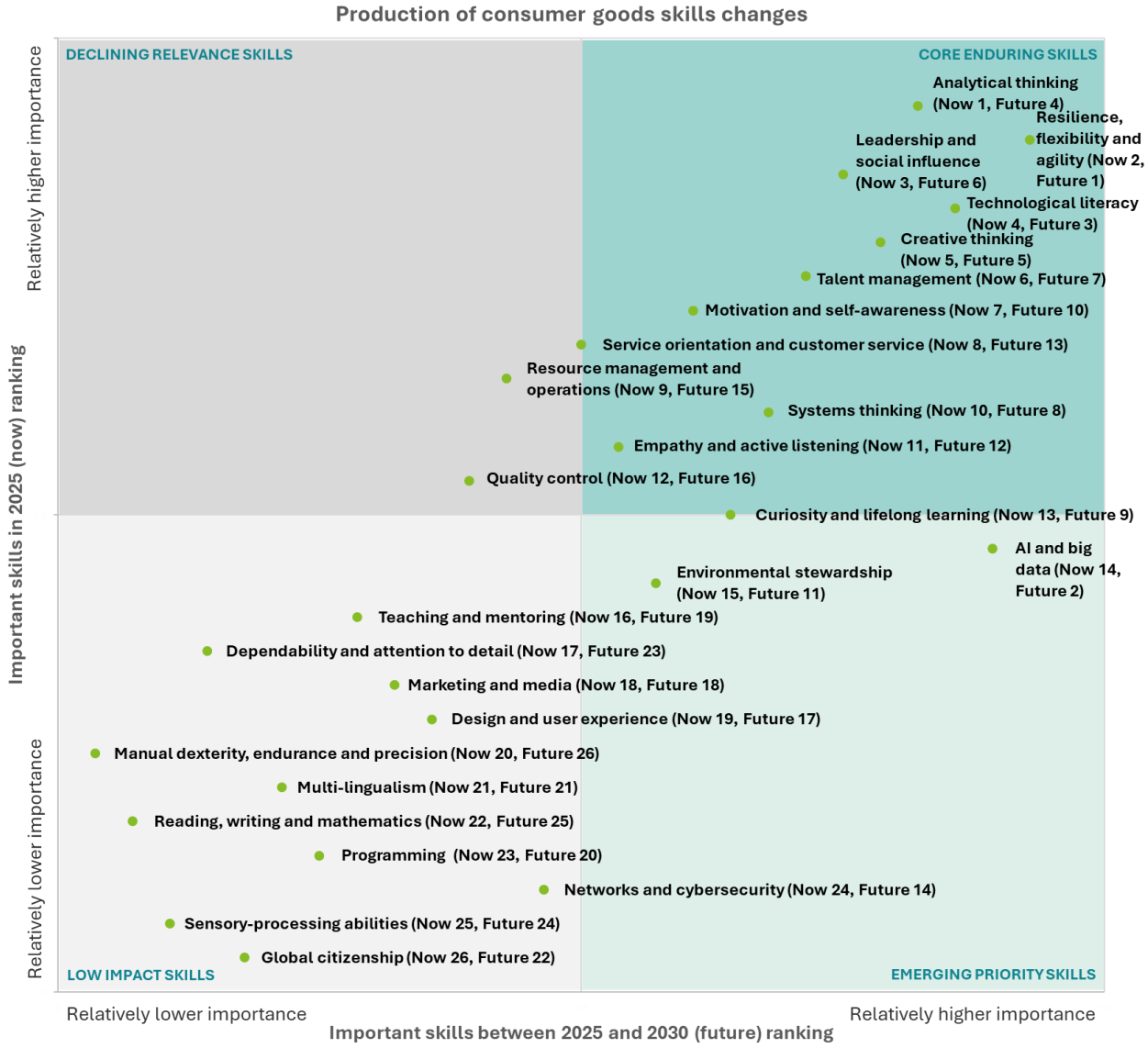
The production of consumer goods is experiencing a similar transformation, with the skills mix shifting toward adaptability and technology driven capabilities.

Core enduring skills (top-left), are those that enable critical thinking, leadership, and resilience, will remain fundamental as organisations navigate complexity and rapid change. These skills form the backbone of future workforce strategies.

Alongside this, **emerging priority skills (bottom-right)**, reflect the growing influence of data, automation, and sustainability. Capabilities linked to advanced technologies and environmental stewardship will become increasingly important as consumer goods production integrates digital systems and responds to global sustainability imperatives.

In contrast, **low impact skills (bottom-left)**, which are largely routine, manual, or narrowly technical, are declining in strategic relevance. Automation and process optimisation are reducing the need for these tasks, requiring organisations to rethink training and workforce planning. However, in New Zealand, foundational skills such as reading, writing, and mathematics remain a critical focus as the nation works to lift literacy and numeracy capabilities to support workforce participation and adaptability.

The next analysis will explore how these changes are reshaping roles and what this means for capability development across the sector.



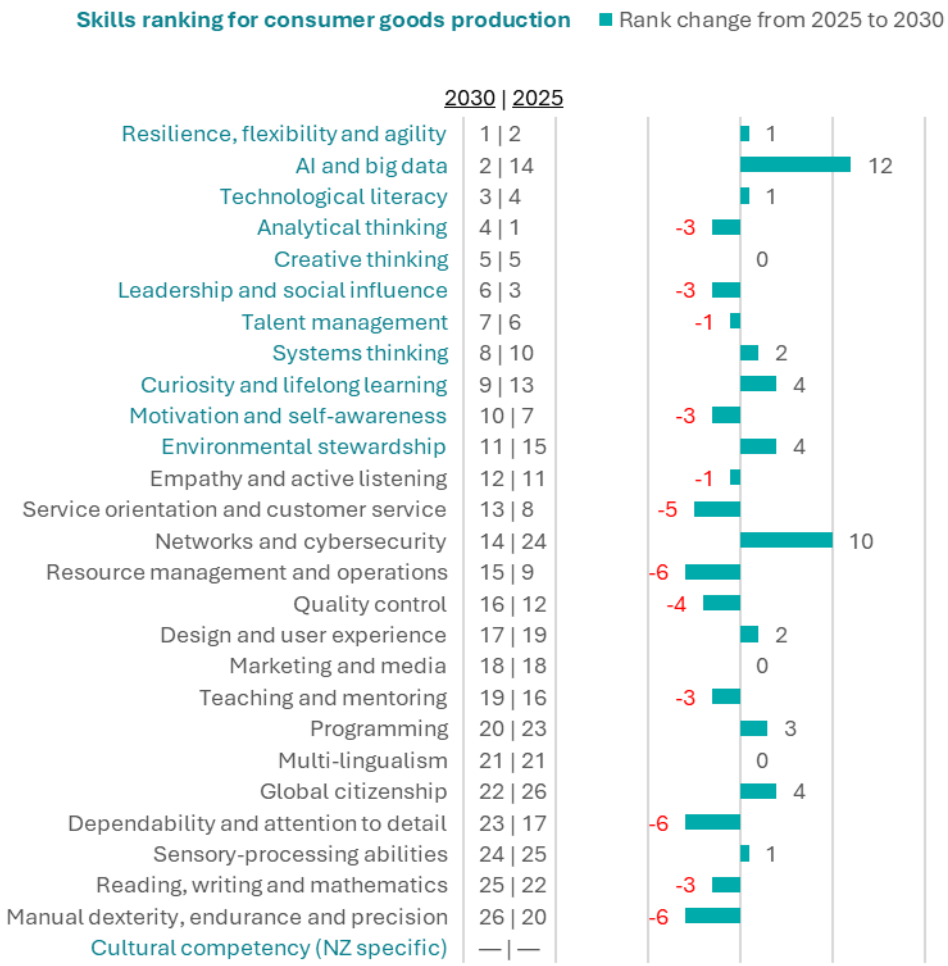
Source: WEF, Deloitte analysis

Skills changes for consumer goods production

Building on these trends, consumer goods production is entering a phase of rapid skill transformation. By 2030, demand will shift strongly towards AI and big data, networks and cybersecurity, and environmental stewardship, alongside enduring capabilities such as resilience, flexibility and agility, and technological literacy. Skills including systems thinking and curiosity and lifelong learning will also gain importance as the sector adopts advanced automation and sustainability practices.

In contrast, manual dexterity, dependability and attention to detail, and routine quality control tasks will decline as robotics and digital systems replace repetitive work. While reading, writing and mathematics remain foundational for New Zealand and for interpreting technical documentation, data and compliance standards, they are considered base skill requirements.

The following chart illustrates the top skills shaping this transition, showing which capabilities are most in demand today, which are expected to grow fastest by 2030, and which are losing importance relatively. This snapshot provides a starting point for workforce planning, vocational education design, and organisational strategies to ensure readiness for the future of work.



Source: WEF, Deloitte analysis

Shared priorities shaping these sectors

Advanced manufacturing, engineering and consumer goods production share a strong emphasis on transferable skills such as analytical thinking, adaptability, technological literacy, and leadership. These skills remain core for managing automation, driving innovation, and guiding workforce transitions. These sectors also highlight emerging capabilities including AI and big data, networks and cybersecurity, and environmental stewardship, reflecting the growing importance of digital integration.

While the global research expects a relative decline in the importance of manual dexterity and routine cognitive skills, these remain critical foundations in New Zealand. Interpreting technical drawings, calculating tolerances, and understanding compliance documentation all require strong reading, writing, and mathematics skills. These capabilities underpin advanced technical and digital competencies, ensuring workers can progress into higher-order roles. Low impact skills will continue to play niche roles in specialised contexts but will not drive major industry transformation.

These findings align with Hanga-Aro-Rau *Post COVID-19 Workforce Development* report, which problem solving, adaptability, and communication. Embedding these skills into VET strategies is essential for building resilience and supporting career mobility in rapidly evolving industries.

These trends highlight the need for lifelong learning, micro-credentials, and flexible pathways to prepare workers for future demands.

Implications for organisations and employers

Employers in manufacturing, engineering, and consumer goods production should foster a culture of continuous learning to keep pace with automation, AI, and sustainability requirements. Workforce planning should identify roles most affected by skill shifts and create clear transition pathways for employees. Leadership development is critical to equip managers for guiding teams through changes such as robotics adoption or connected quality control systems. Structured onboarding for new digital tools and systems will ensure smooth adoption. Offering career mobility opportunities linked to skill development will help retain talent and build resilience.

Implications for SMEs

SMEs face resource constraints, making access to affordable training a priority. Partnerships with vocational education providers and participation in industry led programs can help reduce cost barriers. Shared training hubs or regional clusters offer practical solutions for accessing advanced technologies such as automated packaging or AI-driven forecasting tools.

SMEs should prioritise core and transferable skills to ensure staff can adapt to multiple roles as business needs change. Digital readiness is essential, starting with scalable technology solutions and training employees to use them effectively. Building basic sustainability knowledge into workforce training will help SMEs meet regulatory expectations and align with market trends.

Implications for the VET sector

Vocational education providers should consult with industry and consider embedding digital and sustainability skills into core programs. AI and big data, networks and cybersecurity, and environmental stewardship should become key components of training for relevant qualifications.

At the same time, strong foundations in reading, writing, and mathematics remain essential because they underpin advanced technical and digital skills. In manufacturing and engineering, these capabilities support accurate interpretation of CAD drawings, precise measurement for machining, and compliance with safety standards. In consumer goods production, they enable understanding of automated system instructions, quality assurance documentation, and sustainability reporting. Without these basics, workers struggle to transition into roles requiring problem solving, data analysis, or operating digital systems.

Flexible learning pathways such as micro-credentials and modular courses will allow rapid upskilling as technologies evolve. Collaboration with employers is critical to ensure programs reflect real world processes including robotics integration and automated packaging systems. Transferable skills such as problem solving, adaptability, and communication should be woven into all qualifications to prepare learners for dynamic roles across these sectors.

Implications for industry bodies and other key stakeholders

Industry bodies and stakeholders should lead strategic coordination to align training priorities with future skill needs. This includes developing national frameworks for digital and sustainability competencies, supporting industry wide micro-credential standards, and promoting inclusive workforce strategies to engage Māori, Pacific peoples, and women.

Manufacturing and Engineering ISB

Drawing insights from occupation trends

Manufacturing employment decreased from 260,985 in 2018 to 242,757 in 2023, a decline of 7%, after strong growth between 2013 and 2018.

Photo: S&G Print, New Zealand

Skill levels tell us what capabilities are growing or declining, but they do not show where these changes are happening in the real world of work. Occupation data provides that missing link. It reveals how shifts in technology, automation, and sustainability priorities are reshaping the actual roles people hold and whether the move toward higher skill levels is translating into new opportunities or displacing traditional jobs.

By examining occupation data alongside skill composition, we can see the practical impact of digital transformation:

- which roles are disappearing
- which are evolving
- which are emerging as critical for the future.

This perspective helps validate assumptions drawn from skill trends and highlights unexpected changes such as the rise of service oriented roles in advanced manufacturing or the decline of traditional trades despite demand for technical expertise.

Understanding these patterns is critical for workforce planning and vocational education strategies. It ensures training systems not only teach the right skills but also prepare learners for roles that will exist tomorrow. These roles increasingly combine technical proficiency with adaptability, compliance, and customer engagement, making occupation trend analysis a valuable component of this research.

Skills define capability. Occupations increasingly demand human-centric and higher order skills

Occupation trends

Roles associated with low skilled tasks have contracted sharply. Conversely, occupations requiring higher order capabilities have grown.

Manufacturing occupation trends

The occupation type data, defined using ANZSCO level 3 provides an alternate way to test the observation and assumptions drawn from skill trends and skill level composition. Manufacturing employment decreased from 260,985 in 2018 to 242,757 in 2023, a decline of 7%, after strong growth between 2013 and 2018. This shift reflects the sector's transition towards automation and advanced technologies, which is consistent with the skills outlook predicting reduced reliance on manual and routine roles.

Roles associated with low skilled tasks have contracted sharply. Labourers fell by 29% since 2018, and Sales Workers declined by 13.3%, confirming the forecast that manual dexterity and routine service skills are losing relevance. Technicians and Trades Workers, historically a large share of the workforce, dropped by 11.2%, aligning with the skill composition analysis showing a gradual reduction in level 3 and level 4 roles as robotics and digital systems replace traditional trade functions.

Conversely, occupations requiring higher order capabilities have grown. Professionals increased by 24.3% since 2018, and Community and Personal Service Workers rose by 27.8%. Managers remained relatively stable, while Clerical and Administrative Workers declined slightly, reflecting the automation of routine cognitive tasks.

In line with assumptions:

- Decline in labourers and routine roles supports the expectation that manual skills are losing relevance.
- Growth in professionals aligns with the shift toward knowledge intensive roles requiring digital and analytical capabilities.

Not fully in line:

- Technicians and trades workers declined despite expectations for advanced technical skills, indicating that traditional trade roles are being replaced in the manufacturing sector rather than expanded.
- Significant rise in community and personal service roles was not highlighted in the skills outlook, pointing to emerging priorities in customer engagement and compliance.

This evidence confirms the overall direction knowledge and human-centric focused roles but highlights that operational and service functions remain critical. Workforce planning and vocational education strategies should combine advanced technical training with skills for compliance, customer interaction and adaptive leadership.

Manufacturing – share of number of employees by occupation type

Occupation type	2013	2018	2023
Managers	18.7%	18.1%	19.1%
Technicians and Trades Workers	21.2%	19.5%	18.6%
Labourers	20.1%	21.4%	16.4%
Professionals	9.7%	11.3%	15.1%
Machinery Operators and Drivers	11.1%	11.3%	12.1%
Clerical and Administrative Workers	10.4%	9.8%	10.3%
Sales Workers	7.6%	7.5%	7.0%
Community and Personal Service Workers	1.2%	1.1%	1.5%
All occupations combined	**100%**	**100%**	**100%**

Manufacturing – number of employees by occupation type and % changes

Occupation type	2013	2018	2023	2013 to 2018	2018 to 2023
Managers	39,714	47,346	46,374	19.2%	-2.1%
Technicians and Trades Workers	44,883	50,790	45,120	13.2%	-11.2%
Labourers	42,504	55,953	39,729	31.6%	-29.0%
Professionals	20,643	29,535	36,702	43.1%	24.3%
Machinery Operators and Drivers	23,523	29,454	29,307	25.2%	-0.5%
Clerical and Administrative Workers	22,092	25,515	24,939	15.5%	-2.3%
Sales Workers	16,071	19,515	16,911	21.4%	-13.3%
Community and Personal Service Workers	2,490	2,871	3,669	15.3%	27.8%
All occupations combined	**211,917**	**260,985**	**242,757**	**23.2%**	**-7.0%**

*Source: Stats NZ; * Suppressed counts have not been included in the individual sector counts; Figures are rounded to the nearest 3; Total has been summed independently to the sector sums to minimise suppression*

Occupational shifts in the manufacturing sector

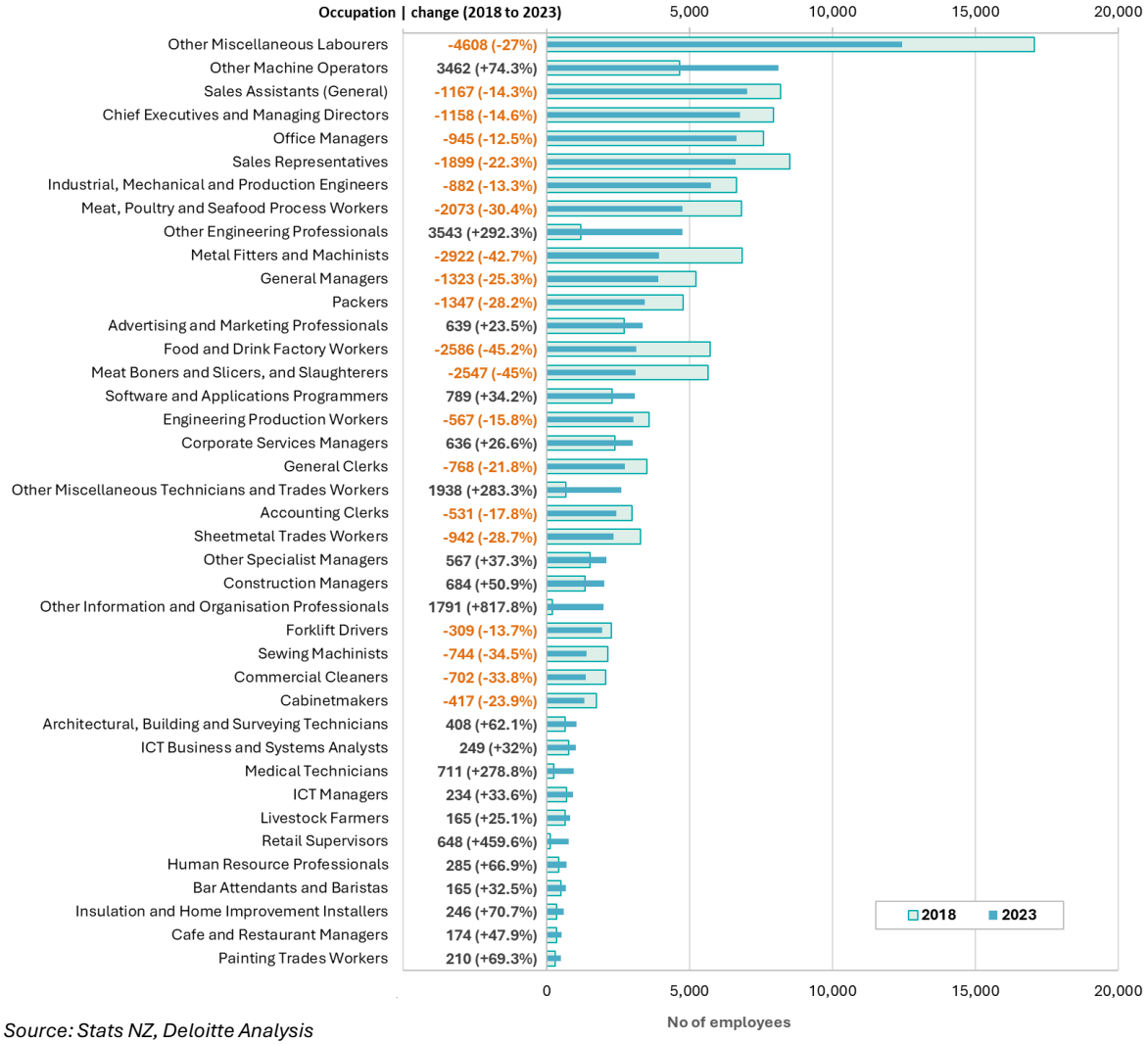
There were significant shifts in occupation types between 2018 and 2023 in manufacturing. The steepest declines were in Food and Drink Factory Workers (-45.2%), Meat Boners and Slicers (-45%), and Metal Fitters and Machinists (-42.7%). These roles are primarily level 3, 4 and 5, which historically accounted for a large share of the sector. This aligns with the earlier skill composition analysis showing level 5 roles dropped from 18% to 16%, and level 3 roles contracted, reflecting automation and efficiency gains in production processes.

Growth was concentrated in smaller but emerging roles requiring higher skill levels. Occupations such as Other Information and Organisation Professionals (+817.8%, level 1), Other Engineering Professionals (+292.3%, level 1), and Software and Applications Programmers (+34.2%, level 1) surged, driven by digitalisation and advanced manufacturing technologies. Technical roles such as Medical Technicians (+278.8%, level 2–3) and Architectural, Building and Surveying Technicians (+62.1%, level 2), and Other Machine Operators (+74.3%, level 3) also grew, supporting compliance and infrastructure needs. These changes explain why level 1 roles increased from 28% to 33% over the decade.

The alignment between occupation trends and skill level trends is clear. Manufacturing is shifting from high volume, low and mid skill roles to specialised, higher skill positions.

For vocational education, this means prioritising advanced technical training, automation systems and digital capability. Employers and SMEs should plan for reskilling strategies to manage the decline of level 3 to level 5 roles and secure talent for emerging level 1 and level 2 positions.

Occupations with the largest workforce and notable growth or decline in manufacturing (2018 to 2023)



Source: Stats NZ, Deloitte Analysis
** The chart includes the top 20 occupations that rank among the top 100 with the highest number of employees and fastest growing roles, as well as the top 20 occupations that rank among the top 100 with the highest number of employees and fastest declining roles within the sector*

Engineering occupational trends

Engineering employment grew strongly from 42,639 in 2013 to 67,131 in 2023, an increase of approximately 57%, confirming the sector's position as a growth leader. This expansion aligns with the skills outlook predicting rising demand for advanced technical and digital capabilities. However, the distribution of roles provides important insights into how this growth connects to skill trends.

Roles associated with higher skill levels have seen the most significant gains. Professionals increased by 22.8% since 2018 and now account for 43% of the engineering sector workforce, reinforcing the dominance of level 1 roles identified in the skill composition analysis. Managers grew by 19.7%, reflecting the need for leadership and systems thinking in complex engineering projects. Technicians and Trades Workers also rose by 10.3%, suggesting continued demand for mid skilled technical expertise despite automation.

Conversely, some roles declined or grew more slowly than expected. Sales Workers fell by 13.7%, indicating reduced emphasis on traditional customer facing functions. Clerical and Administrative Workers grew only slightly, and their share dropped to 9.7%, consistent with the decline in routine cognitive skills highlighted in the skills outlook. Labourers and Machinery Operators, while increasing modestly, remain a small share of the workforce, confirming the limited role of low skilled positions in this sector.

In line with assumptions:

- Strong growth in professionals and managers supports the forecast that knowledge intensive roles are driving expansion.
- Decline in clerical roles aligns with reduced relevance of routine administrative skills.

Not fully in line:

- Continued growth in technicians and trades workers suggests that mid skilled roles remain important, contrary to expectations of sharp decline.
- Modest increase in machinery operators indicates that automation has not fully replaced operational roles.

This evidence confirms the overall direction toward advanced technical and managerial roles but highlights that mid skilled technical positions remain critical. Workforce planning and vocational education strategies should focus on pathways to level 1 and level 2 qualifications while maintaining strong support for practical technical training.

Engineering – share of number of employee by occupation type

Occupation type	2013	2018	2023
Professionals	37.2%	40.5%	43.0%
Technicians and Trades Workers	23.8%	21.8%	20.8%
Managers	17.6%	16.3%	16.8%
Clerical and Administrative Workers	12.4%	10.8%	9.7%
Labourers	3.1%	3.5%	3.3%
Machinery Operators and Drivers	1.7%	2.6%	2.9%
Sales Workers	2.9%	3.3%	2.5%
Community and Personal Service Workers	1.3%	1.3%	1.1%
All occupations combined	**100.0%**	**100.0%**	**100.0%**

Engineering – number of employee by occupation type and % changes

Occupation type	2013	2018	2023	2013 to 2018	2018 to 2023
Professionals	15,879	23,502	28,866	48.0%	22.8%
Technicians and Trades Workers	10,167	12,639	13,938	24.3%	10.3%
Managers	7,485	9,438	11,298	26.1%	19.7%
Clerical and Administrative Workers	5,286	6,249	6,501	18.2%	4.0%
Labourers	1,326	2,049	2,187	54.5%	6.7%
Machinery Operators and Drivers	711	1491	1929	109.7%	29.4%
Sales Workers	1218	1,911	1,650	56.9%	-13.7%
Community and Personal Service Workers	552	741	741	34.2%	0.0%
All occupations combined	**42,639**	**58,011**	**67,131**	**36.1%**	**15.7%**

*Source: Stats NZ; * Suppressed counts have not been included in the individual sector counts; Figures are rounded to the nearest 3; Total has been summed independently to the sector sums to minimise suppression*

Occupational shifts in the engineering sector

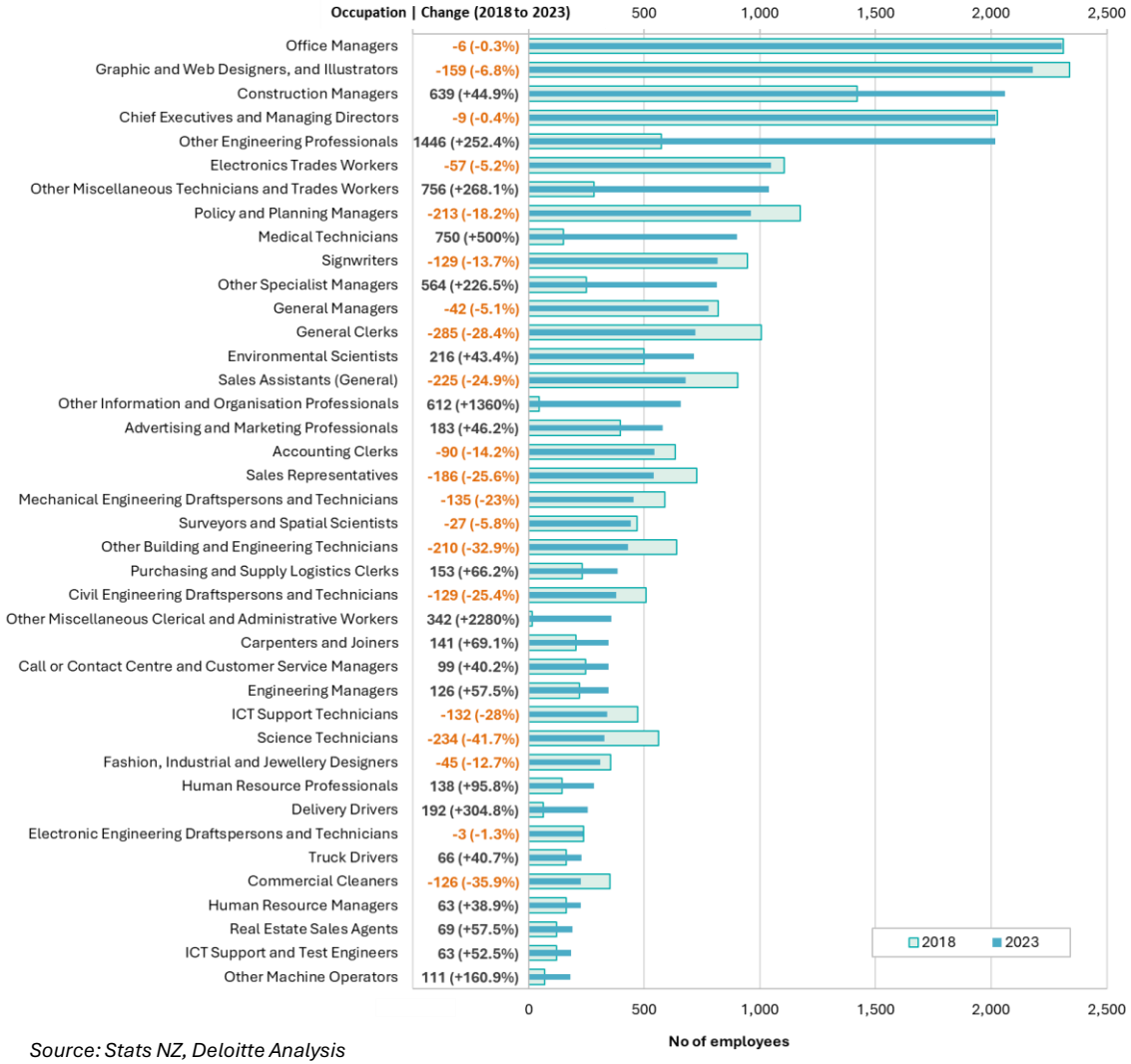
Between 2018 and 2023, engineering saw strong growth in high skill roles and modest gains in some mid skill positions. The largest increases were in Other Information and Organisation Professionals (+1,360%, Level 1), Other Engineering Professionals (+252.4%, Level 1), and Other Specialist Managers (+226.5%, Level 1), reflecting the sector's reliance on advanced technical expertise and leadership for complex projects. Growth in Medical Technicians (+500%, Levels 2–3) and Other Miscellaneous Technicians and Trades Workers (+268.1%, Levels 2–4) shows rising demand for specialised technical support. Emerging digital roles such as ICT Support and Test Engineers (+52.5%, Level 1) expanded, aligning with automation and smart systems adoption.

Operational roles such as Delivery Drivers (+304.8%, Level 4) and Truck Drivers (+40.7%, Level 4) grew moderately, indicating continued reliance on logistics. Declines were concentrated in mid and low skill roles including General Clerks (-28.4%, Level 4), Sales Assistants (-24.9%, Level 5), and Commercial Cleaners (-35.9%, Level 4), consistent with automation and outsourcing trends. These changes align with earlier analysis showing Level 1 roles dominate at 60%, while Levels 4 and 5 remain minimal and declining.

Engineering is consolidating around highly skilled, knowledge intensive roles while reducing low skill positions.

For vocational education, this means strengthening pathways to Level 1 and Level 2 qualifications in advanced engineering, project management, and digital systems. Employers and SMEs should invest in reskilling to move workers from declining Level 4 and Level 5 roles into specialised technical positions.

Occupations with the largest workforce and notable growth or decline in engineering (2018 to 2023)



Source: Stats NZ, Deloitte Analysis
** The chart includes the top 20 occupations that rank among the top 100 with the highest number of employees and fastest growing roles, as well as the top 20 occupations that rank among the top 100 with the highest number of employees and fastest declining roles within the sector*

Overall strategic implications

New Zealand's manufacturing and engineering sectors are evolving in distinct ways. Manufacturing has remained relatively flat over the past 25 years, with GDP hovering between NZ$25 and NZ$30 billion and forecast to stay near NZ$25 billion through to 2035. This signals a mature sector with limited growth unless major transformation occurs.

In contrast, engineering has shown consistent expansion, growing from NZ$3 billion in 2000 to nearly NZ$9 billion in 2025, and is projected to reach NZ$12 billion by 2035, driven by infrastructure development, technology adoption, and demand for specialised skills.

Workforce gaps are emerging across both sectors. Manufacturing is projected to face a shortfall of 29,039 workers by 2030, a 52% increase over five years. Engineering's gap is expected to grow by 55%, reaching 10,284 by 2030. These gaps are influenced by ageing workforces, declining participation among younger workers, and skill mismatches due to automation and advanced technologies.

Both sectors rely heavily on mid career and experienced workers, with limited representation from younger cohorts. Diversity remains a challenge, particularly for Māori, Pacific peoples, women, and disabled people. Skill composition is shifting toward higher level roles, especially in engineering, while manufacturing continues to depend on mid skill labour.

Occupation data confirms a decline in manual and routine roles, with growth in digital, compliance, and customer focused functions.

Emerging skills such as AI and big data, technological literacy, and systems thinking are gaining prominence, alongside enduring capabilities including resilience, flexibility and agility, analytical thinking, and creative thinking. These trends highlight the need for inclusive workforce strategies, lifelong learning, and responsive VET systems to support both transition and growth.

Implications for organisations and employers

- Organisations should respond proactively to workforce shifts by embedding resilience, adaptability, and inclusive practices into their operational and strategic planning.
- Workforce planning should anticipate skill shifts and identify roles most affected by automation, sustainability imperatives, and digital transformation.
- Leadership development is essential to guide teams through change, particularly in adopting robotics, AI, and connected systems.
- Continuous learning cultures should be fostered, with structured onboarding for new technologies and clear career mobility pathways.
- Retention strategies for older workers and targeted attraction of younger talent will help maintain workforce continuity.
- Inclusive recruitment practices are needed to engage Māori, Pacific peoples, women, and disabled individuals, addressing equity and capability gaps.

Implications for SMEs

SMEs should find practical and cost effective ways to build workforce capability while navigating resource constraints and rapid technological change.

- Affordable training access is important. SMEs should leverage partnerships with vocational education providers and industry led programmes.
- Shared training hubs and regional clusters could be considered to support access to advanced technologies and reduce cost barriers.
- Digital readiness should be prioritised, starting with scalable solutions and basic digital literacy training.
- Sustainability knowledge should be embedded into workforce development to meet regulatory and market expectations.
- Cross functional skill development will enable staff to adapt to changing business needs and fill multiple roles.

Implications for VET

- Curriculum redesign is needed to embed technical and human-centric skills into core programmes, including AI and big data, technological literacy, along with resilience, flexibility and agility, analytical thinking, creative thinking, systems thinking, and leadership and social influence skills.
- Foundational skills in reading, writing, and mathematics remain essential for interpreting technical documentation and ensuring compliance.
- Flexible learning pathways such as micro-credentials, modular courses, and work-based learning could support rapid upskilling.

- Targeted programmes for underrepresented groups could help build a sustainable and diverse talent pipeline.
- Stronger alignment with industry is required to ensure training reflects real world processes and emerging technologies.

Implications for industry bodies and key stakeholders

- Industry bodies and agencies must lead coordinated efforts to shape future workforce strategies and ensure inclusive, future ready systems.
- Strategic coordination is needed to align training priorities with future skill needs across sectors.
- National frameworks for digital and sustainability competencies should be developed to guide education and workforce planning.
- Inclusive workforce strategies should be promoted to engage Māori, Pacific peoples, women and disabled communities.
- Policy advocacy for funding and incentives will accelerate workforce transformation and support SMEs and regional employers.
- Occupation trend analysis should be integrated into planning to ensure training prepares learners for roles that will exist in the future.

Implications for learners and employees

- Learners and employees need to be supported to navigate a changing landscape where adaptability, continuous learning, and digital fluency are essential for career progression and job security.
- Curiosity and lifelong learning will be critical, with workers needing access to flexible, modular training that supports upskilling and reskilling.
- Transferable skills such as resilience, flexibility and agility, analytical thinking, creative thinking, systems thinking, and leadership and social influence skills will enable mobility across roles and sectors.
- Clear career pathways linked to qualifications and industry needs will help learners make informed choices and progress into higher skill roles.

Opportunities for the Manufacturing and Engineering ISB

The ISB is uniquely positioned to drive strategic workforce development and ensure the sector remains competitive, inclusive and future ready. Some forward looking actions to be considered include:

- Develop and maintain sector specific skill roadmaps aligned with emerging technologies (e.g. automation, AI and big data, digital systems) and global trends, and use them to guide qualification design, micro-credential development, and workforce planning.
- Strengthen collaboration between industry and education providers to co-design qualifications and competency frameworks that reflect current and future workplace needs, including advanced manufacturing, engineering, and AI literacy.
- Monitor occupation and skill trends to inform responsive qualification design and workforce planning.
- Design qualifications that are rapid and stackable, enabling workers to close skill gaps and maintain lifelong learning, whether they are new entrants or experienced professionals.
- Promote inclusive qualification pathways in manufacturing and engineering, ensuring accessibility for Māori, Pacific peoples, women, and disabled individuals to enter and progress in technical and trade roles.
- Develop targeted qualification pathways and industry partnerships to increase representation of underrepresented groups in advanced technical roles and leadership positions within manufacturing and engineering.
- Identify regional qualification pathways and assessment infrastructure to address workforce gaps in manufacturing and engineering, particularly in areas with ageing workforces and declining young entrants.
- Support local delivery and recognition of manufacturing and engineering qualifications, including apprenticeships and work-based learning, to ensure accessibility and industry relevance.
- Embed transferable human-centric skills, such as analytical thinking, creative thinking, systems thinking, leadership, social influence, resilience, flexibility, and agility, into manufacturing and engineering qualifications to champion curiosity and lifelong learning.
- Embed succession planning, knowledge transfer, mentoring, and leadership development into qualifications to maintain capability and ensure continuity of technical and managerial skills.

Automotive, Transport and Logistics ISB

A closer look at automotive and logistics

The Automotive and Logistics sectors have made a steady positive contribution to GDP. Regulatory and training changes are reshaping compliance and operational standards while redefining the skills mix, qualifications, and career pathways.

Economic outlook

New Zealand's automotive sector has grown steadily over the past 25 years, increasing from around NZ$2 billion in 2000 to just under NZ$4 billion in 2025. Growth has been gradual, with some small fluctuations, and the forecast shows only a slight rise to about NZ$4 billion by 2035.

The logistics sector in New Zealand has grown steadily over the past 25 years, increasing from around NZ$8 billion in 2000 to about NZ$13 billion in 2025. The forecast shows this upward trend continuing, with GDP expected to reach nearly NZ$18 billion by 2035. This strong growth reflects the sector's expanding role in supporting trade, e-commerce, and supply chain efficiency, making it a key contributor to future economic development.

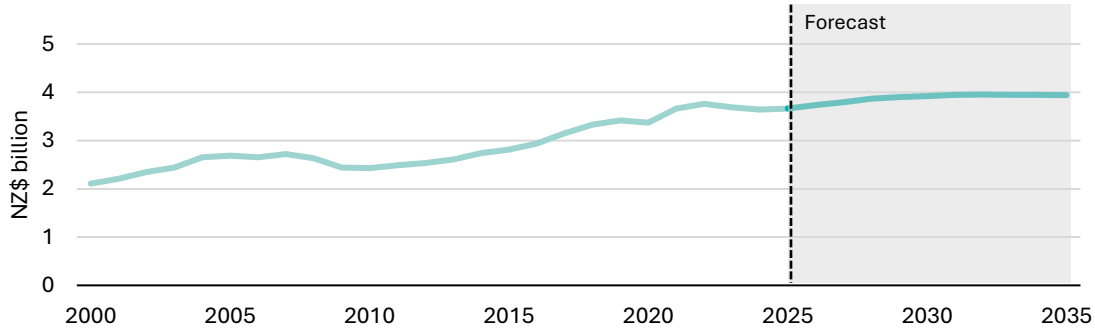
Workforce system changes shaping workforce outlook

While GDP trends show where growth or decline is expected, system level changes in legislation, training, and regulation are reshaping the workforce to match these economic realities. Below are the key system drivers for automotive and logistics:

Common to both automotive and logistics

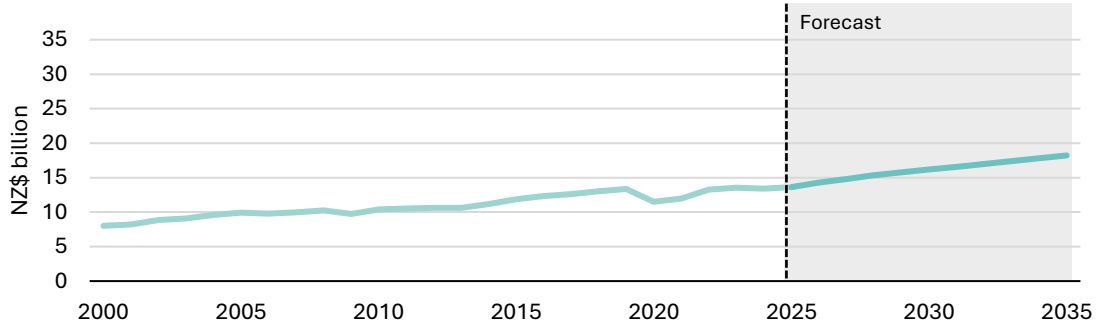
- **Automotive, Transport and Logistics ISB (2026) –** Automotive and logistics are included in new Boards to set qualifications and ensure training relevance and tailored vocational standards.
- **Vocational Education and Training Amendment Bill (effective 2026) –** Creates industry specific Skills Boards to align training with sector needs.

Automotive GDP



Source: Stats NZ, Deloitte Access Economics

Logistics GDP



Source: Stats NZ, Deloitte Access Economics

Note: The sectoral definitions are aligned with those outlined within the Hanga-Aro-Rau legislation, so the GDP figures presented may not align with publicly available GDP figures for sectors under the ANZSIC06 sectoral definition.

Note: Each forecast has been formed using a sector-derived regression equation, and has been projected using Deloitte's in-house Macroeconomic forecasting model DAE-MACRO. The GDP figures presented are in real terms and are in 2009/10 prices.

Automotive specific

- **Hanga-Aro-Rau Automotive Engineering Workforce Development Plan (2025) –** Provides a strategic framework for addressing future skill needs in automotive engineering, including EV technologies, diagnostics, and digital integration.
- **Motor Industry Training Organisation (MITO) Automotive Workforce Development Strategy refresh (2022) –** Addresses ageing workforce, low diversity, and rapid technology shifts; focuses on EV servicing and advanced diagnostics.
- **Industry led training proposal (2023) –** Motor Trade Association (MTA) proposal to restore sector specific vocational training oversight, push to return vocational training control to the automotive sector for better alignment with industry needs.
- **Work and income budget 2025 incentives –** Some apprenticeship subsidies and investment boosts to encourage recruitment and upskilling.
- **New Zealand Transport Agency (NZTA) Clean Vehicle Standard changes (2024 – 2025)** Updated CO_2 targets and credit flexibility to support compliance drives demand for EV and hybrid servicing skills.

Logistics specific

- **Ministry of Transport Freight and Supply Chain Strategy (2023) –** National strategy prioritising resilience, decarbonisation, and digital logistics, a long term plan prioritising resilience and decarbonisation, requiring new skills in green freight and digital logistics.
- **Hanga-Aro-Rau and Deloitte workforce study for the logistics sector (2023) –** Highlights shortages and calls for recruitment of underrepresented groups, especially Pacific women.
- **Energy Efficiency and Conservation Authority Decarbonisation under Zero Carbon Act (accelerated 2024 – 2025) –** Focus on training for EV heavy vehicles and alternative fuel systems.

These regulatory and training changes are reshaping compliance and operational standards while redefining the skills mix, qualifications, and career pathways in automotive and logistics.

This shift is influencing the current workforce profile, with automotive focusing on upskilling for electric vehicle servicing, advanced diagnostics, and attracting younger, more diverse talent through refreshed vocational strategies and apprenticeship incentives.

Logistics, meanwhile, is adapting to decarbonisation targets and digital transformation, driving demand for skills in green freight technologies, supply chain optimisation, and data analytics, alongside initiatives to recruit underrepresented groups.

The following analysis examines the current workforce profile

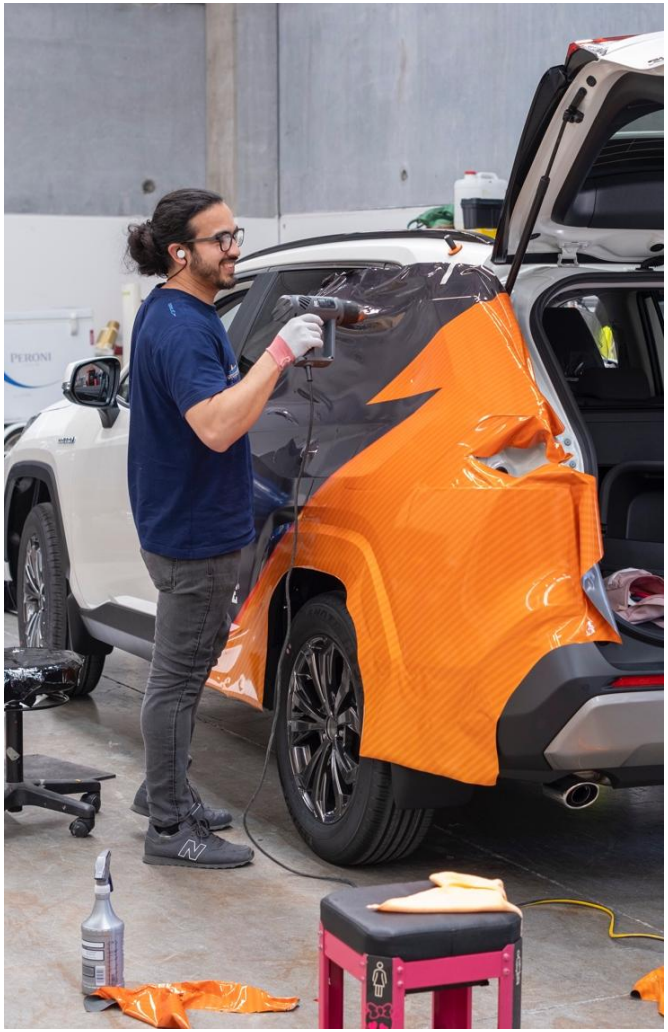


Photo: S&G Print, New Zealand

05 Ō Tātou Pōari Pūkenga | Our Skills Boards

Automotive, Transport and Logistics ISB

Automotive and logistics workforce profiles

The automotive workforce is ageing with declining participation from young workers. Recruiting young adults into the Logistics workforce has consistently proved challenging.

Career stages of the workforce

Employment trends in automotive and logistics show strong reliance on mid-career workers, declining participation among younger workers, and an ageing profile with older workers staying longer. These patterns have significant implications for future skills, succession planning and workforce sustainability.

Young adults (15–24) – This group remains the smallest and most volatile cohort in both sectors. In automotive, participation ranged between 14.2% to 19.4% since 2020, employed 9,300 in June 2020 and dropped to 8,900 in June 2025.

In logistics, young adults represent 9.4% to 10.3% between June 2020 and June 2025, with numbers falling from 12,800 in June 2020 to 11,600 in June 2025. These trends highlight persistent challenges in attracting younger talent. This is likely due to competition from other industries, shifting career preferences, or limited entry level opportunities. Without targeted pathways and training, both sectors risk long term capability gaps.

Early to mid career (25–44) – This group forms the backbone of both workforces. Automotive consistently accounts for over 40% of the workforce, employing 28,600 in June 2020, declining to 27,600 in June 2025. Logistics shows steady growth, with this cohort rising 10.3% from 49,400 in June 2020 to 54,500 in June 2025 and making up 44.1% of the workforce in 2025. Heavy reliance on this cohort underpins technical capability and leadership, but any decline would have an outsized impact on productivity and succession planning.

Experienced workforce (45–64) – Both sectors are showing signs of contraction. Automotive employment declined 0.9% between June 2020 and June 2025, employing 22,700 in June 2025, representing 36.3% of the workforce.

Logistics, historically the largest group represented 42.5% of the workforce in June 2020, fell sharply from 53,100 in June 2020 to 44,800 in June 2025, representing 36.3% of the workforce in 2025. These declines signal looming retirements and potential skill shortages unless retention and knowledge transfer strategies are prioritised. Retention and knowledge transfer strategies will be essential to maintain continuity.

Retirement age (65 and over) – Older workers remain a small but growing presence in both sectors. This group represents 5.4% of automotive workforce, with numbers at 3,000 in June 2020 and 3,400 in June 2025. Logistics has grown from 7.6% in June 2020 to 10.2% in June 2025, increased 32.6% from 9,500 in 2020 to 12,600 employees in 2025. This trend reflects delayed retirement and extended participation, underscoring the need for flexible work options and succession planning.

Implications for the workforce

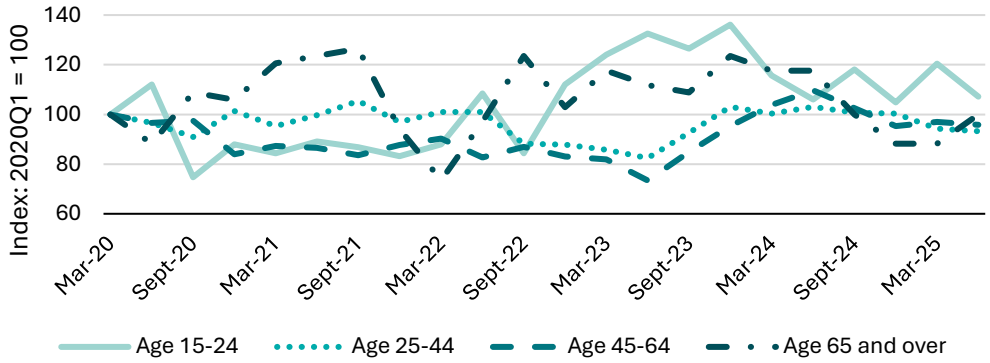
- Both sectors are ageing, with fewer young entrants and more older workers staying longer.
- Heavy reliance on mid career workers supports stability but creates vulnerability if attraction and retention decline.
- Declining experienced workforce signals urgent need for knowledge transfer and succession planning.
- Young adult participation remains inconsistent, requiring targeted pathways and training to build future capability.
- Growing older cohort calls for flexible work arrangements.

Photo: CODA Trucks, New Zealand

Automotive workforce age profile, annual average June 2023 to June 2025							
# employed	2020	% of total	2023	% of total	2025	% of total	% change 2020 to 2025
Age 15-24	9,300	14.6%	11,000	19.4%	8,900	14.2%	-4.3%
Age 25-44	28,600	44.8%	24,400	43.1%	27,600	44.1%	-3.5%
Age 45-64	22,900	35.9%	17,400	30.7%	22,700	36.3%	-0.9%
Age 65+	3,000	4.7%	3,800	6.7%	3,400	5.4%	13.3%
Total	63,800		56,600		62,600		-1.9%

Source: Stats NZ HLFS estimates, Suppressed data is not displayed ; Figures are rounded to the nearest 100

Relative change in age cohort size within Automotive

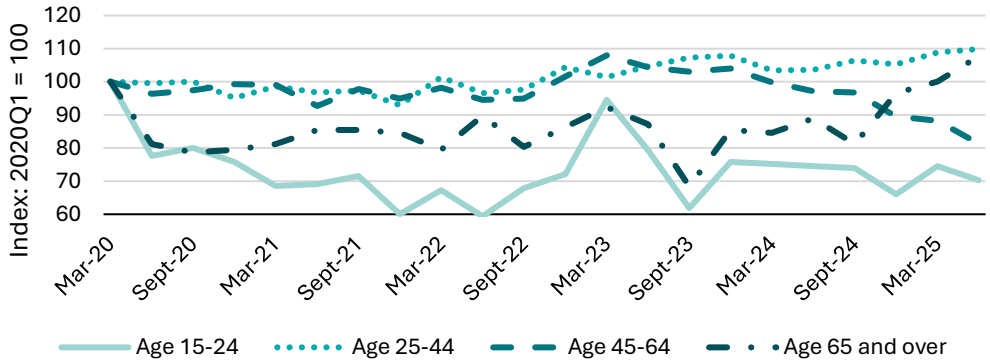


Source: Stats NZ HLFS estimates, Deloitte Access Economics, Suppressed data is not displayed

Logistics workforce age profile, annual average June 2020 to June 2025							
# employed	2020	% of total	2023	% of total	2025	% of total	% change 2020 to 2025
Age 15-24	12,800	10.3%	13,100	9.9%	11,600	9.4%	-9.4%
Age 25-44	49,400	39.6%	51,900	39.1%	54,500	44.1%	10.3%
Age 45-64	53,100	42.5%	57,500	43.3%	44,800	36.3%	-15.6%
Age 65+	9,500	7.6%	10,200	7.7%	12,600	10.2%	32.6%
Total	124,800		132,700		123,500		-1.0%

Source: Stats NZ HLFS estimates, Suppressed data is not displayed ; Figures are rounded to the nearest 100

Relative change in age cohort size within Logistics



Source: Stats NZ HLFS estimates, Deloitte Access Economics, Suppressed data is not displayed

Automotive and logistics workforce diversity

Targeted strategies to attract and retain Māori and Pacific workers, through training, career pathways, and inclusive practices, will help maintain capability and capacity, especially given the favourable demographics of the Māori and Pacific peoples.

Diversity in workforce

A culturally inclusive workforce is essential for addressing labour shortages, supporting innovation, and meeting future skill needs in both automotive and logistics. Māori and Pacific peoples represent a key talent pool that can help close workforce gaps as these sectors face ageing demographics and increasing technical demands.

Māori participation

Māori representation in automotive has grown significantly, from 12.4% to 16.9% since 2020. Employment rose 34.2% from 7,900 in June 2020 to 10,600 in June 2025.

In logistics, Māori participation is the highest among industry sectors, at 19% in 2020. However, employment fell 15.2% from 23,700 in June 2020 to 20,100 in June 2025.

Pacific peoples participation

Pacific workers face changes in both sectors, with a sharp decline in automotive. Automotive participation is at 3% in June 2025, with numbers falling 24% from 2,500 in June 2020 to 1,900 in June 2025.

In logistics, Pacific representation is higher at 9.7% in June 2025, and employment rose 15.4% from 10,400 in June 2020 to 12,000 in June 2025.

Other ethnic groups

European, Asian, and other non-Māori, non-Pacific employees dominate both sectors. In automotive, this group accounts for 80% in June 2025, with employment falling 6.2% from 53,400 in June 2020 to 50,100 in June 2025.

In logistics, representation is slightly lower but still high at 74%, with employment increased 0.8% from 90,700 in June 2020 to 91,400 in June 2025.

Implications for the workforce

Engaging with Māori and Pacific peoples would be highly beneficial to building a sustainable pipeline of workers, especially as both sectors face ageing demographics and skill shortages.

Targeted strategies to attract and retain Māori and Pacific workers, through training, career pathways, and inclusive practices, will help maintain capability and resilience. Without action, declining Pacific participation and retention challenges for Māori in logistics risk reducing diversity and limiting future workforce capacity.

Automotive workforce ethnicity profile, annual average June 2023 to June 2025

# employed	2020	% of total	2023	% of total	2025	% of total	% change 2020 to 2025
Māori	7,900	12.4%	7,000	12.4%	10,600	16.9%	34.2%
Pacific	2,500	3.9%	1,400	2.5%	1,900	3.0%	-24.0%
Other	53,400	83.7%	48,200	85.2%	50,100	80.0%	-6.2%
Total	63,800		56,600		62,600		-1.9%

Source: Stats NZ HLFS estimates, Suppressed data is not displayed ; Figures are rounded to the nearest 100

Logistics workforce ethnicity profile, annual average June 2020 to June 2025

# employed	2020	% of total	2023	% of total	2025	% of total	% change 2020 to 2025
Māori	23,700	19.0%	21,400	16.1%	20,100	16.3%	-15.2%
Pacific	10,400	8.3%	12,600	9.5%	12,000	9.7%	15.4%
Other	90,700	72.7%	98,700	74.4%	91,400	74.0%	0.8%
Total	124,800		132,700		123,500		-1.0%

Source: Stats NZ HLFS estimates, Suppressed data is not displayed ; Figures are rounded to the nearest 100

Gender and disability representation

Women make up about 51% of New Zealand's adult population (15+) in 2025, yet remain underrepresented in both sectors.

In automotive, male employment increased slightly from 44,667 in 2016 to 51,350 in 2025, while female employment changed from 11,367 to 11,900, showing minimal progress and leaving men at over 80% of the workforce.

In logistics, male employment grew from 74,933 to 92,300, while female employment increased from 27,333 to 32,750, showing steady progress but leaving men at nearly three-quarters of the workforce.

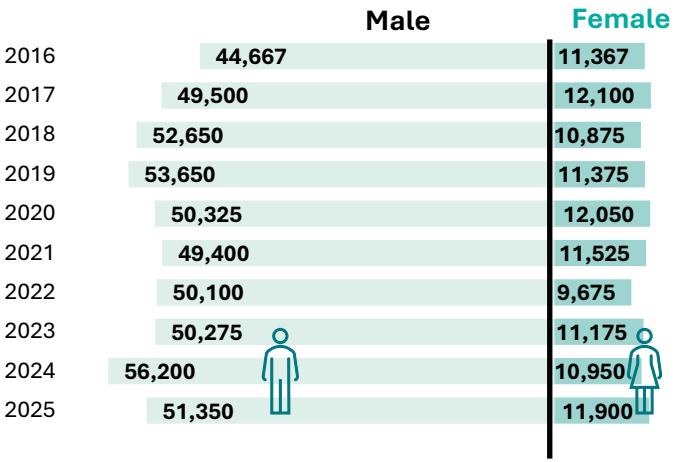
Around 18% of adults identify as disabled, yet representation remains very low. In automotive, disabled workers made up 3.5% of the workforce (1,569 employees) in 2018, rising to 4.5% (1,953 employees) in 2023. In logistics, representation increased from 3.9% (3,168 employees) to 4.4% (3,606 employees) over the same period. These figures highlight persistent barriers to inclusion in sectors where physical and technical demands remain high.

Implications for the workforce

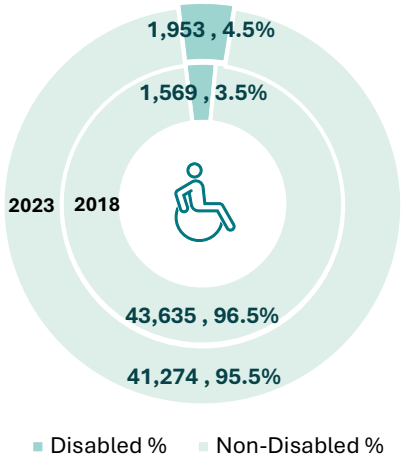
These patterns highlight opportunities for inclusive strategies. For gender equity, initiatives should focus on attracting women into technical and leadership roles through flexible work arrangements, mentorship, and career pathways.

For disabled workers, investment in accessible technologies, adaptive equipment, and inclusive recruitment practices should be explored. Collaboration between industry and vocational education providers will be important to ensure training systems support participation and progression for underrepresented groups.

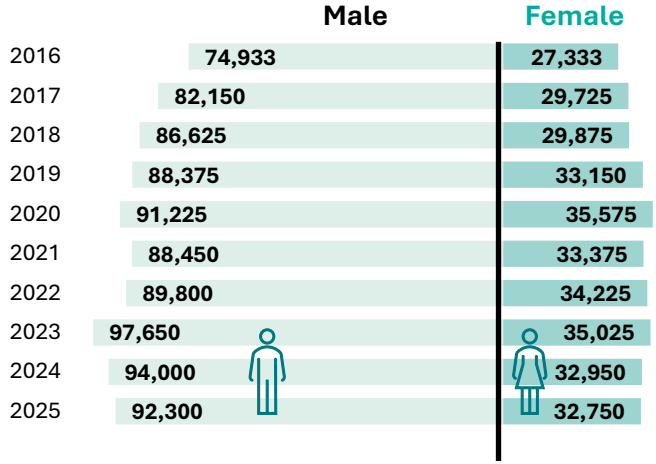
Automotive gender composition



Disabled people in automotive - employee counts, % share

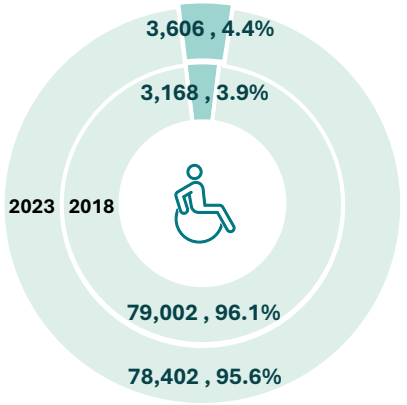


Logistics gender composition



Source: Stats NZ HLFS estimates, Deloitte Access Economics, Suppressed data is not displayed

Disabled people in logistics - employee counts, % share



Source: Stats NZ, Deloitte Access Economics

05 Ō Tātou Pōari Pūkenga | Our Skills Boards

Automotive, Transport and Logistics ISB

Automotive workforce gap

The automotive workforce gap is forecast to grow to nearly 5,000 by 2030.

Workforce gap in automotive

The automotive sector faces a widening workforce gap when measured against demand. Supply is projected to remain relatively flat, increasing slightly from 62,477 in 2026 to 62,658 in 2030, while demand rises from 65,302 in 2026 to 67,466 in 2030. This creates a gap that grows from 2,825 in 2026 to 4,807 in 2030, an increase of 70% over five years.

The widening gap in automotive is likely driven by an ageing workforce with many nearing retirement, fewer young entrants, shifting career preferences toward technology and service sectors, skill mismatches due to rapid adoption of electric vehicle technologies and automation, and slower population growth combined with reduced migration inflows influencing the labour pool.

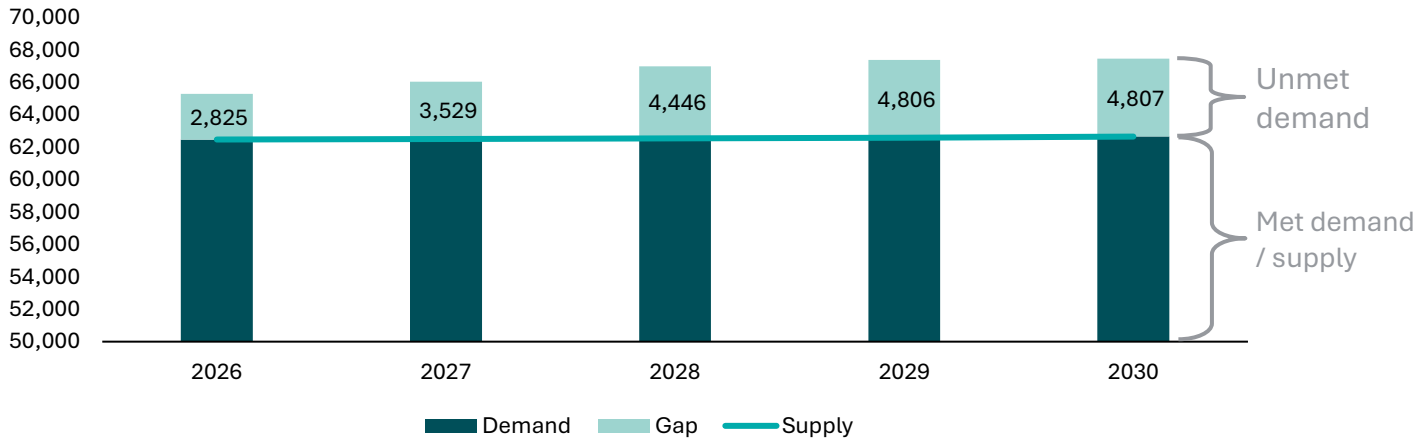
Implications for the automotive sector

- Persistent shortages could constrain innovation and servicing capacity if investment in technology and workforce development are not balanced well.
- Increased reliance on automation and digital diagnostics may be beneficial to offset labour gaps.
- Competition for skilled technicians will intensify, potentially driving wage pressures and retention challenges.
- Diversity strategies, including attracting Māori and Pacific workers, could provide an opportunity to close gaps and strengthen resilience.

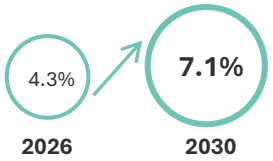
Implications for VET

- Training capacity should expand to meet demand for advanced automotive and EV technology skills.
- Stronger alignment between education providers and industry is needed to ensure graduates are job ready.
- Targeted programmes for underrepresented groups (Māori, Pacific, women) can help build a sustainable talent pipeline.
- Upskilling and reskilling initiatives for existing workers will be necessary to adapt to technology driven roles.

Workforce Gap (Number of employees)



Gap (% of demand)



Source: Stats NZ, Deloitte Access Economics
** The forecasted workforce gap is presented such that it displays both the met and unmet demand if there is a positive workforce gap, and met and unmet supply otherwise.*

Logistics workforce gap

The logistics workforce gap is forecast to grow to nearly 19,000 by 2030.

Workforce gap in logistics

The logistics sector faces a widening workforce gap when measured against demand. Supply is projected to increase modestly from 132,141 in 2026 to 139,467 in 2030, while demand rises from 137,183 in 2026 to 158,332 in 2030. This creates a gap that grows from 5,042 in 2026 to 18,865 in 2030, an increase of 274% over five years.

The widening gap in logistics is likely driven by an ageing workforce with many nearing retirement, fewer young entrants, shifting career preferences toward technology and service sectors, skill mismatches due to automation and digital supply chain technologies, and slower population growth combined with reduced migration inflows influencing the labour pool.

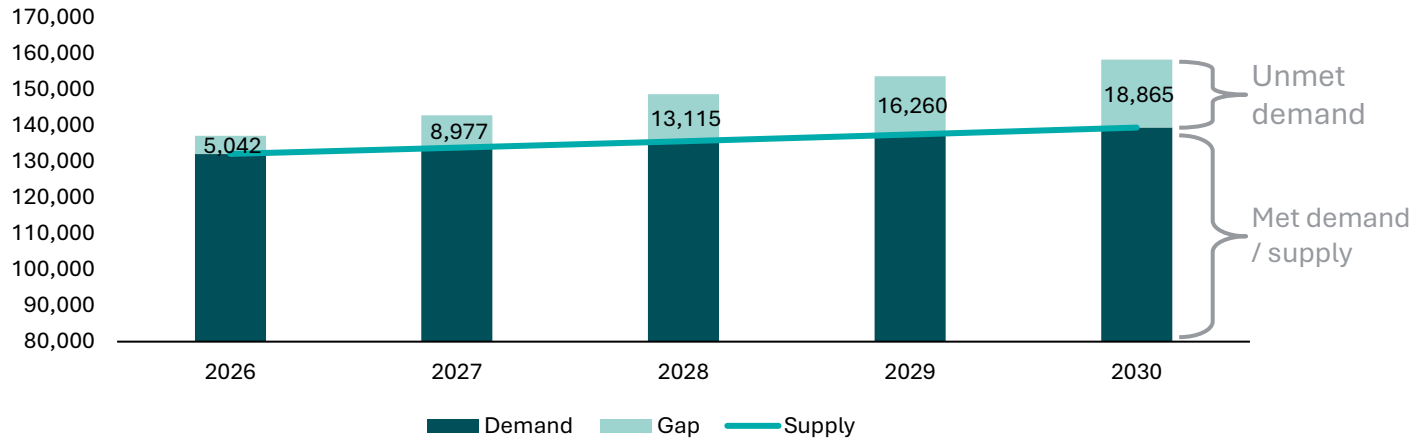
Implications for the logistics sector

- Persistent shortages could constrain supply chain efficiency and service delivery if investment in technology and workforce development are not balanced well.
- Increased reliance on automation, robotics, and digital platforms may be necessary to offset labour gaps.
- Competition for skilled workers will intensify, potentially driving wage pressures and retention challenges.
- Diversity strategies, including attracting Māori and Pacific workers, could provide an opportunity to close gaps and strengthen resilience.

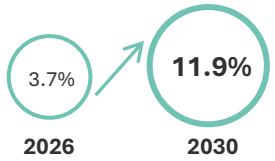
Implications for VET

- Training capacity should expand to meet demand for advanced logistics, warehousing, and digital supply chain skills.
- Stronger alignment between education providers and industry is needed to ensure graduates are job ready.
- Targeted programmes for underrepresented groups (Māori, Pacific, women) can help build a sustainable talent pipeline.
- Upskilling and reskilling initiatives for existing workers will be necessary to adapt to technology driven roles.

Workforce Gap (Number of employees)



Gap (% of demand)



Source: Stats NZ, Deloitte Access Economics
** The forecasted workforce gap is presented such that it displays both the met and unmet demand if there is a positive workforce gap, and met and unmet supply otherwise.*

Automotive and logistics skill levels

The Automotive and Logistics workforces show a shift towards higher skill levels

Skill composition of the automotive workforce

From 2013 to 2023, the automotive sector shows a gradual shift toward higher skill levels.

- Level 1 roles increased from 18% to 23%, reflecting growing demand for technical expertise in areas such as diagnostics and electric vehicle systems.
- Level 2 roles have a light shift from 10% to 11%.
- Level 3 roles remain dominant but declined slightly from 37% to 36%.
- Level 4 roles dropped from 21% to 19%.
- Level 5 roles rose from 12% to 11%, indicating that low skill positions still exist but are shrinking.

This trend suggests the sector is moving toward more specialised roles as technology adoption accelerates.

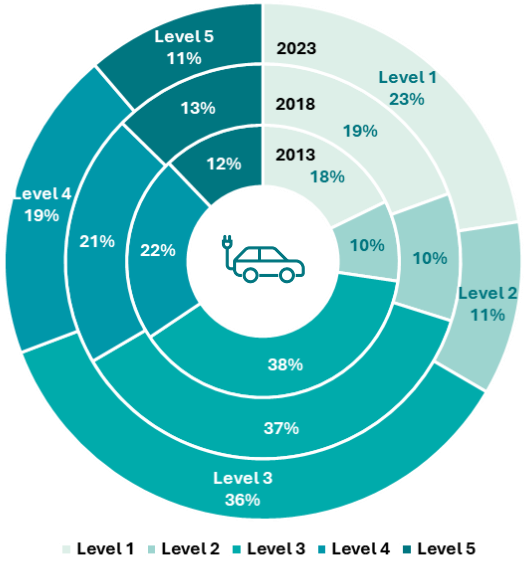
Skill composition of the logistics workforce

The logistics sector remains heavily weighted toward mid skilled roles.

- Level 1 roles increased from 18% to 23%, driven by the need for supply chain planning and digital systems expertise.
- Levels 2 and 3 remain small at 8% and 5%.
- Level 4 roles dominate at 51% in 2023, though down from 55% in 2013, showing a slight shift toward higher skill levels.
- Level 5 roles declined from 20% to 13%, reflecting reduced reliance on low skill manual tasks.

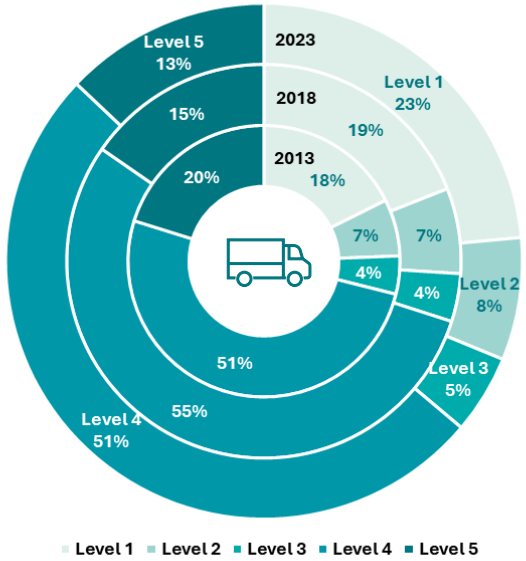
Overall, logistics is evolving slowly, but the rise in Level 1 roles signals growing complexity in supply chain operations.

Automotive
% share of employees by skill level (2013 to 2023)



Source: Stats NZ, Deloitte Access Economics

Logistics
% share of employees by skill level (2013 to 2023)



Source: Stats NZ, Deloitte Access Economics

Skill levels by ethnicity in automotive and logistics

Both automotive and logistics show contrasting patterns in skill distribution, with automotive trending toward higher skill roles and logistics remaining heavily weighted toward mid and lower skill positions.

n **automotive**, Māori representation in Skill Levels 1–3 rises from 55% in 2020 to 71% in 2025, indicating strong upward mobility. Pacific workers show a decline in higher skill roles, dropping from 63% to 52%, while lower skill roles increase to 48%. Other ethnicities remain stable, with 66% in higher skill roles and 34% in lower skill positions, reflecting consistent access to advanced roles.

In **logistics**, mid and lower skill roles dominate across all ethnic groups. Māori improve modestly, with higher skill roles increasing from 16% to 24%, but Skill Level 4 remains high at 60% and Skill Level 5 at 17%. Pacific workers follow a similar pattern, rising from 13% to 23% in higher skill roles, yet still concentrated in Skill Level 4 (52%) and Skill Level 5 (25%). Other ethnicities hold the strongest presence in higher skill roles at 36%, but still have 53% in Skill Level 4, showing limited movement toward top skill levels.

Overall, Māori show significant progress in automotive and modest gains in logistics, while Pacific workers remain disproportionately concentrated in lower skill roles, particularly in logistics. Other ethnicities continue to dominate higher skill positions in both sectors.

Implications for VET

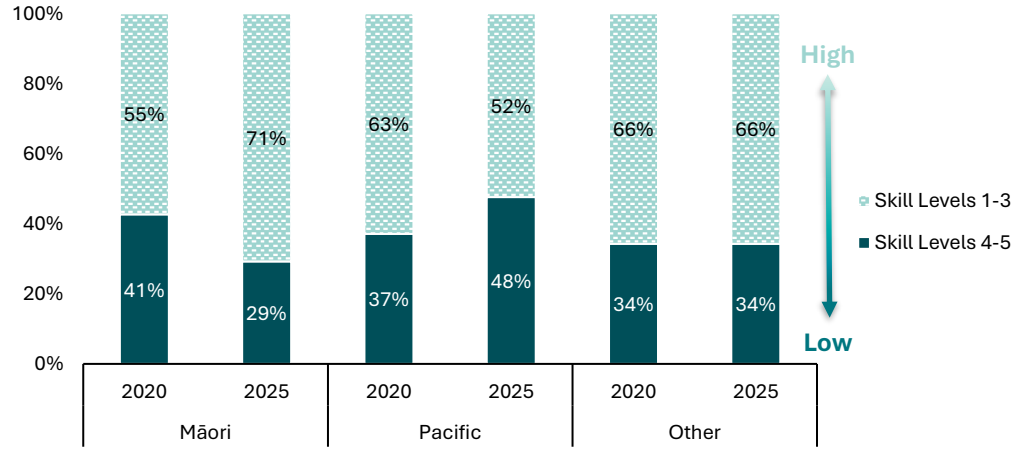
Automotive requires targeted pathways for Pacific learners to prevent further concentration in lower skill roles, alongside continued support for Māori advancement.

Logistics needs strategies to lift all groups into higher skill roles. It could include modular training and work-based learning focused on digital and supply chain technologies.

Across both sectors, strengthening foundational literacy and numeracy remains important to enable progression into advanced technical and digital roles.

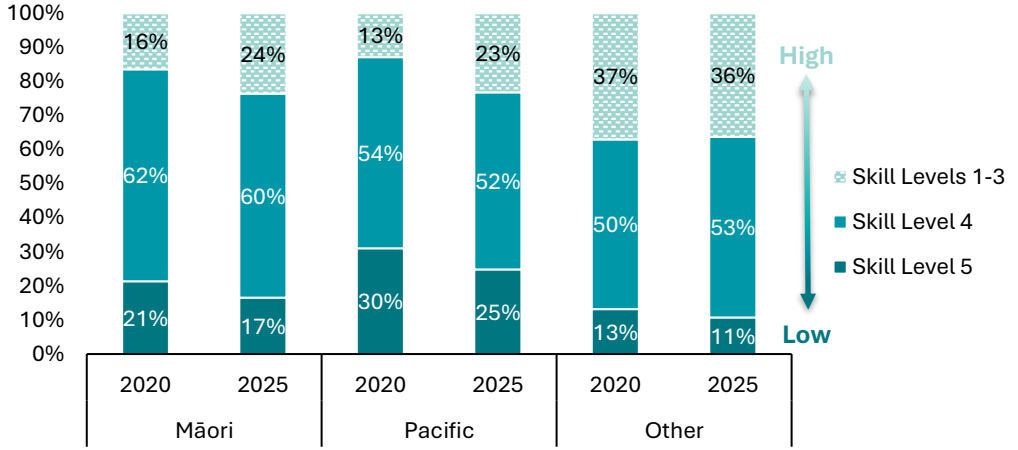
Embedding transferable skills such as problem solving, adaptability, and communication into all qualifications will support career mobility and resilience.

Automotive skills level by ethnicity



Source: Stats NZ HLFS estimates, Suppressed data is not displayed

Logistics skills level by ethnicity



Source: Stats NZ HLFS estimates, Suppressed data is not displayed

Bridging workforce gaps and future skills needs

To prepare for the future, it is essential to identify the skills that matter today, those that are emerging, and those that will be critical by 2030.

Source: Emagnetic - stock.adobe.com, New Zealand Post trucks

Building skills today creates choices tomorrow. Neglect it, and we leave our future to chance.

Understanding current and emerging skills for 2030

Understanding the current workforce profile and its gaps is only the starting point. To prepare for the future, it is essential to identify the skills that matter today, those that are emerging, and those that will be critical by 2030. Global experience offers valuable lessons, particularly through the World Economic Forum's Future of Jobs Report 2025 and other international studies. These insights highlight how technological disruption, automation, and sustainability imperatives are reshaping skill requirements across industries worldwide.

Applying these findings to the New Zealand context is vital. By mapping Hanga-Aro-Rau sectors to WEF's studied industries, we can leverage global foresight to inform local strategies. This alignment enables us to anticipate future skill demands, design responsive vocational pathways, and ensure our workforce remains competitive and inclusive.

Indicative alignment of Hanga-Aro-Rau sectors with WEF Industries

Hanga-Aro-Rau sector	WEF industry
Automotive	Automotive and Aerospace
Logistics	Supply Chain and Transportation

Understanding these skills is not just important, it is strategic. It underpins workforce resilience, supports innovation, and ensures that learners and employers are equipped for a rapidly changing operating environment. The next section explores current critical skills, emerging capabilities, and those projected to be most important by 2030, providing a starting point for action.

Shifting skill priorities for automotive

The core enduring skills that are important now and expected to remain highly important in the future for Automotive include AI and big data, technological literacy, resilience, flexibility and agility; analytical thinking, and creative thinking.

Skills outlook for automotive

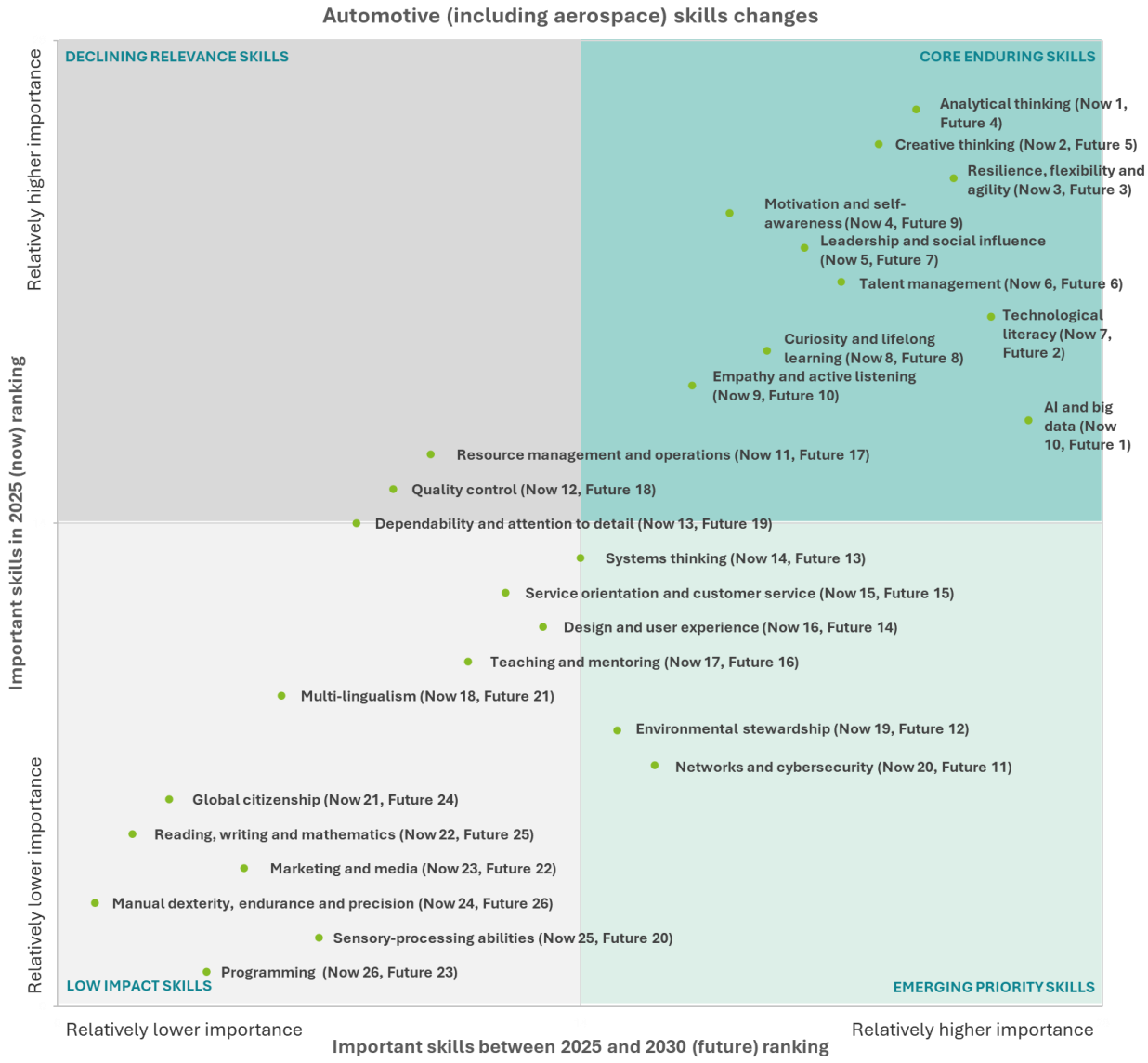
The automotive and aerospace sectors are entering a period of accelerated transformation, driven by digitalisation, automation, and sustainability imperatives.

Core enduring skills (top-right), are those that enable strategic thinking, creativity, and resilience, will remain essential for navigating complexity and fostering innovation. These capabilities will underpin leadership and adaptability as technologies reshape production and design.

At the same time, **emerging priority skills (bottom-right)**, signal a decisive shift toward data centric and environmentally responsible operations. Expertise in advanced technologies, connectivity, and sustainability will be critical for organisations seeking to maintain competitiveness and meet evolving regulatory and market demands.

Conversely, **low impact skills (bottom-left)**, Conversely, low impact skills (bottom-left), which are largely manual or routine, are losing strategic relevance globally as automation and smart systems replace repetitive tasks. However, these skills remain highly significant in the New Zealand context, where there is an ongoing focus on strengthening literacy and numeracy (reading, writing and mathematics) capabilities.

The next analysis will explore how these changes are reshaping roles and what this means for capability development across the sector.



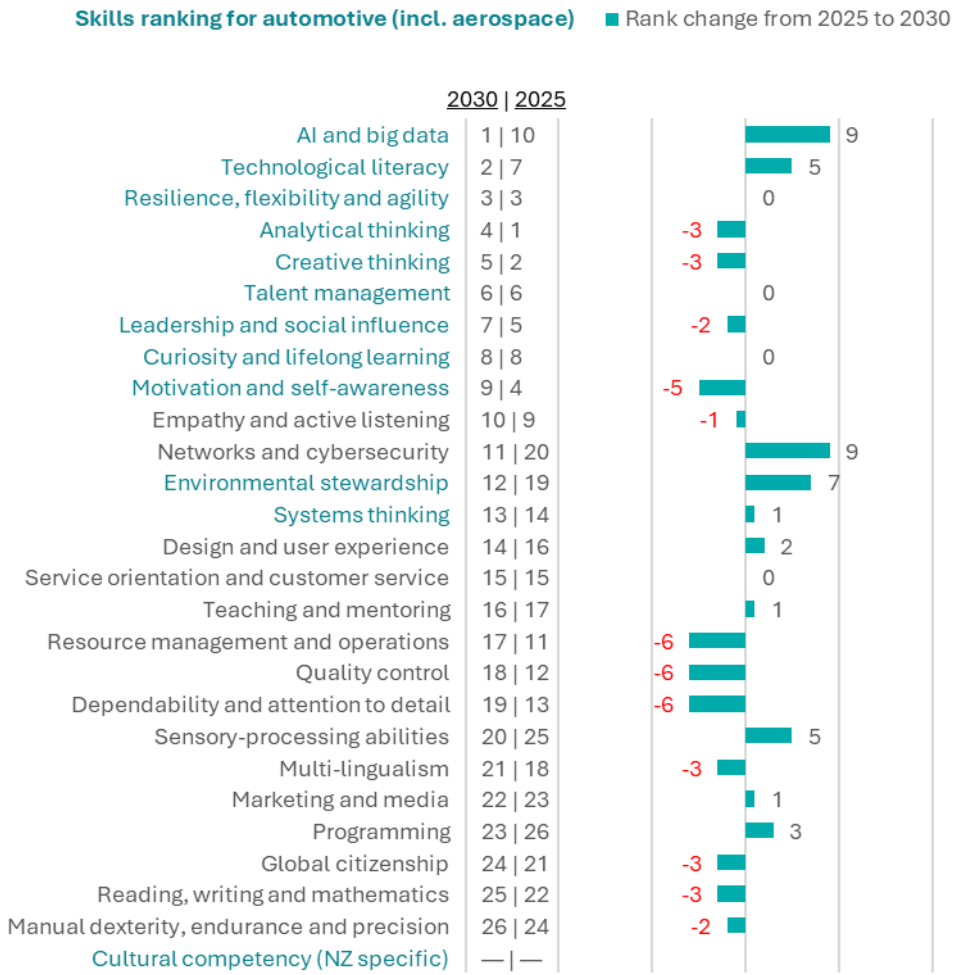
Source: WEF, Deloitte analysis

Skills changes for automotive

Building on these trends, the automotive sector is undergoing significant transformation driven by digitalisation, electrification, and sustainability. By 2030, demand will shift toward AI and big data, technological literacy, and networks and cybersecurity, alongside enduring capabilities such as resilience, flexibility and agility.

While globally declining, manual dexterity and routine cognitive skills remain critical foundations in New Zealand. Interpreting technical documentation, data and compliance standards all require strong reading, writing, and mathematics skills. These capabilities underpin advanced technical and digital competencies, ensuring workers can progress into higher-order roles. Low impact skills will continue to play niche roles in specialised contexts but will not drive major industry transformation.

The following chart illustrates the top skills shaping this transition, showing which capabilities are most in demand today, which are expected to grow fastest by 2030, and which are losing importance relatively. This snapshot provides a starting point for workforce planning, vocational education design, and organisational strategies to ensure readiness for the future of work.



Source: WEF, Deloitte analysis

Shifting skill priorities for logistics

The core enduring skills that are important now and expected to remain highly important in the future for Logistics include analytical thinking, AI and big data, technological literacy, resilience, flexibility and agility; and creative thinking.

Skills outlook for logistics

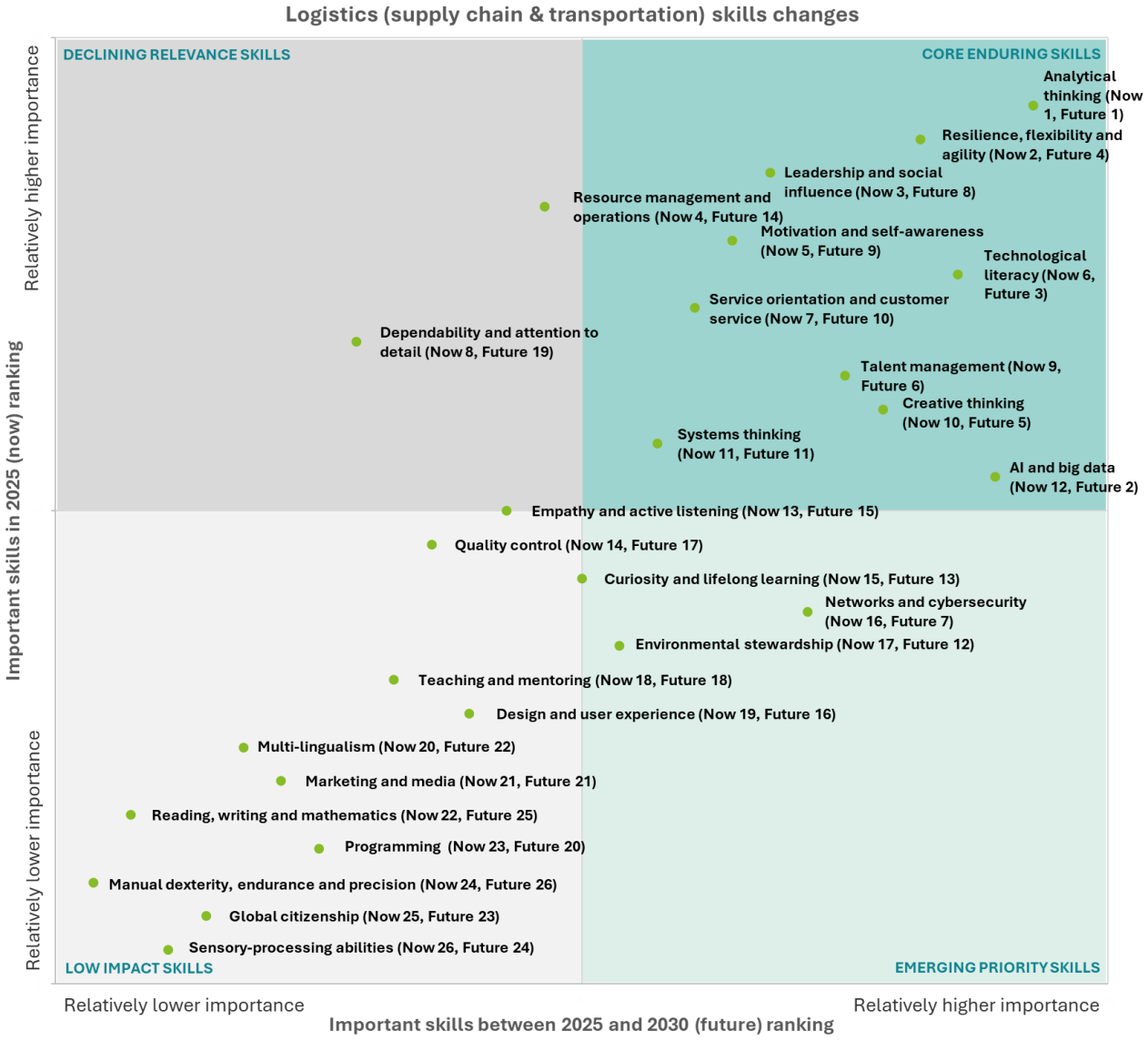
The logistics sector is undergoing significant transformation, shaped by automation, digitalisation, and sustainability imperatives.

Core enduring skills (top-right), are those that enable adaptability, problem solving, and leadership, will remain critical for managing complexity and driving innovation across global supply chains. These capabilities will support resilience and agility as organisations respond to technological disruption and evolving customer expectations.

At the same time, **emerging priority skills (bottom-right)**, point to a future where data driven decision making and advanced connectivity dominate. Expertise in areas such as digital systems, cybersecurity, and environmental stewardship will be essential for building smarter, more sustainable logistics networks.

Conversely, **low impact skills (bottom-left)**, which are primarily manual or routine, are losing strategic relevance as automation and smart technologies streamline repetitive tasks. While these skills will not disappear entirely, their diminishing relative importance globally contrasts with New Zealand's continued focus on strengthening foundational literacy and numeracy to support workforce participation and adaptability.

The next analysis will explore how these changes are reshaping roles and what this means for capability development across the sector.



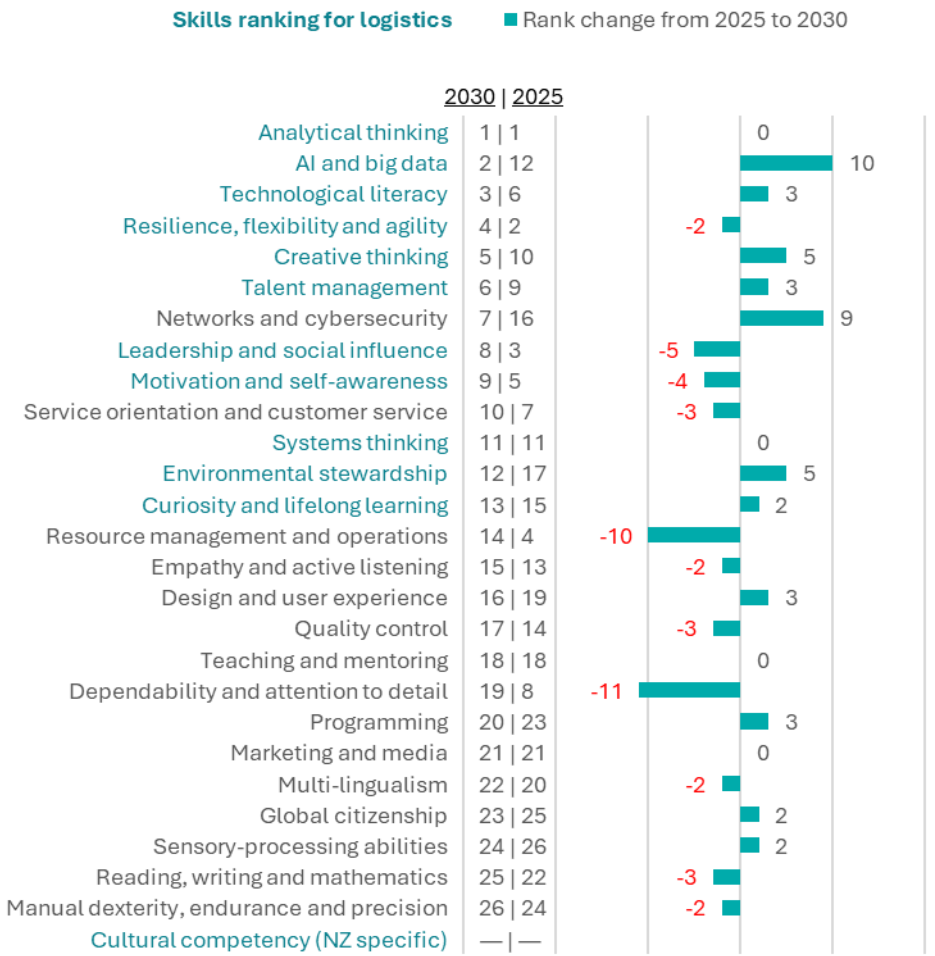
Source: WEF, Deloitte analysis

Skills changes for logistics

Building on these trends, the logistics sector is entering a period of accelerated skill transformation driven by automation, digital platforms, and sustainability. By 2030, demand will shift toward AI and big data, technological literacy, and networks and cybersecurity, alongside enduring capabilities such as analytical thinking, resilience, and creative thinking. Skills including systems thinking, and talent management will also gain importance as supply chains become more integrated and data driven.

In contrast, resource management and operations, dependability and attention to detail, and quality control will decline relatively as digital systems and predictive analytics replace manual coordination and repetitive tasks. While reading, writing and mathematics remain foundational for New Zealand and for interpreting technical documentation, data and compliance standards, they are considered base skill requirements.

The following chart illustrates the top skills shaping this transition, showing which capabilities are most in demand today, which are expected to grow fastest by 2030, and which are losing importance relatively. This snapshot provides a starting point for workforce planning, vocational education design, and organisational strategies to ensure readiness for the future of work.



Source: WEF, Deloitte analysis

Shared priorities shaping these sectors

Automotive and logistics share a strong emphasis on transferable skills such as analytical thinking, adaptability, technological literacy, and leadership. Both sectors highlight emerging capabilities including AI and big data, networks and cybersecurity, and environmental stewardship, reflecting the growing importance of digital integration and sustainability imperatives.

While globally declining, manual dexterity and routine cognitive skills remain critical foundations in New Zealand's automotive and logistics sectors. In automotive, tasks such as precision component assembly, wiring harness installation, and accurate calibration of diagnostic equipment require strong attention to detail and practical skills. In logistics, these foundations support accurate load planning, inventory checks, and compliance with transport documentation. Reading, writing, and numeracy skills are essential for interpreting service manuals, safety regulations, and digital tracking systems. These capabilities underpin advanced technical and digital competencies, enabling workers to progress into higher-order roles such as EV systems diagnostics, telematics integration, and data-driven supply chain optimisation.

These findings align with Hanga-Aro-Rau *Post COVID-19 Workforce Development* report, which problem solving, adaptability, and communication. Embedding these skills into VET strategies is essential for building resilience and supporting career mobility in rapidly evolving industries.

These trends highlight the need for lifelong learning, micro-credentials, and flexible pathways to prepare workers for future demands.

Implications for organisations and employers

Employers in automotive and logistics should foster a culture of continuous learning to keep pace with automation, AI, and sustainability requirements. Workforce planning should identify roles most affected by skill shifts and create clear transition pathways for employees. Leadership development is critical to equip managers for guiding teams through changes such as robotics adoption or digital supply chain platforms. Structured onboarding for new digital tools and systems will ensure smooth adoption. Offering career mobility opportunities linked to skill development will help retain talent and build resilience.

Implications for SMEs

SMEs face resource constraints, making access to affordable training a priority. Partnerships with vocational education providers and participation in industry led programs can help reduce cost barriers. Shared training hubs or regional clusters offer practical solutions for accessing advanced technologies such as automated warehousing or AI-driven logistics forecasting tools. SMEs should prioritise core and transferable skills to ensure staff can adapt to multiple roles as business needs change. Digital readiness is essential, starting with scalable technology solutions and training employees to use them effectively. Building basic sustainability knowledge into workforce training will help SMEs meet regulatory expectations and align with market trends.

Implications for the VET sector

Vocational education providers need to embed digital and sustainability skills into core programs. AI and big data, and analytical thinking should become standard components of training for the relevant qualifications.

At the same time, strong foundations in reading, writing, and mathematics remain essential because they underpin advanced technical and digital skills. In automotive, these capabilities support accurate interpretation of technical manuals, diagnostics, and compliance with safety standards. In logistics, they enable understanding of automated system instructions, inventory documentation, and sustainability reporting. Without these basics, workers struggle to transition into roles requiring problem solving, data analysis, or operating digital systems.

Flexible learning pathways such as micro-credentials and modular courses will allow rapid upskilling as technologies evolve. Collaboration with employers is critical to ensure programs reflect real world processes including robotics integration and digital supply chain systems. Transferable skills such as problem solving, adaptability, and communication should be woven into all qualifications to prepare learners for dynamic roles across these sectors.

Implications for industry bodies and other key stakeholders

Industry bodies and stakeholders should lead strategic coordination to align training priorities with future skill needs. This includes developing national frameworks for digital and sustainability competencies, supporting industry-wide micro-credential standards, and promoting inclusive workforce strategies to engage Māori, Pacific peoples, and women. Stakeholders can also facilitate shared investment in technology enabled training hubs, ensuring SMEs and regional employers have access to advanced learning resources. Advocacy for policy incentives and funding to accelerate workforce transformation will be critical, alongside initiatives that strengthen collaboration between employers, education providers, and government agencies.

Automotive, Transport and Logistics ISB

Drawing insights from occupation trends

Source: Gudellaphoto - stock.adobe.com, Northern Explorer train, New Zealand

Skill levels tell us what capabilities are growing or declining, but they do not show where these changes are happening in the real world of work. Occupation data provides that missing link. It reveals how shifts in technology, automation, and sustainability priorities are reshaping the actual roles people hold and whether the move toward higher skill levels is translating into new opportunities or displacing traditional jobs.

By examining occupation data alongside skill composition, we can see the practical impact of digital transformation:

- which roles are disappearing
- which are evolving
- which are emerging as critical for the future.

This perspective helps validate assumptions drawn from skill trends and highlights unexpected changes such as the rise of service oriented roles in advanced manufacturing or the decline of traditional trades despite demand for technical expertise.

Understanding these patterns is critical for workforce planning and vocational education strategies. It ensures training systems not only teach the right skills but also prepare learners for roles that will exist tomorrow. These roles increasingly combine technical proficiency with adaptability, compliance, and customer engagement, making occupation trend analysis a valuable component of this research.

Occupation data doesn't just track change.
It reveals the pathways to growth, innovation, and inclusive career.

Automotive workforce overview

Roles associated with low skilled tasks have contracted sharply. Conversely, occupations requiring higher order capabilities have grown.

Automotive occupation type trends

The occupation type data, defined using ANZSCO level 3, below provides an alternate way to test the observation and assumptions drawn from skill trends and skill level composition. Automotive employment grew from 42,195 in 2013 to 54,159 in 2018, an increase of 28.4%, but then fell to 49,908 in 2023, a decline of 7.8%. This reversal suggests that while automation and digital technologies are reshaping roles, overall workforce demand has softened after earlier expansion. The distribution of roles, however, reveals structural changes consistent with the skills outlook.

Roles linked to manual and routine tasks have declined. Labourers fell by 22% in numbers since 2018, and Sales Workers dropped by 19.6%, reflecting reduced reliance on repetitive tasks and traditional retail functions as automation and digital platforms expand. Technicians and Trades Workers, historically dominant in this sector, decreased by 9.1% since 2018, despite being associated with mid skilled technical expertise. This aligns with the skill composition analysis showing a gradual shift from level 3 and level 4 roles toward higher skill positions in New Zealand.

Conversely, occupations requiring advanced capabilities have grown. Professionals surged by 33.8% since 2018, and Community and Personal Service Workers rose by 47.5%, indicating increased demand for specialised technical knowledge and customer focused roles potentially in connected and electric vehicle services. Machinery Operators and Drivers also grew by 13.9%, suggesting that while automation is advancing, operational roles remain essential for complex and potentially niche manufacturing processes.

In line with assumptions:

- Decline in labourers and traditional retail roles supports the forecast that manual and routine skills are losing relevance.

Growth in professionals aligns with the shift toward knowledge intensive roles requiring digital and analytical capabilities.

Not fully in line:

- Technicians and trades workers declined despite expectations for advanced technical skills, indicating that traditional trade roles could be being replaced by emerging tech rather than expanded.
- Significant rise in community and personal service roles was not highlighted in the skills outlook, suggesting emerging priorities in customer experience and after-sales.

This evidence confirms the overall direction toward digital and sustainability focused roles but highlights that operational and service functions remain critical. Workforce planning and vocational education strategies should address these nuances by combining advanced technical training with customer engagement and compliance skills.

Automotive – share of number of employee by occupation type

Occupation type	2013	2018	2023
Technicians and Trades Workers	37.4%	36.3%	35.8%
Managers	18.1%	18.1%	18.6%
Sales Workers	15.1%	15.0%	13.1%
Clerical and Administrative Workers	13.0%	11.6%	11.7%
Labourers	9.3%	10.1%	8.5%
Professionals	3.3%	4.7%	6.8%
Machinery Operators and Drivers	3.2%	3.7%	4.6%
Community and Personal Service Workers	0.5%	0.6%	0.9%
All occupations combined	**100.0%**	**100.0%**	**100.0%**

Automotive – number of employee by occupation type and % changes

Occupation type	2013	2018	2023	2013 to 2018	2018 to 2023
Technicians and Trades Workers	15,798	19,662	17,877	24.5%	-9.1%
Managers	7,635	9,801	9,264	28.4%	-5.5%
Sales Workers	6,384	8,112	6,519	27.1%	-19.6%
Clerical and Administrative Workers	5,469	6,261	5,850	14.5%	-6.6%
Labourers	3,927	5,460	4,260	39.0%	-22.0%
Professionals	1,374	2,544	3,405	85.2%	33.8%
Machinery Operators and Drivers	1,362	2,004	2,283	47.1%	13.9%
Community and Personal Service Workers	210	303	447	44.3%	47.5%
All occupations combined	**42,195**	**54,159**	**49,908**	**28.4%**	**-7.8%**

*Source: Stats NZ; * Suppressed counts have not been included in the individual sector counts; Figures are rounded to the nearest 3; Total has been summed independently to the sector sums to minimise suppression*

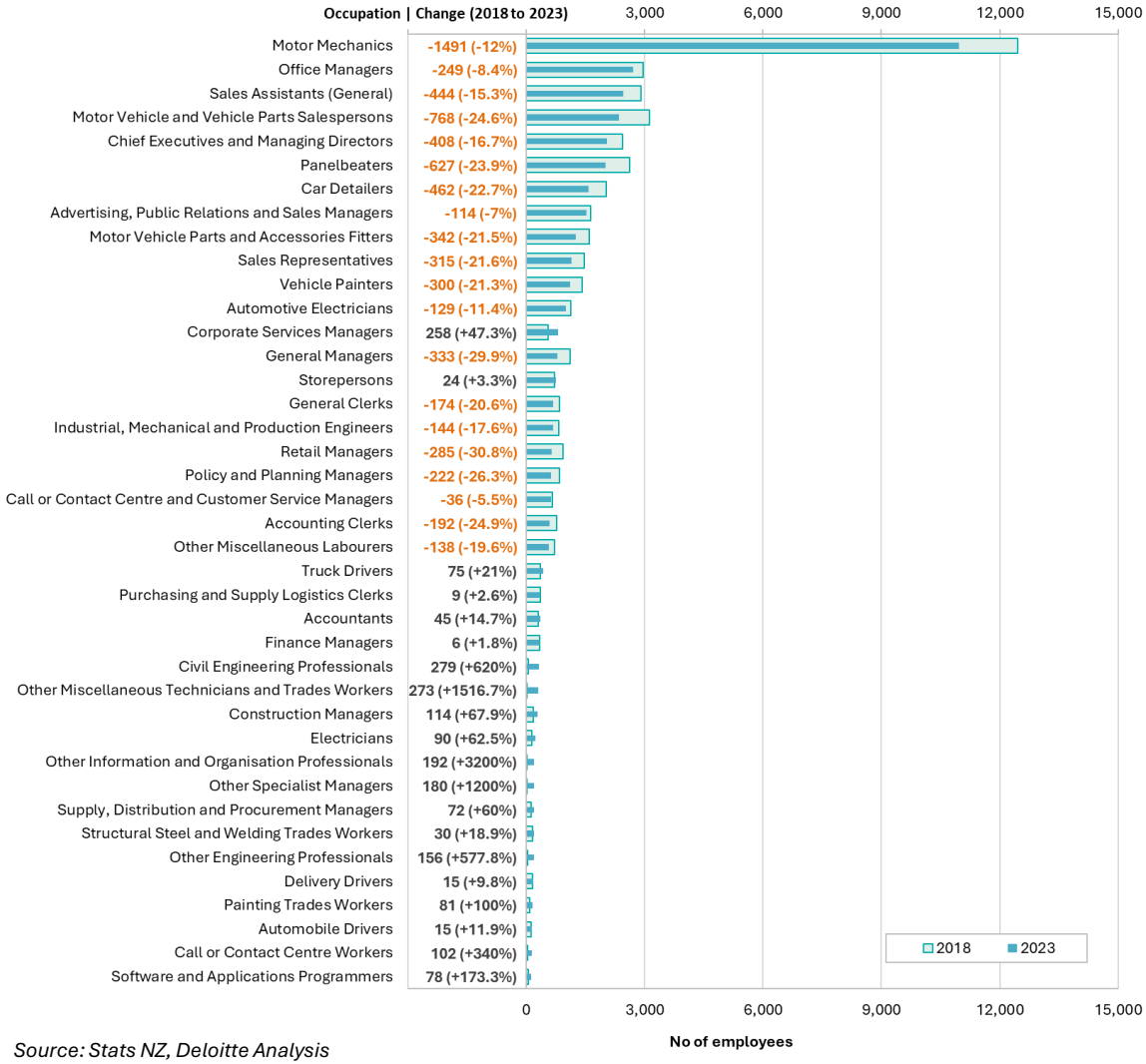
Occupational shifts in the automotive sector

Between 2018 and 2023, the automotive sector saw a clear transition from mid skilled, high volume roles to specialised, higher-skill positions. Traditional occupations such as Motor Mechanics (-12.6%) and Automotive Electricians (-11.4%), both typically level 3 or level 4, declined alongside retail-related roles such as Sales Assistants (-4.8%) and Vehicle Parts Salespersons (-24.6%), which sit at level 4 and Level 5. These declines align with the earlier finding that level 3 and level 4 roles dropped from 37% and 21% in 2013 to 36% and 19% in 2023, reflecting reduced reliance on manual servicing and parts handling as automation and EV technology reshape the industry.

Conversely, growth was concentrated in occupations requiring level 1 and level 2 skills. Roles such as Other Information and Organisation Professionals (+1,420%), Other Specialist Managers (+516.7%), and Software and Applications Programmers (+180%) surged, driven by digital systems, data management and electric vehicle technologies. Even technical roles like Architectural, Building and Surveying Technicians (+229.2%, level 2) and Electricians (+91%, level 3) grew, supporting infrastructure and advanced diagnostics. This shift explains why Level 1 roles increased from 18% to 23% over the decade.

There is a clear linkage between occupation trends and skills level trends, with the automotive workforce moving toward higher skill, technology driven roles, while mid and low skilled positions decline. For vocational education, this means prioritising advanced technical training, EV systems and digital capability. Employers and SMEs should plan for reskilling strategies to manage the displacement of level 3 to level 5 roles and secure talent for emerging level 1 and level 2 positions.

Occupations with the largest workforce and notable growth or decline in automotive (2018 to 2023)



Source: Stats NZ, Deloitte Analysis
** The chart includes the top 20 occupations that rank among the top 100 with the highest number of employees and fastest growing roles, as well as the top 20 occupations that rank among the top 100 with the highest number of employees and fastest declining roles within the sector*

Logistics workforce overview

Roles associated with low skilled tasks have contracted sharply. Conversely, occupations requiring higher order capabilities have grown.

Logistics occupation type trends

Logistics employment fell by 5.7% from 2018 to 2023, dropping from 102,237 to 96,459, despite strong growth of 25.8% between 2013 and 2018. This reversal signals a shift in workforce dynamics as automation and digital optimisation begin to reshape the sector. While overall employment remains higher than a decade ago, the distribution of roles shows structural changes aligned with the skills outlook.

Roles associated with manual and routine tasks have declined. Labourers fell by 23.3% since 2018, and Sales Workers dropped by 13.1%, reflecting reduced reliance on repetitive handling and traditional customer facing roles as automated systems and digital platforms expand. Clerical and Administrative Workers also decreased by 8%, aligning with the forecast that routine cognitive skills are losing relevance. These trends correspond with the shrinking share of level 4 and level 5 roles identified in the skill composition analysis.

Conversely, occupations requiring higher order capabilities have grown. Professionals increased by 29.4% since 2018, and Technicians and Trades Workers rose by 32.8%, suggesting rising demand for technical expertise in operations such as automated warehousing and digital supply chain systems. Managers also grew by 4.5%, reinforcing the importance of leadership and systems thinking for managing complex logistics networks. Machinery Operators and Drivers, while declining slightly since 2018, remain a large share of the workforce at 37.8%, indicating that operational roles are still critical despite automation.

In line with assumptions:

- Decline in labourers and clerical roles supports the expectation that manual and routine skills are losing relevance.
- Growth in professionals and technicians aligns with the shift toward technical and digital capabilities.

Not fully in line:

- Overall workforce growth contrasts with predictions of contraction, suggesting technology adoption is complementing rather than replacing labour in some areas.
- Machinery operators remain significant, indicating slower than expected automation in transport and heavy equipment operations.

This evidence confirms the overall direction toward digital and sustainability focused roles but highlights that operational and technical functions remain essential. Workforce planning and vocational education strategies should combine advanced digital training with practical skills for managing automated systems and complex supply chains.

Logistics – share of number of employee by occupation type

Occupation type	2013	2018	2023
Machinery Operators and Drivers	36.3%	40.8%	37.8%
Clerical and Administrative Workers	20.6%	17.7%	17.3%
Managers	12.0%	12.9%	14.2%
Professionals	7.2%	7.4%	10.1%
Labourers	10.0%	8.4%	6.8%
Technicians and Trades Workers	4.1%	3.5%	5.0%
Sales Workers	5.4%	5.1%	4.7%
Community and Personal Service Workers	4.4%	4.3%	4.1%
All occupations combined	**100.0%**	**100.0%**	**100.0%**

Logistics – number of employee by occupation type and % changes

Occupation type	2013	2018	2023	2013 to 2018	2018 to 2023
Machinery Operators and Drivers	29,469	41,685	36,420	41.5%	-12.6%
Clerical and Administrative Workers	16,740	18,096	16,647	8.1%	-8.0%
Managers	9,747	13,140	13,728	34.8%	4.5%
Professionals	5,883	7,563	9,786	28.6%	29.4%
Labourers	8,109	8,580	6,585	5.8%	-23.3%
Technicians and Trades Workers	3,345	3,612	4,797	8.0%	32.8%
Sales Workers	4,362	5,193	4,512	19.1%	-13.1%
Community and Personal Service Workers	3,588	4,350	3,966	21.2%	-8.8%
All occupations combined	**81,255**	**102,237**	**96,459**	**25.8%**	**-5.7%**

*Source: Stats NZ; * Suppressed counts have not been included in the individual sector counts; Figures are rounded to the nearest 3; Total has been summed independently to the sector sums to minimise suppression*

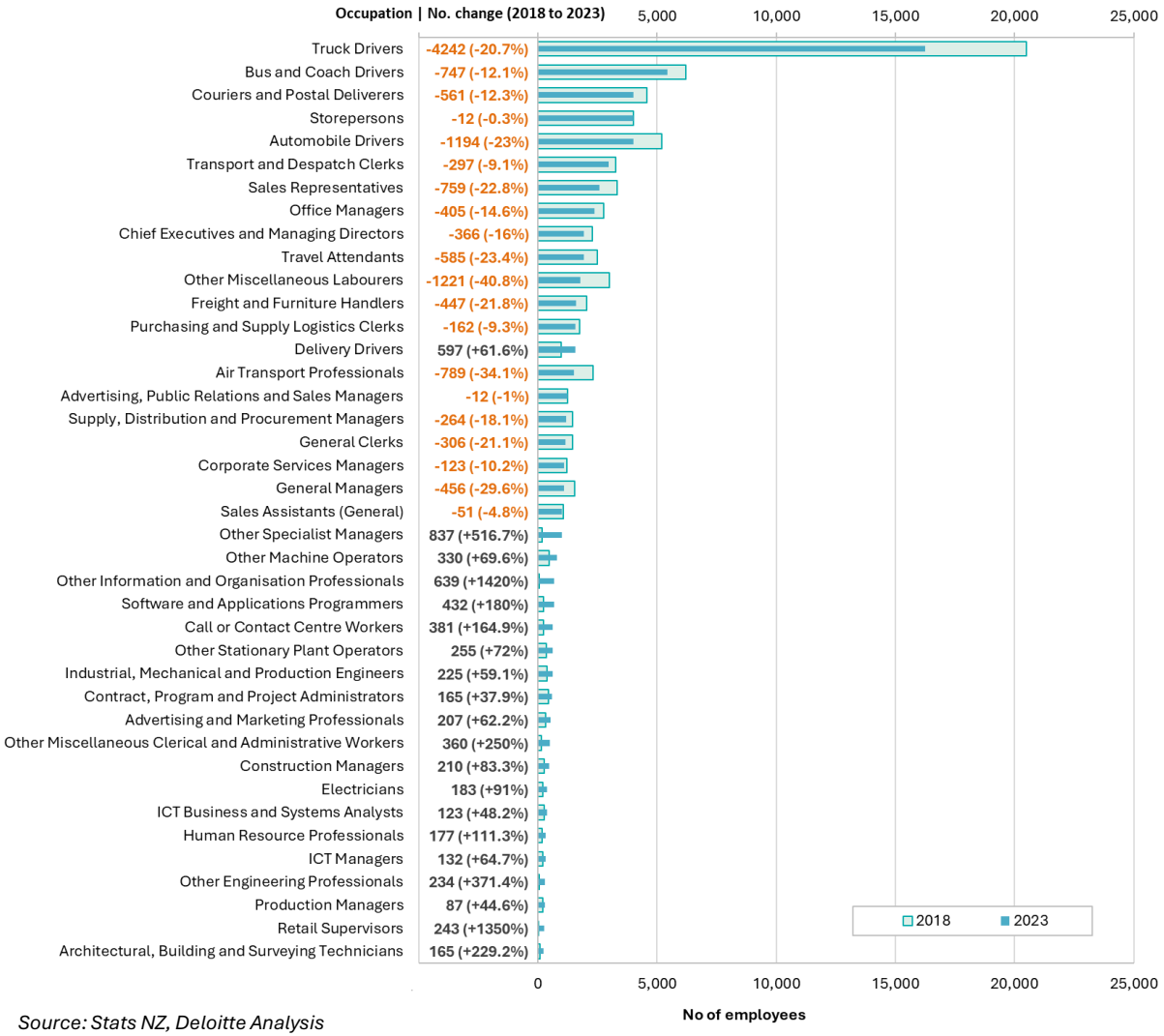
Occupational shifts in the logistics sector

Between 2018 and 2023, the logistics sector experienced significant changes in high volume occupations. The largest declines were in Truck Drivers (-20.7%), General Clerks (-21.1%), and Couriers and Postal Deliverers (-12.3%). These roles are primarily level 4 and level 5, which historically dominated the sector. This aligns with the earlier skill composition analysis showing level 4 roles remain dominant at 51% but have declined from 55%, while Level 5 roles dropped from 20% to 13%. The reduction in these mid and low skilled positions reflects automation, digital supply chain systems, and efficiency driven restructuring.

Conversely, growth occurred in smaller but emerging roles requiring higher skill levels. Occupations such as Other Information and Organisation Professionals (+1,420%, level 1), Other Specialist Managers (+516.7%, level 1), and Software and Applications Programmers (+180%, level 1) surged, driven by the adoption of digital platforms and advanced logistics planning. Even technical roles like Architectural, Building and Surveying Technicians (+229.2%, level 2) and Electricians (+91%, level 3) grew, supporting infrastructure and automation systems. These changes explain why level 1 roles increased from 18% to 23% over the decade.

The linkage between occupation trends and skill level trends is clear. Logistics is shifting from high volume, mid skilled operational roles to specialised, higher skill positions. For vocational education, this means prioritising digital capability, supply chain analytics, and advanced technical training. Employers and SMEs should plan for reskilling strategies to manage the decline of level 4 and level 5 roles and secure talent for emerging level 1 and level 2 positions.

Occupations with the largest workforce and notable growth or decline in logistics (2018 to 2023)



Source: Stats NZ, Deloitte Analysis
** The chart includes the top 20 occupations that rank among the top 100 with the highest number of employees and fastest growing roles, as well as the top 20 occupations that rank among the top 100 with the highest number of employees and fastest declining roles within the sector*

Overall strategic implications

New Zealand's automotive and logistics sectors are experiencing significant structural shifts, shaped by economic trends, workforce demographics, regulatory reform, and rapid technological change.

Automotive has grown steadily but is showing signs of plateauing, with GDP forecast to remain flat through 2035. Logistics, on the other hand, continues to expand, with GDP expected to rise from NZ$13 billion in 2025 to nearly NZ$18 billion by 2035, reflecting its growing role in trade, e-commerce, and supply chain optimisation.

Both sectors face widening workforce gaps. Automotive's shortfall is projected to grow by 70% between 2026 and 2030, while logistics faces a 274% increase over the same period. These gaps are driven by ageing workforces, inconsistent young adult participation, and underrepresentation of Māori, Pacific peoples, women, and disabled individuals.

While automotive is shifting toward higher skill roles in diagnostics, EV servicing, and digital systems, logistics remains weighted toward mid skill operational roles but is gradually evolving toward advanced supply chain and digital capabilities.

Skill composition and occupation data confirm a transition away from manual and routine roles toward specialised, knowledge intensive positions. Emerging skills such as AI and big data, networks and cybersecurity, and technological literacy are gaining prominence, alongside enduring capabilities such as analytical thinking, resilience, flexibility and agility, creative thinking, and talent management. These trends highlight the need for inclusive workforce strategies, lifelong learning, and responsive VET systems.

Implications for organisations and employers

- Organisations should respond proactively to workforce shifts by embedding resilience, flexibility and agility, and inclusive practices into their operational and strategic planning.
- Workforce planning should anticipate skill shifts and identify roles most affected by automation, sustainability imperatives, and digital transformation.
- Leadership development is essential to guide teams through change, particularly in adopting AI, automation, robotics, EV systems, and digital supply chain platforms.
- Curiosity and lifelong learning cultures should be fostered, with structured onboarding for new technologies and clear career mobility pathways.
- Retention strategies for older workers and targeted attraction of younger talent will help maintain workforce continuity.
- Inclusive recruitment practices are beneficial to engage Māori, Pacific peoples, women, and disabled individuals, addressing equity and capability gaps.

Implications for SMEs

- SMEs should find practical and cost effective ways to build workforce capability while navigating resource constraints and rapid technological change.
- Affordable training access is important. SMEs should leverage partnerships with vocational education providers and industry led programmes.
- Shared training hubs and regional clusters could support access to advanced technologies such as automated warehousing and EV diagnostics.
- Digital readiness should be prioritised, starting with scalable solutions and basic digital literacy training.
- Sustainability knowledge should be embedded into workforce development to meet regulatory and market expectations.
- Cross functional skill development will enable staff to adapt to changing business needs and fill multiple roles.

Implications for VET

- Vocational education providers play a central role in equipping learners with the skills needed for future roles, requiring curriculum innovation and stronger industry alignment.
- Curriculum redesign is needed to embed technical and human-centric skills into core programmes, including AI and big data, technological literacy, networks and cybersecurity, along with analytical thinking, resilience, flexibility and agility, creative thinking, and leadership and social influence skills.
- Foundational skills in reading, writing, and mathematics remain essential for interpreting technical documentation and ensuring compliance.
- Flexible learning pathways such as micro-credentials, modular courses, and work-based learning could support rapid upskilling.
- Targeted programmes for underrepresented groups could help build a sustainable and diverse talent pipeline.
- Stronger alignment with industry is required to ensure training reflects real world processes and emerging technologies.

Implications for industry bodies and key stakeholders

- Industry bodies and agencies are required to lead coordinated efforts to shape future workforce strategies and ensure inclusive, future ready systems.
- Strategic coordination is needed to align training priorities with future skill needs across sectors.
- National frameworks for digital and sustainability competencies should be developed to guide education and workforce planning.
- Inclusive workforce strategies should be promoted to engage Māori, Pacific peoples, women and the disabled communities.
- Shared investment in technology enabled training hubs could help ensure equitable access to advanced learning resources.
- Targeted funding and incentives could potentially accelerate workforce transformation and support SMEs and regional employers.
- Occupation trend analysis should be integrated into planning to ensure training prepares learners for roles that will exist in the future.

Implications for learners and employees

- Learners and employees need to be supported to navigate a changing landscape where adaptability, continuous learning, and digital fluency are essential for career progression and job security.
- Curiosity and lifelong learning will be critical, with workers needing access to flexible, modular training that supports upskilling and reskilling.
- Transferable skills such as analytical thinking and creative thinking, along with resilience, flexibility and agility motivation, leadership and social influence, and self-awareness skills will enable mobility across roles and sectors.
- Clear career pathways linked to qualifications and industry needs would help learners make informed choices and progress into higher skill roles.
- Encompassing education and inclusive work ethics will ensure Māori, Pacific peoples, women, and disabled individuals can embrace opportunities and thrive.
- Employees would benefit from structured onboarding and support when adopting new technologies, helping reduce transition stress and improve retention.

Opportunities for the Automotive, Transport and Logistics ISB

The ISB is uniquely positioned to drive strategic workforce development and ensure these sectors remain competitive, inclusive, and future ready. Some forward looking actions to be considered include:

- Develop sector specific skill roadmaps focused on digital transformation, digital supply chain management, automation, compliance, sustainability and global trends, and use these to guide qualification design, micro-credential development, and workforce planning.
- Monitor occupation and skill trends to ensure qualifications remain responsive to emerging technologies, industry and workforce needs.
- Align qualifications with the continued shift towards electric vehicles (EVs), advanced diagnostics, green freight technologies, and digital supply chain systems to ensure relevance and future readiness.
- Design qualifications that enable rapid and stackable learning for new entrants and existing workers, supporting career mobility across automotive, transport, and logistics roles.
- Promote inclusive qualification pathways for Māori, Pacific peoples, women, and disabled individuals, addressing participation and retention challenges through targeted pathways and industry partnerships to facilitate access and progression in technical and leadership roles.
- Address declining Pacific participation and retention challenges for Māori in logistics through targeted qualification pathways and industry partnerships.
- Identify regional qualification pathways and assessment infrastructure to address workforce gaps, particularly in areas with ageing workforces and declining young entrants, and support SMEs to access advanced learning tools and technologies.
- Embed transferable human-centric skills, such as analytical thinking, creative thinking, resilience, flexibility, and agility, into all qualifications to champion curiosity and lifelong learning.
- Embed succession planning, knowledge transfer, mentoring, and leadership development into qualifications to maintain capability and ensure continuity of technical and managerial skills.

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Infrastructure ISB

A closer look at mining and quarrying and oil and gas extraction and wholesaling

There is significant policy attention on the growth of the mining and quarrying, and oil and gas extraction and wholesaling sectors. Regulatory and training changes are reshaping compliance and operational standards while redefining the skills mix, qualifications, and career pathways.

Economic outlook

Mining and quarrying in New Zealand has been in long term decline. After peaking at around NZ$3.5 billion in 2010, the sector has steadily contracted, falling to about NZ$1.6 billion in 2025 in real terms.

In contrast, oil and gas extraction and wholesaling in New Zealand has remained relatively flat for much of the past 25 years, hovering around NZ$1 billion with minor fluctuations.

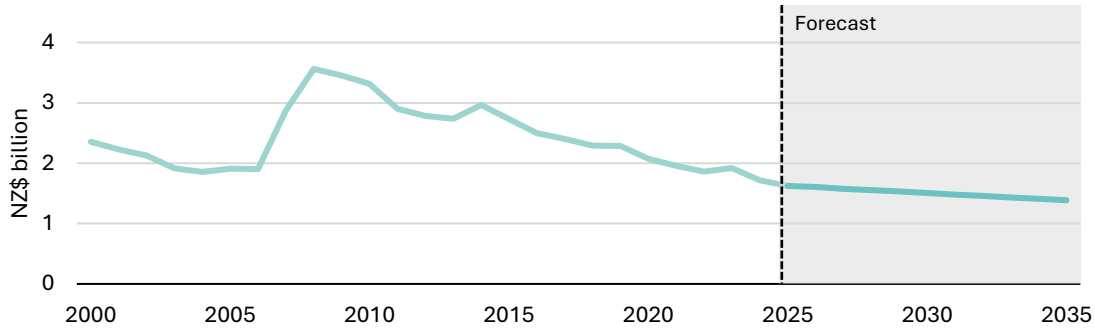
Workforce system changes shaping workforce outlook

System level changes in legislation, training, and regulation are reshaping the workforce. Below are the key system drivers for mining and quarrying, and oil and gas extraction:

Common to both mining and quarrying, and oil and gas extraction

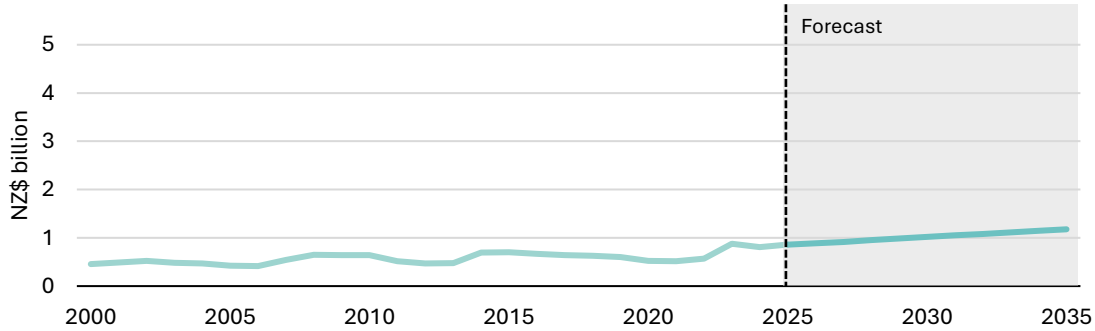
- **Infrastructure ISB (2026) –** Both mining and quarrying, and oil and gas extraction and wholesaling are included in new industry-led boards to align training with evolving needs and sustainability goals.
- **Crown Minerals Amendment Act (2023 and 2025) –** Introduced stronger iwi/hapū consultation requirements and compliance obligations, creating demand for roles in environmental monitoring, community liaison, and regulatory planning.
- **Immigration and workforce reforms (2025) –** Tighter employer compliance and improved protections for migrant workers, affecting recruitment and retention strategies across oil and gas extraction.

Mining and Quarrying GDP



Source: Stats NZ, Deloitte Access Economics

Oil and Gas Extraction and Wholesaling GDP



Source: Stats NZ, Deloitte Access Economics

Note: The sectoral definitions are aligned with those outlined within the Hanga-Aro-Rau legislation, so the GDP figures presented may not align with publicly available GDP figures for sectors under the ANZSIC06 sectoral definition.

Note: Each forecast has been formed using a sector-derived regression equation, and has been projected using Deloitte's in-house Macroeconomic forecasting model DAE-MACRO. The GDP figures presented are in real terms and are in 2009/10 prices.

- **Industry-led energy transition and sustainability focus (2025 onward) –** Workforce planning initiatives encourage upskilling for low carbon technologies and environmental compliance roles.

Mining specific

- **Health and Safety competency regulations (2016, updated 2025) –** Mandatory certifications for site managers and senior executives, raising qualification standards.
- **MBIE's Minerals Strategy for New Zealand to 2040 (2025) –** Outlines the Government's ambition to double the value of our mineral exports to $3 billion by 2035. Emphasises regional employment and value growth, requiring skilled roles in resource planning and rehabilitation projects.

Oil and gas extraction and wholesaling specific

- **Exploration ban reversal (2025) –** Creates new roles in offshore exploration, decommissioning planning, and compliance.
- **WorkSafe petroleum regulations (2025) –** Introduces fitness certificates and safety case standards, increasing demand for certified safety professionals.
- **Industry-led energy workforce planning (2025) –** Mapping skills gaps and creating pathways for transition into hydrogen and renewable energy roles.

These regulatory and training changes are reshaping compliance and operational standards while redefining the skills mix, qualifications, and career pathways in mining and quarrying and oil and gas extraction and wholesaling sectors.

This shift is influencing the current workforce profile, with growing emphasis on specialised roles in environmental management, safety certification, and energy transition, alongside opportunities for upskilling and diversification across the sector.

The following analysis examines the current workforce profile in detail.

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Infrastructure ISB

Mining and quarrying, and oil and gas extraction and wholesaling workforce profiles

The mining and quarrying workforce has declined

Photo: Gold mine at Waihi, New Zealand

Career stages of the workforce

Employment in mining and quarrying, and oil and gas extraction is concentrated in mid career and experienced workers, with limited visibility of younger and retirement age cohorts due to suppressed data. The sector shows significant reliance on older age groups, which has implications for succession planning and workforce sustainability. There is insufficient data to analyse age composition for the oil and gas sector.

Young adults (15–24) – Data for this group is suppressed, indicating very low participation. This suggests mining and quarrying, and oil and gas extraction and wholesaling is not attracting younger workers, creating a risk for future talent pipelines. Without targeted pathways and training, the sector faces long term capability gaps.

Early to mid career (25–44) – This group accounts for just over half of the workforce in mining and quarrying. Employment number is at 2,400 in June 2025. Given the small sector, volatility in this group could impact operational stability. Heavy reliance on this cohort underpins technical capability and leadership, but any decline would have an outsized impact on productivity and succession planning.

Experienced workforce (45–64) – Historically the largest cohort in both sectors, representing over 40% of the mining and quarrying workforce. Employment number is at 2,200 in June 2025 in mining and quarrying. The index for mining shows strong growth through 2022 to 2023, followed by a decline, signalling upcoming retirements and potential skill shortages unless retention and knowledge transfer strategies are prioritised.

Retirement age (65 and over) – Data is suppressed, but the presence of older workers is likely minimal. This suggests limited extended participation compared to other sectors, reducing opportunities for phased retirement or mentoring roles.

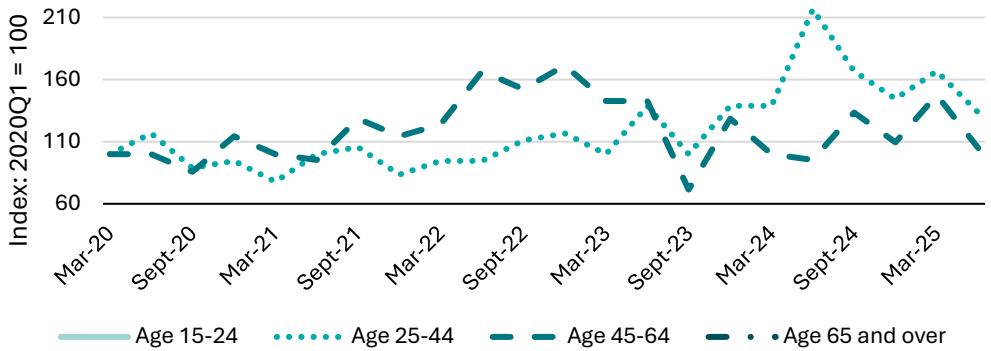
Implications for the workforce

- Mining and quarrying, and oil and gas extraction and wholesaling faces a critical challenge with an ageing workforce and almost no young entrants.
- Heavy reliance on experienced workers creates vulnerability as retirements accelerate.
- Lack of younger workers highlights the need for targeted attraction and training pathways, especially if the sectors are going to meet the government's ambitions to grow the sectors.
- Proximity to the large Australian mining sector presents both opportunities to incorporate lessons learned and threats in terms of labour force mobility.
- Succession planning and knowledge transfer are urgent priorities to maintain capability.

Mining and quarrying workforce age profile, annual average June 2023 to June 2025							
# employed	2020	% of total	2023	% of total	2025	% of total	% change 2020 to 2025
Age 15-24	-	-	-	-	-	-	
Age 25-44	2,100	50.0%	2,500	45.5%	2,400	52.2%	14.3%
Age 45-64	2,100	50.0%	3,000	54.5%	2,200	47.8%	4.8%
Age 65+	-	-	-	-	-	-	
Total	4,200+		5,500+		4,600+		9.5%

Source: Stats NZ HLFS estimates, Suppressed data is not displayed ; Figures are rounded to the nearest 100

Relative change in age cohort size within Mining and Quarrying



Source: Stats NZ HLFS estimates, Deloitte Access Economics, Suppressed data is not displayed

Oil and gas workforce age profile, annual average December 2018 to March 2024							
# employed	Dec-18	% of total	Sep-23	% of total	Mar-24	% of total	% change 2018 to 2024
Age 15-24	-	-	-	-	-	-	
Age 25-44	1,100	100.0%	-	-	-	-	
Age 45-64	1,100	100.0%	1,200	100.0%	1,100	100.0%	0.0%
Age 65+	-	-	-	-	-	-	
Total	2,200+		1,200+		1,100+		

Source: Stats NZ HLFS estimates, Suppressed data is not displayed ; Figures are rounded to the nearest 100

Mining and oil and gas extraction workforce diversity

Targeted strategies to attract and retain Māori and Pacific workers, through training, career pathways, and inclusive practices, will help maintain capability and capacity, especially given the favourable demographics of the Māori and Pacific peoples.

Diversity in the mining and quarrying workforce

A culturally inclusive workforce in mining and quarrying is beneficial for addressing labour shortages and ensuring operational resilience in a sector with small, specialised teams. Māori communities represent a critical talent pool that can help close workforce gaps, while Pacific participation appears negligible, highlighting an opportunity for targeted engagement.

Māori participation

Māori participation in mining and quarrying is highly variable due to the small workforce size, at 30.4% in June 2020, 32.3% in 2023 and 22.4% in 2025, when reported. Employment fluctuated from 1,400 in 2020 to 2,000 in 2023 to 1,300 in June 2025. The mining sector remains highly volatile and constrained by its limited scale.

Pacific peoples participation

Pacific representation is suppressed throughout, indicating low levels of participation. This suggests a significant opportunity to attract Pacific workers through targeted pathways and inclusive practices.

Other ethnic groups' participation

This group includes European, Asian and other non-Māori non-Pacific employees. This group makes up the majority of the workforce, estimated at 77.6% in June 2025. Employment rose 40.6% from 3,200 in June 2020 to 4,500 in June 2025, showing growth.

Implications for the workforce

- Māori participation is substantial when present and offers a strong opportunity to address skill gaps.
- Pacific participation is almost absent, requiring focused attraction strategies.
- Targeted engagement with Māori and Pacific peoples can help build a sustainable workforce for this specialised sector.

Diversity in the oil and gas workforce

There is insufficient data to analyse ethnic composition for the oil and gas sector.

Mining and quarrying workforce ethnicity profile, annual average June 2023 to June 2025

# employed	2020	% of total	2023	% of total	2025	% of total	% change 2020 to 2025
Māori	1,400	30.4%	2,000	32.3%	1,300	22.4%	-7.1%
Pacific	-	-	-	-	-	-	-
Other	3,200	69.6%	4,200	67.7%	4,500	77.6%	40.6%
Total	4,600+		6,200+		5,800+		26.1%

Source: Stats NZ HLFS estimates, Suppressed data is not displayed ; Figures are rounded to the nearest 100

Gender and disability representation

Women make up about 51% of New Zealand's adult population (15+) in 2025, yet remain significantly underrepresented across mining and quarrying and oil and gas extraction and wholesaling sectors.

In mining, male employment grew from 2,133 in 2016 to 5,750 in 2025. Female employment increased from 1,200 in 2023 to 1,600 in 2025, showing some progress but leaving men at over 78% of the workforce. Analysis of female participation before 2023 is not possible due to data suppression by Stats NZ.

In oil and gas, men have historically dominated the workforce. Male employment fell from approximately 2,833 in 2016 to around 1,300 following industry contraction. Women's participation is suppressed throughout.

Around 18% of adults identify as disabled, yet representation remains very low. In mining, disabled workers made up 4.1% of the workforce (141 employees) in 2018, rising slightly to 4.2% (126 employees) in 2023. In oil and gas, there were approximately 51 disabled employees in 2018 and 90 in 2023. These figures highlight persistent barriers with high physical demands and remote work environments.

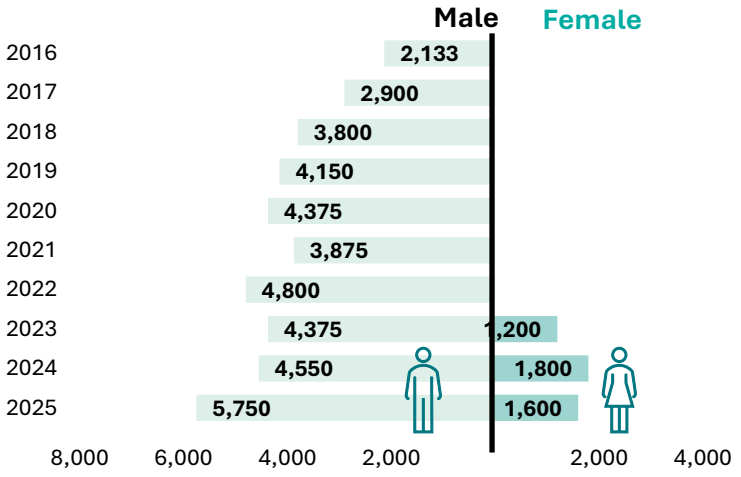
Implications for the workforce

There are opportunities for targeted strategies to improve inclusion, alongside transition planning for oil and gas extraction and wholesaling.

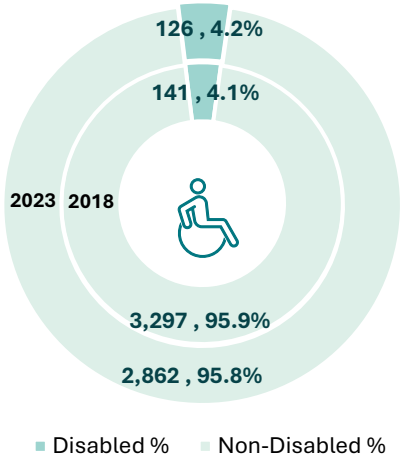
Initiatives should focus on attracting women into technical and leadership roles in mining and creating pathways into adjacent sectors as oil and gas employment declines.

For disabled workers, investment in accessible technologies, adaptive equipment, and inclusive recruitment practices remains important.

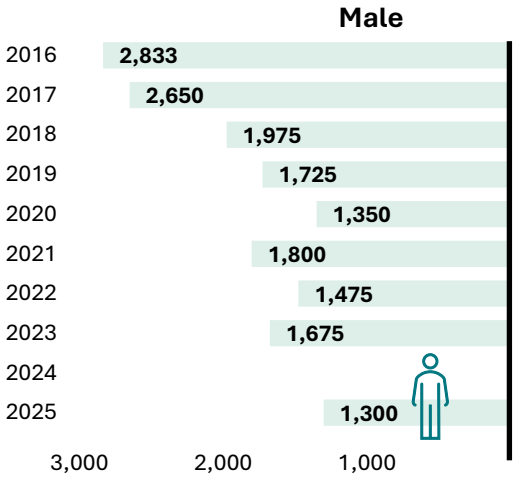
Mining and quarrying gender composition



Disabled people in mining and quarrying - employee counts, % share

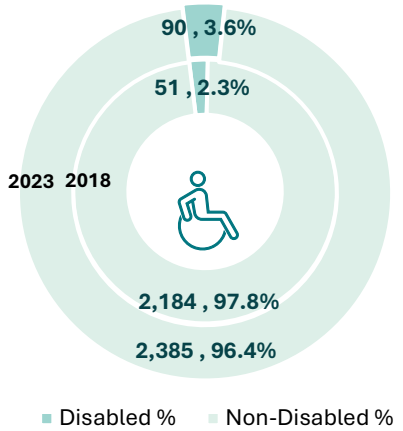


Gender Composition



Source: Stats NZ HLFS estimates, Deloitte Access Economics, Suppressed data is not displayed

Disabled people in oil and gas extraction and wholesaling - employee counts, % share



Source: Stats NZ, Deloitte Access Economics

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Infrastructure ISB

Mining workforce gap

The mining and quarrying workforce gap is forecast to remain at about 700 if nothing is changed.

Workforce gap in mining and quarrying

The mining and quarrying sector faces a modest workforce gap when measured against demand. Supply is projected to increase from 7,318 in 2026 to 9,366 in 2030, while demand rises from 7,950 in 2026 to 10,036 in 2030. This creates a gap that grows from 632 in 2026 to 671 in 2030, an increase of 6% over five years.

The gap is likely driven by an ageing workforce with many nearing retirement, limited attraction of younger workers, skill mismatches due to the adoption of new extraction technologies, and slower population growth combined with reduced migration inflows influencing the labour pool.

Implications for the mining and quarrying sector

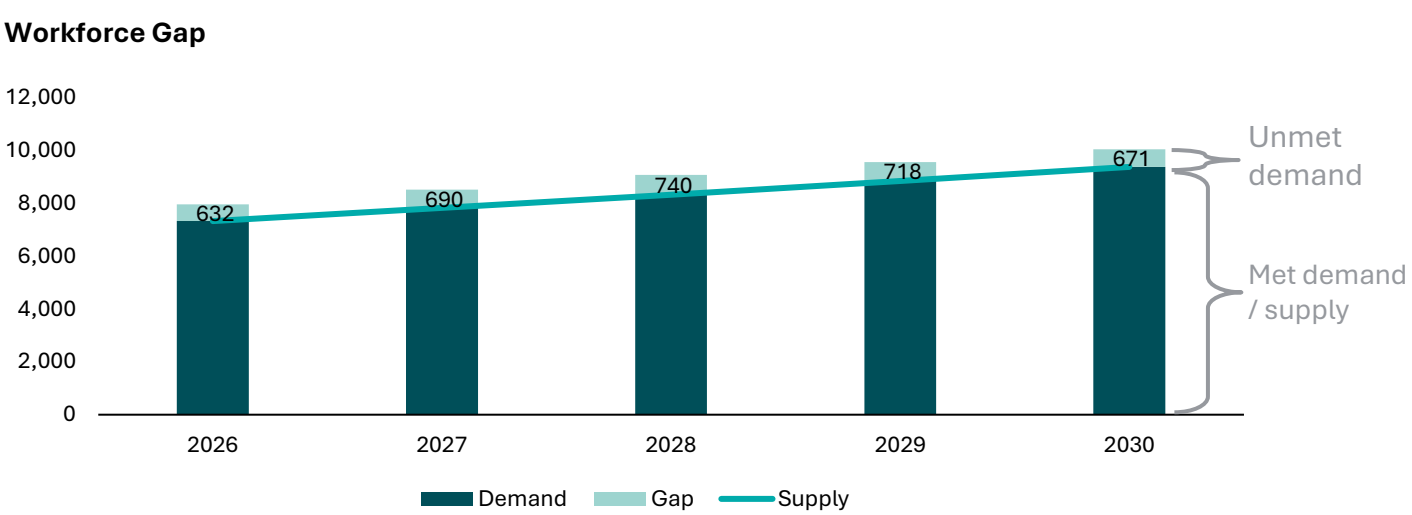
- Even small shortages could disrupt operations and project timelines in this highly specialised sector.
- Increased reliance on automation and remote monitoring may be necessary to offset labour gaps.
- Competition for skilled workers will remain strong, particularly for technical and safety critical roles.

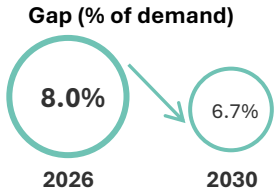
New Zealand's proximity to Australia adds another dimension to these challenges. Australia's mining sector is significantly larger and offers higher wages and more extensive projects, creating a risk of talent migration across the Tasman. At the same time, Australia's leadership in automation and remote operations presents an opportunity for collaboration, knowledge sharing, and joint training initiatives to accelerate technology adoption in New Zealand.

Implications for VET

- Training programmes should focus on specialised mining and quarrying skills, including safety and technology integration.
- Stronger alignment between education providers and industry is needed to ensure graduates are job ready.
- Targeted qualifications for underrepresented groups (Māori, Pacific, women) can help build a sustainable talent pipeline.
- Promoting upskilling and reskilling system wide initiatives for existing workers will be necessary to adapt to technology driven roles.

It is important to note that this workforce gap has been modelled off the current state, and the Government has set ambitions to double the value of the sector as indicated in New Zealand's mineral exports by 2035 document.





Source: Stats NZ, Deloitte Access Economics
** The forecasted workforce gap is presented such that it displays both the met and unmet demand if there is a positive workforce gap, and met and unmet supply otherwise.*

Mining workforce gap scenario analysis

Successful implementation of the Government's policy ambitions to grow the mining and quarrying, and oil and gas and wholesaling sectors could result in a sizeable workforce gap

Background

The Government has current ambitions to grow the export competitiveness of the nation's mining and quarrying, and oil and gas extraction and wholesaling sector.

To explore this further, a scenario is built to take into consideration how the workforce gap could evolve if the mining and quarrying sector's output, by value, doubled by 2035. This is broadly consistent with the MBIE's recently released "A Minerals Strategy for New Zealand to 2040", which outlines the Government's ambition to drive growth within the mining and quarrying and oil and gas extraction and wholesaling sector in New Zealand. The report is underpinned by the Minister's goal to double the value of mineral exports by 2035, from $1.46 billion to $3 billion.

Achieving this target has significant workforce implications for the mining and quarrying sector. To better understand the workforce requirements of the strategy, Deloitte undertook scenario modelling, focussing on the incremental labour demand generated by a doubling of output value.

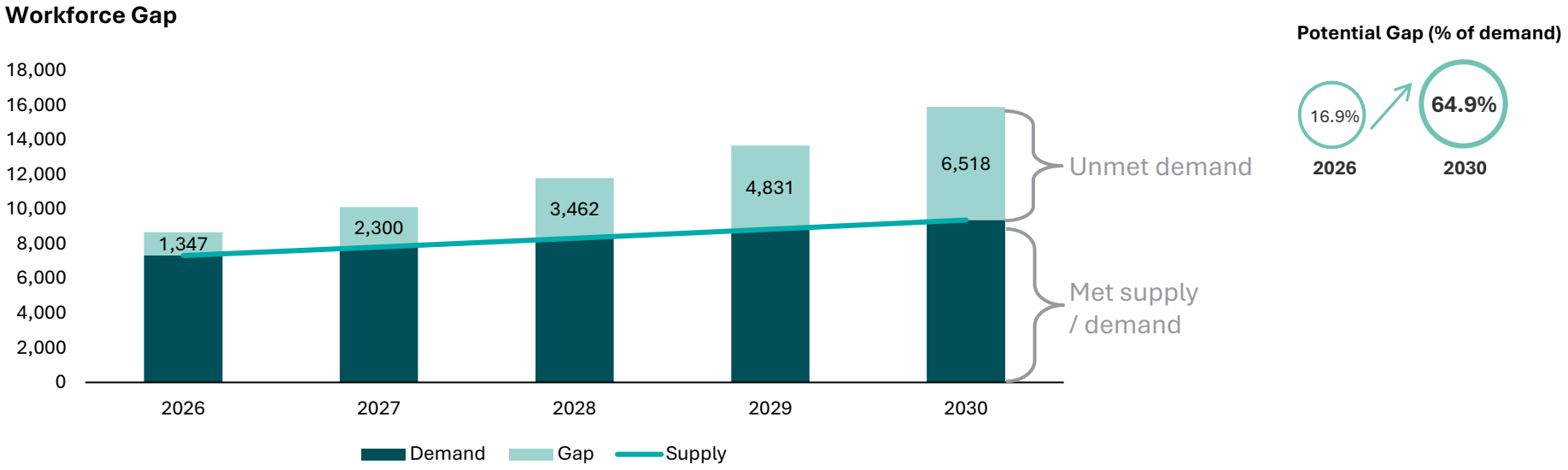
Methodology

To evaluate the change in labour demand necessary to meet the 2035 goal, the employment deviations were estimated in a computable general equilibrium (CGE) framework by applying an export-demand shock in Deloitte's in-house model DAE-RGEM.

Results

The modelling results suggest that, relative to the baseline, the mining and quarrying sector would require an estimated 5,847 additional employees by 2030 in order to be on track to meet the Government's 2035 goal. Assuming mineral prices and the labour supply for the mining and quarrying sector remains at the same level as the baseline scenario, the result is a total workforce gap of 6,518 by 2030.

This suggests that either the labour supply needs to be increased through a push for vocational training in the mining and quarrying sector, or productivity needs to be improved, or a combination of both.



Source: Stats NZ, Deloitte Access Economics
** The forecasted workforce gap is presented such that it displays both the met and unmet demand if there is a positive workforce gap, and met and unmet supply otherwise.*

Oil and gas extraction workforce gap

The oil and gas extraction and wholesaling workforce gap is forecast to remain small and negative, though this sector is highly reliant on policy decisions.

Workforce gap in oil and gas extraction and wholesaling

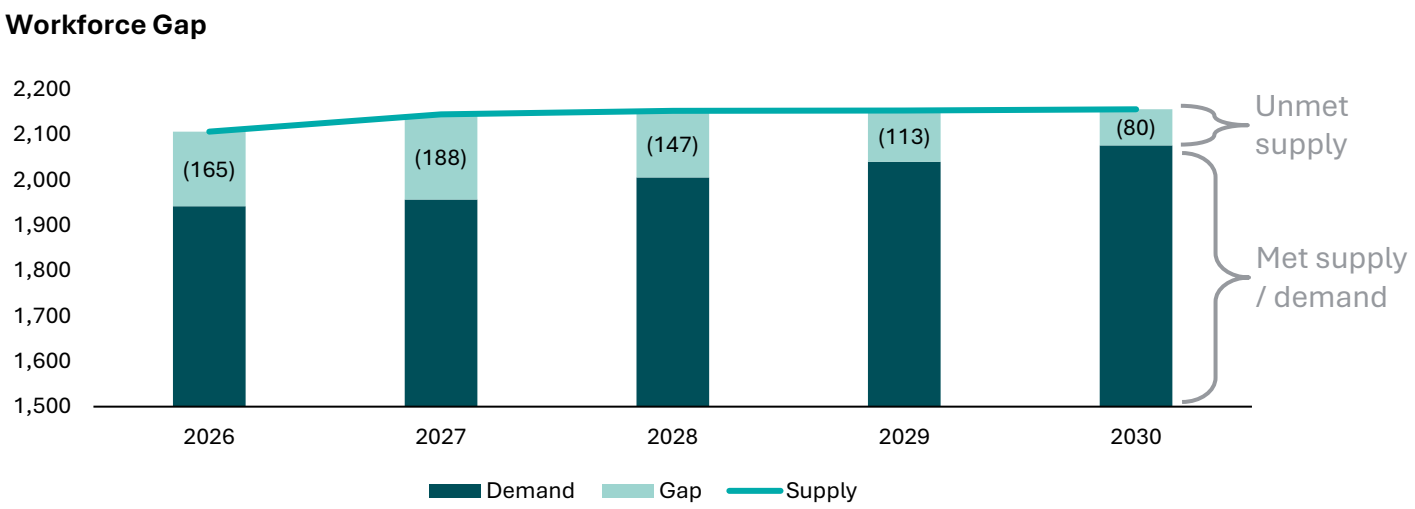
The oil and gas extraction and wholesaling faces a narrowing workforce gap when measured against demand. Supply is projected to remain slightly above demand, increasing from 2,106 in 2026 to 2,156 in 2030, while demand rises from 1,942 in 2026 to 2,076 in 2030. This results in a gap that decreases from 165 in 2026 to 80 in 2030, a reduction of 52% over five years.

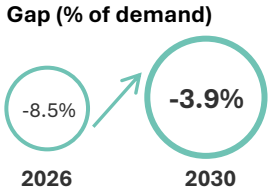
Implications for the oil and gas sector

- Current oversupply may mask future shortages in specialised technical roles as older workers retire.
- Increased reliance on automation and remote monitoring will require new digital skills.
- Attraction strategies for younger workers remain critical to maintain capability in a transitioning energy market.

Implications for VET

- Training should focus on specialised oil and gas skills alongside emerging energy technologies.
- Stronger alignment between education providers and industry is needed to ensure graduates are job ready.
- Promoting upskilling and reskilling system wide initiatives will be essential to support workers moving into low carbon and digital roles.





Source: Stats NZ, Deloitte Access Economics
** The forecasted workforce gap is presented such that it displays both the met and unmet demand if there is a positive workforce gap, and met and unmet supply otherwise.*

Mining and quarrying, and oil and gas extraction and wholesaling skill levels

The mining and quarrying, and oil and gas extraction and wholesaling workforces show a shift towards higher skill levels

Skill composition of the mining and quarrying workforce

From 2013 to 2023, the mining and quarrying sector shows a modest shift toward higher skill levels.

- Level 1 roles increased from 29% to 31%, indicating a growing need for technical and managerial expertise.
- Levels 2 and 3 stayed relatively stable at around 7% to 11%.
- Level 4 roles remain dominant at 46%, though slightly down from 49%, reflecting the sector's continued reliance on mid skilled operational roles.
- Level 5 roles declined from 6% to 4%.

This pattern suggests incremental movement toward more specialised roles, but the sector still depends heavily on mid skilled labour for extraction and processing activities.

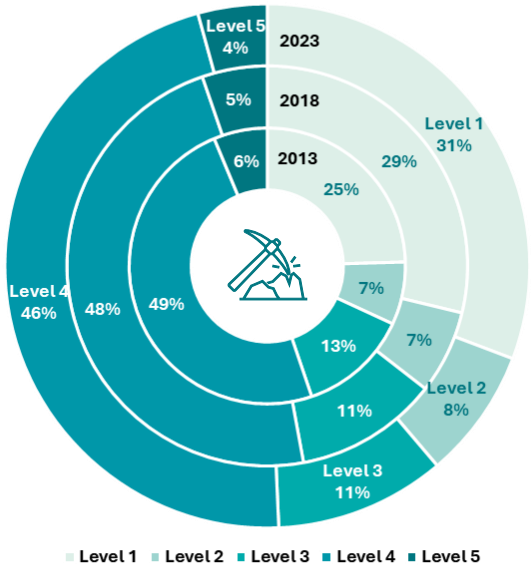
Skill composition of the oil and gas extraction and wholesaling workforce

The oil and gas sector is more concentrated at the top skill level.

- Level 1 roles rose from 39% in 2013 to 44% in 2023, highlighting the growing importance of engineering and technical expertise for exploration and energy transition projects.
- Levels 2 and 3 have contracted, reinforcing the trend toward higher qualifications and specialised knowledge.
- Level 4 roles declined slightly from 36% to 38%.
- Level 5 roles remain low at 6%, down from 7%.

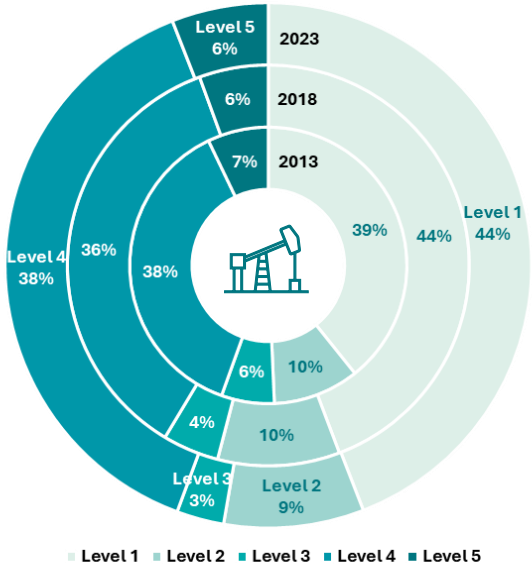
This shift reflects the complexity of operations and the sector's adaptation to sustainability and regulatory requirements.

Mining and quarrying
% share of employees by skill level (2013 to 2023)



Source: Stats NZ, Deloitte Access Economics

Oil and gas
% share of employees by skill level (2013 to 2023)



Source: Stats NZ, Deloitte Access Economics

Skill levels by ethnicity in mining and oil and gas

The mining sector remain dominated by mid and lower skill roles, with minimal representation in advanced positions and limited diversity. Data is not complete due to suppression to generate a chart for the oil and gas sector.

In **mining and quarrying**, Māori hold 35% in Skill Levels 1–3, while Pacific workers have no reported data. Other ethnicities show stronger access at 44% in Skill Levels 1–3. Lower skill roles dominate, with Māori at 57% in Skill Level 4 and 9% in Skill Level 5, while Other ethnicities hold 39% and 18% respectively, suggesting reliance on manual and operational work despite automation trends.

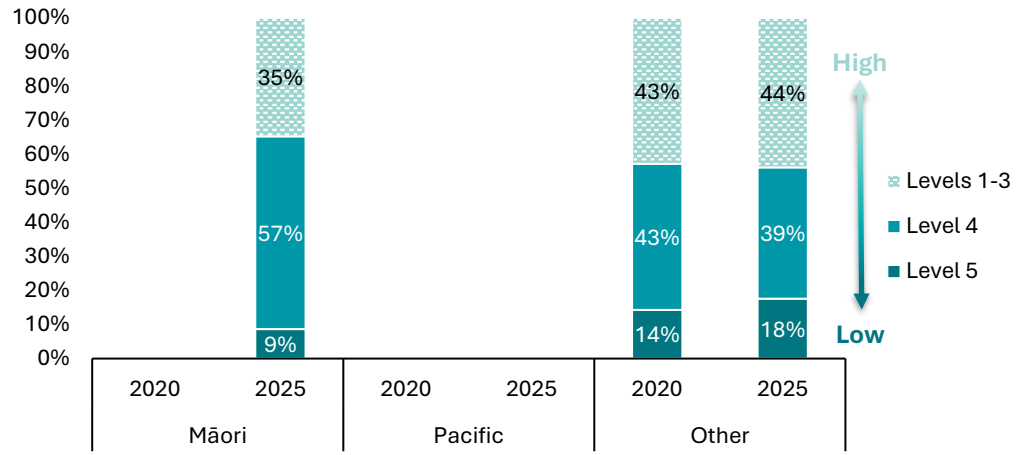
In **oil and gas extraction and wholesaling**, there is insufficient data.

Overall, mining shows continued concentration in mid and lower skill roles, with Māori and Pacific underrepresented in higher skill positions. Other ethnicities maintain stronger representation in higher skill roles where present, but overall workforce numbers remain small.

Implications for VET

- Mining requires targeted pathways to lift Māori and Pacific participation in advanced technical roles, which could be supported by modular training and work-based learning.
- Oil and gas needs transition focused strategies, embedding digital and sustainability skills to enable redeployment into emerging energy sectors.
- Across both sectors, strengthening foundational literacy and numeracy remains essential for progression into roles requiring problem solving and digital competencies.
- Align curriculums with flexible learning models such as micro-credentials could be useful for rapid upskilling as technologies and regulatory requirements evolve.

Mining and quarrying skills level by ethnicity



Source: Stats NZ HLFS estimates, Suppressed data is not displayed

Bridging workforce gaps and future skills needs

To prepare for the future, it is essential to identify the skills that matter today, those that are emerging, and those that will be critical by 2030.

From skill lacking to skill stacking. Building resilience for the future.

Understanding current and emerging skills for 2030

Understanding the current workforce profile and its gaps is only the starting point. To prepare for the future, it is essential to identify the skills that matter today, those that are emerging, and those that will be critical by 2030. Global experience offers valuable lessons, particularly through the World Economic Forum's Future of Jobs Report 2025 and other international studies. These insights highlight how technological disruption, automation, and sustainability imperatives are reshaping skill requirements across industries worldwide.

Applying these findings to the New Zealand context is vital. By mapping Hanga-Aro-Rau sectors to WEF's studied industries, we can leverage global foresight to inform local strategies. This alignment enables us to anticipate future skill demands, design responsive vocational pathways, and ensure our workforce remains competitive and inclusive.

Indicative alignment of Hanga-Aro-Rau sectors with WEF Industries

Hanga-Aro-Rau sector	WEF industry
Mining	Mining and Metals
Oil and Gas	Oil and Gas

Understanding these skills is not just important, it is strategic. It underpins workforce resilience, supports innovation, and ensures that learners and employers are equipped for a rapidly changing operating environment. The next section explores current critical skills, emerging capabilities, and those projected to be most important by 2030, providing a starting point for action.

Shifting skill priorities for mining

The core enduring skills that are important now and expected to remain highly important in the future for Mining include systems thinking, environmental stewardship, creative thinking, technological literacy, and AI and big data.

Skills outlook for mining

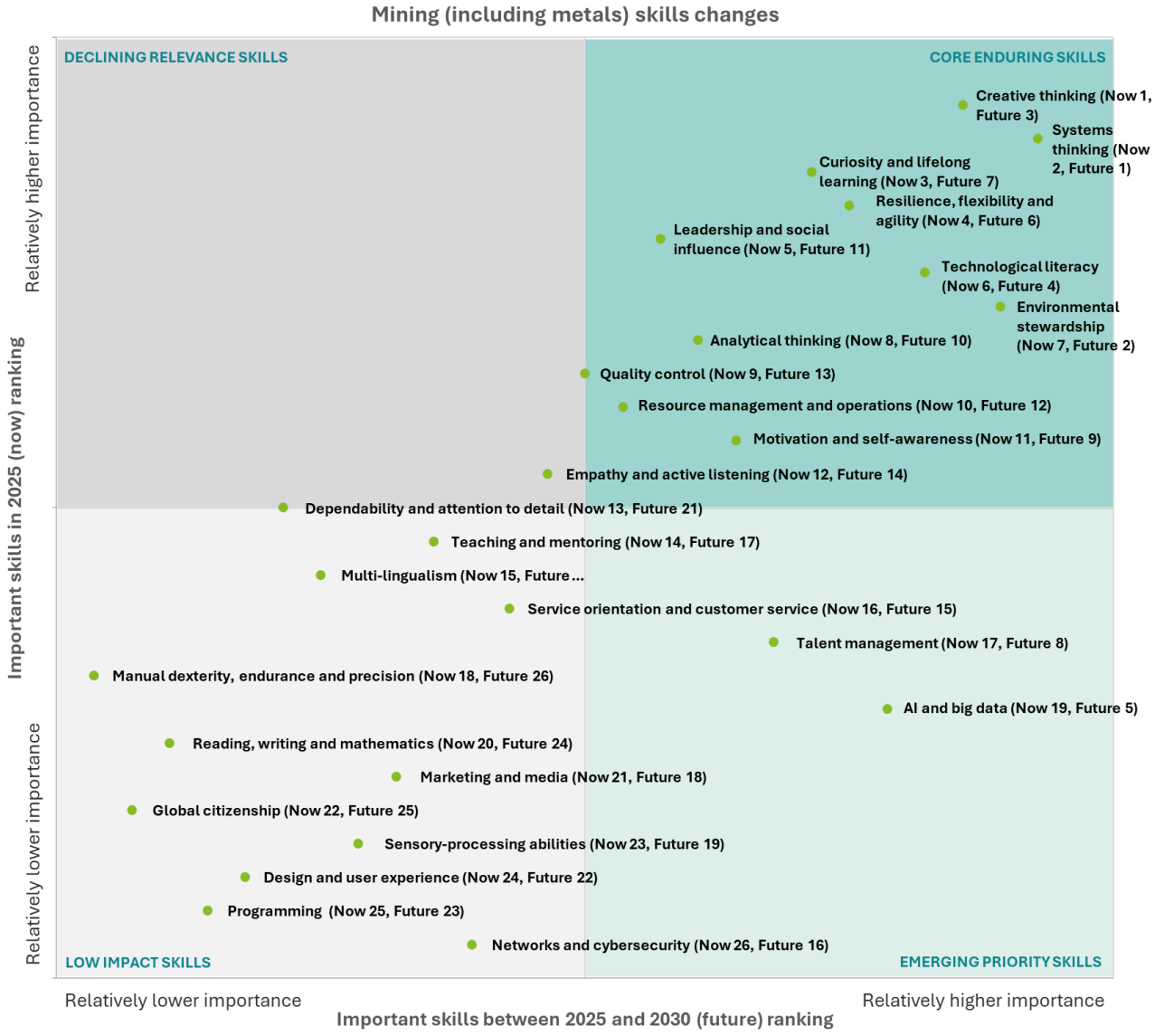
The mining sector, including metals, is entering a phase of transformation driven by automation, digital technologies, and sustainability imperatives.

Core enduring skills (top-right), are those that foster adaptability, problem solving, and resilience, will remain essential for managing operational complexity and enabling innovation in increasingly automated environments. These capabilities will underpin leadership and agility as organisations respond to global pressures for efficiency and environmental responsibility.

At the same time, **emerging priority skills (bottom-right)**, highlight the growing importance of data driven decision making and sustainable practices. Expertise in advanced technologies, connectivity, and environmental stewardship will be critical for organisations seeking to maintain competitiveness and meet evolving regulatory and market expectations.

Conversely, **low impact skills (bottom-left)**, which are primarily manual or routine, are losing strategic relevance as automation and smart systems replace repetitive tasks. While these skills will not disappear entirely, their diminishing importance globally contrasts with New Zealand's continued focus on strengthening foundational literacy and numeracy to support workforce participation and adaptability.

The next analysis will explore how these changes are reshaping roles and what this means for capability development across the mining sector.



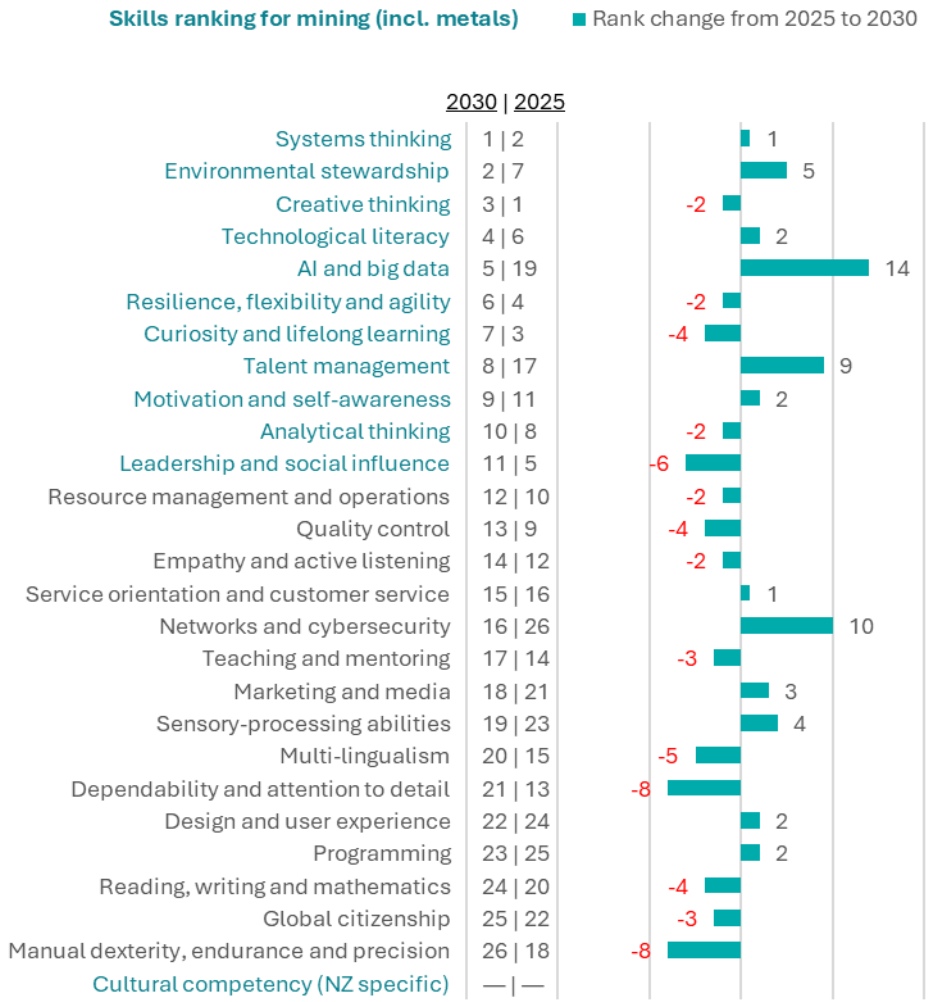
Source: WEF, Deloitte analysis

Skills changes for mining

Building on these trends, the mining sector is entering a phase of accelerated skill transformation globally driven by automation, sustainability, and digital technologies. This will have an impact on the New Zealand mining sector. By 2030, demand will shift toward AI and big data, networks and cybersecurity, and environmental stewardship, alongside enduring capabilities such as systems thinking, technological literacy, and resilience and flexibility. Skills including talent management and curiosity and lifelong learning will also gain importance as operations become more data driven and environmentally regulated.

While globally declining, manual dexterity and routine cognitive skills remain critical foundations in New Zealand. Interpreting technical documentation, data and compliance standards all require strong reading, writing, and mathematics skills. These capabilities underpin advanced technical and digital competencies, ensuring workers can progress into higher-order roles. Low impact skills will continue to play niche roles in specialised contexts but will not drive major industry transformation.

The following chart illustrates the top skills shaping this transition, showing which capabilities are most in demand today, which are expected to grow fastest by 2030, and which are losing importance relatively. This snapshot provides a starting point for workforce planning, vocational education design, and organisational strategies to ensure readiness for the future of work.



Source: WEF, Deloitte analysis

Shifting skill priorities for oil and gas extraction

The core enduring skills that are important now and expected to remain highly important in the future for oil and gas extraction and wholesaling include resilience, flexibility and agility; leadership and social influence, AI and big data, technological literacy, and creative thinking.

Sills outlook for oil and gas extraction

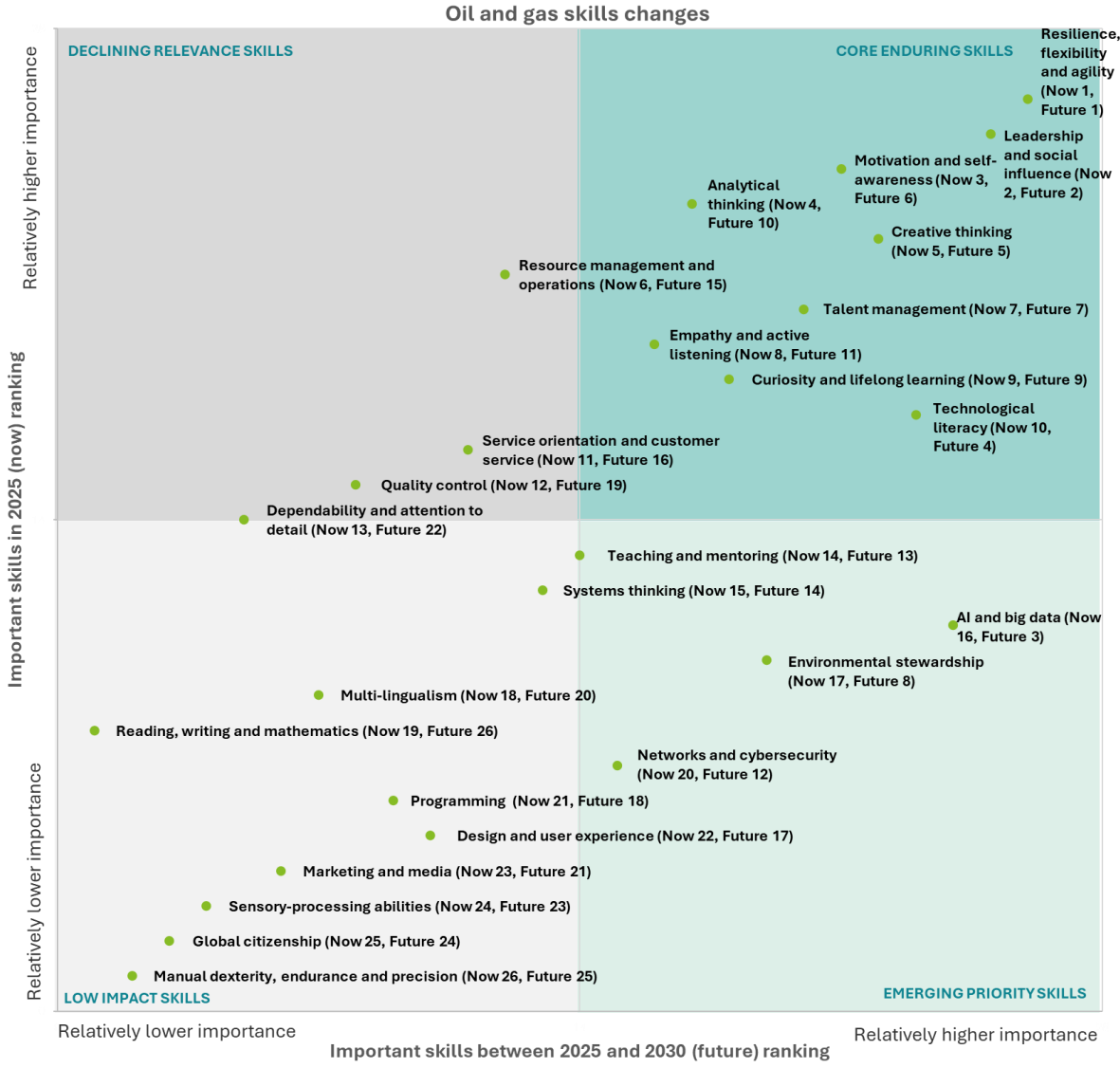
The oil and gas sector is navigating a period of profound change, driven by automation, digitalisation, and the global transition toward sustainability.

Core enduring skills (top-right), are those that enable adaptability, problem-solving, and resilience, will remain essential for managing operational complexity and fostering innovation in a rapidly evolving energy landscape. These capabilities will underpin leadership and agility as organisations respond to technological disruption and shifting market dynamics.

At the same time, **emerging priority skills (bottom-right)**, signal a future where data driven decision making and environmental stewardship are critical. Expertise in advanced technologies, connectivity, and sustainability will be vital for organisations seeking to maintain competitiveness and meet regulatory and societal expectations.

Conversely, **low impact skills (bottom-left)**, which are primarily manual or routine, are losing strategic relevance as automation and smart systems replace repetitive tasks. While these skills will not disappear entirely, their diminishing importance globally contrasts with New Zealand's continued focus on strengthening foundational literacy and numeracy to support workforce participation and adaptability.

The next analysis will explore how these shifts are redefining roles and outline strategies for building a future ready workforce in oil and gas.



Source: WEF, Deloitte analysis

Skills changes for oil and gas

The oil and gas extraction sector is entering a period of accelerated skill transformation globally driven by automation, sustainability, and digital technologies. This will have an impact on the New Zealand oil and gas extraction and wholesaling sector. By 2030, demand will shift toward AI and big data, technological literacy, alongside enduring capabilities such as resilience, flexibility and agility and leadership and social influence. Skills in particular environmental stewardship will also gain importance as operations become more data driven and environmentally regulated.

In contrast, manual dexterity, quality control, and dependability and attention to detail will decline as robotics and predictive systems replace repetitive tasks. While reading, writing and mathematics remain foundational for New Zealand and for interpreting technical documentation, data and compliance standards, they are considered base skill requirements.

The following chart illustrates the top skills shaping this transition, showing which capabilities are most in demand today, which are expected to grow fastest by 2030, and which are losing importance relatively. This snapshot provides a starting point for workforce planning, vocational education design, and organisational strategies to ensure readiness for the future of work.

Source: WEF, Deloitte analysis

Shared priorities shaping these sectors

Mining and oil and gas share a strong emphasis on transferable skills such as analytical thinking, resilience, flexibility and agility, technological literacy, and talent management. These skills will become even more critical as the sector scales up to meet growth ambitions. Emerging capabilities including AI and big data and environmental stewardship reflect the growing importance of digital integration and sustainability imperatives, both essential for achieving operational efficiency and maintaining social license as production expands.

While globally declining, manual dexterity and routine cognitive skills remain foundational in New Zealand. Interpreting technical drawings, calculating tolerances, and understanding compliance documentation all require strong reading, writing, and mathematics skills. These capabilities underpin advanced technical and digital competencies, ensuring workers can progress into higher-order roles. As output doubles, the need to strengthen these foundations will increase because they enable workers to transition into roles requiring problem solving, data analysis, and digital system operation.

These findings align with Hanga-Aro-Rau *Post COVID-19 Workforce Development* report, which problem solving, adaptability, and communication. Embedding these skills into VET strategies is essential for building resilience and supporting career mobility in rapidly evolving industries.

These trends highlight the need for lifelong learning, micro-credentials, and flexible pathways to prepare workers for future demands and to meet the labour requirements of a sector experiencing accelerated growth.

Implications for organisations and employers

Employers in mining and oil and gas should foster a culture of continuous learning to keep pace with automation, AI, and sustainability requirements. Workforce planning should anticipate the additional labour demand created by increased production and identify roles most affected by skill shifts. Clear transition pathways for employees and leadership development will be critical to guide teams through changes such as robotics adoption or digital monitoring systems. Structured onboarding for new digital tools and systems will ensure smooth adoption. Offering career mobility opportunities linked to skill development will help retain talent and build resilience as the sector expands.

Implications for SMEs

Although the mining and quarrying, and oil and gas extraction and wholesaling sector is dominated by large operators, smaller businesses and contractors still support operations and specialist services. For these businesses, affordable, relevant training is needed. Priorities include core and transferable skills to enable staff to work across multiple functions, digital readiness through scalable technology solutions, and basic sustainability knowledge to meet regulatory requirements and align with market trends.

Implications for the VET sector

Vocational education providers should consult with industry and consider embedding digital and sustainability skills into core programs. AI literacy, data analytics, networks and cybersecurity, and environmental stewardship could become components of training for relevant qualifications.

At the same time, strong foundations in reading, writing, and mathematics remain essential because they underpin advanced technical and digital skills. In mining, these capabilities support accurate interpretation of geological data, safety protocols, and compliance documentation. In oil and gas, they enable understanding of automated system instructions, environmental reporting, and safety standards. Without these basics, workers struggle to transition into roles requiring problem solving, data analysis, or operating digital systems.

Flexible learning pathways such as micro-credentials and modular courses will allow rapid upskilling as technologies evolve and production targets increase. Collaboration with employers will be beneficial to ensure programs reflect real world processes including robotics integration and digital monitoring systems. Transferable skills such as problem solving, adaptability, and communication should be woven into all qualifications to prepare learners for dynamic roles across these sectors.

Implications for industry bodies and other key stakeholders

Industry bodies and stakeholders should lead strategic coordination to align training priorities with future skill needs and MBIE's growth targets. This includes developing national frameworks for digital and sustainability competencies, supporting industry-wide micro-credential standards, and promoting inclusive workforce strategies to engage Māori, Pacific peoples, and women. Stakeholders could also facilitate shared investment in technology enabled training hubs, ensuring SMEs and regional employers have access to advanced learning resources. Advocacy for policy incentives and funding to accelerate workforce transformation could be considered, alongside initiatives that strengthen collaboration between employers, education providers, and government agencies.

05 Ō Tātou Pōari Pūkenga | Our Skills Boards

Infrastructure ISB

1. Mining and quarrying, and oil and gas extraction and wholesaling sectors insights
2. Demographic overview for mining and quarrying, and oil and gas extraction and wholesaling
3. Skills overview for mining and quarrying, and oil and gas extraction and wholesaling
4. **Occupations overview for mining and quarrying, and oil and gas extraction and wholesaling**

Bridging workforce gaps and future skills needs

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Understanding current and emerging skills for 2030

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Understanding how skills and jobs transform.
Turns disruption into direction.

Mining and quarrying workforce overview

Roles associated with low skilled tasks have contracted sharply. Conversely, occupations requiring higher order capabilities have grown.

Mining and quarrying occupation type trends

The occupation type data, defined using ANZSCO level 3, below provides an alternate way to test the observation and assumptions drawn from skill trends and skill level composition. Mining employment fell from 4,362 in 2013 to 3,471 in 2023, a decline of nearly 20% overall. This supports the expectation that automation and efficiency gains reduce reliance on manual labour. The sharp drop in labourers, down 42.9% since 2018, and machinery operators and drivers, down 14.2%, confirms the predicted decline in roles linked to level 4 and level 5 skills. Technicians and trades workers also contracted by 10.7%, consistent with the shrinking share of mid skilled positions.

However, the data shows some discrepancies. Managers grew strongly between 2013 and 2018 but fell by 9.2% from 2018 to 2023. This suggests that while leadership remains important conceptually, leaner operations may limit headcount growth in managerial roles. Professionals increased slightly to 10.5% share, which aligns with the shift toward knowledge intensive roles but is less pronounced than expected given the emphasis on systems thinking and environmental stewardship. Technicians and trades workers declined in numbers despite assumptions that advanced technical skills would rise, indicating that traditional trade roles are being replaced by automation rather than expanded.

In line with assumptions:

- Decline in labourers and machinery operators supports the forecast that manual and routine skills are losing relevance.
- Modest growth in professionals aligns with the move toward higher skill roles.

Not fully in line:

- Managerial roles did not sustain growth as strongly as anticipated.
- Technical trade roles declined despite expectations for advanced technical skills.

This evidence shows that while the overall direction of change toward digital and sustainability focused roles is clear, the pace and distribution vary. Workforce planning and vocational education strategies need to account for these nuances to ensure alignment with real occupational shifts.

Mining and quarrying – share of number of employee by occupation type

Occupation type	2013	2018	2023
Machinery Operators and Drivers	38.2%	37.9%	38.2%
Managers	12.2%	16.0%	17.1%
Technicians and Trades Workers	14.2%	11.7%	12.3%
Labourers	17.0%	16.6%	11.1%
Professionals	9.2%	8.5%	10.5%
Clerical and Administrative Workers	6.6%	6.2%	6.8%
Sales Workers	0.8%	1.0%	1.8%
Community and Personal Service Workers	0.1%	0.0%	0.3%
All occupations combined	**100.0%**	**100.0%**	**100.0%**

Mining and quarrying – number of employee by occupation type and % changes

Occupation type	2013	2018	2023	2013 to 2018	2018 to 2023
Machinery Operators and Drivers	1,668	1,545	1,326	-7.4%	-14.2%
Managers	534	654	594	22.5%	-9.2%
Technicians and Trades Workers	618	477	426	-22.8%	-10.7%
Labourers	741	678	387	-8.5%	-42.9%
Professionals	402	348	363	-13.4%	4.3%
Clerical and Administrative Workers	288	252	237	-12.5%	-6.0%
Sales Workers	33	42	63	27.3%	50.0%
Community and Personal Service Workers	6		9		-
All occupations combined	**4,362**	**4,080**	**3,471**	**-6.5%**	**-14.9%**

*Source: Stats NZ; * Suppressed counts have not been included in the individual sector counts; Figures are rounded to the nearest 3; Total has been summed independently to the sector sums to minimise suppression*

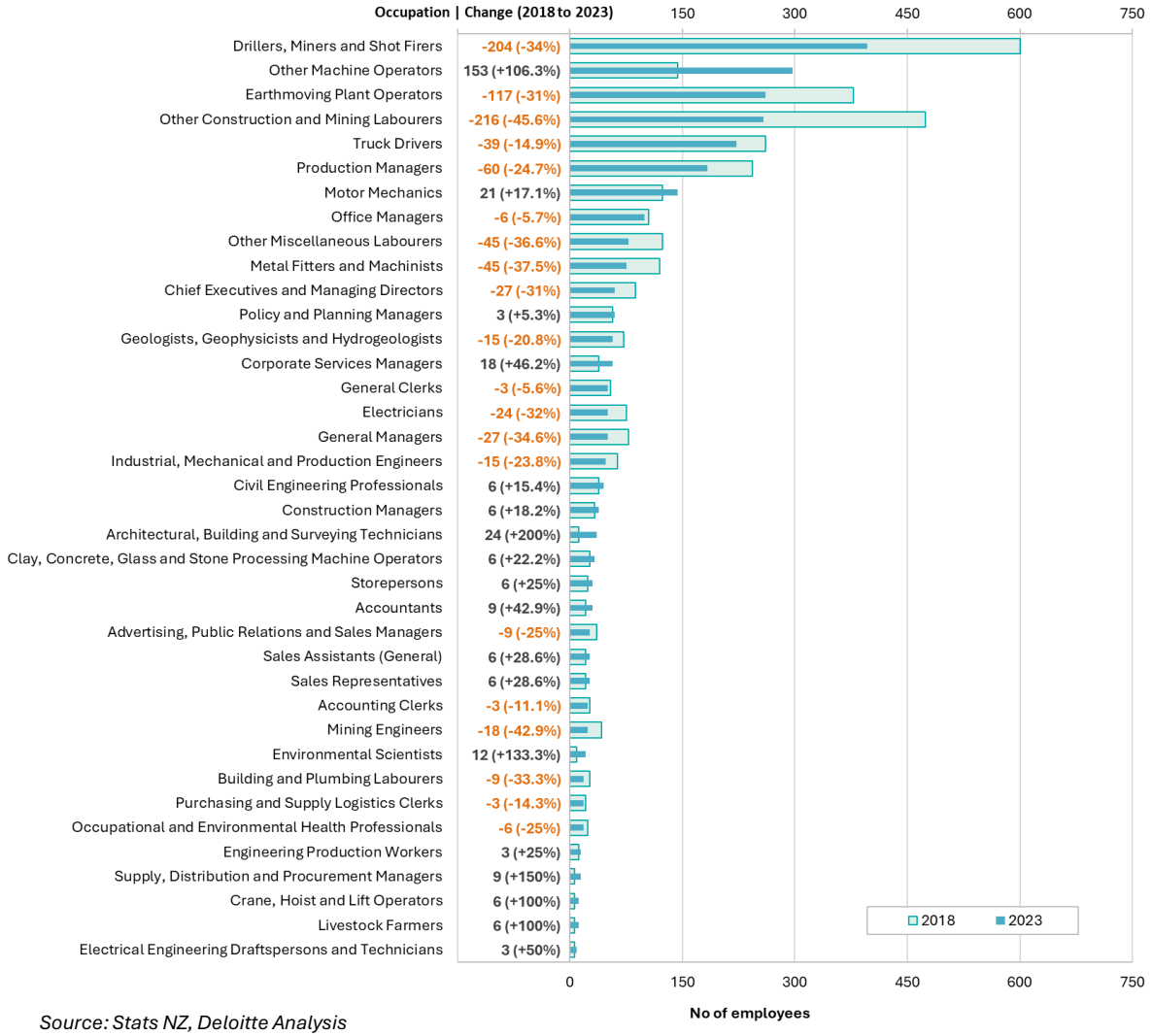
Occupational and skill level shifts in the mining sector

Between 2018 and 2023, the mining sector saw contrasting trends between high volume operational roles and specialised positions. The steepest declines were in Other Construction and Mining Labourers (-45.6%), Mining Engineers (-42.9%), and Metal Fitters and Machinists (-37.5%). These roles are primarily level 3, 4 and 5, which historically formed a large share of the sector. This aligns with the earlier skill composition analysis showing level 4 roles remain dominant but declining, and level 5 roles shrinking from 6% to 4%, reflecting automation, mechanisation and reduced reliance on manual labour.

Growth was concentrated in smaller but emerging roles requiring higher skill levels. Occupations such as Architectural, Building and Surveying Technicians (+200%, level 2), Supply, Distribution and Procurement Managers (+150%, level 1), and Environmental Scientists (+133.3%, level 1) surged, driven by compliance, sustainability and operational planning needs. Technical roles such as Electrical Engineering Draftspersons and Technicians (+50%, level 2) also grew, supporting advanced systems and safety standards. These changes explain why level 1 roles increased modestly, while mid skilled roles (level 2) gained importance for specialised technical support.

The linkage between occupation trends and skill level trends is clear. Mining is shifting from high volume, low skill labour to **knowledge intensive** and **compliance driven** roles. For vocational education, this means prioritising pathways to level 1 and level 2 qualifications in **environmental science**, **engineering** and **supply chain management**. Employers and SMEs should plan for reskilling strategies to transition workers from declining level 4 and level 5 roles into **specialised technical** and **sustainability focused** positions.

Occupations with the largest workforce and notable growth or decline in mining and quarrying (2018 to 2023)



Source: Stats NZ, Deloitte Analysis

** The chart includes the top 20 occupations that rank among the top 100 with the highest number of employees and fastest growing roles, as well as the top 20 occupations that rank among the top 100 with the highest number of employees and fastest declining roles within the sector*

Oil and gas extraction and wholesaling workforce overview

Roles associated with low skilled tasks have contracted sharply. Conversely, occupations requiring higher order capabilities have grown.

Oil and gas extraction occupation type trends

Employment in the oil and gas extraction and wholesaling sector increased from 2,151 in 2013 to 2,661 in 2023, a rise of approximately 24% overall. This growth suggests that while technology adoption is reshaping roles, the sector still requires a substantial workforce for operational and compliance functions.

Roles linked to low skill and routine tasks have declined sharply. Labourers fell by 60% since 2018, and Technicians and Trades Workers dropped by 38.9% in numbers, consistent with the shrinking share of level 4 and level 5 positions and the reduced importance of manual dexterity and endurance.

Conversely, occupations associated with higher skill levels have grown. Managers increased by 9.2% in numbers since 2018, and Professionals rose by 7%, reinforcing the demand for analytical thinking, technological literacy and environmental stewardship. Clerical and Administrative Workers grew by 32%, which may reflect the need for compliance and reporting in sustainability driven operations.

In line with assumptions:

- Decline in labourers and trades workers supports the expectation that manual and routine skills are losing relevance.
- Growth in professionals and managers aligns with the shift toward knowledge intensive roles.

Not fully in line:

- Overall workforce growth contrasts with predictions of contraction, suggesting technology adoption is complementing rather than replacing labour in some areas.
- Significant rise in clerical and sales roles points to priorities in compliance and stakeholder engagement that were not emphasised in the skills outlook.

This evidence confirms the direction of change toward digital and sustainability focused roles but highlights that operational and administrative functions remain critical. Workforce planning and vocational education strategies should address these nuances by combining advanced technical training with compliance and communication skills.

Oil and gas extraction– share of number of employee by occupation type

Occupation type	2013	2018	2023
Managers	22.7%	23.9%	24.0%
Machinery Operators and Drivers	20.5%	21.2%	20.3%
Professionals	16.2%	20.9%	20.6%
Clerical and Administrative Workers	12.4%	11.9%	14.4%
Sales Workers	10.2%	10.2%	13.1%
Technicians and Trades Workers	9.5%	6.6%	3.7%
Community and Personal Service Workers	0.0%	0.0%	1.2%
Labourers	5.7%	3.1%	1.1%
All occupations combined	**100.0%**	**100.0%**	**100.0%**

Oil and gas extraction – number of employee by occupation type and % changes

Occupation type	2013	2018	2023	2013 to 2018	2018 to 2023
Managers	489	585	639	19.6%	9.2%
Machinery Operators and Drivers	441	519	540	17.7%	4.0%
Professionals	348	513	549	47.4%	7.0%
Clerical and Administrative Workers	267	291	384	9.0%	32.0%
Sales Workers	219	249	348	13.7%	39.8%
Technicians and Trades Workers	204	162	99	-20.6%	-38.9%
Community and Personal Service Workers	-	-	33	-	-
Labourers	123	75	30	-39.0%	-60.0%
All occupations combined	**2,151**	**2,451**	**2,661**	**13.9%**	**8.6%**

*Source: Stats NZ; * Suppressed counts have not been included in the individual sector counts; Figures are rounded to the nearest 3; Total has been summed independently to the sector sums to minimise suppression*

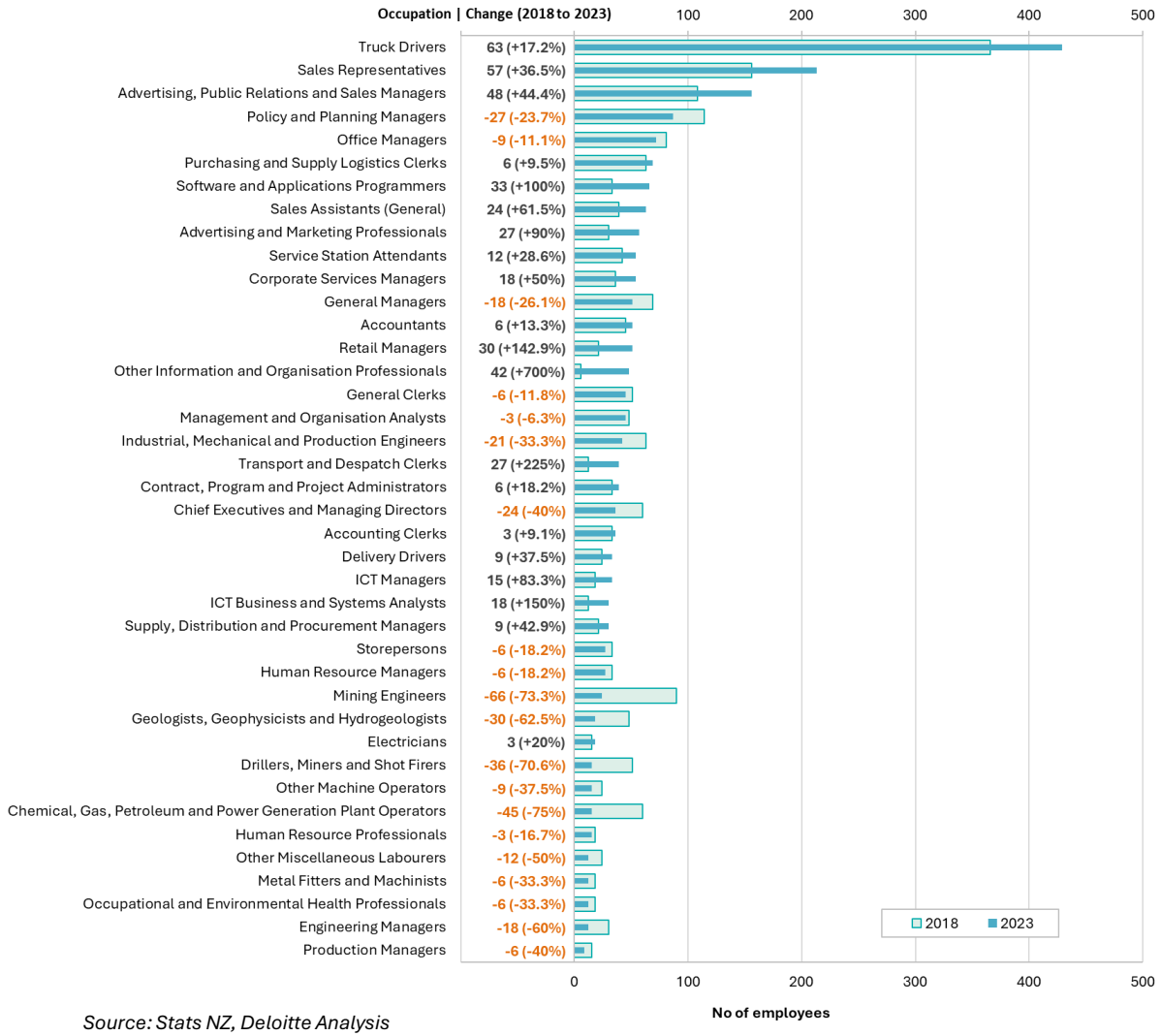
Occupational and skill level shifts in the oil and gas extraction sector

Between 2018 and 2023, the oil and gas extraction and wholesaling sector saw sharp declines in traditional, high volume roles. Drillers, Miners and Shot Firers fell by -70.6%, Mining Engineers by -73.3%, and Chemical, Gas, Petroleum and Power Generation Plant Operators by -75%. These roles are primarily level 3 and level 4, with some at level 1 for engineering positions. This aligns with the earlier skill composition analysis showing level 4 roles remain significant but declining, and level 5 roles shrinking from 6% to 4%, reflecting automation, mechanisation and the transition away from fossil fuel extraction.

Growth was concentrated in smaller but emerging roles requiring higher skill levels. Occupations such as Other Information and Organisation Professionals (+700%, level 1), ICT Business and Systems Analysts (+150%, level 1), and Software and Applications Programmers (+100%, level 1) surged, driven by digitalisation and compliance requirements. Managerial roles like Supply, Distribution and Procurement Managers (+42.9%, level 1) and Corporate Services Managers (+50%, level 1) also grew, supporting operational planning and sustainability initiatives. These changes explain why level 1 roles increased modestly, while mid skilled roles (level 2) gained importance for project administration and compliance.

The are linkages between occupation trends and skill level trends. Oil and gas extraction is shifting from high volume, manual roles to knowledge intensive, technology driven positions. For vocational education, this means prioritising pathways to level 1 and level 2 qualifications in digital systems, environmental management and supply chain planning. Employers and SMEs should invest in reskilling strategies to transition workers from declining level 3 to level 5 roles into specialised technical and compliance focused positions.

Occupations with the largest workforce and notable growth or decline in the oil and gas extraction (2018 to 2023)



Source: Stats NZ, Deloitte Analysis
** The chart includes the top 20 occupations that rank among the top 100 with the highest number of employees and fastest growing roles, as well as the top 20 occupations that rank among the top 100 with the highest number of employees and fastest declining roles within the sector*

Overall strategic implications

New Zealand's mining and quarrying and oil and gas extraction sectors are undergoing a complex transformation. Mining and quarrying have experienced decline, falling from NZ$3.5 billion in 2010 to NZ$1.8 billion in 2025. However, government ambitions to double mineral export value by 2035 signal a potential resurgence.

Oil and gas extraction, while historically volatile, is showing signs of modest recovery, with GDP expected to reach NZ$2 billion by 2035.

Workforce gaps are emerging across both sectors. Mining faces a modest shortfall under current conditions, but scenario modelling shows that achieving the government's growth target would require an additional 6,518 workers by 2030. Oil and gas currently shows a slight oversupply, but this may mask future shortages in specialised roles as older workers retire and technology reshapes job requirements.

Both sectors are heavily reliant on mid career and experienced workers, with minimal participation from younger cohorts. Diversity remains limited, particularly for Māori, Pacific peoples, women, and disabled individuals.

Skill composition is shifting toward higher level roles, especially in oil and gas, but mining still depends on mid skill operational labour. Occupation data confirms a decline in manual and routine roles, with growth in compliance, stakeholder engagement, and digital functions.

Emerging skills such as AI and big data, environmental stewardship and technology literacy are gaining prominence, alongside enduring capabilities including creative thinking, systems thinking, leadership and social influence, resilience, flexibility and agility, and curiosity and lifelong learning. These trends highlight the need for inclusive workforce strategies, lifelong learning, and responsive VET systems to support both transition and growth.

Implications for organisations and employers

- Organisations should prepare for both operational continuity and strategic expansion by embedding adaptability, digital readiness, and inclusive practices into workforce planning.
- Workforce planning should anticipate increased labour demand and identify roles most affected by automation, sustainability imperatives, and digital transformation.
- Leadership development is essential to guide teams through changes such as AI, automation and robotics adoption and digital monitoring systems.
- Structured onboarding for new technologies could support smoother adoption and reduce disruption.
- Career mobility, for adequate roles, linked to skill development would help retain talent and build resilience.
- Inclusive recruitment and retention strategies are needed to engage Māori, Pacific peoples, women, and disabled individuals.

Implications for SMEs

- SMEs are not the dominant players in mining and quarrying and oil and gas extraction. For those that are supporting mining and quarrying and oil and gas extraction and wholesaling operations should find scalable ways to build capability while navigating resource constraints and evolving compliance requirements.
- Affordable, relevant training is important, especially in core and transferable skills.
- Digital readiness should begin with scalable technology solutions and basic digital literacy.
- Sustainability knowledge should be embedded into workforce development to meet regulatory expectations.
- Cross functional skill development could enable staff to adapt across roles and support operational flexibility.

Implications for VET

- Vocational education providers play a critical role in preparing learners for future roles, requiring curriculum innovation and stronger industry alignment.
- Embed technical, human-centric and sustainability skills into core programmes, including AI literacy, technological literacy, environmental stewardship, along with creative thinking, systems thinking, resilience, flexibility and agility, curiosity and lifelong learning, and motivation and self-awareness skills.
- Maintain strong foundations in reading, writing, and mathematics to support progression into technical. compliance roles and higher skilled roles.
- Offer flexible learning pathways such as micro-credentials and modular courses to support rapid upskilling.
- Develop targeted programmes for underrepresented groups to build a sustainable and diverse talent pipeline.
- Collaborate with employers to ensure training reflects real world processes and emerging technologies.

Implications for industry bodies and key stakeholders

- Industry bodies and agencies are required to lead coordinated efforts to align workforce strategies with MBIE's growth targets and sector transformation.
- Develop national frameworks for digital and sustainability competencies.
- Support industry-wide micro-credential standards and inclusive workforce strategies.
- Facilitate shared investment in technology enabled training hubs for SMEs and regional employers.
- Consider targeted policy incentives and funding to accelerate workforce transformation.
- Integrate occupation trend analysis into planning to ensure training prepares learners for future roles.

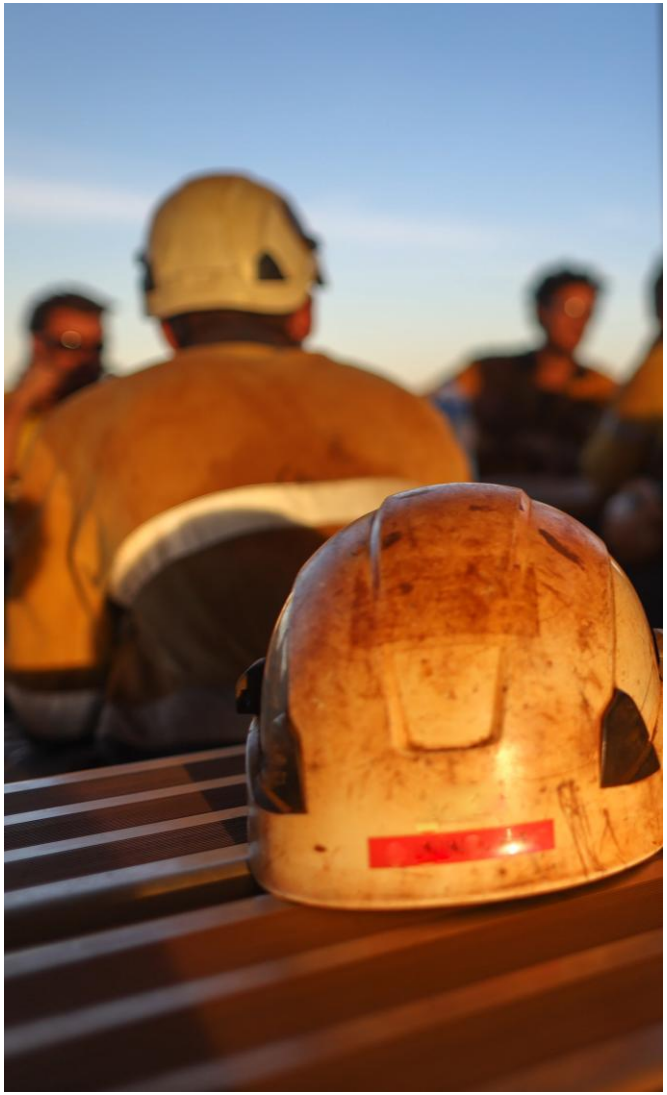
Implications for learners and employees

- Learners and employees need to be supported to navigate a changing landscape where adaptability, continuous learning, and digital fluency are essential for career progression and job security.
- Resilience, flexibility and agility, along with curiosity and lifelong learning will be critical, with access to flexible, modular training that supports upskilling and reskilling.
- Transferable skills such as analytical thinking, creative thinking, systems thinking, and motivation and self-awareness would enable mobility across roles and sectors.
- Clear career pathways linked to qualifications and industry needs would help learners make informed choices and progress into higher skill roles.
- Encompassing education and inclusive work ethics will ensure Māori, Pacific peoples, women, and disabled individuals can embrace opportunities and thrive.
- Employees could benefit from structured onboarding and support when adopting new technologies, helping reduce transition stress and improve retention.

Opportunities for the Infrastructure Industry Skills Board (ISB)

The ISB is uniquely positioned to drive strategic workforce development and ensure the sector remains competitive, inclusive, and future ready. Some forward looking actions to be considered include:

- Develop and maintain sector skill roadmaps aligned with MBIE growth targets, sustainability goals, and global trends to guide qualification design and workforce planning.
- Monitor occupation and skill trends to ensure qualifications remain responsive to technology and sustainability shifts.
- Embed transferable human-centric skills, such as analytical thinking, resilience, flexibility, and agility, into all qualifications to support adaptability and lifelong learning.
- Align NZ qualifications with Australian standards (e.g. AQF levels and competency frameworks)
- Co-design qualifications, curriculums and micro-credentials with Australian industry bodies for interoperability and recognition.
- Embed human-centric and transferrable skills such as systems thinking, technological literacy, resilience, flexibility and agility to support adaptability across sectors.



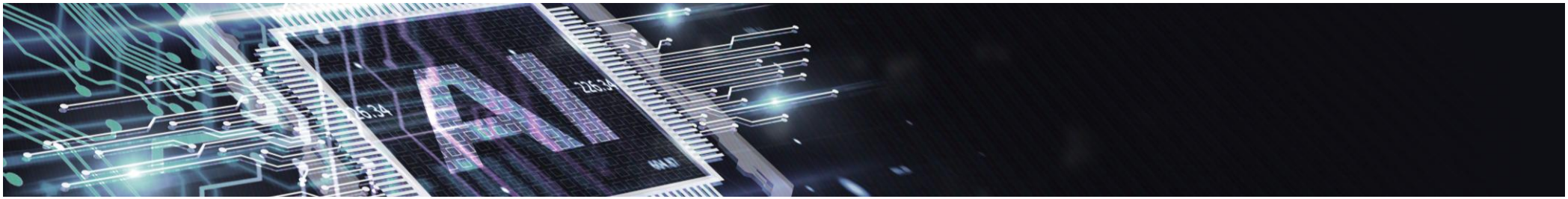
06

Te Ara Atamai Horihori ki Tua
Our Future with AI

Photo: Robocup, New Zealand

AI impact on the workforce and skills

AI is recognised as a general purpose technology that can transform productivity, innovation and employment



Global perspectives on the AI-augmented workforce

Artificial intelligence (AI) is no longer a futuristic concept. It is actively reshaping how work is done across industries. While AI has existed for decades, breakthroughs in the past five years, particularly in generative AI (GenAI) and agentic AI, are transforming the future of work in profound ways. GenAI can now produce text, images, code and documents, while agentic AI can make decisions and take actions independently. These technologies are being compared to past game changers such as microprocessors, personal computers, mobile phones and the internet.

However, it is important not to overlook traditional AI approaches such as predictive analytics, optimisation, and machine learning. These “small and narrow” AI applications remain critical for improving forecasting, resource allocation, and operational efficiency. They often deliver faster, lower cost productivity gains compared to more complex generative models. Organisations that focus solely on GenAI risk missing these proven opportunities for economic impact.

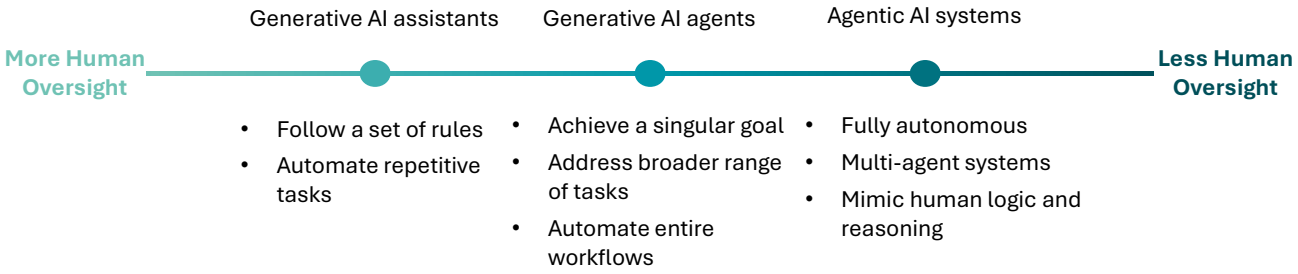
From automation to augmentation

The rise of the AI-augmented workforce marks a shift from automation replacing jobs to AI enhancing human capabilities. This transformation is being felt globally, with varying strategies and outcomes depending on regional readiness, industry maturity and workforce adaptability. As with previous innovations, there is considerable uncertainty around how quickly and deeply AI will impact the workforce. The potential applications across industries are vast, and there are both benefits and consequences to consider when integrating AI into the workplace.

The spectrum of AI autonomy

The progression of AI technologies can be understood through the level of human oversight they require. GenAI assistants typically follow predefined rules and automate repetitive tasks under close human supervision. GenAI agents operate with more autonomy, pursuing specific goals and managing broader workflows with less frequent input. At the furthest end, agentic AI systems function with minimal oversight, coordinating across multiple agents and simulating human reasoning. As these systems become more capable, the shift toward autonomy is prompting new considerations around governance, accountability and workforce integration.

Evolution of Agentic AI



Source: AWS, Deloitte Access Economics

Emerging technology disruption and convergence

A key challenge in forecasting the impact of AI on the workforce is its convergence with a broader ecosystem of emerging technologies. In simplified terms, these include:

- **Artificial intelligence** – AI is when computers and machines are designed to think and learn like humans, supporting us make decisions, solve problems and do tasks faster and more efficiently. In sectors like manufacturing, logistics and mining, AI is being explored to predict equipment failures, streamline supply chains and enhance safety monitoring.
- **Edge-to-Cloud Computing –** This is the powerful, behind the scenes technology that helps run apps, websites and smart devices by processing huge amounts of data quickly, whether in the cloud, at the edge, on your phone or in a factory. This capability supports real time simulations in engineering, helps manage connected machinery in smart factories and improves responsiveness in logistics operations.
- **Engineering biology –** This involves using science and technology to redesign living things, such as cells or bacteria, to create new medicines, grow food more efficiently or make eco-friendly materials, or developing bio-based materials for vehicles and producing alternatives to traditional plastics in manufacturing.
- **Spatial intelligence –** These are technologies that help computers understand and interact with the physical world, like virtual reality, digital maps, or systems that help self-driving cars "see" their surroundings. Through tools such as digital twins, 3D mapping and augmented reality, it supports factory layout planning, remote equipment maintenance in mining and navigation for autonomous vehicles and warehouse robots.
- **Robotics –** Robotics is about building machines that can move and do tasks including assembling products, delivering packages or helping in factories, often with the help of AI. It could play a role in assembling vehicles, moving materials in mining operations and inspecting infrastructure in engineering.
- **Advanced materials –** These are new types of materials that are stronger, lighter or more sustainable than traditional ones, used in everything from smartphones to buildings and electric cars. They are being developed to improve the durability of tools, reduce the weight of heavy machines and industrial equipment such as heat-resistant alloys for aerospace, wear-resistant coatings for mining tools or advanced batteries for electric vehicles.
- **Next generation energy –** This includes cleaner and smarter ways to produce and store energy including solar power, wind energy, hydrogen fuel and better batteries, helping us move toward a greener future. These technologies are shaping low emission mining operations, renewable-powered manufacturing and high performance electric vehicles.
- **Quantum technologies –** Quantum tech uses the rules of quantum physics to build super-powerful computers and ultra-secure communication systems that could solve problems regular computers can't. They offer new possibilities for solving complex problems, such as optimising global logistics networks, simulating advanced materials and improving industrial decision making.

These technologies are converging to accelerate transformation and create disruption across industries, making it harder to predict how jobs and skills will evolve. Unlike past technology waves, AI is not limited to one sector, it is influencing everything from manufacturing to logistics and supply chains. This broad reach means workers in nearly every field will need to adapt to new tools, workflows and expectations.

AI converges with other emerging technologies. Together they are transforming work and driving demand for new skills.

Real world convergence scenarios are already emerging. For example, always-connected sensors feeding real time data into AI systems, supported by cloud computing, can enable predictive maintenance, dynamic scheduling, and energy optimisation in smart factories. Digital twins powered by AI and Internet of Things (IoT) allow manufacturers to simulate production environments, reduce downtime, and optimise resource use. These integrated systems illustrate how convergence, not just standalone technologies, will drive the next wave of operational efficiency and business model innovation.

AI – A focal point for workforce transformation

As emerging technologies converge, AI remains one of the most talked about and transformative areas in technology today. It is redefining roles, shifting tasks and creating new opportunities across industries. Routine and repetitive tasks are increasingly automated, allowing people to focus on creativity, strategy and collaboration. Organisations adopting AI report up to three times higher revenue growth per employee, with roles evolving instead of disappearing.

Benefits of AI-driven transformation

AI adoption brings significant advantages for organisations and employees, reshaping how work is done and creating new opportunities for growth. Key benefits include:

- **Efficiency gains –** Automating repetitive tasks frees time for higher value work. Employees using AI report productivity boosts of around 40%, driven by tool familiarity, experimentation and upskilling.
- **Enhanced decision making –** AI delivers data driven insights for faster, more accurate decisions. Generative AI can cut documentation time by up to 60% and reduce logistics workloads by around 10–20%, improving planning, warehousing and asset maintenance.
- **Job enrichment –** Roles are becoming more meaningful and complex. AI tools that support language, creativity and decision making augment human work, leading to more hiring, higher productivity and greater business value.

Employment outlook and transition challenges

The workforce impact of AI is complex. In high income countries, about 5.5% of jobs are at risk of automation, while 13.4% are likely to be augmented by AI. Global forecasts suggest a net increase in employment, but uncertainty remains around how many workers will need to transition and how quickly.

Productivity potential and policy drivers

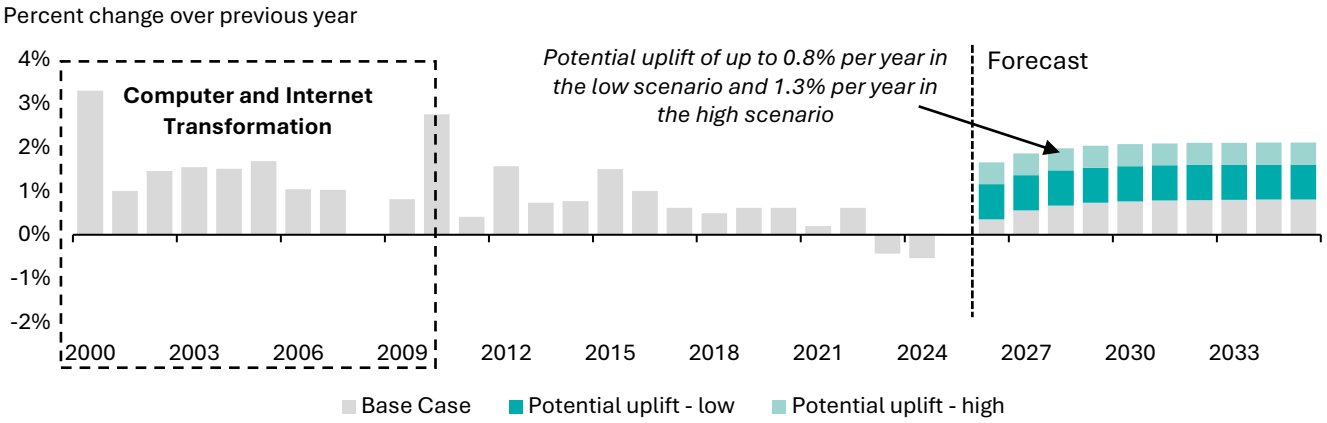
AI's impact on productivity depends on adoption rates, policy frameworks and economic structures.

OECD analysis across the G7 economies shows that countries with strong AI strategies could see annual labour productivity growth of 0.4% to 1.3%, compared to 0.2% to 0.8% in slower adopting economies. The chart below illustrates New Zealand's labour productivity trend and potential uplift from AI, with forecasts showing gains of up to 0.8% in the low scenario and 1.3% in the high scenario, which is almost doubling base case growth from 2027 onwards.

The early 2000s provides a comparable time period in which significant productivity growth occurred due to technological change, where advancements in computers and the internet drove significant increases in labour productivity.

To fully realise AI's potential, adoption strategies must go beyond technology deployment and explicitly connect to economic transformation goals. This means framing AI as a driver of productivity growth, GDP uplift, and competitiveness, not just as a tool for operational efficiency. Countries that integrate AI into broader economic strategies will be better positioned to pioneer innovation, attract investment, and raise GDP per capita.

New Zealand labour productivity growth and the potential uplift from AI



Source: Deloitte Access Economics
Note: Potential uplift is based on the range of OECD estimates of potential productivity growth attributable to AI across G7 economies, which have been applied to Deloitte Access Economics' base case labour productivity projections.

Global strategies and disparities

Countries are approaching AI workforce integration with varying urgency and capability:

- **G7 economies** are leading in strategic AI role creation and skill development, with targeted upskilling pathways emerging.
- **Asia-Pacific countries** such as Singapore and South Korea are investing heavily in AI education and national strategies.
- **Australia** is integrating AI into its digital economy strategy with emphasis on responsible AI and workforce transition.
- **Countries in the early stages of AI adoption**, such as those in Africa, parts of Southeast Asia and Latin America, face challenges in infrastructure and AI literacy but are accelerating progress through public-private partnerships, education reforms and capacity building initiatives.

The World Economic Forum predicts that 85 million jobs will be displaced by AI and automation by 2025, but 97 million new roles will be created, particularly in areas requiring human-machine collaboration.

Relative AI hiring rate (year-over-year ratio)

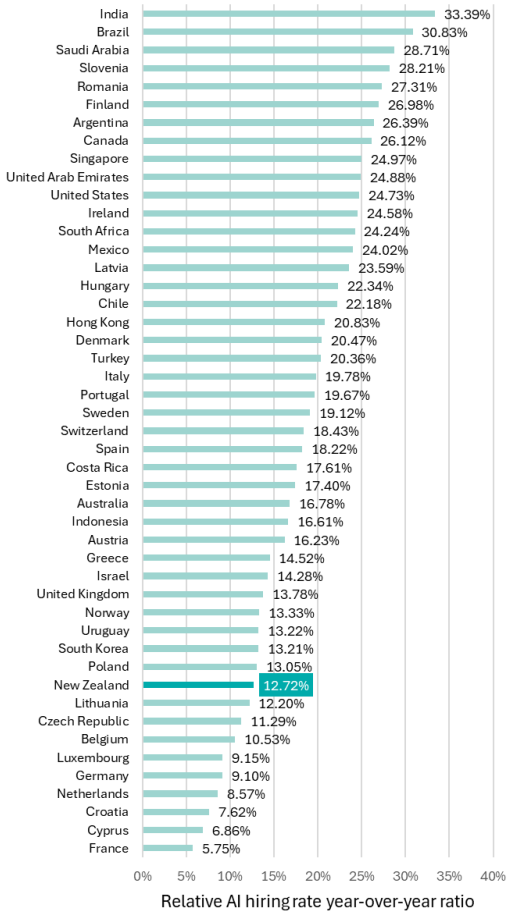
To provide a perspective on how AI hiring is evolving globally, the AI Index 2025 Annual Report by Stanford University uses the relative AI hiring rate year-over-year ratio. This metric shows the percentage change in the ratio of AI hiring compared to overall hiring from one year to the next.

The 2024 data, illustrated in the chart, reveals significant variation across countries:

- **Global leaders –** India (33.39%), Brazil (30.83%), Saudi Arabia (28.71%), and Slovenia (28.21%) recorded the highest increases, signalling strong momentum in AI hiring relative to overall hiring.
- **Advanced economies –** Canada (26.12%) and Finland (26.98%) show steady gains, while the United States (24.73%) and United Kingdom (13.78%) remain moderate.
- **Asia-Pacific contrasts** – Singapore (24.97%) and South Africa (24.24%) are accelerating, while South Korea (13.21%) and Indonesia (16.61%) show slower growth.
- **Australia and New Zealand –** Australia at 16.78% and New Zealand at 12.72% fall below global leaders, indicating incremental progress rather than leadership.
- **Lagging regions –** France (5.75%), Cyprus (6.86%), and Croatia (7.62%) show minimal change, reflecting structural challenges.

This data suggests that while AI hiring is improving globally, the pace varies widely. Emerging markets and transformation focused economies are pulling ahead, while countries like Australia and New Zealand remain in the mid range, highlighting the need for stronger talent pipelines and targeted investment.

Relative AI hiring rate year-over-year ratio by geographic area in 2024



Source: Stanford AI index Report 2025

New Zealand's strategic opportunity

While global economies race ahead, New Zealand has generally been a late adopter of emerging technologies such as AI. This may seem like a disadvantage, but it offers a strategic opportunity. By observing global deployment, Aotearoa can learn from international experience to anticipate impacts and prepare its workforce. This includes adapting education and training systems, shaping policy responses, and supporting businesses, particularly SMEs, to navigate technological change.

SMEs, which form the backbone of New Zealand's economy, often lack resources for large scale digital transformation. Providing clear, evidence based insights into how AI interacts with occupational skill requirements can help these businesses make informed decisions about technology adoption, workforce planning, and training investment.

AI isn't just automation. It's evolution.

From global trends to workforce implications

AI is not just automating tasks, it is reshaping processes and creating new ways of working. These changes are increasingly domain specific, requiring workers to build competencies aligned with the functional capabilities of AI.

For this research, seven AI functional capabilities have been selected: language AI, perception AI, motor control AI, engagement AI, decision making AI, learning AI, and creativity AI. These AI capabilities were chosen because they provide a less technical, more practical way of describing how people interact with AI and are directly relevant to the industry sectors examined in this research.

Language AI	Perception AI	Motor control AI	Engagement AI	Decision making AI	Learning AI	Creativity AI
Natural language processing and generation	Vision, audio, and sensory interpretation	Robotics and physical actuation	Human interaction and behavioural response	Planning, reasoning, and optimisation	Machine learning and adaptive systems	Generative and design oriented AI
Helps computers understand and use human language i.e. speaking, listening, reading, and writing	Enables machines to recognise and interpret sights, sounds, and other sensory information	Powers robots and devices to move and handle objects in response to their surroundings	Allows systems to interact with people and respond to their actions or behaviour	Helps systems weigh options and choose the best course of action based on available information	Enables systems to learn from experience and improve over time without being explicitly programmed	Creates new ideas, designs, or solutions beyond traditional patterns and rules

How AI functions translate into industry applications

Understanding AI capabilities is only the first step. What matters is how these functions are applied in real world contexts. AI is not just theoretical, it is embedded in tools and processes across sectors, transforming how work gets done.

The examples below illustrate how seven AI functional capabilities are being used in industries such as manufacturing, engineering, logistics, automotive, mining and quarrying, and oil and gas extraction. These are only a few examples, not an exhaustive list, but they show the breadth of AI's impact on operational tasks and emerging skill requirements.

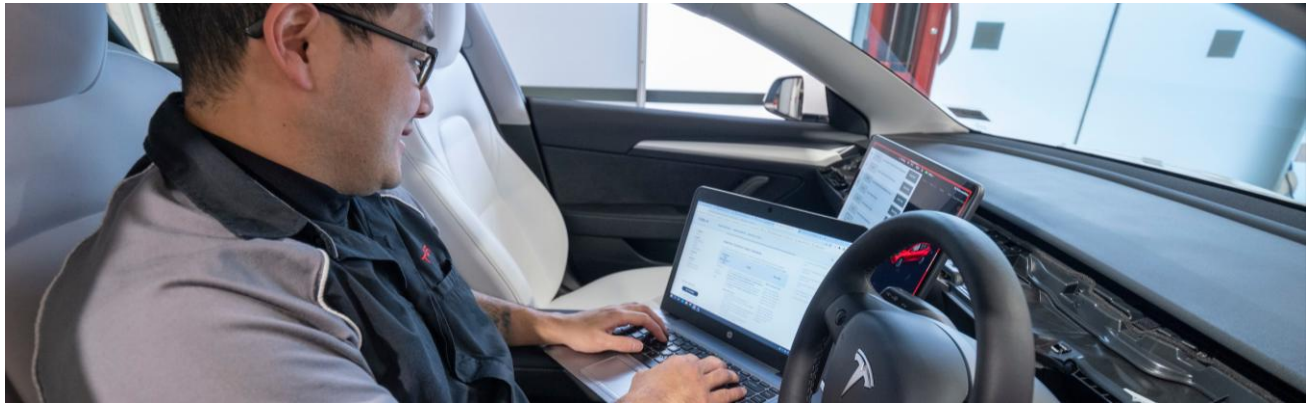


Photo: TESLA, New Zealand

AI type	Manufacturing	Engineering	Logistics	Automotive	Mining and quarrying	Oil and gas extraction
Language AI	AI-generated Standard Operating Procedures	Voice controlled computer aided design (CAD) tools	Chatbots (e.g. Siri, Alexa)	Voice diagnostics (real time voice translation)	Compliance documentation and safety logs	Reporting for environmental impact assessments
Perception AI	Defect detection (computer vision systems)	Drone inspections	Inventory tracking (sensor fusion)	Autonomous sensors (AR/VR)	Satellite imagery analysis	Drone inspection of quarries and pipelines
Motor control AI	AGVs; warehouse robots; robotic arms for assembly	Surgical robots; robotic prototyping	Mobile robots; drones	Autonomous vehicles	Exoskeletons; prosthetic limbs	Remote-operated machinery
Engagement AI	Cobots (social Non-Player Characters – NPCs)	Augmented reality (AR) repair guides	Dispatch coordination (virtual agents)	Adaptive assistants (ChatGPT)	AR-assisted underground equipment servicing	Remote support for offshore and quarry sites
Decision making AI	Smart scheduling	Design validation	Robotic fulfilment	Autonomous driving	Excavation control	Optimising refining and separation
Learning AI	Adaptive quality control (machine learning models)	Design refinement	Delivery prediction	Driver personalisation	Geological modelling	Real time extraction tuning with machine learning
Creativity AI	Generative design (Adobe Firefly)	AI brainstorming	Layout optimisation	Concept design (OpenAI Sora)	Mine layout alternatives	Sustainable extraction strategies

Different AI and automation capabilities demand different skill sets. The specific requirements for each sector will vary depending on how these technologies are applied. To illustrate this point, not to provide an exhaustive list, the following three examples show how AI and automation skill needs can differ across industries.

Mining and quarrying, and oil and gas extraction

- Automation drives efficiency, not headcount
- AI-powered geological modelling opens new opportunities

Logistics

- AI optimises routes and delivery accuracy
- Smart logistics platforms reshape supply chain resilience

Manufacturing

- Industry 4.0 transforms production and safety
- Generative AI and robotics redefine design and operations

The mining and quarrying sector in New Zealand is rapidly adopting advanced technologies and automation to enhance operational efficiency and health and safety outcomes. According to MITO New Zealand Incorporated's Workforce Development Strategy, labour productivity in mining and quarrying is more than four times the national average, yet the sector maintains a relatively small workforce with a range of technical skills. This indicates that automation is being widely leveraged to increase efficiency rather than expand headcount.

Technological advancements such as automated haul trucks, robotic drilling rigs, and remote monitoring systems are transforming operations, driving productivity, safety, and environmental performance. Autonomous safety systems, smart equipment, and real time monitoring further contribute to improved productivity and safety outcomes, underlining the need for continuous workforce upskilling in alignment with these emerging technologies.

Emerging AI applications, such as digital twin for tailings management, predictive analytics and geological modelling are being explored globally and represent potential opportunities for New Zealand.

COVID-19 accelerated the adoption of automation technologies in logistics firms, including robotics, AI, and connected systems. Deloitte's New Zealand Ports and Freight Yearbook 2025 notes that this rapid adoption of automation technologies has, and will continue to increase as the sector strives to maintain its competitive edge. Advanced digital systems, artificial intelligence, predictive automated tracking, and smart logistics platforms are enhancing efficiency, reducing bottlenecks and enabling better decision making.

As an example, New Zealand freight and transport companies are using AI for route optimisation, dynamic expected time arrivals (ETAs), and last-mile delivery planning. AI models consider traffic patterns, delivery windows, vehicle constraints, and ferry schedules to reduce kilometres travelled and improve delivery accuracy.

Other applications such as demand forecasting and roster planning, warehouse automation with AI and GenAI in supply chains are also becoming a reality in New Zealand's logistics sector, helping businesses improve efficiency and resilience.

Manufacturing Industry 4.0 continues to drive innovation and transformation in New Zealand. Leading manufacturers have invested in advanced technologies including AI and automation to improve efficiency, enhance workplace safety, and maintain global competitiveness. Examples include end-to-end process automation, robotics integration across production stages, and smart systems that minimise human exposure to hazardous environments.

There is a growing body of research highlighting AI applications globally and in New Zealand's manufacturing sector. Examples include the use of digital twins, machine learning for machining process optimisation, and autonomous robotics for human–robot collaboration. Other applications already in practice or emerging include robotic automation in NZ factories, generative AI for product design optimisation, predictive maintenance, real time data analytics, and AI-driven quality control.

Industry 5.0 builds on Industry 4.0 by adding a stronger focus on human-centricity, sustainability and resilience. It promotes collaboration between humans and advanced technologies such as AI and robotics, aiming to create value for society while reducing environmental impact and improving adaptability to disruptions.

AI capabilities, skills and occupations

Preparing for AI means mastering both foundational skills and emerging tech competencies

Our future is human and AI.

Not human or AI.

Workforce readiness skills for AI-enabled roles

As AI technologies become deeply embedded across industries, understanding the skills required to work effectively with them is essential for workforce planning. This research identifies 28 emerging skills that non-technical professionals can develop to confidently use AI tools in their roles. These skills are designed to support workforce readiness, guide curriculum development, inform job profiling, and shape strategic workforce planning.

To frame these skills, it is useful to consider two complementary perspectives:

1. **Forward looking, AI and tech specific skills –** These focus on practical capabilities needed to interact with, manage, and adapt to AI tools in real world settings. Examples include prompt engineering, AI model validation, and machine learning operations (MLOps). These are the competencies that enable workers to guide and optimise AI outputs rather than simply perform tasks AI might automate or augment. These skills are critical for thriving in AI-integrated environments but are not widely represented in traditional skills databases.
2. **Foundational cognitive and human-centric skills –** Derived from empirical analysis of existing job tasks and skill ratings (e.g. O*NET database), these skills quantify the importance of baseline capabilities across occupations. Examples include reading comprehension, writing, speaking, troubleshooting, coordination, and critical thinking. These remain essential for roles most exposed to AI technologies and help identify which occupations are likely to be impacted.
3. **Business innovation and entrepreneurial mindset –** These skills focus on the ability to design new business models, create value streams, and leverage AI for strategic advantage rather than simply adopting existing solutions. Examples include system thinking, innovation management, and process reimagination. These competencies enable organisations to pioneer AI-driven innovation, develop differentiated offerings, and respond to market shifts proactively. Without these skills, economies risk remaining followers rather than leaders, limiting competitiveness and long term growth.

Both skill perspectives matter because they provide a holistic view of workforce transformation. Foundational skills represent the current baseline needed for adaptability and problem solving, while AI and tech specific skills signal the emerging capabilities required to work effectively with advanced technologies. Together, they ensure workforce are prepared to meet immediate needs and future demands.

This dual approach supports policymakers, VET providers, and employers in identifying reskilling priorities and future skill pathways. It ensures workforce development strategies are grounded in both current occupational realities and emerging technological demands.

Complementing these non-technical person skills, industry sectors also require Information and Communication Technology (ICT) specialists to build, maintain, and optimise AI systems. Workforce training must therefore address both ends of the spectrum:

- **Upskilling non-technical workers** to confidently use AI tools in their roles.
- **Developing advanced technical expertise** to design, deploy, and manage AI infrastructure.

This integrated approach ensures businesses, especially SMEs, can adopt AI responsibly and productively without creating capability gaps.

The following table presents the 28 emerging skills for AI-enabled roles for non-technical workers, along with the primary functional AI types where these skills are most relevant.

Non-technical AI and tech specific skills required to work with AI tools:

Skill #	Skill	Description	Rationale	Relevant AI capability
1	**Basic AI literacy**	Understanding how Natural Language Processing (NLP) and generative models work	Provides foundational understanding of AI models, enabling informed use and reducing misuse	Language AI, Learning AI, Decision making AI, Creativity AI
2	**Prompt engineering**	Crafting effective inputs for generative AI tools and guiding generative models to produce relevant outputs	Critical for guiding generative AI tools to produce accurate, relevant outputs	Language AI, Creativity AI, Learning AI
3	**Bias awareness**	Ability to question AI outputs, detect potential bias, and avoid over-reliance on automation	Prevents over-reliance on AI and mitigates risks of biased outputs	Decision making AI, Language AI, Learning AI
4	**Data literacy**	Ability to interpret charts, dashboards, and AI-generated insights to make informed decisions	Enables interpretation of AI-generated insights for better decision making	Decision making AI, Learning AI, Language AI
5	**Sensor data interpretation**	Ability to work with visual and environmental data streams	Essential for working with AI systems that rely on environmental and visual data	Perception AI, Motor control AI, Decision making AI
6	**Generative content creation**	Using AI tools for ideation and prototyping	Facilitates innovation by leveraging AI for ideation and prototyping	Creativity AI, Language AI
7	**Computer visual basics**	Understanding image recognition and pattern concept	Helps professionals interpret AI-driven image recognition and pattern detection systems	Perception AI, Motor control AI
8	**Human–machine interaction**	Operating collaborative robots (cobots) and using AR systems	Real time collaboration between humans and AI systems, such as cobots and AR interfaces, adapting workflows	Engagement AI, Motor control AI
9	**Robotics operation**	Managing pre-programmed robots or cobots	Technical control of pre-programmed robots or cobots, setting up, ensure safe and efficient use of tools	Motor control AI, Engagement AI
10	**Safety protocols**	Applying standards in AI assisted physical environments	Protects workers in AI assisted environments, reducing risk of accidents	Motor control AI, Engagement AI
11	**Interface fluency**	Navigating AI-driven dashboards and wearable tech	Improves ability to navigate AI dashboards and wearable tech for decision making	Engagement AI, Decision making AI
12	**Quality control knowledge**	Applying AI outputs to real time inspection and monitoring	Ensures AI outputs are applied effectively in inspection and monitoring processes	Perception AI, Learning AI
13	**Technical troubleshooting**	Diagnosing and resolving control system issues	Allows quick resolution of AI system-level issues, minimising downtime for hardware and software integration	Motor control AI, Perception AI
14	**Basic troubleshooting for AI tools**	Knowing how to identify and resolve common user-level issues e.g. incorrect prompts	Empowers users to resolve user-level common AI-related issues without specialist support	Engagement AI, Motor control AI, Language AI

Non-technical foundational cognitive and interpersonal skills required to work with AI tools:

Skill #	Skill	Description	Rationale	Relevant AI capability
15	**Collaboration with tech teams**	Working with data scientists, engineers and other technical teams	Bridges communication between non-technical staff and AI specialists for smooth integration	Learning AI, Creativity AI
16	**Digital communication skills**	Ability to interact with AI interfaces and voice systems.	Enables clear interaction with AI interfaces and voice systems	Language AI, Engagement AI
17	**Situational awareness**	Responding to AI prompts in dynamic environments	Helps workers respond appropriately to AI prompts in dynamic environments	Engagement AI, Decision making AI
18	**Creative thinking**	Thinking through user experience design creatively with AI agents	Supports design of user experiences and innovative solutions using AI	Engagement AI, Creativity AI
19	**Systems thinking**	Understanding how AI integrates with operational workflows	Provides understanding of how AI fits into broader operational workflows	Decision making AI, Learning AI
20	**Analytical thinking**	Making data-informed decisions with AI support	Improves ability to make data-informed decisions with AI support	Decision making AI, Learning AI
21	**Design thinking**	Applying AI-generated ideas to real world situations	Translates AI-generated ideas into practical, user-focused solutions	Creativity AI, Engagement AI
22	**Innovation management**	Evaluating and implementing AI-driven ideas	Guides innovation, evaluation and implementation of AI-driven ideas effectively	Creativity AI, Decision making AI
23	**Digital security awareness**	Understanding privacy, data protection, and safe handling of sensitive information for trust	Protects sensitive data and maintains trust in AI systems	All AI types (especially Decision making AI, Learning AI, Engagement AI)
24	**Interpersonal skills**	Communication, leadership, empathy, networking, time management, coordination	Critical for teamwork, leadership, and coordination in AI-augmented workplaces	Engagement AI, Decision making AI, Learning AI
25	**Collaboration in human-AI teams**	Working effectively in environments where AI augments human roles	Promotes effective teamwork in environments where AI augments human roles	Engagement AI, Learning AI, Creativity AI
26	**Ethical awareness**	Navigating automation impacts, implications of AI decisions on fairness, transparency, and accountability	Ensures responsible use of AI, addressing fairness, transparency, and accountability	Decision making AI, Engagement AI, Language AI
27	**Change adaptability**	Comfort with continuous technology updates and evolving workflows	Builds resilience to ongoing technological changes and workflow updates	All AI types
28	**Continuous learning mindset**	Staying updated with evolving AI tools	Keeps knowledge updated as AI tools and technologies evolve rapidly	All AI types (especially Learning AI)

How AI transforms VET

AI is transforming vocational education with adaptive learning, automated assessments, and inclusive design, boosting engagement and accessibility.

AI and its impact on VET

VET systems worldwide are undergoing significant change as artificial intelligence reshapes industries and workforce needs. Institutions are rethinking how they deliver training, assess competencies, and support diverse learners. The following trends highlight the most notable shifts.

AI-enhanced learning

AI is introducing personalised, adaptive, and immersive training experiences that improve learner engagement and outcomes. Intelligent systems analyse learner performance data to tailor content delivery, pacing, and complexity to individual need that is far beyond traditional static approaches.

A high level literature scan suggests the following example benefits from AI enhanced learning:

- Learner engagement increased through adaptive learning systems.
- Skill proficiency improved with real time feedback from automated assessments.
- long term efficiency rose, due to AI-assisted grading reducing administrative workload.

Long term integration of AI in VET shows even greater impact. Some studies have reported the following:

- Completion rates improved.
- Assessment accuracy rose.
- Skill retention increased.

AI also enhances training efficiency:

- Trainer workload reduced through automated grading and performance tracking.
- Training customisation achieved efficiency gain with AI-enabled systems.

Assessment reform

The rise of generative AI has prompted a fundamental shift in assessment strategies within vocational education. Traditional written exams are increasingly vulnerable to AI-generated responses, making them less effective for measuring authentic learner capability. As a result, institutions are moving towards performance based assessments that prioritise practical application, critical thinking, and problem solving, skills that AI cannot easily replicate.

Key changes include:

- Project based learning and real time simulations that require hands-on engagement and contextual decision making.
- Oral examinations and live demonstrations to validate learner understanding beyond text-based outputs.
- AI-assisted evaluation tools that analyse submissions for originality, coherence, and skill mastery, offering faster feedback and reducing grading workload.

Impact on educators and learners:

- Assessment accuracy improves through AI-driven analytics, reducing human error and bias.
- Feedback cycles become more immediate, supporting continuous improvement.
- Ethical considerations remain critical, including transparency in AI grading and safeguards against surveillance or algorithmic bias.

Inclusive design

AI is enabling greater accessibility and inclusivity in vocational education, addressing barriers faced by learners with diverse needs. Adaptive learning platforms personalise content delivery based on individual learning styles, while assistive technologies provide real time support for learners with disabilities or neurodivergent profiles.

Key applications driving inclusivity:

- Voice recognition and text-to-speech tools to support learners with visual or motor impairments.
- Predictive typing and AI-powered translation to assist multilingual learners and those with language challenges.
- Adaptive content sequencing that adjusts complexity and pacing for different cognitive profiles.

Impact on equity and reach:

- Expands access to vocational training in remote and underserved regions through AI-enabled remote learning.
- Enhances learner confidence and engagement by removing physical and cognitive barriers.
- Raises ethical challenges, including cultural sensitivity and bias mitigation in AI algorithms.

Key considerations for New Zealand in an AI-driven economy

While global trends set the pace for AI adoption, New Zealand faces unique circumstances shaped by its economic structure, workforce composition, and education system. SMEs form the backbone of the economy, vocational education plays a critical role in skills development, and larger organisations drive innovation through advanced technologies. To harness AI's potential and mitigate risks, these stakeholders should address pressing challenges while capitalising on emerging opportunities. The following section outlines the top three challenges and opportunities for organisations and employers, SMEs, and vocational education providers in Aotearoa.

Organisations and employers

Challenges:

- **Workforce transition and reskilling –** Large organisations are needing to balance automation with human roles while ensuring employees acquire AI-related skills quickly. In New Zealand, where labour markets are relatively small, this transition is critical to avoid skill shortages.
- **Governance and accountability –** Managing ethical use of AI, data privacy, and compliance is increasingly complex as autonomous systems become embedded in operations.
- **Integration complexity –** Aligning AI with existing workflows, legacy systems, and organisational culture without disrupting productivity remains a major hurdle.

Opportunities:

- **Productivity and efficiency gains –** Automating repetitive tasks and augmenting decision making can potentially boost output, helping New Zealand firms compete globally.
- **Job enrichment and innovation –** AI enables employees to focus on creativity, strategy, and collaboration, creating more meaningful roles and improving retention.
- **Competitive advantage –** Early adoption of AI-driven tools positions organisations for higher revenue growth and market leadership, particularly in export oriented sectors such as manufacturing and logistics.

AI adoption is not just a technology upgrade. It's a cultural shift.

Small and medium-sized enterprises

Challenges

- **Resource constraints –** Limited budgets and technical expertise make large scale AI adoption difficult for SMEs, which dominate New Zealand's economy.
- **Digital readiness gaps –** Many SMEs lack infrastructure and AI literacy, slowing transformation and creating uneven adoption across regions.
- **Risk of falling behind –** Global competitors and larger firms are moving faster, putting pressure on SMEs to adapt or risk losing market share.

Opportunities

- **Affordable AI solutions –** Cloud-based AI tools and SaaS (Software as a Service) platforms lower entry barriers, enabling SMEs to adopt AI without heavy upfront investment. Traditional AI applications such as predictive analytics and optimisation also offer practical, low cost productivity gains for SMEs.
- **Operational resilience –** AI-driven forecasting, logistics optimisation, and automation can help SMEs manage volatility and supply chain disruptions, especially in export heavy industries.
- **Niche innovation –** SMEs can leverage AI for customised products, personalised services, and agile business models, creating differentiation in competitive markets.

VET sectors

Challenges

- **Curriculum lag –** Traditional training frameworks do not reflect emerging AI skills such as prompt engineering or model validation, leaving graduates underprepared.
- **Assessment integrity –** Generative AI challenges conventional exams, requiring new performance based evaluation methods to ensure authentic learning.
- **Equity and access –** Ensuring inclusive AI-enabled learning for diverse learners and remote communities is essential for New Zealand's regional workforce development.

Opportunities

- **AI-enhanced learning –** Adaptive platforms improve engagement and skill proficiency, making training more effective and scalable.
- **Future-proof skills –** Embedding both foundational cognitive skills and AI-specific competencies prepares learners for evolving roles across industries.
- **Inclusive education –** AI-powered assistive technologies expand access for learners with disabilities and underserved regions, supporting New Zealand's equity goals.

Learners, employees, and people entering the industries

Challenges

- **Skill uncertainty –** Rapid AI adoption creates ambiguity around which skills will remain relevant and which new competencies are essential. Many workers and learners lack clear guidance on future-proof pathways.
- **Access to training –** Cost, time, and geographic barriers limit access to upskilling opportunities, particularly for those in remote regions or SMEs with limited resources.
- **Job transition anxiety –** Fear of displacement and uncertainty about career prospects can discourage workers from engaging with AI-related learning.

Opportunities

- **Career mobility and new roles –** AI is creating demand for hybrid roles that combine technical literacy with domain expertise, opening pathways in industry and emerging tech sectors.
- **Accessible learning platforms –** AI-powered adaptive learning and micro-credentialing make it easier for individuals to gain targeted skills at lower cost and with flexible delivery.
- **Human-AI collaboration skills –** Developing critical thinking, problem solving, and prompt engineering positions workers for roles that AI augments rather than replaces.

Tāpiritanga
Appendices

Appendix 1

Workforce gap analysis methodology

Workforce gap methodology

Deloitte forecasts sector specific labour demand and supply in two separate models, informed by in-house sectoral GDP, Productivity, Population, and Employment Ratio projections.

Supply

Population

- Population forecasts were generated using Deloitte's in-house demographic forecasting model. For this application, the population was forecasted by sex and age at the national level.
- To forecast at a more granular level, for the sectors where it was appropriate, population forecasts were further disaggregated by ethnicity using historic proportions.

Labour supply

- Within each sector, historic employment to population (E:P) ratios were linearly extrapolated to 2030. These forecasted E:P ratios were then applied to the in-house disaggregated population forecasts to calculate the expected sectoral labour supply.
- For each sector other than Mining and Quarrying and Natural Oil and Gas Extraction and Wholesaling, these E:P ratios were calculated, extrapolated, and applied at the age and ethnicity level, then aggregated up to form a sector wide view. For Mining and Quarrying and Natural Oil and Gas Extraction and Wholesaling, the E:P ratios were calculated, extrapolated, and applied at the sector-wide level due to data limitations preventing more granular analysis.

Demand

Sectoral GDP

- Split level 1/2 ANZSIC specific GDP into level 4 ANZSIC specific GDP using employment counts from business demography data.
- Aggregate the level 4 ANZSIC specific GDP into the sector definitions outlined by the Hanga-Aro-Rau legislation.
- Create custom regressions for each specific sectoral GDP series and forecast sectoral GDP to 2030.

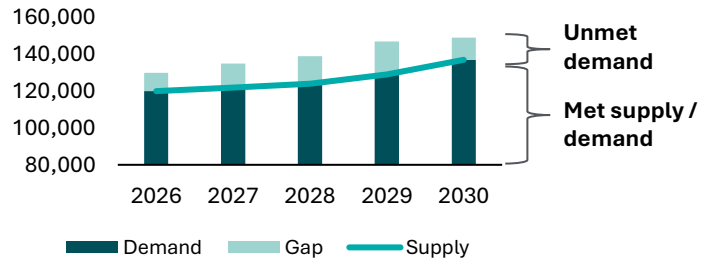
Labour demand

- Estimate implied productivity growth by applying a log-linear regression to historical Output/FTE data.
- Apply the forecasted GDP growth and implied productivity rates to employment data to forecast the future labour demand for each sector.

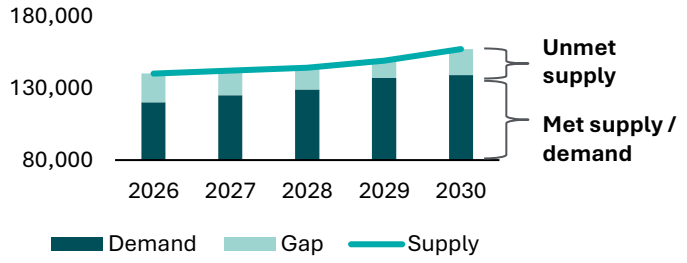
Gap

- The gap is calculated by subtracting the forecasted labour supply from the forecasted labour demand. A negative gap (expected to occur in the Natural Oil and Gas Extraction and Wholesaling sector) indicates that labour supply outstrips labour demand, leading to unemployment rather than unfilled jobs.

Positive Workforce Gap



Negative Workforce Gap



Appendix 2

Global skills taxonomy

Global skills taxonomy

the World Economic Forum's Global Skills Taxonomy Adoption Toolkit 2025

Level 1: Attitudes

Level 2	Level 3	Level 4
Curiosity and lifelong learning	Curiosity and lifelong learning	Curiosity
		Initiative
		Willingness to learn
Dependability and attention to detail	Dependability and attention to detail	Assuming responsibility
		Attention to detail
		Meeting commitments and deadlines
		Time management and prioritisation
Ethics	Civic responsibility	Ethical leadership
		Social justice
		Social-cultural awareness
		Technology ethics
	Environmental stewardship	Adopting green technologies
		Environmental awareness
		Sustainable and efficient resource usage
Resilience, flexibility and agility	Resilience, flexibility and agility	Adaptation to change
		Frustration management
		Persistence
		Stress management
Self-efficacy	Motivation and self-awareness	External self-awareness
		Internal self-awareness
		Self-control
Working with others	Empathy and active listening	Asking questions
		Empathy
		Giving and receiving feedback
	Leadership and social influence	Building trust
		Liaising, networking and exchanging information
		Persuasion and negotiation
	Service orientation	Assisting and supporting co-workers
		Following instructions and procedures
	Teaching, mentoring and coaching	Coaching
		Mentoring
		Teaching

Level 1: Skills, knowledge and abilities

Level 2	Level 3	Level 4
Cognitive skills	Creativity and problem solving	Analytical thinking
		Creative thinking
		Systems thinking
	Mathematical and statistical thinking	Algebraic facility
		Calculating and estimating
		Data analysis and mathematical modelling
		Number facility
	Speaking, writing and languages	Editing
		Multi-lingualism
		Reading
		Speaking
		Writing
Engagement skills	Customer experience	Customer relationship management
		Customer service
	Marketing and media	Digital marketing
		Sales, communication and marketing of products and services
Management skills	Financial management	Accounting
		Finance
	Operations and logistics	Coordination and time management
		Project management
		Supply-chain management
	Quality management	Quality assurance
		Quality control
		Risk management
	Talent management	Skill evaluation
		Talent planning and development
Physical abilities	Manual dexterity, endurance and precision	Dexterity
		Flexibility and coordination
		Strength and stamina
	Sensory-processing abilities	Auditory abilities
		Information-processing abilities
		Spatial abilities
		Visual abilities
Technology skills	Artificial intelligence and big data	Cloud computing
		Data mining
		Supervised learning
		Unsupervised learning
	Design and user experience	Human-technology interaction
		Mobile development
		Web development
	Networks and cybersecurity	Computer hardware and networking
		Cybersecurity and application security
	Programming	Computational thinking
		Functional programming
		Object-oriented programming
	Technology literacy	Collaboration and productivity software
		Installation
		Manufacturing technologies

Skills taxonomy definitions

For the purpose of this research, the following definitions of skills have been adapted from the World Economic Forum's Global Skills Taxonomy Adoption Toolkit 2025, publicly available source. Global citizenship, resource management and operations, and social cultural awareness skills have been adopted from the World Economic Forum's Skills Taxonomy 2021

AI and big data

- Building and developing machines capable of thinking autonomously and performing tasks that mimic human intelligence.

Analytical thinking

- Capacity to break down concepts and complex ideas into basic or fundamental principles. Includes critical thinking, whereby judgements are made by analysing and interpreting facts and information.

Creative thinking

- Capacity to bring a new idea or concept into existence through imagination and to imagine something that does not exist.

Curiosity and lifelong learning

- Understanding the implications of new information for both current and future problem-solving and decision making.

Dependability and attention to detail

- Dependability, commitment to doing the job punctually, correctly and carefully, and paying attention to details.

Design and user experience

- Developing and delivering effective and efficient physical and digital designs given a systematic understanding of how users will perceive their value, function, usability and aesthetic.

Empathy and active listening

- Paying attention to what others say and understanding points being made, establishing rapport, adjusting the register, and respecting the intervention of others.

Environmental stewardship

- Sustainably using natural resources and protecting the natural environment.

Global citizenship

- Global citizenship and civic responsibility: Playing an active role in the global and local community and the application of civic values.

Leadership and social influence

- Having an impact on others in the organisation, and displaying energy and leadership. Leadership is defined as a quality that can be possessed by anyone, regardless of their particular function within an organisation.

Manual dexterity, endurance and precision

- Abilities related to the capacity to manipulate and control objects, strength, endurance, flexibility, balance and coordination.

Marketing and media

- Capacity to promote and sell products or services.

Motivation and self-awareness

- Seeing one's own values, passions, aspirations, fit with environment, reactions (including thoughts, feelings, behaviours, strengths, and weaknesses), and impact on others, as well as understanding how one is perceived by others, in terms of those same factors.

Multi-lingualism

- Communicating through reading, writing, speaking and listening in foreign languages.

Networks and cybersecurity

- Securely and efficiently delivering information-technology solutions.

Programming

- Using software and programming languages.

Quality control

- Inspecting products to ensure they fulfil quality requirements.

Reading, writing and mathematics

- **Reading:** Understanding written sentences and paragraphs in work-related documents.
- **Writing:** Communicating effectively in writing as appropriate for the needs of the audience.
- **Mathematical and statistical thinking:** Quantitative reasoning in order to calculate, estimate or model phenomena.

Resilience, flexibility and agility

- Maturity, poise, flexibility, and restraint to cope with pressure, stress, criticism, setbacks, and personal and work-related problems.

Resource management and operations

- Resource management and operations: Capacity to allocate resources efficiently and effectively, and manage activities that businesses engage in daily to gain value from physical or intangible assets.

Sensory-processing abilities

- Abilities that influence visual, auditory and spatial perception, and the acquisition and application of knowledge in problem-solving

Service orientation and customer service

- **Service orientation:** Actively looking for ways to help others as well as to make them feel attended to and welcome.
- **Customer service:** Responding to customer enquiries in a manner that balances speed and quality, and represents brand values.

Social cultural awareness

- Social cultural awareness: Respecting and valuing others. Awareness of the wider world, of history and of social justice issues

Systems thinking

- Capacity to understand how concepts work together, embrace a multidisciplinary approach, and identify patterns over time.

Talent management

- Capacity for evaluating skills and skills gaps, and gathering personnel resources to achieve tasks, including how human capital will be allocated to get the work done.

Teaching and mentoring

- **Teaching:** Inculcating knowledge and skills using techniques from cognitive psychology such as helping learners construct meaning through active engagement with the world and by building on the conceptual scaffolding of prior experience.
- **Mentoring:** Supporting the development of a mentee over an extended period by sharing experiences and expertise, and setting growth targets.

Technological literacy

- Capacity to select the right tools needed to perform tasks, use those tools and set up and operate technology.

Appendix 3

Skills level definitions

Skill levels definitions

High skilled

Consistent with previous Hanga-Aro-Rau research, this research used employment data from the Household Labour Force Survey which categories occupations into five categories, ranging from highly skilled (level 1) to lower skilled (level 5). The skill levels are assigned based on the level of formal education, training and on-the-job training required for the occupation and are based on the Australian and New Zealand Standard Classification of Occupations (ANZSCO).

The levels that are considered “high skilled” are subjective to each sector and therefore vary depending on the nature of qualifications, skills and experience required.

The below table outlines Statistics New Zealand’s definitions from the Household Labour Force Survey.

ANZSCO skill levels

Level 1: Highly skilled	Level of skill commensurate with a bachelor degree or higher qualification. At least five years of relevant experience may substitute for the formal qualification.
Level 2	**Level of skill commensurate with one of the following:** • NZ Registered Diploma or • AQF Associate Degree, Advanced Diploma or Diploma. • At least three years of relevant experience may substitute
Level 3: Skilled	**Level of skill commensurate with one of the following:** • NZ Registered Level 4 qualification • AQF Certificate IV or • AQF Certificate III including at least two years of on-the-job training. • At least three years of relevant experience may substitute.
Level 4	**Level of skill commensurate with one of the following:** • NZ Registered Level 2 or 3 qualification or • AQF Certificate II or III. • At least one year of relevant experience may substitute.
Level 5: Lower skilled	**Level of skill commensurate with one of the following:** • NZ Registered Level 1 qualification • AQF Certificate I or • Compulsory secondary education.

New Zealand Qualification Framework (NZQF) level descriptors

he NZQF has ten levels, organised by complexity. Level 1 represents the least complex learning outcomes, while Level 10 represents the most complex. These descriptors outline what a graduate should know, understand, and be able to do as a result of learning.

Knowledge refers to what a graduate understands. It progresses from basic general knowledge through to factual, operational, theoretical, technical, specialised, and frontier knowledge. Complexity is described in terms of both breadth and depth within a field of study or work.

Skills describe what a graduate can do. They involve integration, independence, and creativity, and their progression depends on how familiar the task or problem is.

Application of knowledge and skills refers to the context in which graduates use what they know and can do.

NZQF levels are not explored in this research report. Refer to The New Zealand Qualifications Framework and NZQF level descriptors up to 2025 for more information.

Dimension	Level 1	Level 2	Level 3a	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10
Knowledge	Basic general and/or foundation knowledge	Basic factual or operational knowledge of a field of work or study	Some operational and theoretical knowledge in a field of work or study	Broad operational and theoretical knowledge in a field of work or study	Broad operational and theoretical knowledge within a specific field of work or study	Specialised technical or theoretical knowledge with depth in a field of work or study	Specialised technical or theoretical knowledge with depth in one or more fields of work or study	Advanced technical or theoretical knowledge in a discipline or practice, involving a critical understanding of the key principles	Highly specialised knowledge, some of which is at the forefront of knowledge, and a critical awareness of issues in a field of study or practice	Knowledge at the most advanced frontier of a field of study or professional practice
Skills	Apply basic solutions to simple problems Apply basic skills required to carry out simple tasks	Apply known solutions to familiar problems Apply standard processes relevant to the field of work or study	Select and apply from a range of known solutions to familiar problems Apply a range of standard processes relevant to the field of work or study	Select and apply solutions to familiar and sometimes unfamiliar problems Select and apply a range of standard and non-standard processes relevant to the field of work or study	Select and apply a range of solutions to familiar and sometimes unfamiliar problems Select and apply a range of standard and non-standard processes relevant to the field of work or study	Generate solutions to familiar and unfamiliar problems Select and apply a range of standard and non-standard processes relevant to the field of work or study	Analyse, generate solutions to unfamiliar and sometimes complex problems Select, adapt and apply a range of processes relevant to the field of work or study	Analyse, generate solutions to complex and sometimes unpredictable problems Evaluate and apply a range of processes relevant to the field of work or study	Develop and apply new skills and techniques to existing or emerging problems Mastery of the field of study or practice to an advanced level	Critical reflection on existing knowledge or practice and the creation of new knowledge
Application (of knowledge and skills)	Highly structured contexts Requiring some responsibility for own learning Interacting with others	General supervision Requiring some responsibility for own learning and performance Collaborating with others	Limited supervision Requiring major responsibility for own learning and performance Adapting own behaviour when interacting with others Contributing to group performance	Self-management of learning and performance under broad guidance Some responsibility for performance of others	Complete self-management of learning and performance within defined contexts Some responsibility for the management of learning and performance of others	Complete self-management of learning and performance within dynamic contexts Responsibility for leadership within dynamic contexts	Advanced generic skills and/or specialist knowledge and skills in a professional context or field of study	Developing identification with a profession and/or discipline through application of advanced generic skills and/or specialist knowledge and skills Some responsibility for integrity of profession or discipline	Independent application of highly specialised knowledge and skills within a discipline or professional practice Some responsibility for leadership within the profession or discipline	Sustained commitment to the professional integrity and to the development of new ideas or practices at the forefront of a discipline or professional practice

Appendix 4

Hanga-Aro-Rau sector definitions

Hanga-Aro-Rau Sector Definitions

Manufacturing and Engineering

Manufacturing ANZSIC Codes

ANZSIC L4 Code	Description
C111100	Meat processing
C111200	Poultry processing
C111300	Cured meat and smallgoods manufacturing
C113100	Milk and cream processing
C113200	Ice cream manufacturing
C113300	Cheese and other dairy product manufacturing
C114000	Fruit and vegetable processing
C115000	Oil and fat manufacturing
C116100	Grain mill product manufacturing
C116200	Cereal, pasta, and baking mix manufacturing
C117100	Bread manufacturing (factory based)
C117200	Cake and pastry manufacturing (factory based)
C117300	Biscuit manufacturing (factory based)
C117400	Bakery product manufacturing (non-factory based)
C118100	Sugar manufacturing
C118200	Confectionery manufacturing
C119100	Potato, corn, and other crisp manufacturing
C119200	Prepared animal and bird feed manufacturing
C119900	Other food product manufacturing n.e.c.
C121100	Soft drink, cordial, and syrup manufacturing
C121200	Beer manufacturing
C121300	Spirit manufacturing
C121400	Wine and other alcoholic beverage manufacturing (excluding wine)
C122000	Cigarette and tobacco product manufacturing
C131100	Wool scouring
C131200	Natural textile manufacturing
C131300	Synthetic fibre textile manufacturing
C132000	Leather tanning, fur dressing, and leather product manufacturing

Manufacturing ANZSIC Codes (Continued)

ANZSIC L4 Code	Description
C133100	Textile floor covering manufacturing
C133200	Rope, cordage, and twine manufacturing
C133300	Cut and sewn textile product manufacturing
C133400	Textile finishing and other textile product manufacturing
C134000	Knitted product manufacturing
C135100	Clothing manufacturing
C135200	Footwear manufacturing
C141100	Log sawmilling
C141200	Wood chipping
C141300	Timber resawing and dressing
C149100	Prefabricated wooden building manufacturing
C149200	Wooden structural fitting and component manufacturing (excluding prefabricated timber wall frames and roof trusses)
C149300	Veneer and plywood manufacturing
C149400	Reconstituted wood product manufacturing
C149900	Other wood product manufacturing n.e.c.
C151000	Pulp, paper, and paperboard manufacturing
C152100	Corrugated paperboard and paperboard container manufacturing
C152200	Paper bag manufacturing
C152300	Paper stationery manufacturing
C152400	Sanitary paper product manufacturing
C152900	Other converted paper product manufacturing
C161100	Printing
C161200	Printing support services
C162000	Reproduction of recorded media
C170100	Petroleum refining and petroleum fuel manufacturing
C170900	Other petroleum and coal product manufacturing
C181100	Industrial gas manufacturing

Manufacturing ANZSIC Codes (Continued)

ANZSIC L4 Code	Description
C181200	Basic organic chemical manufacturing
C181300	Basic inorganic chemical manufacturing
C182100	Synthetic resin and synthetic rubber manufacturing
C182900	Other basic polymer manufacturing
C183100	Fertiliser manufacturing
C183200	Pesticide manufacturing
C184100	Human pharmaceutical and medicinal product manufacturing
C184200	Veterinary pharmaceutical and medicinal product manufacturing
C185100	Cleaning compound manufacturing
C185200	Cosmetic and toiletry preparation manufacturing
C189100	Photographic chemical product manufacturing
C189200	Explosive manufacturing
C189900	Other basic chemical product manufacturing n.e.c.
C191100	Polymer film and sheet packaging material manufacturing
C191200	Rigid and semi-rigid polymer product manufacturing
C191300	Polymer foam product manufacturing
C191400	Tyre manufacturing
C191500	Adhesive manufacturing
C191600	Paint and coatings manufacturing
C191900	Other polymer product manufacturing
C192000	Natural rubber product manufacturing
C201000	Glass and glass product manufacturing
C202100	Clay brick manufacturing
C202900	Other ceramic product manufacturing
C203100	Cement and lime manufacturing
C203200	Plaster product manufacturing
C209000	Other non-metallic mineral product manufacturing
C211000	Iron smelting and steel manufacturing
C212100	Iron and steel casting

Hanga-Aro-Rau Sector Definitions

Manufacturing and Engineering

Manufacturing ANZSIC Codes (Continued)

ANZSIC L4 Code	Description
C212200	Steel pipe and tube manufacturing
C213100	Alumina production
C213200	Aluminium smelting
C213300	Copper, silver, lead, and zinc smelting and refining
C213900	Other basic non-ferrous metal manufacturing
C214100	Non-ferrous metal casting
C214200	Aluminium rolling, drawing, and extruding
C214900	Other basic non-ferrous metal product manufacturing
C221000	Iron and steel forging
C222100	Structural steel fabricating
C222200	Prefabricated metal building manufacturing
C222300	Architectural aluminium product manufacturing
C222400	Metal roof and guttering manufacturing (except aluminium)
C222900	Other structural metal product manufacturing
C223100	Boiler, tank, and other heavy gauge metal container manufacturing
C223900	Other metal container manufacturing
C224000	Sheet metal product manufacturing (except metal structural and container products)
C229100	Spring and wire product manufacturing
C229200	Nut, bolt, screw, and rivet manufacturing
C229300	Metal coating and finishing
C229900	Other fabricated metal product manufacturing n.e.c.
C231100	Motor vehicle manufacturing
C231200	Motor vehicle body and trailer manufacturing
C231300	Automotive electrical component manufacturing
C231900	Other motor vehicle parts manufacturing
C239100	Shipbuilding and repair services
C239200	Boatbuilding and repair services

Manufacturing ANZSIC Codes (Continued)

ANZSIC L4 Code	Description
C239300	Railway rolling stock manufacturing and repair services
C239900	Other transport equipment manufacturing n.e.c.
C241100	Photographic, optical, and ophthalmic equipment manufacturing
C241200	Medical and surgical equipment manufacturing
C241900	Other professional and scientific equipment manufacturing
C242100	Computer and electronic office equipment manufacturing
C242200	Communication equipment manufacturing
C242900	Other electronic equipment manufacturing
C243100	Electric cable and wire manufacturing
C243200	Electric lighting equipment manufacturing
C243900	Other electrical equipment manufacturing
C244100	Whiteware appliance manufacturing
C244900	Other domestic appliance manufacturing
C245100	Pumps and compressor manufacturing
C245200	Fixed space heating, cooling, and ventilation equipment manufacturing
C246100	Agricultural machinery and equipment manufacturing
C246200	Mining and construction machinery manufacturing
C246300	Machine tool and parts manufacturing
C246900	Other specialised machinery and equipment manufacturing
C249100	Lifting and material handling equipment manufacturing
C249900	Other machinery and equipment manufacturing n.e.c.
C251100	Wooden furniture and upholstered seat manufacturing
C251200	Metal furniture manufacturing
C251300	Mattress manufacturing
C251900	Other furniture manufacturing
C259100	Jewellery and silverware manufacturing (manufacturing of jewellery against defined specifications only)

Manufacturing ANZSIC Codes (Continued)

ANZSIC L4 Code	Description
C259200	Toy, sporting, and recreational product manufacturing
C259900	Other manufacturing n.e.c.
F332200	Metal and mineral wholesaling
F332300	Industrial and agricultural chemical product wholesaling
F333100	Timber wholesaling
F333900	Other hardware goods wholesaling
F341100	Agricultural and construction machinery wholesaling
F341900	Other specialised industrial machinery and equipment wholesaling
F349100	Professional and scientific goods wholesaling
F349200	Computer and computer peripheral wholesaling
F349300	Telecommunication goods wholesaling
F349400	Other electrical and electronic goods wholesaling
F349900	Other machinery and equipment wholesaling n.e.c.
F360200	Meat, poultry, and smallgoods wholesaling
F360300	Dairy produce wholesaling
G412100	Fresh meat, fish, and poultry retailing
G424500	Marine Equipment Retailing
S949100	Clothing and footwear repair
S953200	Photographic film processing

Hanga-Aro-Rau Sector Definitions

Manufacturing and Engineering

Engineering ANZSIC Codes

ANZSIC L4 Code	Description
E323300	Air conditioning and heating services
E323400	Fire and security alarm installation services (excluding circuit video surveillance system installation)
J591000	Internet service providers and web search portals
J592100	Data Processing and Web Hosting Services
J592200	Electronic Information Storage Services
M692300	Engineering design and engineering consulting services (boat designing service, chemical engineering consulting service, drafting service, engineering, electronic engineering consulting service, engineering consulting service n.e.c., hydraulic engineering consulting service, industrial design service, marine engineering consulting service, materials handling engineering consulting service, mechanical engineering consulting service, mining engineering consulting service, naval architecture service, process engineering consulting service only)
M692400	Other specialised design services
M692500	Scientific testing and analysis services
S942200	Electronic (except domestic appliance) and precision equipment repair and maintenance (locksmithing only)
S942900	Other machinery and equipment repair and maintenance
S949900	Other repair and maintenance n.e.c.

Engineering ANZSCO Codes

ANZSIC L4 Code	Description
233512	Mechanical Engineer
312511	Mechanical Engineering Draftsperson
312512	Mechanical Engineering Technician
312911	Maintenance Planner
312912	Metallurgical or Materials Technician
322111	Blacksmith
322112	Electroplater
322114	Metal Casting Trades Worker
323211	Fitter (General)
323212	Fitter and Turner
323214	Metal Machinist (First Class)
323299	Metal Fitters and Machinists nec
323312	Gunsmith
323315	Saw Maker and Repairer
323411	Engineering Patternmaker
323412	Toolmaker
341113	Lift Mechanic
839111	Metal Engineering Process Worker
322115	Metal Polisher
322211	Sheetmetal Trades Worker
322311	Metal Fabricator
712311	Engineering Production Systems Worker
839111	Metal Engineering Process Worker

Hanga-Aro-Rau Sector Definitions

Automotive and Logistics

Automotive ANZSIC Codes

ANZSIC L4 Code	Description
F350100	Car wholesaling
F350200	Commercial vehicle wholesaling
F350300	Trailer and other motor vehicle wholesaling
F350400	Motor vehicle new parts wholesaling
F350500	Motor vehicle dismantling and used parts wholesaling
G391100	Car Retailing
G391200	Motor Cycle Retailing
G391300	Trailer and Other Motor Vehicle Retailing
G392100	Motor Vehicle Parts Retailing
G392200	Tyre Retailing
S941100	Automotive electrical services
S941200	Automotive body, paint, and interior repair
S941900	Other automotive repair and maintenance

Logistics ANZSIC Codes

ANZSIC L4 Code	Description
D291100	Solid waste collection services
D291900	Other waste collection services
D292100	Waste treatment and disposal services
D292200	Waste remediation and materials recovery services
I461000	Road freight transport
I462100	Interurban and rural bus transport
I462200	Urban bus transport (including tramway)
I462300	Taxi and other road transport
I471000	Rail freight transport
I472000	Rail passenger transport
I481000	Water freight transport
I482000	Water passenger transport
I490000	Air and Space Transport
I501000	Scenic and sightseeing transport
I502100	Pipeline transport
I502900	Other transport n.e.c.
I510100	Postal services
I510200	Courier pick-up and delivery services
I521100	Stevedoring services
I521200	Port and water transport terminal operations
I521900	Other water transport support services
I529100	Customs agency services
I529200	Freight forwarding services
I529900	Other transport support services n.e.c.
I530100	Grain storage services
I530900	Other warehousing and storage services

Hanga-Aro-Rau Sector Definitions

Mining and Quarrying and Oil and Gas Extraction and Wholesaling

Mining and Quarrying ANZSIC Codes

ANZSIC L4 Code	Description
B060000	Coal mining
B080100	Iron ore mining
B080200	Bauxite mining
B080300	Copper ore mining
B080400	Gold ore mining
B080500	Mineral sand mining
B080600	Nickel ore mining
B080700	Silver-lead-zinc ore mining
B080900	Other metal ore mining
B091100	Gravel and sand quarrying
B091900	Other construction material mining
B099000	Other non-metallic mineral mining and quarrying
B101200	Mineral exploration
B109000	Other mining support services

Oil and Gas Extraction and Wholesaling ANZSIC Codes

ANZSIC L4 Code	Description
B070000	Oil and gas extraction
B101100	Petroleum exploration
F332100	Petroleum product wholesaling

Appendix 5

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Appendix 6

Abbreviations and Te Reo Māori glossary

Abbreviations

Abbreviation	Term
AI	Artificial intelligence
ANZSCO	Australian and New Zealand Standard Classification of Occupations
ANZSIC	Australian and New Zealand Standard Industrial Classification
AR	Augmented reality
AEWV	Accredited Employer Work Visa
CAD	Computer aided design
CAM	Computer aided manufacturing
CIIP	Canadian Immigrant Integration Programme
CPD	Continuing Professional Development
CPI	Consumer price index
DASS	Digital Assessment Standards System
DPT	Development Pathways Tool
ETAs	Expected time arrivals
EV	Electronic vehicle
G7	Group of Seven
ICT	Information and Communication Technology
IoT	Internet of Things
ISB	Industry Skills Board
ITPs	Institutes of technology and polytechnics
MBIE	Ministry of Business, Innovation and Employment
MSD	Ministry of Social Development
NCEA	National Certificate of Educational Achievement
NEET	Not in Education, Employment, or Training
MITO	Motor Industry Training Organisation

Abbreviation	Term
MLOps	Machine learning operations
MTA	Motor Trade Association
NLP	Natural Language Processing
NOL	National Occupation List
NPCs	Non-Player Characters
NZ	New Zealand
NZQA	New Zealand Qualifications Authority
NZACE	New Zealand Advanced Certificate of Education
NZIM	New Zealand Institute of Management and Leadership
OCR	Official Cash Rate
OECD	Organisation for Economic Co-operation and Development
PTE	Private Training Establishment
RHVA	Refrigeration, heating, ventilation, and air conditioning
SENA	The National Training Service (Servicio Nacional de Aprendizaj)
SME	Small and medium-sized enterprises
Stats NZ	Statistics New Zealand
STEM	Science, Technology, Engineering, and Mathematics
TVET	Technical and Vocational Education and Training
TEC	Tertiary Education Commission
TESDA	Technical Education and Skills Development Authority
VR	Virtual reality
WDC	Workforce Development Council
WEF	World Economic Forum

Te Reo Māori glossary

Term	Translation
Aotearoa	New Zealand
Ākonga Māori	Māori learners
Hapū	Hapū are groups of whānau connected by common ancestry and whakapapa (genealogy)
Iwi	Iwi are large tribal groups made up of hapū (sub-tribes) and whānau (families)
Kaupapa Māori	Approach grounded in Māori values, principles, and worldviews; Māori ways of knowing and doing into systems, processes, and practices
Kai	Food
Kaimahi	Workers or employees
Manaakitanga	Hospitality, kindness, support; the process of showing respect, generosity and care for others.
Mātauranga Māori	Body of knowledge originating from Māori ancestors, including traditional concepts, worldviews, values, and practices
Pākehā	People of European descent
Pāngarau	Mathematics
Tuakana-teina	Elder-younger; Mentoring relationships based on whānau practices
Tikanga Māori	Correct procedure, custom, habit; the customary system of values and practices that have developed over time and that are deeply embedded in the social context.
Tāngata whaikaha	People with disabilities.
Te ao Māori	The Māori world or worldview
Rangatahi	Younger generation, youth, or younger individuals in the context of the age, seniority, or status of the wider group.
Wai	Water
Whānau	Family, immediate or extended relatives, kinship
Whanaungatanga	Relationship, kinship, sense of family connection; a relationship through shared experiences and working together which provides people with a sense of belonging.

Whakatauki | Proverb

Haruru ana te pūkenga,

Haruru ana te wānanga,

Haruru ana te whakaaro ki tōna pito mata

Amplify skills and experience

Carry forward learnings and knowledge

Elevate thinking to realise its full potential

The skills and experiences of our workforce form a foundation that resonates across generations, carrying forward the accumulated knowledge and insights of those who came before. This continuity of learning strengthens capability and fosters innovation

When thinking is elevated and applied to its fullest potential, it enables transformative outcomes, creating workplaces that are not only inclusive but strategically positioned to thrive in a diverse and evolving Aotearoa.

Restrictions and limitations

- This Research report is commissioned by and in accordance with the scope agreed with our addressee client Hanga-Aro-Rau.
- Workforce totals differ between occupation, skill level, and demographic analyses because they use different data sources: the occupation analysis is based on the 2023 Census, while the skill level and demographic analyses use Household Labour Force Survey estimates.
- The reader acknowledges that this Research report was prepared at the direction of Hanga-Aro-Rau and may not be appropriate for the purposes of the reader. This Research report is based on the specific facts and circumstances relevant to our addressee client.
- This Research report includes a compilation of evidence from desktop research, analysis and data sources. Some of the evidence presented, particularly from the desktop research and stakeholder engagement, are perspectives provided from third parties, which may not necessarily represent the view of Deloitte.
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Reliance on information

- In preparing this Research report we have relied upon and assumed, without independent verification, the accuracy and completeness of all information that is available from public sources, from Stats NZ and all information that was provided to us by Hanga-Aro-Rau.
- We reserve the right to review the analysis and conclusions included or referred to in this Research report and, if we consider it necessary, to revise our work in the light of any information existing at the current date which becomes known to us after the date of this Research report.
- This Research report has been prepared with care and diligence and the statements and conclusions in this Research report are given in good faith and in the belief, on reasonable grounds, that such statements and conclusions are not false or misleading. However, in no way do we guarantee or otherwise warrant any statements, forecasts or scenarios. Forecasts are inherently uncertain. They are predictions of future events that cannot be assured. They are based upon assumptions, which may be beyond the control of Hanga-Aro-Rau and its management. Actual results will vary from the forecasts and these variations may be significantly more or less favourable.

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