RESEARCH REPORT

Future focussed skills

Growth opportunities for Māori and Pasifika owned businesses in greener construction

JULY 2025

POUTAMA Amotai CONCOVE TŪHURA

Acknowledgements

This report was commissioned by ConCOVE Tūhura, Amotai, and Poutama Trust.

With special thanks to those who contributed to the report through interviews and discussions:

- Casimir MacGregor, BRANZ
- Sam Sefuiva, Māori and Pacific Trades Training
- Atarau Pouwhare-Ellis, Māori and Pacific Trades Training
- Matt Keir, Te Waihanga
- Nick Sterling, Callaghan Innovation
- Ali Ghaffarian Hoseini, AUT
- Tina Wieczorek, Scaffolding, Access and Rigging NZ
- Brad Crowley, NZ Green Building Council
- Matiu Taurau, Tū Mai Rā
- Heather Lennan, Evolve Electrical and Technology Ltd
- Maurice Banse, Resonate Solutions NZ
- Daniele Davies, Davies Contracting Ltd

Table of contents

1. Executive Summary **5**

2. Introduction **6**

Purpose 6

Background 6

Methodology 7

3. Current State **8**

Māori and Pasifika business and employment demographics 8

4. Detailed Findings **14**

Longlist opportunities 14

Multi-criteria analysis 17

Short-listed opportunities 19

5. Deep Dive Opportunities **20**

Opportunity 1 – Trenchless technologies 20

Opportunity 2 – Building Information Modelling (BIM) for trades 25

Opportunity 3 – Commercial Building Energy Retrofits 31

Opportunity 4 – Installation of Renewable Consumer Energy Resources (CER) 36

6. Conclusions and recommendations **41**

7. Appendix 1 – Longlist opportunities **42**

Smart and Digital Technologies 42

Energy Efficiency/Resource Conservation 45

Circular Economy 47

Green Construction 48

8. Appendix 2 – Interview Guide **49**

9. Appendix 3 – Glossary of Terms **51**

10. References **52**

1. Executive Summary

This report, commissioned by ConCOVE, Amotai, and Poutama Trust, provides a focused analysis of the future workforce skills needed for Māori and Pasifika-owned businesses in New Zealand's construction sector. The goal for this project was to identify actionable and aspirational skill areas that enable these businesses to capitalise on emerging green construction and infrastructure technologies.

The analysis began with the development of a comprehensive longlist of 54 potential opportunities, which demonstrates the wide-ranging opportunities that exist across a broad range of trades and sectors. These opportunities were assessed through multi-criteria analysis, which evaluated their alignment with current capabilities, barriers to entry, demand/growth potential, and the ability to support high-skill, high-paying jobs as well as their suitability for vocational training. This process allowed us to identify a shortlist of high-potential focus areas that offer the greatest alignment with Māori and Pasifika business capability while maintaining low barriers to entry.

Four high-potential focus areas emerged from this process: Trenchless technologies, Building Information Modelling (BIM) for trades, commercial building energy retrofits, and the installation of renewable consumer energy resources (CER). These shortlisted focus areas were analysed in more detail, exploring the demand, potential benefits, and barriers to adoption within the New Zealand context as well as identifying key system players, and industry partnerships crucial for success.

Across the focus areas, shared barriers include the upfront costs associated with specialised equipment, the need for targeted training and certification, and navigating regulatory requirements. Reassuringly, the opportunities allow for incremental adoption, with businesses able to build capabilities over time if required.

These findings serve as a foundation for developing training programs and business cases to position Māori and Pasifika businesses at the forefront of New Zealand's construction sector's green transformation. By targeting both immediate and long-term opportunities, Māori and Pasifika businesses can leverage sustainable innovation to drive economic growth while also creating positive social and environmental change for their communities.

2. Introduction

Purpose

The purpose of this research was to analyse and identify the future workforce skills needed by Māori and Pasifika businesses to capitalise on emerging opportunities in the construction sector. The goal for this 'tight and specialised' industry analysis was to identify a select few innovative, future-proofed and future-focused green construction/infrastructure technology and/or skills with proven success in overseas markets and/or strong demand in Aotearoa.

Background

The construction sector is undergoing significant change, driven by technological advancements, evolving environmental standards, and shifts in societal expectations. The adoption of digital tools such as Building Information Modelling (BIM), artificial intelligence, and robotics is transforming how projects are designed, managed, and executed. The increasing emphasis on sustainability and green construction practices is reshaping industry priorities, with a growing demand for expertise in energy-efficient design, renewable materials, and waste reduction techniques.

These changes mean that traditional construction skills, while still valuable, must now be complemented by a broader range of technical, environmental, and interpersonal abilities to meet the demands of a rapidly evolving industry. This research seeks to support Māori and Pasifika businesses to shift to the forefront of innovation in construction and infrastructure, driving a new practice, demonstrating the intersection between disruptive technology, culture, environmental standards and social outcomes.

Māori and Pasifika businesses make up a higher proportion of the construction sector than any other sector. Despite this prevalence, Māori and Pasifika businesses often remain in backstage positions or down the value chain, with the average Māori-owned construction businesses earning 88 cents on the dollar in sales compared with non-Māori businesses (Te Puni Kōkiri, 2021).

Supporting these businesses to develop and thrive creates wide-ranging impacts and helps to address some longstanding inequalities. Māori and Pasifika businesses tend to employ more Māori and Pasifika workers, and maintain smaller ethnic pay gaps (Amotai and TSI, 2025). There is evidence that they retain employees for longer periods, and are more likely to provide opportunities for those who face the greatest barriers to employment (Amotai and TSI, 2025). More than half (60%) of the full-time employees in Amotai businesses identify as Māori and/or Pasifika. This is vastly higher than the average rate of Māori and Pasifika workers across all industries, which as of the 2018 Census was a little under 20% (Statistics New Zealand, 2018).

Māori businesses are nimble - they fail faster and restart up in green pastures (Amotai and TSI, 2025). To capitalise on these characteristics, it is necessary to build pathways for Māori and Pasifika businesses to transition into productive and emergent parts of the construction and infrastructure market. The number of Māori-owned businesses in construction has increased 67% faster than non-Māori businesses over the last 10 years, demonstrating how Māori entrepreneurship has responded strongly to growth opportunities during the country's construction boom period (Amotai and TSI, 2025). Māori and Pasifika-owned businesses also have been consolidating and doing well in allied trades, infrastructure and logistics that are part of the construction supply-chain (Amotai and TSI).

With a shared objective of seeing Māori and Pasifika businesses thrive, ConCOVE Tūhura, Amotai and Poutama Trust engaged Height Project Management to conduct this industry analysis. This high-level industry analysis is intended to guide future research and the development of business cases to identify any vocational training requirements and industry partnerships to bring the initiatives to fruition.

Methodology

The research included the following key stages:

Current state analysis: Review of available data to identify the current state of Māori and Pasifika businesses in the construction and energy sectors (detailed in Section 0).

Long-list development: Stakeholder interviews, and desktop research was conducted to inform the development of a longlist of opportunity areas (detailed in Section 0)

Multi-criteria analysis: A pairwise analysis process was used to derive a weighting for each of the below criteria based on its relative importance to the others. The longlist opportunities were rated against each criteria to create an overall score out of 100. The criteria are detailed in Section 0 below.

Validation interviews: Interviews with Māori/Pasifika businesses to validate the findings and identify any further barriers to entry.

Deep-dive: Further desktop research for the shortlisted options included an assessment of the system players and organisations to be involved in the project, provide a strong steer for the rapid design and delivery of training programmes, and identify any barriers to entry (See Section 5)

3. Current State

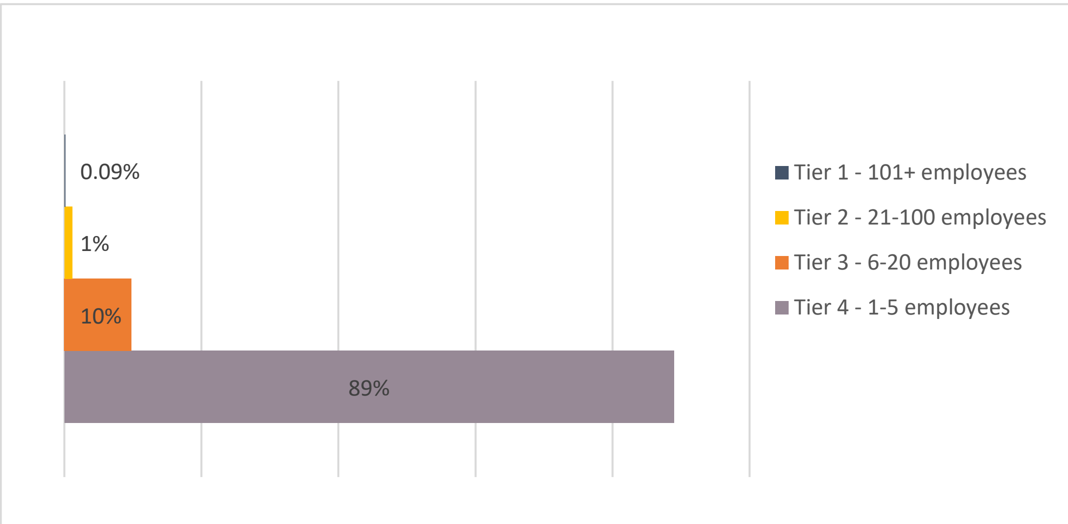
Māori and Pasifika business and employment demographics

To inform this industry analysis, we began by reviewing available data on Māori and Pasifika business demographics, training, and employment trends in the construction sector. This initial review provided critical insights into the scale, composition, and areas of focus for Māori and Pasifika businesses, as well as their workforce distribution and participation in industry training. While Te Matapaeroa provided an excellent resource for information on Māori businesses, we note that the same level of detail is not available for Pasifika businesses.

The data highlights the significant contributions of Māori and Pasifika to the construction industry while also reflecting the nature of these businesses—often smaller in size and acting in subcontractor rather than main contractor capacity. While this allows for the agility and adaptability previously mentioned, it can also limit access to substantial capital or large-scale staffing.

In FY21, Māori construction businesses made up 14% of all construction businesses in New Zealand - 4,854 out of a total of 34,755 businesses. The majority of these businesses (89%) are considered Tier 4 – Sole Traders up to five employees, and the remainder mostly Tier 3 – having 6-20 employees and typically working in subcontractor providing services to other contractors.

Figure 1 Size of Māori construction businesses in Aotearoa

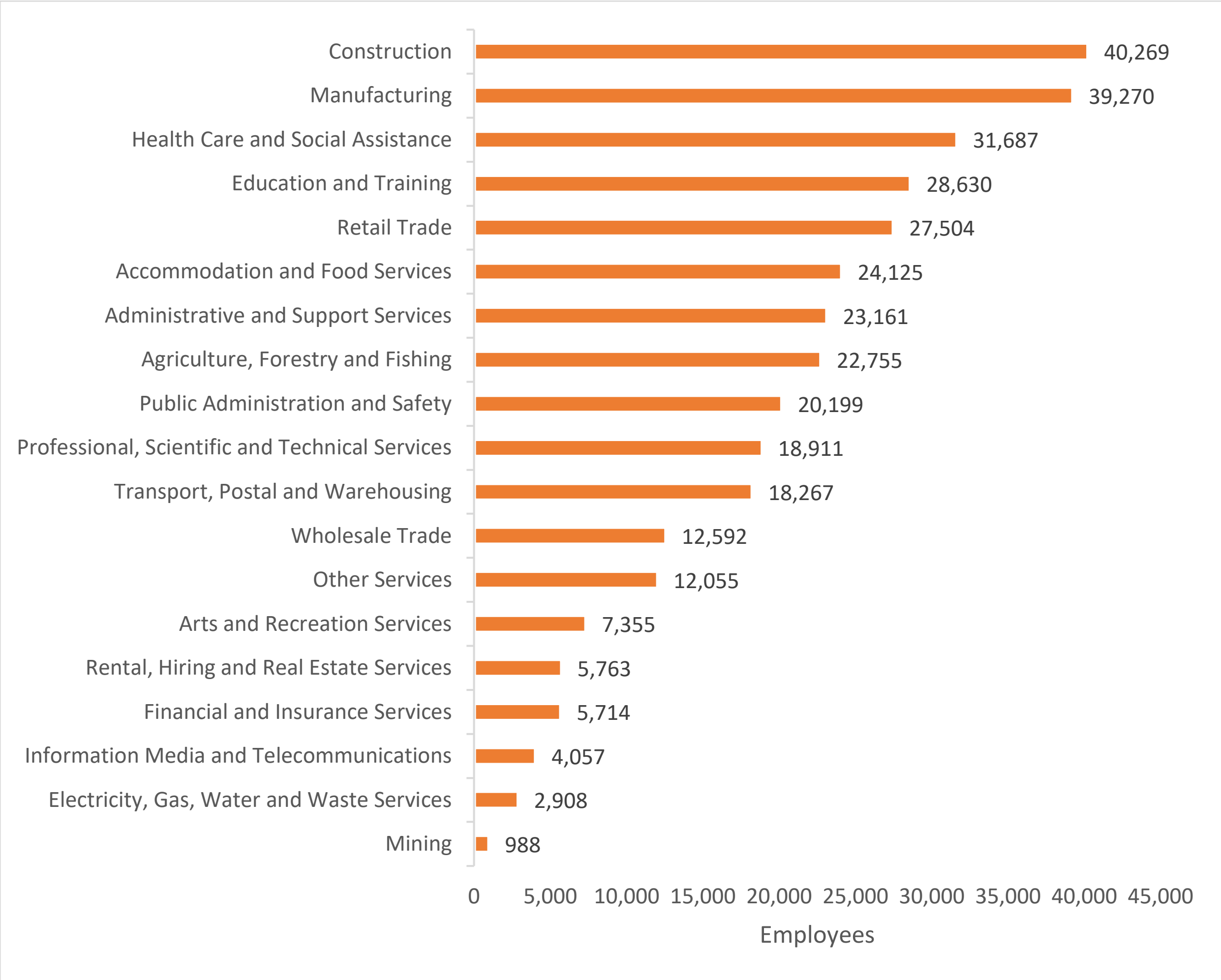


Source: (MBIE, 2024)

Employment in the construction industry

Between 2000 and 2020, almost 26,000 additional Māori were employed in the Construction sector – more than any other sector, with growth of 5.3% per annum on average. The proportion of Māori employed in Construction reached 11.6% in 2020, equating to 40,269 individuals (Infometrics, Te Rau Ora, 2022). In 2021, there were 16,400 Pasifika individuals employed in Utilities and Construction, 66% of whom were sole traders (Ministry for Women, 2021).

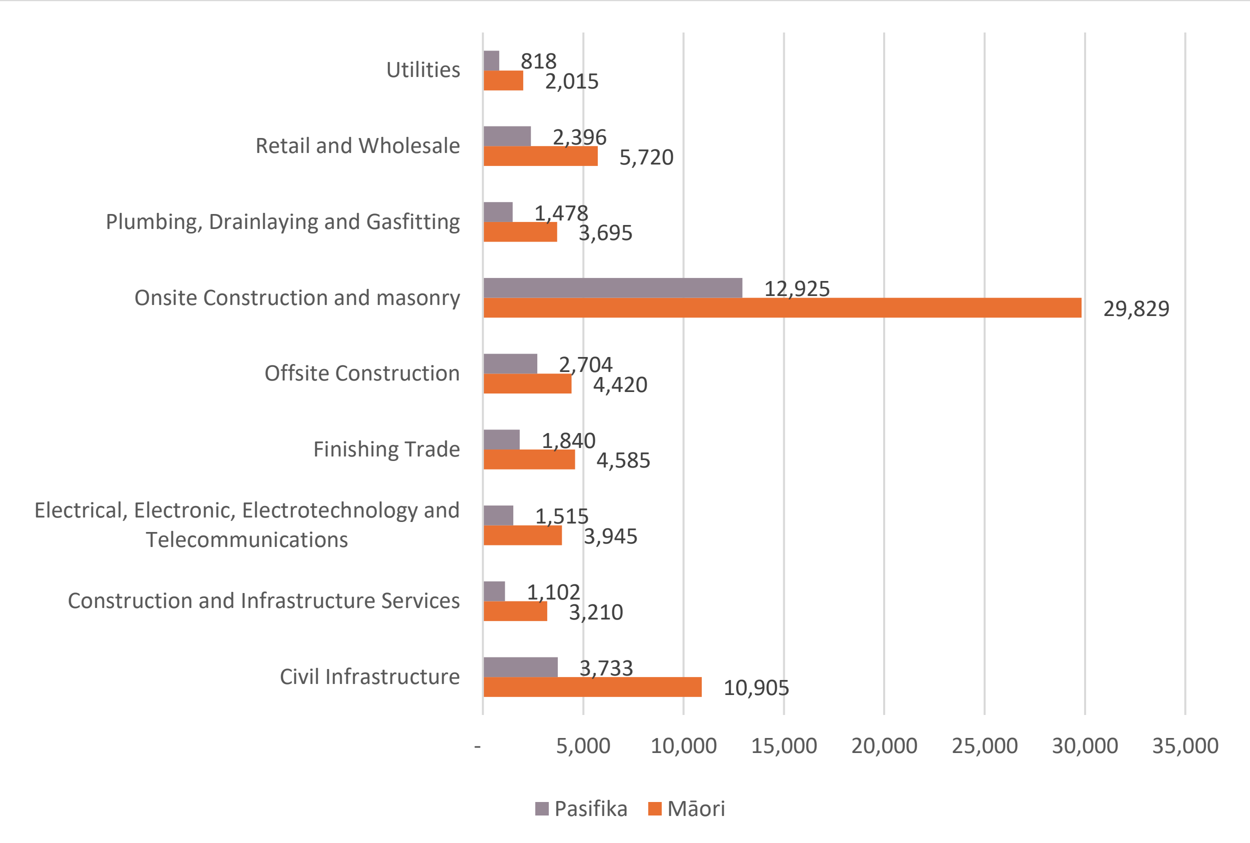
Figure 2 Māori employment distribution (2020)



Source: Infometrics, Te Rau Ora 2022

Figure 3 below shows the total Māori and Pasifika workforce numbers by construction sub-sectors. Onsite construction and masonry accounted for the greatest number of workers for both Māori and Pasifika, followed by civil infrastructure.

Figure 3 Annual Workforce size, by ethnicity (2022)



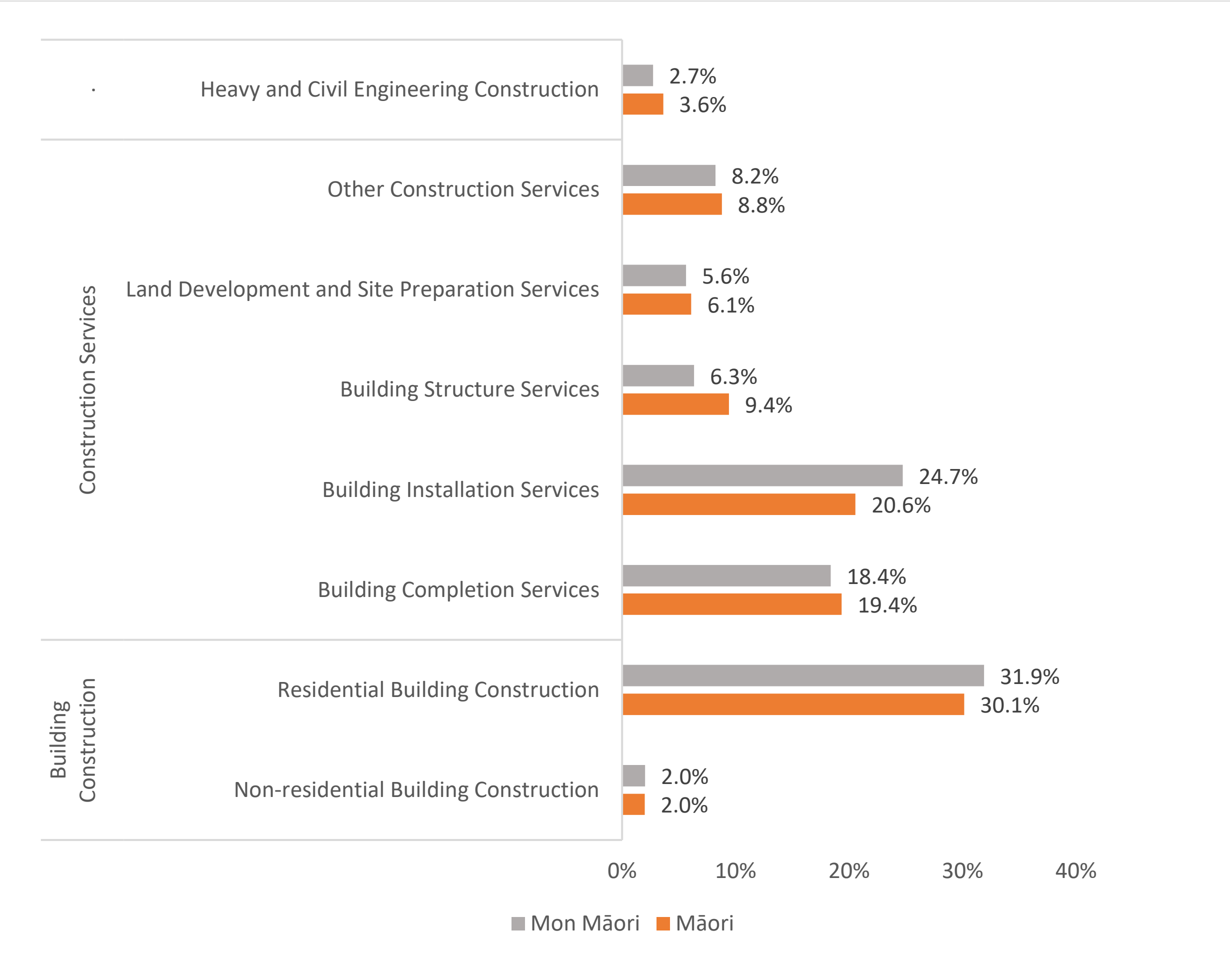
Source: Statistics NZ (2022) [1]

[1] These results are not official statistics. They have been created for research purposes from the [Integrated Data Infrastructure (IDI) and/or Longitudinal Business Database (LBD)] which [is/are] carefully managed by Stats NZ. For more information about the [IDI and/or LBD] please visit https://www.stats.govt.nz/integrated-data/.

Construction Sector

Māori construction businesses are similarly distributed to non-Māori businesses, with the majority in either Residential Building Construction (30.1%), Building Installation (including electrical) (20.6%), or Building Completion Services (19.4%). Māori businesses are slightly over-represented in Building Structure Services (9.4% of Māori Construction Businesses vs 6.3% of Non-Māori).

Figure 4 Māori construction business distribution



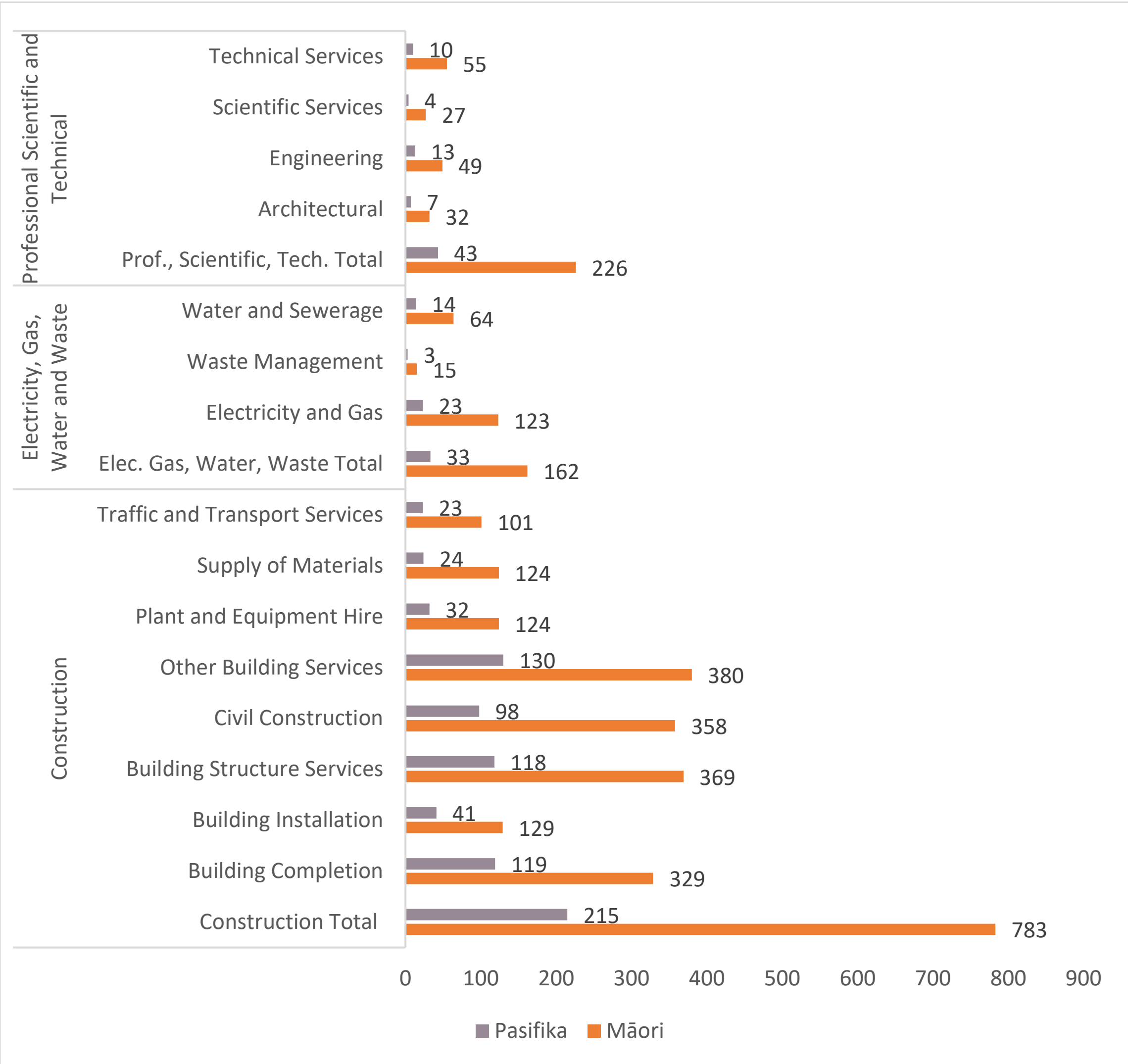
Source: Te Matapaeroa 2021

Services provided

Amotai is Aotearoa New Zealand's supplier diversity intermediary, connecting buyers with verified Māori and Pasifika-owned businesses to promote inclusive and equitable procurement practices. Analysis of businesses registered on the Amotai database provides a more detailed view of the services provided by Māori and Pasifika-owned businesses.

Figure 5 below gives a snapshot of the number of Amotai registered Māori and Pasifika businesses by service offering. It is important to note that the Amotai database is run on a voluntary registration process, which means there will likely be a self-selection bias towards larger and more experienced businesses.

Figure 5 Amotai registered Māori and Pasifika businesses

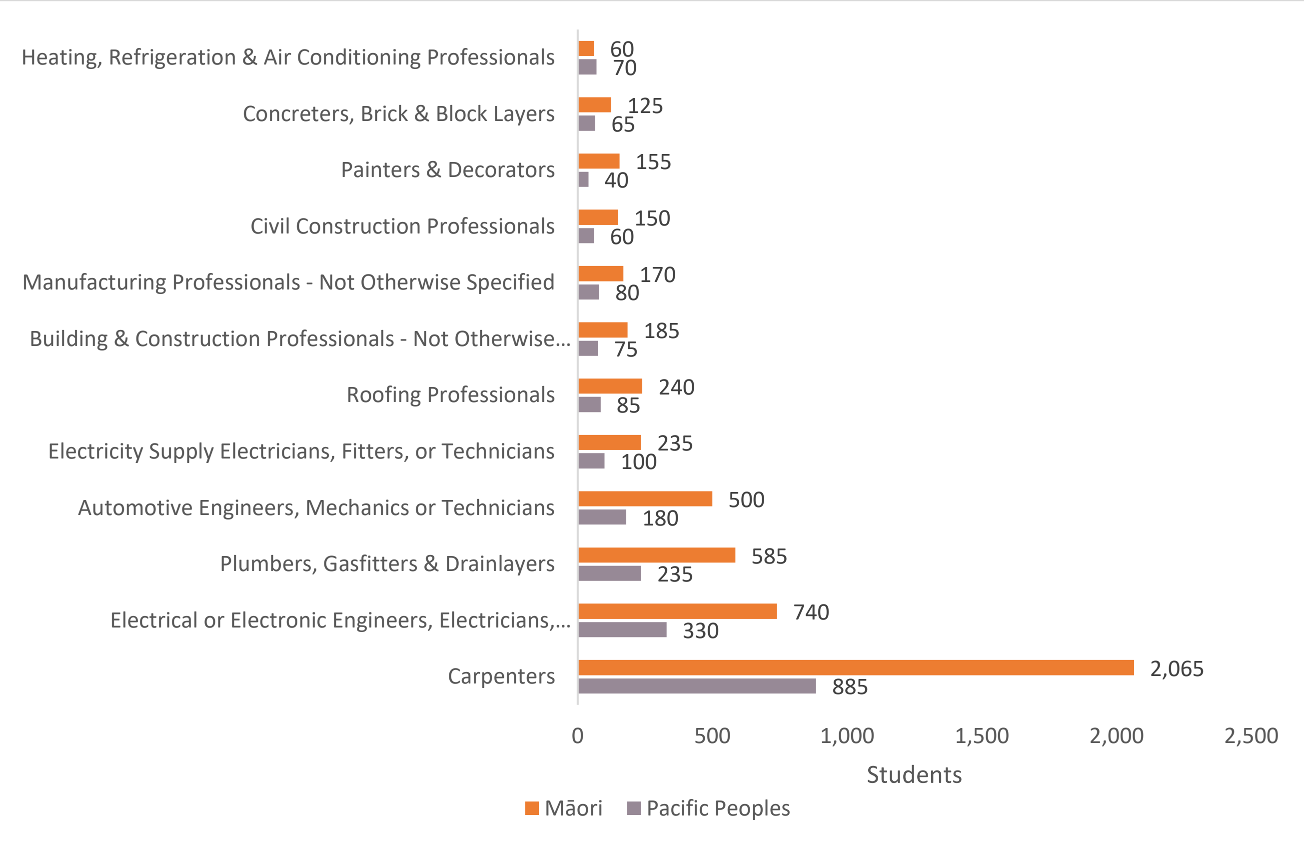


Source: Amotai database (as of 4 December 2024)

Participation in industry training

Data from the Ministry of Education shows that the largest number of Apprenticeships are in Carpentry, followed by Electrical, and Plumbing, Gas fitting and Drainlaying. These patterns mimic those for Māori as shown below in Figure 6. Note: This data is from 2018, so it is not current, but it was the most detailed breakdown available by ethnicity publicly available at the time of writing.

Figure 6 Participation in industry training by Māori and Pasifika 2022



Source: Tertiary Education Participation: Participation in industry training, Ministry of Education 2018

4. Detailed Findings

Longlist opportunities

Through our interviews and desktop research, we identified a longlist of 54 areas of opportunity across the categories: Smart and Digital Technologies, Energy Efficiency/Resource Conservation, Circular Economy, and Green Construction. Within these categories, there were opportunities for each of the core trades, with some applying across multiple.

Overview of stakeholder interview findings

Our interviews highlighted several overarching themes relevant to the future of the construction workforce in New Zealand which aligned closely with the international and national literature.

Digital and technological transformation including AI and automation is transforming the sector, from generative design to automated compliance checks and waste tracking.

Automation will transform the workforce landscape as repetitive manual tasks are being streamlined or replaced by robotic systems. As these roles are phased out by the introduction of new technology, new roles are emerging in the design, monitoring, and maintenance of automated systems, requiring advanced technical skills in robotics, AI, and digital systems management.

Building Information Modelling (BIM) across various dimensions (e.g., costs, scheduling, and health) is seen as pivotal. Similarly, off-site manufacturing and modular construction are introducing opportunities for efficiency and waste reduction, although widespread uptake by Māori and Pasifika businesses will be constrained by high initial costs, logistical complexity, and scalability limitations.

The stakeholders we interviewed emphasised that this evolving environment requires a workforce equipped with both technical and adaptive skills to navigate and leverage the sector's digital transformation effectively. Despite the technological emphasis, human skills—communication, collaboration, and adaptability were also seen as essential for implementing sustainable and innovative practices. These skills support cohesive teamwork between trades, and a shared focus on long-term project goals.

A recurring focus for stakeholders was the integration of indigenous values such as kaitiakitanga (guardianship) and intergenerational equity into construction practices, promoting sustainable materials and designs that respect the environment. The shift towards a circular economy which emphasises reusing and recycling materials while adopting innovative, sustainable products like timber and other bio-based materials aligns closely with traditional Māori and Pasifika values.

Key drivers

This research identified the following key drivers shaping the future workforce needs within construction:

- Rising urbanisation and shift to multi-unit dwellings
- Global and national commitments to reduce Green House Gas (GHG emissions)
- Need to build resilience and adapt against climate change impacts such as severe weather
- Low productivity in the sector

Longlist development

Using the stakeholder feedback, as well as industry reports, research papers, and infrastructure pipeline data we developed the longlist of opportunities detailed below in Table 1 Summary of longlist opportunities by trade.

This table provides an overview of the longlist opportunities identified, by trade.

It's important to note that during the longlist development, opportunities were not screened, so the list includes those with low demand in New Zealand, as well as those with prohibitive barriers to entry. Additional detail on the nature of each opportunity and it's rating is provided in Appendix 1 – Longlist opportunities – and the full data is available in the companion Excel File.

Table 1 Summary of longlist opportunities by trade

	Building	Civils	Design	Electrical	Plumbing	Scaffolding	Combination / Other
Smart and Digital Technologies							
3d mapping and modelling for pipeline design and repair							✓
AI in land planning and development			✓				
AI in traffic management.							✓
AI Safety							✓
Augmented reality in training/onsite	✓						
Autonomous Cranes	✓						
Autonomous earthmoving		✓					
Building Information Modelling (BIM)			✓				
CCTV/Facial recognition							✓
Cyber security in water treatment							✓
Digital twins							✓
Drone-based surveying							✓
Energy modelling and simulation				✓			
Erosion control: Modular and adaptable shoring for slope stability		✓					
Erosion control: Smart sensors and monitoring for slope stability		✓					
Grid interactive buildings				✓			
IoT in traffic management							✓
Robotic lifting and hoist solutions						✓	
Robotics (on-site)	✓						
Smart buildings technology installation							✓
Smart irrigation							✓
Smart plumbing systems and IoT integration					✓		
Smart scaffolding technologies						✓	
Smart thermostats/energy management				✓			
Smart water management systems							✓
Steel design and fabrication							✓
Telecommunications							✓
Wearable tech							✓
Energy Efficiency/Resource Conservation							
BESS Battery Energy Storage Systems				✓			
Bioenergy							✓
Charging infrastructure				✓			
Clean energy supply							✓
Clean energy supply - High Voltage transmission				✓			
Energy efficient construction (Passive homes etc)							✓
HVAC / Energy retrofits				✓			

	Building	Civils	Design	Electrical	Plumbing	Scaffolding	Combination / Other
Hydrogen infrastructure							✓
Hydrogen - Health and Safety							✓
Offshore wind farms							✓
Other energy storage solutions				✓			
Renewable energy integration into buildings				✓			
Smart grids				✓			
Water conservation and management					✓		
Circular Economy							
AI for deconstruction	✓						
Building with biodegradable/reclaimed materials	✓						
Deconstruction/ reuse of with recycled and reclaimed materials	✓						
Design for deconstruction	✓						
Robotics in demolition	✓						
Green Construction							
3D printed buildings	✓						
Apartments/Multi-unit dwelling construction	✓						
Biophilic design							✓
Green roofs	✓						
Offsite Manufacturing OSM (Prefab. and Modular Construction)	✓						
Sustainable building materials (earth-based, bio-based, wood/mass timber)	✓						
Trenchless technology							✓

Multi-criteria analysis

The longlist opportunities were each evaluated against the criteria below to give an overall score out of 100. The highest scores represents the opportunities that best aligned with current Māori and Pasifika business capabilities, have existing demand and growth potential, are suitable for on the job training and did not have excessive entry costs.

It's important to note that given the scale and short timeframe for this research the multi-criteria analysis was carried-out at a relatively high level. The ratings were intended as preliminary indicators only. Further detailed analysis and validation would be required for use in other contexts or decision-making processes.

Table 2 Criteria used to assess longlist opportunities

Criteria	*Weighting*
Link to the current capability and capacity of Māori and Pacific industries	*25%*
The degree to which the opportunity aligns with the existing strengths and resources of Māori and Pacific industries by comparing them to the current number of businesses and employers. It helps ensure the approach aligns with their present capabilities and supports their growth and needs effectively.	
Meet existing or future demand or stimulate growth	*20%*
How well the skills being developed are aligned with current or future demand in Aotearoa by considering factors like government policy, consumer behaviour, and international trends. This includes potential to stimulate growth and drive demand in areas where these skills will drive innovation or meet emerging needs.	
Achievable entry costs	*20%*
Assessing the costs associated with entering the industry to make sure they are affordable, including expenses such as tuition, plant and equipment, or certification fees, so that Māori and Pasifika do not face insurmountable barriers to entry.	
Suitability for vocational training and on-the-job upskilling	*20%*
Suitability for vocational training, focusing on those with clear practical applications in the workplace, particularly in hands-on roles. Ideally providing opportunities for entry-level accessibility, allowing individuals with minimal prior experience to quickly gain certifications and start a career. Clear pathways for continuous learning and professional development make these opportunities appealing, leading to long-term career growth and increased earning potential.	
Support sustainable, future-proofed, high-skilled and high-paid work	*15%*
The degree to which the opportunity enables individuals to gain high-level skills and access well-paying jobs that offer stability and financial security. Including roles that demand specialised expertise. Opportunities should not only provide immediate employment but also create conditions for sustainable income that adapts to changing economic trends, ensuring relevance and longevity in the job market.	

Short-listed opportunities

The following were shortlisted as the highest ranking future-proofed and future-focused green construction/infrastructure technology and/or skills for Māori and Pasifika businesses. These are each discussed in further detail below.

1) Trenchless Technologies

2) Building Information Modelling (BIM) for subcontractors

3) Installation of Renewable Consumer Energy Resources (CER)

4) HVAC / Energy Retrofits

5. Deep Dive Opportunities

Opportunity 1 – Trenchless technologies

The opportunity

The term trenchless technology refers to a “no-dig” civil engineering process for the installation, replacement or renewal of underground utilities. Typically used for underground utilities including water mains, storm and sanitary sewers, gas main, electrical and fibre optics conduits, this method generates minimal, or no disruption to the surface. The use of robotics allows trenchless technologies to provide unparalleled pipe condition diagnostics to accurately identify infrastructure priorities.

Trenchless construction methods include tunnelling, micro-tunnelling, horizontal directional drilling (HDD), pipe ramming, pipe jacking, and auger boring to install pipelines and cables underground with minimal excavation. For rehabilitation, techniques such as slip-lining, thermoformed pipe, pipe bursting, cured-in-place pipe (CIPP), grout-in-place pipe, and mechanical spot repair are used to repair, rehabilitate, or replace buried pipes and structures.

Benefits

Trenchless technologies dramatically reduce disruption for vehicles, pedestrians, businesses and households and provide a lighter-touch method for working in environmentally sensitive areas compared to traditional open trench methods. These benefits make trenchless technologies the ideal choice for crossing major roads, railways, and waterways.

Importantly, these techniques can generate significant cost savings over traditional open trench methods when used in urban areas giving businesses with these skills a clear competitive advantage. Research has also shown trenchless technology used achieves a reduction of 59.2% in carbon emissions compared to the excavation technology (Chorazy, et al., 2024).

Demand

The rapid development of the trenchless industry and the fast-paced introduction of new technologies has resulted in a shortage of competent technicians and management personnel. Advances in technology, including the development of more durable materials and advanced robotic inspection techniques, are creating new opportunities.

Globally, the Trenchless Pipe Repair Market alone grew from USD 1.82 billion in 2023 to USD 1.94 billion in 2024. It is expected to continue growing at a CAGR of 6.74%, reaching USD 2.88 billion by 2030 (Research and Markets, 2024).

In New Zealand, demand is fuelled by our existing three waters infrastructure (drinking water, wastewater, and stormwater) which requires between investment of $120 billion to $185 billion over the next 30 years to meet drinking water and environmental standards, provide for future population growth, and deliver ongoing maintenance, asset refurbishment and renewals (Infrastructure New Zealand, 2023).

At the time of writing, Aotearoa's National Infrastructure Pipeline listed 2,047 upcoming projects in the water sector. Across water, waste, transport and energy, there were 1,776 upcoming projects with relevant services (Te Waihanga).

Link to current capabilities

Te Matapaeroa (Te Puni Kōkiri, 2021) identified 4,857 Māori-owned Construction businesses[2]. Of these, 272 businesses provide Land Development and Site Preparation, and 175 engage in Heavy and Civil Engineering Construction. The Amotai register lists 110 businesses that provide underground services, 82 are Māori-owned, 20 are Pasifika-owned, and 7 have combined Māori/Pasifika ownership.

Of the Civil Construction companies registered with Amotai, just 23 (9.5%) list underboring as a service provided. This indicates a significant opportunity for upskilling among existing Civils businesses.

Pathways to upskilling

Training is currently available through various providers, including the Polytechnic, Te Pukenga, and private entities such as Pipelining supplies.

The New Zealand Certificate in Infrastructure Works (Pipeline Construction and Maintenance) (Level 4) includes a strand in Trenchless Technologies. While Te Pukenga offers Horizontal Directional Drilling (Level 4) (Micro-credential).

---

[2] Note for this statistic Te Matapaeroa defined a Māori-owned business is: A business where at least one WP is of Māori ethnicity or descent, and receives a non-zero ownership income in a financial reporting year. This is broader than the 50% Māori ownership definition typically used by Amotai.

Barriers to entry

While large scale tunnel boring is not within scope for most Māori/Pasifika businesses and typically only conducted within alliance arrangements with Tier 1 companies in New Zealand, all other aspects of trenchless technologies have relatively modest barriers to entry, if businesses have confidence in a strong future pipeline using the technology.

Specialised plant and equipment

The key barrier is the cost for upfront investment of specialised plant and equipment. A civils company looking to break into trenchless technology would need to invest in boring and drilling systems, such as micro-tunnelling machines, HDD rigs, and auger boring machines. They would also require piping and pipe installation tools, including steel pipes, jacking systems, winches, and casing placement equipment. Pumping and mixing equipment for slurry, grout, and mud alongside welding and curing tools for slip-lining, thermoforming, and cured-in-place pipe.

Additionally, monitoring and control systems for tracking, inspection, and managing the processes would be needed. Finally, for repair and rehabilitation, the company would require robotic systems and sealing tools for mechanical spot repairs. These investments would allow the company to effectively handle the range of trenchless technologies and their associated challenges.

Depending on the technologies involved, the plant investment can be low to moderate. These can also be effectively phased in over time, by adopting new technologies one at a time for example, starting with camera inspection equipment, cured-in-place pipe equipment, and moving up to micro-tunnelling boring machines.

Training and recruitment

A second barrier is the training and or recruitment of qualified operators and technicians. The roles required include:

- *Civil Engineers* – to assess site conditions and determine the most suitable trenchless methods, design trenchless installation or rehabilitation projects, and ensure compliance with regulatory standards and project specifications.
- *Construction Foreman/Foreperson* – to supervise on-site crews during trenchless installation or repair activities, ensure work is performed safely and meets quality standards.
- *Pipe Rehabilitation Specialists* – to implement methods like cured-in-place pipe (CIPP) or sliplining

for repairing aging infrastructure, conduct assessments to determine the best rehabilitation approach.

- *Trenchless Equipment Operator* – to operate specialised machinery like horizontal directional drills, auger boring machines, or pipe jacking systems, maintain and troubleshoot equipment.
- *Utility Technicians* – to install, repair, or replace underground utility lines using trenchless methods, conduct inspections to identify issues and recommend rehabilitation techniques.
- *Environmental Consultants* – to evaluate the environmental impact of trenchless methods compared to traditional excavation, develop plans to ensure minimal disruption to ecosystems and communities.
- *Project Managers* – may also need additional training to plan and oversee trenchless construction projects, manage budgets, schedules, and teams to deliver projects efficiently.

Risk profile

Trenchless projects can be technically complex and involve higher risks, particularly in urban environments with existing infrastructure. The potential for unexpected challenges, such as unforeseen ground conditions, can make these projects riskier and more costly, discouraging new entrants from taking on such projects.

System Players

Workforce Development Council/Industry Skills Board

The key system player will be the entity responsible for Workforce Development Council activities for construction/infrastructure, within the Government's redesigned vocational education and training system.

Australasian Society for Trenchless Technology (ASTT)

The ASTT is the professional body for trenchless technology in Australasia, encompassing both Australia and New Zealand. It provides advocacy, leadership, support, and educational opportunities for individuals and organizations involved in trenchless technology. They offer a Certificate III in Trenchless Technology (RII31615 Australian Qualification), for skilled operators in the civil construction industry specialising in trenchless technology.

Civil Contractors New Zealand (CCNZ)

The national association for civil contractors, representing more than 800 member businesses and organisations who are involved in constructing the country's essential transport, water, energy, internet and other infrastructure networks. CCNZ connect the industry with avenues to interact with decision makers, career development opportunities, networking events, technical knowledge and up-to-date information on industry trends.

Water New Zealand

Water New Zealand is the country’s largest water industry body and provides leadership in the water sector through collaboration, professional development and networking.

MBIE

As MBIE absorbs the R&D tax scheme and other start-up and incubator programmes formerly managed by Callaghan Innovation, the business unit that takes on these functions could be a suitable partner to advise on the latest technology and recommended adoption.

Opportunity 2 – Building Information Modelling (BIM) for trades

The opportunity

The BIM in New Zealand (BIMinNZ) Steering Committee defined Building Information Modelling (BIM) as a collaborative set of processes, supported by technology, that adds value through the sharing of structured information across building and infrastructure assets.

While general contractors have been early adopters of BIM for presenting, managing, executing, and handing over projects, BIM is increasingly seen as an integral tool for subcontractors to interact with during the construction process. For subcontractors, BIM provides a tool for facilitating communication, data sharing, and efficient management of project workflows. It is used as a communication exchange medium and information carrier; an integrated building process management; and a data sharing platform among different project phases and disciplines.

There are two levels of competency for subcontractors. The first level is foundational, where the company needs to:

- Understand the implications of the BIM process on the worksite and the role of site staff.
- Learn to navigate BIM viewers and interact with the BIM model.
- Find and extract relevant information from the model.
- Communicate through annotations and documents attached to the model.
- Comprehend the integration of a 4D schedule to manage sequencing and logistics.

The second level involves a more proactive use of BIM, where subcontractors leverage advanced BIM capabilities to enhance their internal processes and planning, rather than solely interacting with the general contractor's model. This includes:

- Estimating: Using BIM to automate quantity take-offs and improve cost estimate accuracy.
- Fabrication Processes and Constructability Evaluations: Using BIM models to streamline prefabrication workflows, evaluate constructability, and optimise designs for off-site manufacturing or modular assembly.
- On-site Project Management: Employing BIM for real-time progress tracking, schedule management, and asset coordination to ensure efficient resource utilisation and timely project delivery.

Benefits

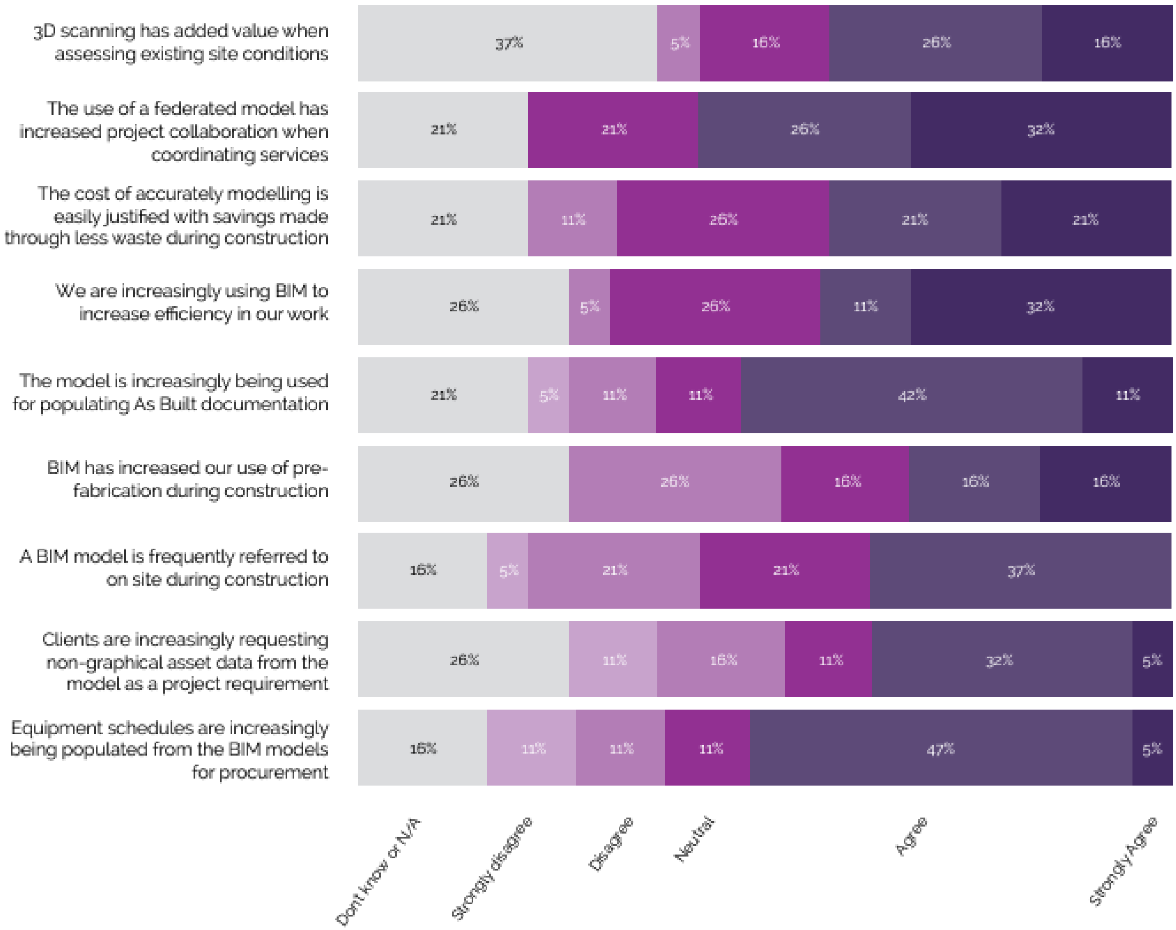
During construction, BIM allows main contractors to coordinate complex tasks with those of various subcontractors and specialist trades. It streamlines collaboration, enabling the project to be completed more efficiently and effectively than traditionally methods. Real-time updates and adjustments to the building model ensure everyone remains aligned, minimising the risk of errors, delays, and cost overruns.

From a subcontractor perspective, understanding BIM can lead to greater efficiencies on-site, better coordination with main contractor and other trades, reduced rework due to clearer communication and visualisation of projects, and increased competitiveness in securing work on modern projects where BIM is becoming an industry standard.

By engaging with BIM processes, subcontractors gain access to a comprehensive view of the project's goals and workflows, enabling them to understand how their work fits into the broader picture. It also allows them to assess and address issues in other teams' work that could impact their output, minimising errors, change orders, and delays. This elevates their project contribution, adding value beyond delivering trade-specific elements to become integral project partners.

The BIM in New Zealand research with subcontractors using BIM (BIM Acceleration Committee, 2021) found that 48% reported improved profits, 58% experienced improved quality of outputs, and 64% experience improved efficiency. Figure 7 below shows more detail in the benefits these subcontractors reported.

Figure 7 Subcontractor value of implementing BIM - NZ



Source: Reproduced from BIM in New Zealand — an industry-wide view 2021

Demand

The global BIM market size was valued at $7.9 billion USD in 2022, and projected to reach $34.2 billion USD by 2032, growing at a Compound Annual Growth Rate of 16% from 2023 to 2032 during the market forecast.

The BIM Acceleration Committee (BAC) survey of BIM adoption (BIM Acceleration Committee, 2021) found that use of BIM in their industry cohort doubled from 34% of projects in 2014, to 70% by 2021. Within their subcontractor respondents[3] – all mechanical contractors had used BIM in 2021, while the same was true for 67% of Electrical Contractors, and 77% of other subcontractors.

For mechanical subcontractors responsible for HVAC Systems, Refrigeration systems, Plumbing and

[3] Note this was both a small sample of 19 businesses

Electrical systems BIM can improve the fabrication process. Many are frequent users of offsite fabrication for their systems. With BIM they can see improvements in the labour costs, material waste generated, quality of installed work, schedule performance, and avoiding the purchase of extra pipes and fittings. By using BIM, mechanical subcontractors can leverage the technology to conduct more analysis on their projects using BIM for shop drawings and spatial coordination as well as constructability evaluations.

The use of BIM in the electrical subcontractor network internationally has been expanding in recent years. BIM can be useful for visualisation, prefabrication, clash detection, and on-site installation. For projects requiring BIM, additional time is devoted to making the model and shop drawings rather than a 2D drawing. In the BIM case, all the subtleties are thought of while modelling, reducing time required for fabrication and installation.

Link to current capabilities

This opportunity applies across a range of construction subcontracting specialties. It is most relevant to subcontracting fields that require detailed coordination, precise planning, and integration into broader project workflows and those that involve complex installations or prefabrication. It is less applicable to businesses that are primarily focused on smaller, single-specialty jobs, as the complexity and coordination requirements of larger projects are where this approach delivers the most value.

They key subcontracting fields align well with Māori/Pasifika business ownership.

- Mechanical, Electrical, and Plumbing (MEP).
- Interior Fit-Outs (Joinery, Drywall, Ceilings, Flooring)
- Structural engineering and steel fabrication
- HVAC (Heating, Ventilation, and Air Conditioning)
- Fire Protection Systems
- Civil Works (Earthworks, Drainage, and Utilities)
- Concrete and Reinforcement
- Landscaping and Site Preparation

Pathways for upskilling

The BIM Acceleration Committee developed a handbook and a series of resources to promote the adoption of BIM technologies by construction companies. It also provides case studies to demonstrate the costs, benefits and risk management benefits of using BIM in a local context.

While there are post-graduate certificates available for people with a relevant degree-level qualification (BCon, BEng, BEngTech, BArch, BAS, or equivalent), for most tradespeople short courses will be more appropriate. Organisations including Constructing Excellence in NZ, and BSI Group offer these.

System players

Workforce Development Council/Industry Skills Board

The entity responsible for Workforce Development Council activities for construction/infrastructure, within the Government's redesigned vocational education and training system.

New Zealand Institute of Building (NZIOB)

NZIOB is a pan-industry membership organisation for individuals, with members from across the entire construction sector. They took a leading role in developing the New Zealand BIM Handbook.

Association of Consulting and Engineering New Zealand (ACE New Zealand)

ACE represent more than 270 professional services consulting and engineering firms, ranging from large global firms to employee owned SMEs.

Te Kāhui Whaihanga New Zealand Institute of Architects (NZIA)

NZIA is a membership-based professional organisation that represents registered architects and promotes architecture in Aotearoa New Zealand. They were involved in the development of the BIM Handbook.

Construction and Engineering Firms

Leading firms that actively use BIM, such as Beca, Jasmax, Naylor Love and Hawkins, would provide practical insights into what skills are required. These firms had representatives on the BIMinNZ Steering Group and are also a part of the Amotai buyer network.

Barriers to entry

One of the key barriers identified in the BIM Acceleration Committee (BIM Acceleration Committee, 2021) is the overall cost for subcontractors. This includes both software/hardware, and resourcing costs. While the time taken to engage with the model typically returns value through reduced revisions, these benefits are at times not realised due to other contractors not following the model which diminishes the value of the pre-planning.

Some barriers to the adoption of BIM in quantity surveying practice in New Zealand include a lack of awareness and understanding of BIM, lack of BIM standards and protocols, lack of interoperability and integration among BIM software, high cost of BIM software and hardware, and the reluctance of construction industry stakeholders to adopt BIM.

Opportunity 3 – Commercial Building Energy Retrofits

The opportunity

While new buildings can be designed as zero carbon-ready, most commercial buildings that will exist in 2050 have already been built. Reducing the carbon footprint of our building stock to meet our emissions reduction targets will require upgrading and retrofitting these existing structures.

The retrofitting of buildings refers to modifications that decrease energy demand or improve energy efficiency. It typically includes modification of heating, cooling and lighting and structural, architectural, mechanical or electrical work done to improve the energy performance of the building. Integrated energy retrofits of commercial buildings can include:

- Building automation and controls, including smart sensors and software for energy management;
- Building fabric upgrades, including insulation, draught proofing, windows and shading;
- Heating, ventilation and air conditioning (HVAC) upgrades, including space heating and cooling, including efficient electrification of chillers and boilers, tuning, ventilation and controls;
- Hot water upgrades, including efficient electrification and replacement of gas and resistive electric water heaters with heat pump hot water systems;

Retrofitting buildings requires skilled workforce and businesses throughout the process; from energy audits and design in the planning stages, installation, through to monitoring and optimisation when the upgraded system is operational.

The retrofitting process offers numerous opportunities for businesses to contribute at every stage, from planning and installation to ongoing optimisation. By understanding the specific demands and roles required throughout the retrofit lifecycle, businesses can position themselves to capitalise on the growing demand for energy efficiency solutions.

Assessment and planning

Businesses offering energy auditing and consultancy services can thrive in this initial phase, providing expertise in evaluating building performance and identifying inefficiencies. This represents an expansion opportunity for businesses specialising in any of the above areas (i.e. HVAC, glazing, smart building technologies, renewable energy systems (solar panels and heat pumps), and energy management software). Energy audits can be comprehensive building wide audits, or relative to specific subsystems like compressed air, pump, fan and refrigeration systems (typically to support business cases).

Material supply

Suppliers of energy-efficient materials and systems, such as high-performance insulation, double-glazed windows, and smart technologies, are critical players at this stage. Businesses can also specialise in sourcing and distributing renewable energy components like solar panels and heat pumps.

Implementation and installation

Retrofitting requires a skilled workforce across multiple trades, creating opportunities for contractors and subcontractors in HVAC upgrades, lighting system installations, and building fabric improvements. Companies with expertise in the installation of smart building technologies or electrification systems can gain a competitive edge.

Monitoring and optimisation

The ongoing management of upgraded systems presents long-term opportunities for businesses in energy monitoring solutions and building management systems (BMS). Companies can provide analytics platforms, smart sensors, and remote diagnostics to track and optimise energy performance.

Maintenance and upgrades

Retrofitted systems require regular maintenance, creating opportunities for service providers to offer maintenance contracts for HVAC, solar, and other energy-efficient systems. Additionally, businesses focused on lifecycle upgrades can stay ahead by integrating emerging technologies into previously retrofitted buildings.

Benefits

While New Zealand's electricity is predominantly renewable (80-85%, EECA), this represents only part of our total energy use. When we consider all primary energy sources including petrol and diesel for transport, coal and gas for industrial processes, fossil fuels for space and water heating, and household gas and LPG, the picture changes significantly. Around 60% of New Zealand’s primary energy supply comes from fossil fuels.

The benefits of moving away from fossil fuel use extend beyond greenhouse gas emission reduction. A key benefit among these is the reduction in operating costs through energy efficiency and fuel switching. Commercial buildings use 21 percent of New Zealand’s electricity, at a cost of $800 million every year to businesses. According to NABERSNZ, on average building energy performance could be improved by 20-25 percent leading to substantial saving.

Switching to low-emissions solutions can protect businesses from potential fossil fuel supply and cost uncertainty as well as staying ahead of potential regulations for climate change mitigation. Businesses may also benefit through improved brand alignment, and employee comfort by making these changes.

Demand

The global energy retrofit systems market was worth $174.86 billion USD in 2023. The market is projected to grow from USD 182.99 billion in 2024 to USD 234.96 billion by 2032 a CAGR of 3.17% over the forecast period (Fortune Business Insights, 2025).

According to the International Energy Agency (IEA) an estimated 10.9 million people work in energy efficiency in buildings globally. They found that installation and repair positions were facing severe skilled labour shortages. Three-quarters of survey respondents reporting difficulty hiring qualified technicians, trade workers and project supervisors (International Energy Agency, 2024).

EECA research shows that a third of businesses (34%) are actively seeking to reduce the impact of their energy use and transport choices. The New Zealand market is supported by Government subsidies, with support available for both public and private entities wishing to improve the energy efficiency of their buildings. Crown Loans are available for government ministries, departments, district hospitals, Crown owned companies, regional councils, Territorial authorities, public and integrated schools, and tertiary education institutes. For private entities, the energy systems optimisation programme offers up to 40% of the cost of optimising existing equipment and assets to save energy and emissions (EECA).

Link to current capabilities

Amotai database has 62 businesses listing building retrofit as a service provision,43 Māori-owned, 13 Pasifika-owned and 6 with combined Māori/Pasifika ownership from a total of 492 that work in Building Completion.

The core knowledge and practical skills of construction professionals such as understanding building systems, interpreting blueprints, and conducting site inspections—provide a strong foundation for energy auditing and retrofitting.

Pathways for upskilling

While implementation, installation, and maintenance align directly with existing skills in the electrical and HVAC industries, those wanting to expand into energy audits, advanced energy management, or high-efficiency system integration will require additional training in the following areas:

• **Energy auditing and compliance:** Training in energy auditing methodologies (such as NABERSNZ accreditation) will be crucial for businesses looking to assess and optimise building performance.

• **Building automation and controls:** Training in smart building systems, including IoT-based energy management, building management systems (BMS), and demand response technologies.

• **Advanced HVAC optimisation:** Courses in system tuning, ventilation control strategies, and integration of energy recovery solutions to enhance HVAC efficiency.

• **Renewable energy integration:** Training in solar photovoltaic (PV) system installation and integration with commercial buildings, as well as battery storage and microgrid solutions.

Carbon and Energy Professionals NZ offer the following certification programmes:

- Certified Carbon Auditor
- Certified Process Heat Emissions Plan Reviewer
- Certified Measurement and Verification Professional

System Players

Workforce Development Council/Industry Skills Board

The entity responsible for Workforce Development Council activities for construction/infrastructure, within the Government's redesigned vocational education and training system.

Carbon and Energy Professionals New Zealand (CEP)

A membership organisation of individuals working or interested in energy efficiency and carbon emissions reduction, working across the private and public sectors, in in-house and consultancy roles, in academia, in renewables and in policy advice. CEP runs training and accreditation programmes in carbon and energy management that develop the capacity of businesses to improve efficiency, productivity and reduce carbon emissions.

Energy Efficiency and Conservation Authority (EECA)

EECA is the government agency that promotes and supports energy efficiency and conservation as well as the use of renewable energy sources.

NABERS New Zealand (NABERSNZ)

NABERSNZ is a building certification system for a building's energy performance that was adapted from Australia's National Australian Built Environment Rating System (NABERS). NABERSNZ is licensed to the Energy Efficiency and Conservation Authority (EECA) and is administered by the New Zealand Green Building Council (NZGBC). Ratings are carried out by trained assessors.

Building Research Association of New Zealand (BRANZ)

BRANZ provide practical research, testing, quality assurance and expertise to support better buildings.

New Zealand Green Building Council

A membership body that advocates for the adoption of green building practices, provide independent certification, and support New Zealand on its path to a low carbon future.

Barriers to Entry

The barriers to entry in this field are relatively low and should not be prohibitive for most SMEs.

Capital

Energy retrofits often require upfront investment in specialised tools and equipment. Smaller businesses may struggle to secure the necessary funding for training staff or purchasing advanced technologies like thermal cameras, energy modelling software.

Accreditation/Certification

In some cases formal accreditation is required and businesses will need to invest in training to get staff accredited. To be eligible for EECA funding for example, the provider must be accredited with Carbon and Energy Professionals Aotearoa.

Opportunity 4 – Installation of Renewable Consumer Energy Resources (CER)

The opportunity

New Zealand has committed to achieving net zero greenhouse gas emissions by 2050 (other than for biogenic methane). Electricity has a key role to play in achieving these ambitions, and the speed at which changes must be implemented is unprecedented. MBIEs Climate Change Commission modelling (2021) forecasts that the share of our energy produced by solar energy will increase from 1% in 2021, up to 6% in 2040.

The transition to renewable electricity presents significant opportunities across the energy value chain, including utility-scale generation integrated into the national grid, as well as decentralised residential and community resources. Within this sphere, the installation of Consumer Energy Resources (CER) represents an easy opportunity for Māori/Pasifika electrical businesses to upskill to take advantage of the opportunity.

CER is a collective term for devices that are owned and used by consumers to generate, store or manage electricity and other forms of power. These include rooftop solar panels, batteries, DPV panels, and small to medium scale energy resources such as wind turbines with rooftop solar being the most common due to its relatively low installation cost, scalability, and the widespread availability of sunlight in many regions.

The Amotai database showed 17 Māori businesses out of 165 Electricity and Gas businesses providing solar installations – highlighting a significant opportunity for these businesses to benefit from expanding their offerings in the solar market.

Demand

In New Zealand, the key drivers for consumers include protecting against rising electricity prices and increasing energy independence through reduced reliance on the grid. While the energy intensive manufacturing process of PV panels leads to 'embodied emissions' which take several years to offset, solar causes no direct greenhouse gas emissions, and local environmental impacts (EECA).

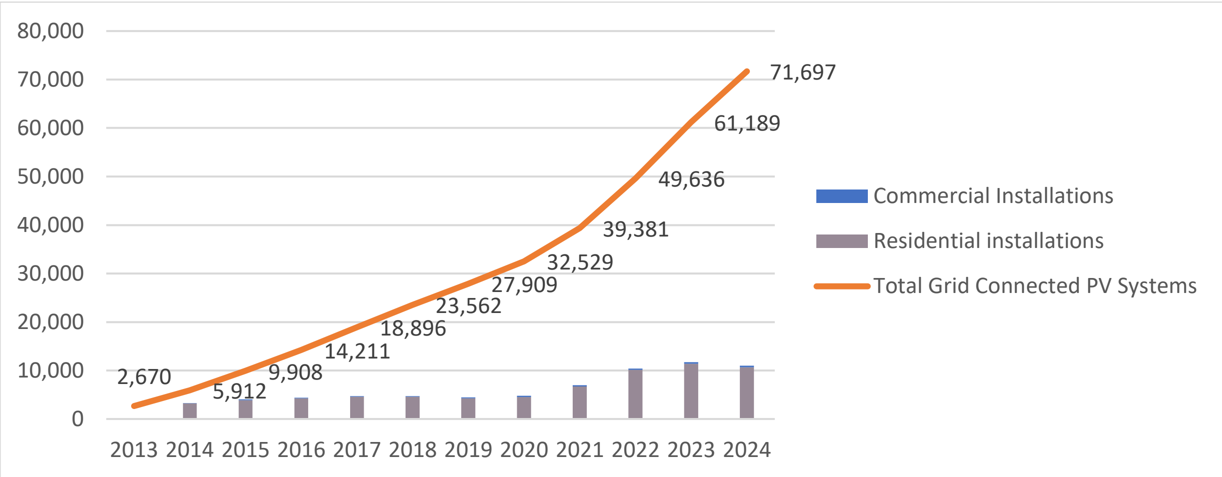
According to Electricity Networks Aotearoa, the consequences of the market failing to deliver additional generation capacity has manifested itself in elevated risk of generation shortfalls at peak times and unduly high prices to industrial, commercial, and residential consumers at time when general inflation is at the highest level for a generation.

The Government has acknowledged New Zealand currently has an energy shortage that has led to the country currently having the highest wholesale electricity prices of any of the countries we normally compare ourselves to (Beehive.govt.nz, 2024). While electricity prices in New Zealand had historically seen only modest increases year on year (with the cost per unit averaging 3% increase annually from 2007-2022), consumers saw a 6% annual increase on average in 2024 (MBIE). According to Genless, under the right circumstances, residential solar panels can pay themselves off in around eight years, then deliver free energy for the next 20.

Demand for CER in recent years has further been driven by a combination of the reduction in the price of solar panels and home batteries, as well as rising electricity costs and increase in electricity usage as businesses and households transition to electric vehicles (EVs) and plug in hybrids from gas or diesel.

As Figure 8 shows, residential has been the key driver of growth in the industry, while commercial represents a smaller number of larger-scale installations (just 350 in 2024). In 2021, the government published a detailed report on the financial viability of on-site solar generation for businesses (Energy Efficiency and Conservation Authority, 2021). The report showed marked regional impacts, showing a strong case and good investment returns for solar for large retailers in Christchurch and Hamilton, while Auckland lead for retailers, wastewater treatment plants, and manufacturers. Returns in Dunedin and Wellington made solar investments less attractive in these regions.

Figure 8 Total number of Grid Connected PV Systems and Annual Installations in New Zealand



Source: EMI Electricity Authority Te Mana Hiko

According to NZ Electricity Authority, just 2.6% of New Zealand residences had rooftop solar in 2024. This lags significantly behind our neighbours in Australia, where 4 million households (1 in 3 homes) now have solar panels (Department of Climate Change, Energy, the Environment and Water). The Minister for Energy noted several planned regulatory changes that will reduce regulatory barriers and cut through red tape to deliver affordable and secure electricity. These include:

- Updating more than 400 references to international standard in regulations to make it cheaper to install rooftop solar systems
- Increasing the regulated supply voltage range at which homes and businesses connect to electricity networks which will enable more generated distribution, such as rooftop solar

The energy competition task force led by the Electricity Authority and Commerce Commission is investigating two additional actions to support the uptake of household solar panels and batteries:

- Requiring distributors to pay a rebate when consumers export electricity at peak times
- Requiring retailers to better reward consumers for supplying power

Increasingly we are seeing successful examples of PV panels to power marae infrastructure, and in some cases, with the excess providing energy at reduced or no cost to local communities (see Māniaroa and Taarewaanga Marae, and the The Kia Whitingia project in Manawatū). As these projects demonstrate their success and positive impact for whānau, they are likely to inspire greater demand for similar initiatives from other iwi/hapu. Having a skilled Māori workforce to deliver this work would further enhance their cultural and economic value.

Pathways for upskilling

Electricians can upskill to become solar PV system designers by completing SEANZ endorsed NZQA micro credential training course. International research shows that the wage premium for clean energy specific skills is sufficient to pay back the cost of training shortly thereafter (International Energy Agency, 2024).

While electricians are central to renewable consumer energy projects, a wide range of other professionals such as system designers, structural specialists, technicians, and IT experts are involved.

There are significant upskilling opportunities for unskilled workers with the right attributes, to transition into installer roles. These roles often require specific technical training, but those with understanding of construction processes and hands-on experience in the industry have a good foundation to build from. Targeted training programmes and apprenticeships can bridge the gap, offering clear pathways for motivated individuals to enhance their expertise, earn higher wages, and secure long-term careers in high-demand industries.

Barriers to Entry

Skills and workforce development

In September 2024, changes were made to electrical worker licensing, introducing Electrical License Endorsement requirement for parallel generation, including Solar & BESS. This endorsement recognises the additional risks and competency requirements associated with this high-risk work.

These changes introduced a stepped licencing pathway for registered electrical workers, with electricians required to either complete a SEANZ endorsed NZQA micro credential training course, or go through a grandfathering process to recognise prior Learning/experience. Continuous Professional Development points will be required to maintain the endorsement.

Market Saturation in Urban Areas

- Urban centres have established players, making it difficult for new businesses to compete. SEANZ has 272 members.
- Regions with less solar exposure (e.g., areas with higher rainfall or cloud cover) have lower demand, affecting the feasibility of new businesses in those areas.

Lack of Government incentives

- Unlike other countries, where CER is a key strategy to move away from fossil fuel use, New Zealand does not currently offer significant subsidies or rebates to offset the cost of installing solar.

Equipment

The key expenses for an electrician transitioning to solar installations would include the cost of a PV tester or I-V curve tracer, solar cable stripping tools, MC4 connector tools, thermal cameras, and any required mounting and roof anchor equipment. The total cost of these tools should not represent a major barrier to entry but will need to be balanced by confidence in the demand.

System Players

Workforce Development Council/Industry Skills Board

The entity responsible for Workforce Development Council activities for construction/infrastructure, within the Government's redesigned vocational education and training system.

Sustainable Energy Association of New Zealand SEANZ

SEANZ represents manufacturers, system integrators, distributors, some retailers, technology companies, aggregators, software developers, finance industry participants and energy end-users.

New Zealand Green Building Council

A membership body that advocates for the adoption of green building practices, provide independent certification, and support New Zealand on its path to a low carbon future.

Energy Efficiency and Conservation Authority (EECA)

EECA is the government agency that promotes and supports energy efficiency and conservation as well as the use of renewable energy sources.

6. Conclusions and recommendations

This report highlights the significant opportunities for Māori and Pasifika businesses in construction, to embrace technological advances and benefit from innovative, sustainable, and high-value sectors. There are sustainable construction opportunities spanning all trades. The opportunities align with the cultural and entrepreneurial strengths of Māori and Pasifika businesses, such as adaptability and kaitiakitanga.

By targeting industries with low barriers to entry and strong links to existing capabilities, we identified four key opportunities: BIM, trenchless technologies, energy retrofits, and renewable consumer energy systems. These areas all demonstrate the potential to stimulate demand, support sustainable practices, and are suitable for on-the-job upskilling. They represent immediate and aspirational opportunities that can position Māori and Pasifika businesses as leaders and active participants in the green construction economy. The key barriers to entry include access to capital, specialised training, and navigating regulatory requirements. Addressing these barriers will enable businesses to seize these opportunities.

Next steps

To ensure Māori and Pasifika businesses can fully participate in the construction industry's green transformation, it is critical to build a supportive ecosystem that includes training, funding, and partnerships. By engaging in high-growth, innovative sectors, these businesses can drive sustainability, create high-skilled jobs, and enhance the well-being of their communities. We have identified the following key next steps:

1. **Further research and validation**: Conduct detailed local market analyses to validate these findings, with a focus on understanding specific regional demands, workforce gaps, existing training provision and gaps, and business readiness.
2. **Training and qualifications**: Develop tailored training programmes for Māori and Pasifika businesses, prioritising practical, on-the-job learning. Collaborate with training providers to create pathways for transitioning existing skills into high-value sectors. Work with Tertiary Education Commission to secure funding for training outside of core trade qualifications.
3. **Partnerships**: Explore industry partnerships and funding opportunities to design and implement new qualifications.

With the right investments and partnerships, Māori and Pasifika businesses can play a pivotal role in shaping a sustainable and inclusive construction future.

7. Appendix 1 – Longlist opportunities

Smart and Digital Technologies

Opportunity	Description	Score / 100
Building Information Modelling (BIM)	Using digital 3D models to access detailed, real-time 3D models and project data, enabling accurate installation, better coordination, and early identification of clashes or issues on-site. Using integrated data from multiple disciplines, to enabling efficient coordination, visualisation, and decision-making throughout a project's lifecycle. Note this is focused on interacting/working with BIM from a trade perspective rather than as the architect/designer.	87
Steel design and Fabrication	Steel design and fabrication are increasingly required in both commercial and residential sectors to meet the demand for durable, sustainable, and architecturally innovative buildings. Steel is increasingly used in modular construction and prefabrication, significantly reducing on-site construction time.	82
Smart Buildings technology installation	Smart buildings leverage various technologies to optimise building operations, enhance occupant comfort, and minimise environmental impact. Some key smart technologies being adopted in buildings include Artificial Intelligence (AI) for predictive maintenance and energy management, voice control for ease of system interaction.	81.5
Smart thermostats/energy management	Installing and configuring smart thermostats, sensors, and energy management systems.	80.5
Erosion control: Modular and adaptable shoring for slope stability	A trend in shoring technology and methods is the development of modular and adaptable shoring systems that can be easily assembled, disassembled, and reused in different projects and conditions. Modular and adaptable shoring systems can include prefabricated components such as steel frames, panels, beams, or boxes that can be connected or stacked in various configurations, or flexible elements such as geosynthetics, geocells, or geogrids that can conform to irregular shapes and slopes.	79
AI in and planning and development	Leveraging advanced tools like GIS, AI, and digital twins to analyse data, optimise resource allocation, and create sustainable, adaptive urban and rural environments. These technologies enable smarter, data-driven decision-making to balance development, conservation, and community needs.	78
Robotic Lifting & Hoist Solutions	Artificial intelligence and advanced robotics to transport construction materials, tools, and equipment to and from high places quickly and safely, whilst simultaneously recording critical site efficiency data and feeding it back to the teams in our office for analysis.	73.5
CCTV/Facial recognition	Leveraging IoT devices, AI, and real-time monitoring systems to enhance site safety and protect valuable assets. Integrating features like AI-powered surveillance cameras for threat detection, access control systems using biometric or RFID technology, and real-time alerts for unauthorised entry, remote monitoring through mobile apps, drone surveillance for large sites, and predictive analytics to identify potential vulnerabilities.	72.5
Smart Water Management systems	Smart water management systems, IoT sensors, and AI for leak detection, flow monitoring, and predictive maintenance. Roles include Water Infrastructure Specialists to understand traditional water systems and how to integrate smart technologies effectively, Maintenance Technicians to perform on-site equipment checks and manage IoT devices.	72

Smart Plumbing Systems and IoT Integration	The use of remote monitoring allows for real-time alerts and predictive maintenance, enabling plumbers to detect issues before they become significant problems. Energy efficiency is also a major benefit of smart plumbing systems, as they can optimise water usage and reduce overall energy consumption.	71.5
Smart Scaffolding Techn ologies	Incorporating sensors and connectivity, smart scaffolding systems can gather real-time data on factors such as wind speed, tilt, load-bearing capacity, and structural integrity. This data can be remotely monitored and analysed, providing valuable insights into safety risks and potential maintenance needs.	71
Energy Modelling and Simulation	Energy modellers and auditors - proficient in energy modelling software, building physics, thermodynamics and HVAC systems. Familiar with Green Building certifications.	71
Autonomous earthmoving	Adopting sensing and information technologies to reduce operation costs, enhance productivity, and improve automation and safety standards in practical use case involving excavator loading, dumper transport, bulldozer spreading, and roller compacting for road construction.	70
IoT in Traffic Management	Sensors, cameras and communication with connected vehicles (autonomous and other)	68.5
AI Safety	AI technologies are being employed to mitigate risks and improve on-site safety. Computer vision and IoT sensors can monitor workers' movements and detect safety hazards in real-time by analysing images and videos from jobsites to identify potential safety risks and ensure compliance with safety protocols.	66.5
Smart irrigation	Smart irrigation leverages advanced technologies such as Internet of Things (IoT), artificial intelligence (AI), big data analytics, and precision sensors to optimize water use in agriculture, landscaping, and other irrigation applications.	66
Cyber security in water treatment	As water utilities continue to digitise, data connectivity and online operations management bring an increased risk of cyber-attack. As a result, water utilities face a need to constantly transform and improve their cyber-threat protections.	63.5
AI in traffic management.	Predictive analytics for traffic flow optimisation. Real-time decision making for improved safety. Enhanced efficiency during peak hours and special events, data-driven decision making for improved efficiency.	63.5
Erosion control: Smart sensors and monitoring for slope stability	One of the current trends in slope stability and shoring is the use of smart sensors and monitoring systems to collect and analyse data on soil conditions, groundwater levels, slope movements, and shoring performance.	62.5
Drone-based Surveying	Using AI algorithms to process aerial imagery and LiDAR data for accurate topographic surveys and volumetric calculations. This technology enhances surveying efficiency and provides detailed site information essential for construction planning and progress monitoring. MPTT - Also mentioned and including site mapping, project planning and execution. The global construction sector is increasingly integrating digital technologies, such as Building Information Modelling (BIM) and drones, to enhance project planning and execution. Additional use across horticulture and forestry. Ground survey, mapping, planting etc.	62
3d mapping and modelling for pipeline design and repair	3D mapping and modelling for pipeline design and repair typically involves engineers, CAD specialists, and GIS technicians who use advanced software and technologies to create accurate, detailed representations of pipeline systems. These professionals design and analyse pipeline routes, identify potential challenges such as terrain obstacles or environmental impacts, and ensure compliance with industry standards. During repair work, 3D models help visualise existing infrastructure, detect faults, and plan efficient solutions with minimal disruption. By leveraging tools like LiDAR, drones, and simulation	61.5

	software, teams can enhance accuracy, improve decision-making, and streamline the design and repair process for reliable and cost-effective pipeline management.	
Digital Twin	Digital twins—virtual replicas of physical buildings— used to monitor building performance in real-time. This technology supports sustainable maintenance practices and optimises energy use, predicting wear and tear to reduce waste. IoT engineers to deploy and integrate sensors and IoT devices to collect real-time data from the building.	61.5
Robotics (on-site)	Robotic and automation use (e.g., raising walls, polishing floors), bricklaying. Deloitte (US): 76% of E&C executives in a recent Deloitte survey indicated they are investing in digital technologies to address broader cost and margin challenges, and 24% are investing in drones and robotics at job sites to increase worker productivity and efficiency.	53.5
Augmented reality in training/onsite	Augmented reality (AR) in construction safety involves overlaying digital information onto the physical world through devices like smart glasses, smartphones, or tablets, enhancing situational awareness and safety on job sites. By providing real-time hazard identification, visualising underground utilities, and offering step-by-step guidance for complex tasks, AR can significantly reduce risks. Additional features include virtual training simulations for workers, live data integration from IoT sensors to alert teams of potential dangers, and collaborative tools for remote safety assessments.	51.5
Telecommunications	leveraging advanced connectivity technologies to overcome challenges of isolation and limited infrastructure. Key features include the deployment of satellite-based internet systems like Starlink, 5G networks for high-speed and low-latency communication, and IoT integration for real-time monitoring and data sharing. Additionally, mesh networks can provide reliable local connectivity, while edge computing enables efficient data processing on-site.	51
Autonomous Cranes	Autonomous cranes. Equipped with object detection capabilities, the crane can detect the presence of workers or other objects nearby, thereby preventing collisions, accidents, and delays.	41
Wearable tech	Devices that track workers’ locations, movements, and even biometric data help managers monitor safety compliance and quickly respond to potential health issues like heat stress or fatigue.	36
Grid Interactive Buildings	Grid Interactive Buildings (GIBs) are advanced structures equipped with energy systems that can dynamically interact with the electric grid to optimise energy use, reduce costs, and improve grid stability. These buildings integrate energy-efficient technologies, on-site renewable energy generation (such as solar panels), energy storage systems (like batteries), and smart controls to manage energy consumption in response to real-time grid conditions.	0

Energy Efficiency/Resource Conservation

Opportunity	Description	Score / 100
Renewable energy integration into buildings	Integrating solar panels, wind turbines, and geothermal systems into buildings to generate clean energy onsite. Photovoltaic glass and other technologies that allow windows to generate energy are also becoming more popular.	87
Water conservation and management	Techniques such as rainwater harvesting, greywater recycling, and low-flow fixtures are reducing water use in buildings. Some projects are achieving net-zero water use by treating and reusing wastewater onsite. Including larger scale, development-wide water recycling schemes.	87
HVAC / Energy retrofits	Structural, architectural, mechanical or electrical work done to improve the energy performance of an existing building. Retrofit specialists are needed to implement energy-efficient upgrades, such as improved insulation, window replacements, and HVAC system upgrades. Mechanical, Electrical, and Plumbing (MEP) Engineers to design and install energy-efficient systems, including heating, cooling, ventilation, lighting, and renewable energy systems. In New Zealand, 60% of space heating and 24% of water heating for commercial buildings relies on fossil fuels - including gas, coal, LPG, and diesel. (MPTT also see HVAC installation and maintenance as higher paying roles).	85.5
Energy Efficient construction (Passive homes etc)	Training in energy-efficient design principles, advanced construction techniques, as well as certification programs, knowledge of passive building standards like PHI or PHIUS. Blower door testing has been identified as a skills shortage in Aotearoa.	82
Other Energy Storage solutions	Construction and maintenance of other energy storage systems, pumped hydro, thermal energy, compressed air storage.	81.5
BESS Battery Energy Storage Systems	Stationary energy storage systems, including those for utility-scale, commercial, industrial, and residential storage, make up this segment. Fastest growing battery segment (forecast to be 10% of battery-cell demand in 2040). Front-of-the-meter installations— the utility-scale BESS systems installed on the electric grid to store and dispense energy—account for the majority, about 65 percent, of the BESS segment. Behind-the-meter installations—systems installed at residential, commercial, or industrial locations for generation, consumption, and storage—account for the remaining 35 percent of the BESS segment.	80.5
Charging infrastructure	Installation of EV charging infrastructure requires skilled electricians and electrical engineers to assess sites, design electrical layouts, and ensure compliance with safety and regulatory standards. These professionals handle tasks such as wiring, power distribution, load calculation, and testing to guarantee the safe and efficient operation of charging systems. They need to troubleshoot technical issues and coordinate with civil contractors for physical installations, to integrate the charging equipment into existing electrical systems.	79
Clean Energy Supply - High Voltage Transmission	The demand for High Voltage power systems are expected to grow. With a growth in renewable energy sources, they will need to be connected to the national grid. This requires skilled electrical engineers, power systems engineers, and HV electrical technicians to design, install, and maintain complex electrical infrastructure. These professionals handle tasks such as system planning, load analysis, grid connection, and testing to ensure safe and reliable operation. Maintenance engineers play a critical role in system inspections and upgrades, ensuring long-term reliability and compliance with safety and regulatory standards.	78.5

Clean energy supply	Clean energy generation, transmission and distribution. Solar PV large scale, Wind, Hydroelectricity, Biomass, Geothermal. Construction and installation, operations and maintenance.	77
Offshore wind farms	The construction and maintenance of offshore wind farms will involve a complex mix of fabrication, installation, undersea cabling and maintenance activities.	77
Smart grids	The installation and maintenance of smart grids on the supplier side typically involve electrical engineers, grid specialists, and technicians who design, implement, and monitor advanced grid infrastructure. These professionals ensure seamless integration of smart technologies, such as automated controls, sensors, and real-time communication systems, to enhance grid reliability and efficiency. Tasks include upgrading existing power systems, optimising energy distribution, and ensuring compliance with regulatory standards. Maintenance engineers and technicians play a key role in monitoring system performance, diagnosing faults, and performing regular updates to ensure the smart grid remains resilient and capable of meeting dynamic energy demands.	75.5
Hydrogen	Infrastructure, storage and distribution - pipeline engineering. There is a need for qualified technicians that install or service hydrogen equipment from networks and gas meters.	75
Hydrogen - Health and Safety	Hydrogen professionals, including safety engineers, technicians, and compliance specialists, will be needed in future, to focus on preventing hazards such as leaks, fires, and explosions when dealing with Hydrogen. Key tasks include implementing ventilation systems, monitoring for leaks with specialised sensors, maintaining proper storage pressure, and ensuring compliance with health and safety regulations. These professionals will also be required to deliver training for personnel on emergency response, safe handling, and risk management.	74
Bio-energy	Oversee the building of biofuel production plants, storage facilities, and pipelines. Design plant layouts, access roads, and structural foundations. Electrical Engineers to design electrical systems for biofuel plants, including power distribution, controls, and safety mechanisms. Develop energy-efficient systems for processing and production facilities. Electricians to install, maintain, and repair electrical systems in biofuel production facilities. Work on high-voltage systems, motor controls, and industrial machinery wiring.	62.5

Circular Economy

Opportunity	Description	Score / 100
Building with Biodegradable/Reclaimed Materials	Bamboo, straw bales, and mycelium-based materials are becoming common for sustainable builds. They are low-impact, rapidly renewable, and reduce waste.	74
Deconstruction/ reuse of with Recycled and Reclaimed Materials	Reusing materials like reclaimed wood, metal, and bricks reduces resource demand and waste. This approach supports circular economy practices and can add unique aesthetics to buildings.	70
Robotics in Demolition	The integration of robotic systems into current demolition processes, with techniques such as concrete cutting and core drilling, also helps with the intricate dismantling of joints in structures. These automated demolitions not only remove humans from the process for safety reasons but can also efficiently separate building components for easier recycling. Autonomous robots operate independently, making decisions using intelligence gathered through their sensors and programming without direct human interventions. Teleoperated robots are controlled by humans from a remote location. This will be most useful in carrying out complex assignments in hazardous environments or situations where direct human presence is not feasible.	63.5
Design for deconstruction	Responsibly manage end-of-life building materials and minimise the consumption of raw materials in the production of new buildings. This is achieved by optimizing materials removed during demolitions and exploring ways to reuse them in another construction project or recycle them into a new product. Includes preparation of material passports and catalogues based on original construction drawings and the current state of a building at its end of life. This material catalogue provides information on the functional and structural capacity of different material components of the building, the process of disassembly, and their quality for resale or reuse in other structures.	61.5
AI for deconstruction	Machine learning predictive models have been applied to various aspects, such as predicting deconstruction costs, analysing the deconstruction process, assessing the technical reusability of building components, and estimating end-of-life waste. Robotics has demonstrated effectiveness in tasks like component finish partitioning and removal, insulation partitioning and removal, and adhesion removal. At the same time, optimisation techniques have enhanced deconstruction process planning, scheduling, and salvage material logistics.	54.5

Green Construction

Opportunity	Description	Score / 100
Trenchless technology	Construction methods and techniques used to install, repair, or replace underground infrastructure, such as pipelines, conduits, and cables, without the need for extensive surface excavation. It minimises surface disruption and environmental impact, making it a cost-effective and efficient alternative to traditional open-cut excavation methods. Includes Horizontal Directional Drilling (HDD), Pipe Bursting, Cured-in-Place Pipe (CIPP), Microtunnelling, Sliplining, and Auger Boring..	84
Apartments/Multi-unit dwelling construction	Project management, concrete or steel framing, fireproofing, soundproofing.	82
Sustainable building materials (earth-based, bio-based, wood/mass timber)	Bio-based materials have low environmental impact and high biodegradability. They can also reduce the dependence on fossil fuels and synthetic materials. Some examples of biobased materials are straw, mass timber and hempcrete. Earth-based materials are made from soil, such as clay, sand, gravel, or silt. They can be used to create various building materials such as rammed earth, compressed earth blocks and clay plasters. Earth-based building materials have enormous potential as solutions for low-energy dwellings, energy efficiency, thermal comfort, eco-architecture, climate responsiveness, affordability, and recyclability. Mass timber, growth industry internationally but rarely used in NZ. To accelerate the construction industry's use of wood and mass timber, the government has partnered with Red Stag Investments Limited to implement the Mid-Rise Wood Construction programme. The programme is expected to deliver economic benefits, with net value of $155 million by 2023 and $330 million by 2036.	77
Offsite Manufacturing OSM (Prefab and Modular Construction)	Prefabrication and modular building reduce on-site waste, improve energy efficiency, and lower construction time. Offsite construction also allows for more precise building techniques that minimize energy and material waste.	72
3D Printed buildings	3D Printing is another Modern Method of Construction (MMC) technique that is growing rapidly due to benefits of time and cost savings, as well as reduced waste. It uses materials like concrete, metal, and resin to build entire structures or components for houses, bridges, etc.	63.5
Green Roofs	Integrating vegetation on roofs and walls to improve insulation, reduce heat islands in urban areas, and enhance biodiversity. Green roofs also manage stormwater and improve air quality.	62
Biophilic design	Biophilic design is another growing architectural trend that connects humans and nature within buildings. It involves incorporating natural elements into buildings to improve occupant well-being and promote sustainability. Biophilic design has gained global attention as more evidence has shown its benefits in reducing stress and anxiety, boosting mood, and improving cognitive function and creativity. Biophilic design can resemble nature, traditional architecture, or cultural heritage, using symbols, shapes, colours and materials. It can also incorporate natural elements like plants, water, light, ventilation and views into the structure.	57

8. Appendix 2 – Interview Guide

Following introductions to the project and the participant's role and area of expertise, we conducted a semi-structured interview based around the questions below. This served as a flexible framework to ensure key themes were addressed, while allowing a free-flowing dialogue to explore the unique perspectives and insights of each participant.

Industry Trends and Demand

- What are the fastest-growing areas in your field that will require skilled workers in the next 5–10 years?
- Are there specific technologies or practices emerging in your field that you anticipate will become essential?
- Are there any disruptive technologies emerging in your field that are likely to replace or significantly change existing jobs? What jobs are most at risk?
- Which roles in your industry currently face skill shortages?
- Are there any government or industry initiatives driving demand for specific skills or roles?
- If we consider sustainability in these fields, are there any specific trends you are aware of?
- Are there any trends that specifically relate to the regions or areas where Māori communities are (Northland, East Coast?).

Suitability for Māori/Pasifika Workforce

- Are there particular roles in your field that you think align well with Māori and/or Pasifika values, such as kaitiakitanga (guardianship) or community well-being?
- How can existing Māori/Pasifika capabilities, such as land stewardship, construction skills, or natural resource management, be leveraged in your field?

Accessibility and Training

- What level of education or training is typically required for the high-demand roles in your field?
- What are the barriers (e.g., cost, location, prerequisites) for retraining in your field, and how can they be addressed?
- Are there existing partnerships or programs focused on upskilling Māori in your industry?
- Are there opportunities for on the job training, going from lower skilled roles, to more highly skilled.

Economic and Job Quality Factors

- What are the typical salary ranges for the high-demand roles you've identified?
- Are these roles secure and long-term, or are they dependent on short-term trends?
- Are there opportunities for career progression within these roles?

Future-Proofing and Sustainability

- How are the roles in your field impacted by automation or technological advancements?
- What roles are likely to remain relevant and in demand as the industry evolves?
- How is your industry incorporating sustainability, and what roles contribute to that shift?

Broader Workforce Needs

- What soft skills (e.g., leadership, communication) are valued in your field alongside technical expertise?
- Are there specific regions or communities where demand for these skills is higher?
- Are there cross-disciplinary opportunities that combine skills from your field with others (e.g., combining construction and environmental management)?

9. Appendix 3 – Glossary of Terms

Term	Meaning
CoVE	Centres of Vocational Excellence
ConCOVE	Construction and Infrastructure Centre of Vocational Excellence
Industry Training	On-job or off-job learning to develop skills and key competencies
MBIE	Ministry of Business, Innovation and Employment
Te Pūkenga	New Zealand Institute of Skills and Technology

10. References

Amotai and TSI. (2025). *Amotai Snapshot 1: Rates of Māori and Pasifika owned businesses by region and industry (Analysis of Te Matapaeroa data Tables) [publication forthcoming].*

Amotai and TSI. (2025). *Amotai Snapshot 2: Māori and Pasifika-owned business sales and growth (Analysis of Te Matapaeroa data tables) [publication forthcoming].*

Amotai and TSI. (2025). *Amotai Snapshot 3: : Gender and ethnic pay gaps (Amotai and TSI analysis of Te Matapaeroa data tables) [publication forthcoming].*

Beehive.govt.nz. (2024). Retrieved from https://www.beehive.govt.nz/release/urgent-action-taken-bolster-energy-security

BIM Acceleration Committee. (2021). *BIM in New Zealand — an industry-wide view 2021.*

Chorazy, T., Hlavínek, P., Racek, J., Pietrucha-Urbanik, K., Tchórzewska-Cie´slak, B., Keprdová, Š., & Dufek, Z. (2024). *Comparison of Trenchless and Excavation Technologies in the Restoration of a Sewage Network and Their Carbon Footprints.* MDPI.

Electricity Networks Aotearoa. (2023). *Briefing to Incoming Energy Minister.*

Energy Efficiency and Conservation Authority. (2021). *Commercial-scale solar in New Zealand.*

Energy Efficiency Council. (2023). *Commercial building energy upgrades workforce mapping.*

Fortune Business Insights. (2025). *Energy Retrofit Systems Market Size, Share & Industry Analysis.*

Infometrics, Te Rau Ora. (2022). *Broad Māori Workforce.*

Infrastructure New Zealand. (2023). *Position Paper Water Infrastructure and Services.*

International Energy Agency. (2024). *World Energy Employment 2024.*

International Energy Agency do not use. (2024). *World Energy Employment 2024.*

MBIE. (2023a). *Building and Construction Sector Trends.*

MBIE. (2024). *Māori Construction Business Capability Development.*

Ministry for Women. (2021). *Pacific women and men in business.*

Research and Markets. (2024). *Trenchless Pipe Repair Market by Type, Diameter Size, End User, Application - Global Forecast 2025-2030.*

Statistics New Zealand. (2018). 2018 Census of Population and Dwellings.

Te Puni Kōkiri. (2021). *Te Matapaeroa.*

Waihanga Ara Rau. (2022). *Re-energise, ESI Workforce Development Strategy.*