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The future of work for Māori

REPORT BASED ON 'A FUTURE THAT WORKS – HARNESSING AUTOMATION FOR A MORE PRODUCTIVE AND SKILLED NZ' BY THE PRIME MINISTER'S BUSINESS ADVISORY COUNCIL

CONFIDENTIAL DRAFT FOR DISCUSSION AND IDEATION ONLY
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Maori Labour Context

Jobs Impacted

Jobs Gained

Special topic – Maori Asset Base

Prioritised recommendations for advancing the Future of Work for Maori (1/3)

Business
Government
Maori community

		Description	Parties involved
Educational transformation	Early intervention for developing minds in first 1000 days	▪ Provide support to Maori families to nurture healthy mental and emotional development for Maori kids in the first 1000 days (e.g., nutritional education, family counselling, housing support)	
	Targeted training and apprenticeship programs in secondary and tertiary education	▪ Elevate performance of high schools with large Maori student bases (as per Onehunga High School model) through: – Recruiting world class leaders for the management team and Board – Adjusting curriculum offered with active industry engagement to ensure continuous feedback loop between school curriculum and industry requirements ▪ Create an optional National Digital Certificate and Digital Curriculum to build sought after skills in young Maori ▪ Set-up cross sector large scale apprenticeship and rotation schemes with top 20 institutions who are the most significant employers of Maori	
	Scholarships to elevate high performing Maori and provide access to world-class skills	▪ Award prestigious international scholarships for Maori students to obtain world-class expertise and build a bench of future leaders. Have recipients commit to spending ~3 years in NZ after completion of studies	
	'Kiwisaver for skills' for working adults to upskill and build capabilities suited to evolving market needs	▪ Create credits program that can be used on training with incentives aligned to increased willingness to take part in selected training programs. Elements to consider beyond 'future skills': family accounts, individual case managers, subsidized transportation and child care while training ▪ Provide free 1-day training in basic digital skills relevant in today's workforce (MS Office, emailing, internet, CV writing, anti-spam and phishing protection etc)	

Prioritised recommendations for advancing the Future of Work for Maori (2/3)

Business
Government
Maori community

		Description	Parties involved
Support for business and entrepreneurs	**Entrepreneurial hubs to support existing and new small businesses**	▪ Provide 'SME in a box' resources that support Maori SMEs and help 'variabalise' the cost of starting/running a business (e.g., shared working spaces, tax and accounting services, business advisory). Format would be akin to a cross between an incubator and WeWork ▪ Engage Maori community including Iwi, trusts and corporations to publicise service and encourage SME participation	
	Focused Accelerator to incubate SMEs with potential to be national and global champions	▪ Start an Accelerator which offers high potential SMEs expert partner support, resources and networks and have an independent body review and select high potential businesses for the Accelerator in a structured way ▪ Fund prospective growth companies along "the 4 I's" as used in the US for indigenous acceleration: – Incubate: Provide seed funding to cohorts of Maori entrepreneurs – Innovate: Distribute grants for innovative investments in growth industries – Incentivise: Develop a ratings framework for innovation in iwi and publish in a transparent manner – Influence: Provide iwi and Maori non-profits with support to expand their impact in community	
	Removal of physical/data/ information infrastructure barriers for doing business (e.g., broadband access) and improve access to capital	▪ Identify 'black spots' in infrastructure for Maori (e.g. broadband, road access) and invest in programs to address ▪ Simplify lending rules and restrictions for Maori owned SMEs ▪ Simplify and rationalise Maori land ownership structure ▪ Expand channels of equity funding for Maori SMEs and start-ups	

Prioritised recommendations for advancing the Future of Work for Maori (3/3)

Business
Government
Maori community

		Description	Parties involved
Leadership development	Maori leadership academy to grow capabilities of next generation of managers and leaders	▪ Create Maori leadership academy to foster development of managerial skills and business acumen. Participants to rotate through roles at participating companies with the expectation of taking on a leadership position in a Maori enterprise after the program and mentoring the next generation of leaders	
	Business organisations/platform for rangatahi to explore new fields of work	▪ Encourage Maori participation in existing business platforms such as Young Enterprise through extending outreach and support (e.g., Maori school advisor, Maori-targeted promotions) ▪ Create Maori youth organisations to help rangatahi explore a broad range of professional interests and build networks with like-minded individuals (e.g., coding club, Maori young business leaders)	
Positive social narrative	Showcase of influential Maori to inspire rangatahi	▪ Create a networking platform for rangatahi to explore careers with high-profile role models ▪ Establish formal mentoring programs between young Maori and Maori community leaders (e.g., Iwi leaders, business executives)	
	Showcase Maori heritage and culture to overseas audiences	▪ Highlight the richness of Maoridom in international tourism campaigns and link campaigns to on-the-ground experiences for international visitors	
	Success campaigns of adult upskillers to set 'new norms' on adult education	▪ Run public service campaign to 'normalise' adult upskilling and highlight the potential benefits to participants	

Additional recommendations

Government-led	▪ Overall: create dedicated crown entity as delivery agent for all Maori future of work-related initiatives ▪ Set up industry advisory boards within wānanga to ensure continuous feedback loop between wānanga offering and industry requirements ▪ Improve data collection on Maori business and community progress ▪ Provide targeted business acumen support to maximise iwi asset/capital productivity (eg accounting, strategic portfolio building, risk management, effective governance)
Business-led	▪ Require a minimum percentage of interviewees/hires to be Maori ▪ Establish specific technical scholarships for Maori employees ▪ Set procurement targets to include Maori/SME businesses in the preferred supplier set
Maori community-led	▪ Pioneer with targeted apprenticeships and training programs in areas relevant to specific iwi (e.g. deploy tech in agriculture, start businesses in tourism) ▪ Run active engagement campaigns on opportunities for training programs and job opportunities ▪ Co-funded basic digital training and skills for iwi members (young and old) ▪ Allocate 5% of iwi annual budget/balance sheet to invest in future growth areas

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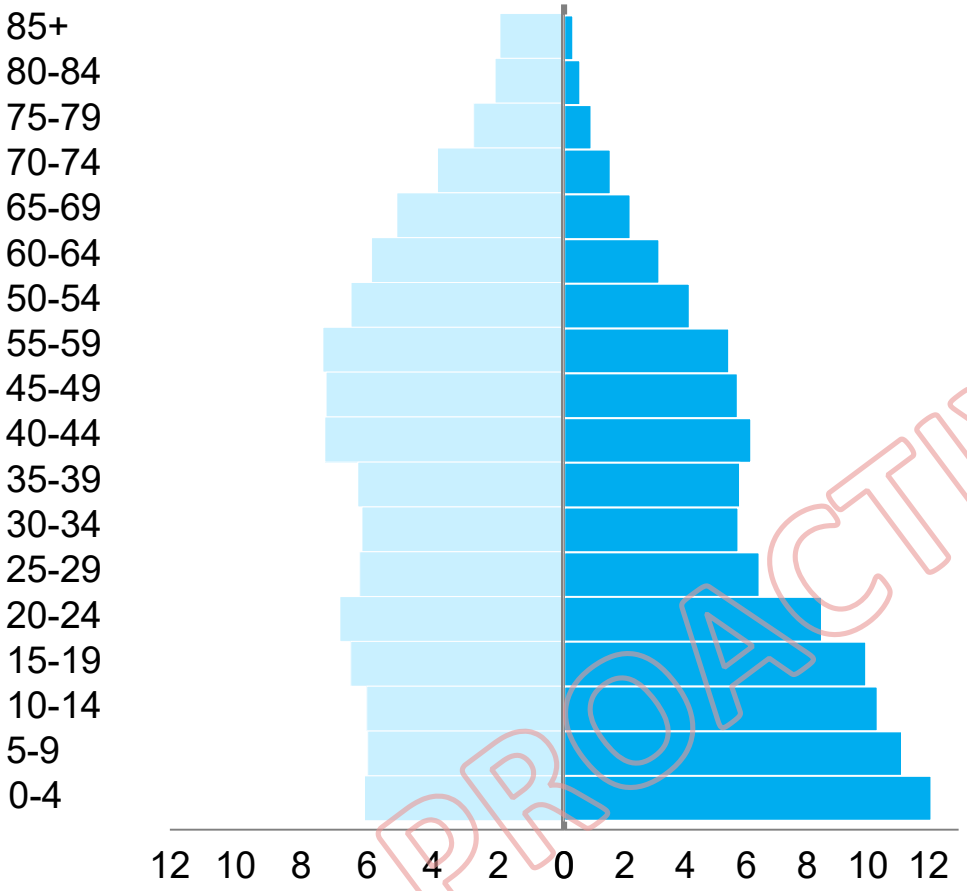
Māori are a growing and important part of New Zealand's working population

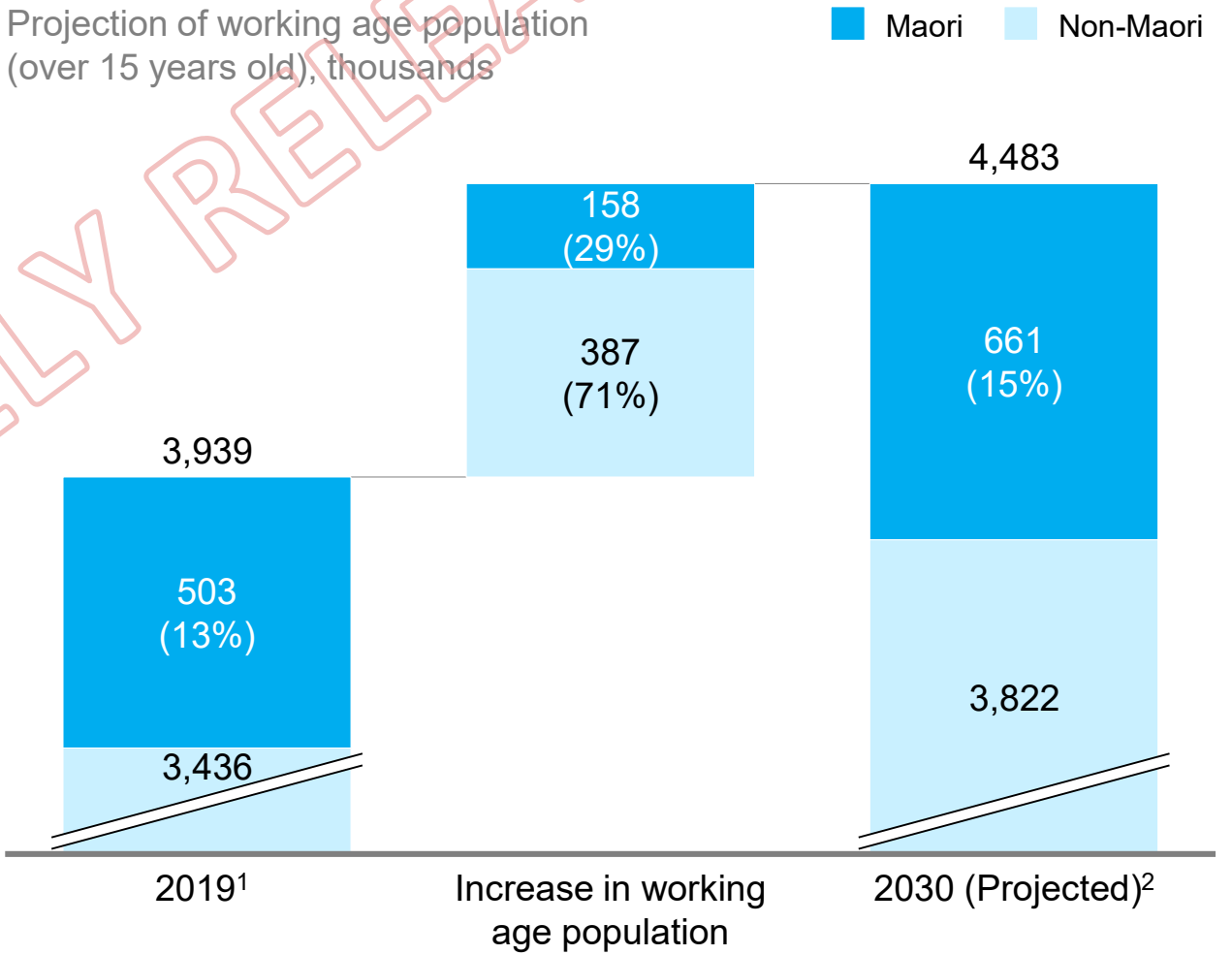
Māori are disproportionately young compared to the rest of New Zealand's population

Distribution of population by age group, %



Māori account for 15% of the working age population but will contribute 29% of growth between 2019 and 2030

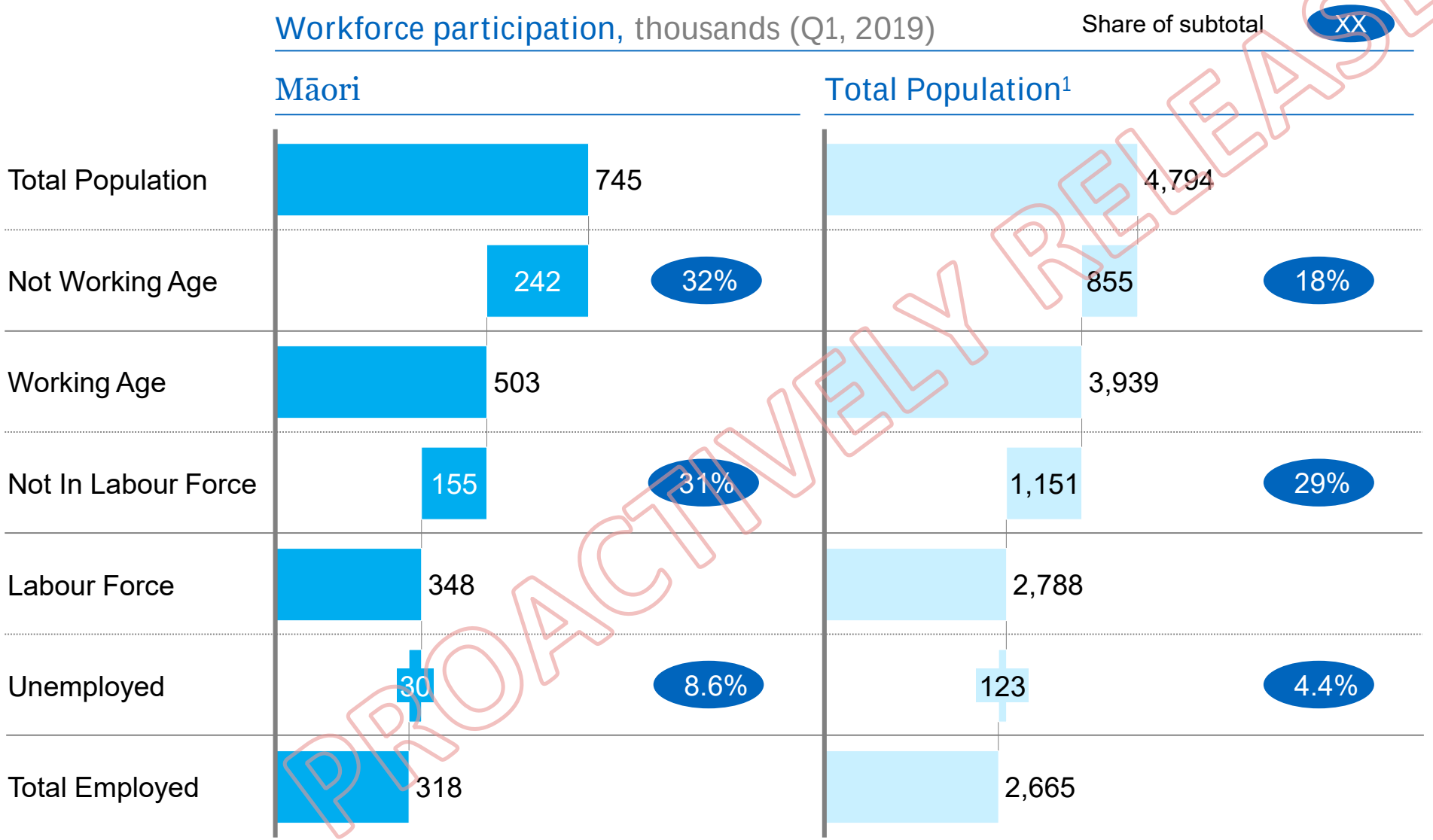
Projection of working age population (over 15 years old), thousands



1 Workforce Participation Survey, Q1 2019
2 National ethnic population projections, by age and sex, 2013(base)-2038

SOURCE: Stats NZ

The Māori population has a different workforce participation profile to the overall New Zealand population



- Māori are younger than the average population, resulting in a **larger proportion of non-working age individuals**
- Māori have a **higher share of working age population not in the labour force**
- Māori have **higher unemployment rates** than the overall population

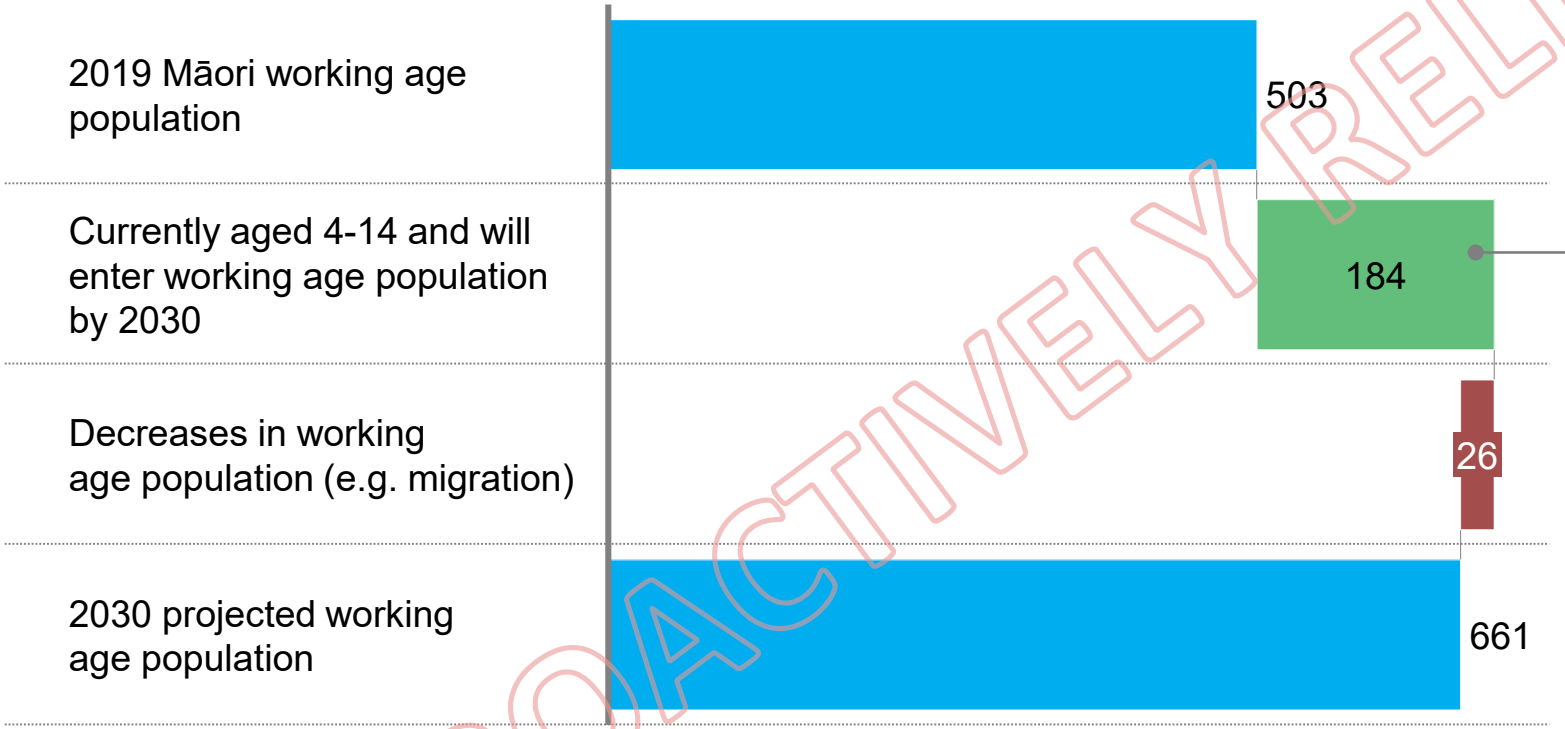
1 Includes Māori

SOURCE: Statistics NZ Workforce Participation Survey, Q1 2019

Of the Māori working age population in 2030, 32% are under 15 today and can be prepared for the future of work

Change in Māori working age population (over 15 years old)

Thousands



- 28% of Māori who will be working age in 2030 are not yet 15 years old
- 23% (150,000+ children) have not yet started secondary school, creating an opportunity to skill for future facing industries

SOURCE: Statistics NZ Population Projections

Contents

Key messages

1 In our midpoint modelled scenario, 24% of tasks currently done by Māori versus 21% for NZ as a whole, are estimated to be replaced by automation by 2030, potentially displacing ~100,000 workers

2 At the same time ~90,000 – ~110,000 new Māori jobs will also be created due to economic growth, automation and technology

3 There will be an 95% increase in demand for technological skills and 43% increase for social & emotional skills

SOURCE: McKinsey Global Institute

To assess the automation potential of current work activities, we created a very detailed view on 800 occupations, ~2,000 activities and 18 capabilities

Occupations

1. Retail sales- people
2. Food and beverage service workers
3. Teachers
4. Health practitioners

- ...
- …
- …

~800 occupations

Activities (retail example)

- Answer questions about products and services
- Greet customers
- Clean and maintain work areas
- Demonstrate product features
- Process sales and transactions

- ...
- …
- …

~2,000 activities assessed across all occupations

Capability requirements

Physical
- Fine motor skills/dexterity
- Gross motor skills
- Navigation
- Mobility

Sensory
- Sensory perception

Cognitive
- Retrieving information
- Recognizing known patterns / categories (supervised learning)
- Generating novel patterns / categories
- Logical reasoning / problem solving
- Optimizing and planning
- Creativity
- Articulating/display output
- Coordination with multiple agents

Natural language processing
- Understanding natural language
- Generating natural language

Social
- Social and emotional sensing
- Social and emotional reasoning
- Emotional and social output

SOURCE: OEF, GGM, Stats NZ, O*NET, MGI Automation Model March 2018, Jobs Lost Jobs Gained December 2017; McKinsey Global Institute analysis

In NZ, very few occupations are fully automatable by adopting current technologies, while many other occupations are partially automatable

1.6% of occupations have close to

~100% of tasks automatable

Example occupation

Sewing machine operators

Assembly-line workers

~60% of occupations have

~30% of tasks automatable

Bus drivers

Nursing assistants

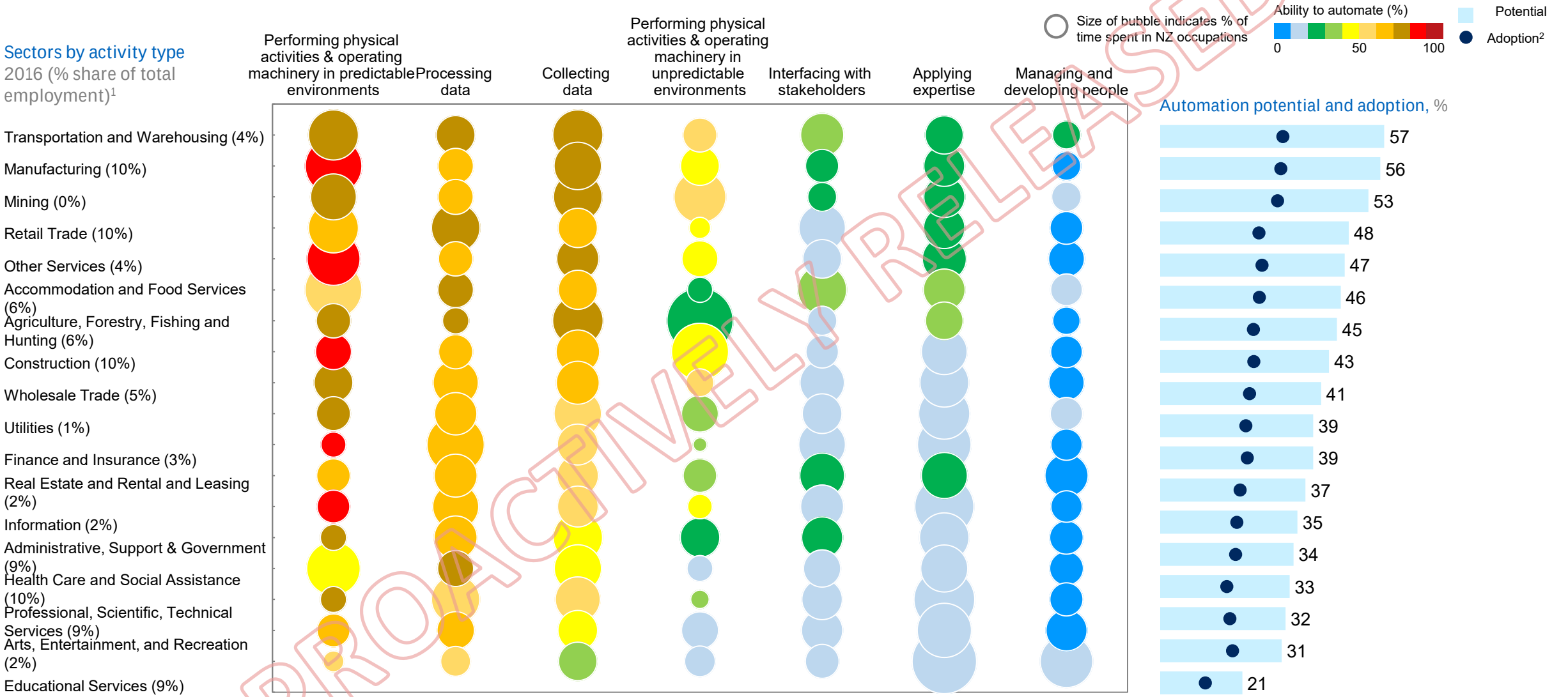
Web developers

Stock clerks

Travel agents

SOURCE: MBIE New Zealand, Stats NZ, Figure.NZ, ONET, World Bank, Oxford Economics, McKinsey Global Institute analysis

Automation potential for NZ varies across industries depending on mix of work activity types



NOTE: Numbers may not sum due to rounding.
1 The data is from New Zealand Business Demographic Statistics on Feb 2016 downloaded from Stats NZ. The "administrative, support & government" figure was derived by summing the "administrative & support services" category and the "public administration & security" category in the data
2 Midpoint adoption scenario by 2030

SOURCE: New Zealand Business Demographic Statistics Feb 2016, ONET, World Bank, Oxford Economics, McKinsey Global Institute analysis, Stats NZ

Five factors are required for automation potential to be translated into automation adoption

Key factor	Technical feasibility		Cost of developing and deploying	Labour market dynamics	Economic benefits	Regulatory and social acceptance
Impact on pace and extent of automation	For an activity to be automated, every capability utilised for that activity must reach the required level of performance.	Capabilities need to be integrated to form solutions.	Costs associated with developing and deploying different solutions determine the pace of reaching economic feasibility.	Economic feasibility of automation will depend on comparison with cost of human labour, affected by supply and demand dynamics.	In addition to labour cost savings, automation could bring more benefits to employers, including increased quality and efficiency and decreased error rate.	Adoption of automation shaped by pace of organisational change, policy choices and acceptance to stakeholders.

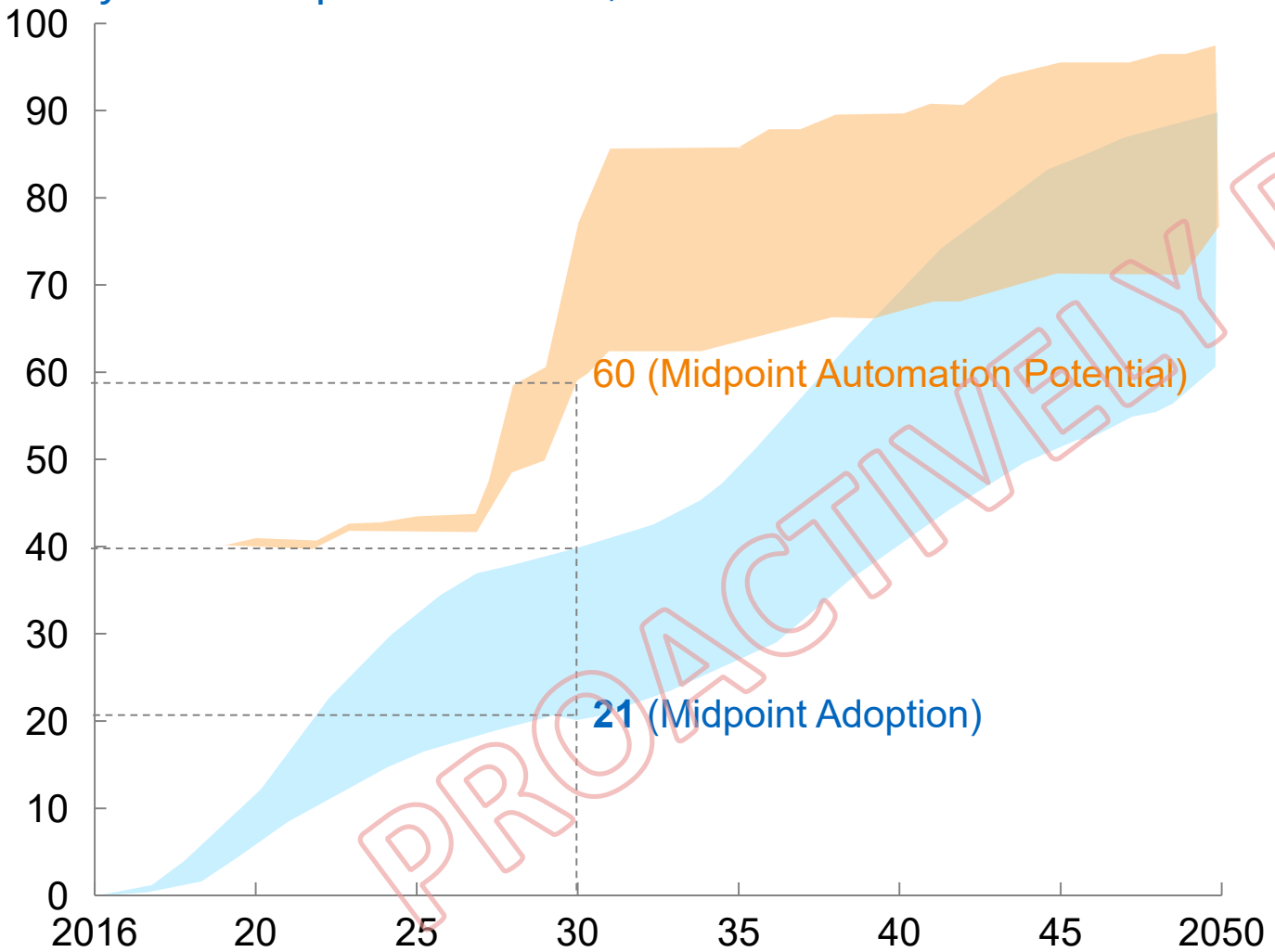
Stage	Technical automation potential	Solution development	Economic feasibility	Adoption
How we model it	▪ Estimate the technology progression timeline for each capability through interviews and surveys with industry and academic experts	▪ Estimate solution development times for activities based on required capabilities and historical development timelines	▪ Assume adoption begins when automation cost for an activity is at parity with labour cost ▪ Compare labour wage and solution cost	▪ Model an S-shaped adoption curve based on historical technology adoption rates

NOTE: Economic benefits affect both when adoption will begin and its pace. For determining economic feasibility, we assume that decision-makers discount the uncertain benefits of initial labour cost savings by roughly the same amount as they believe the (also uncertain) non-labour cost-related benefits will be captured.

SOURCE: McKinsey Global Institute analysis

We estimate that 21% of time spent at work in New Zealand will be automated by 2030 out of a total potential of 60%

Time spent on current work activities
Early and mid-point Scenario, %

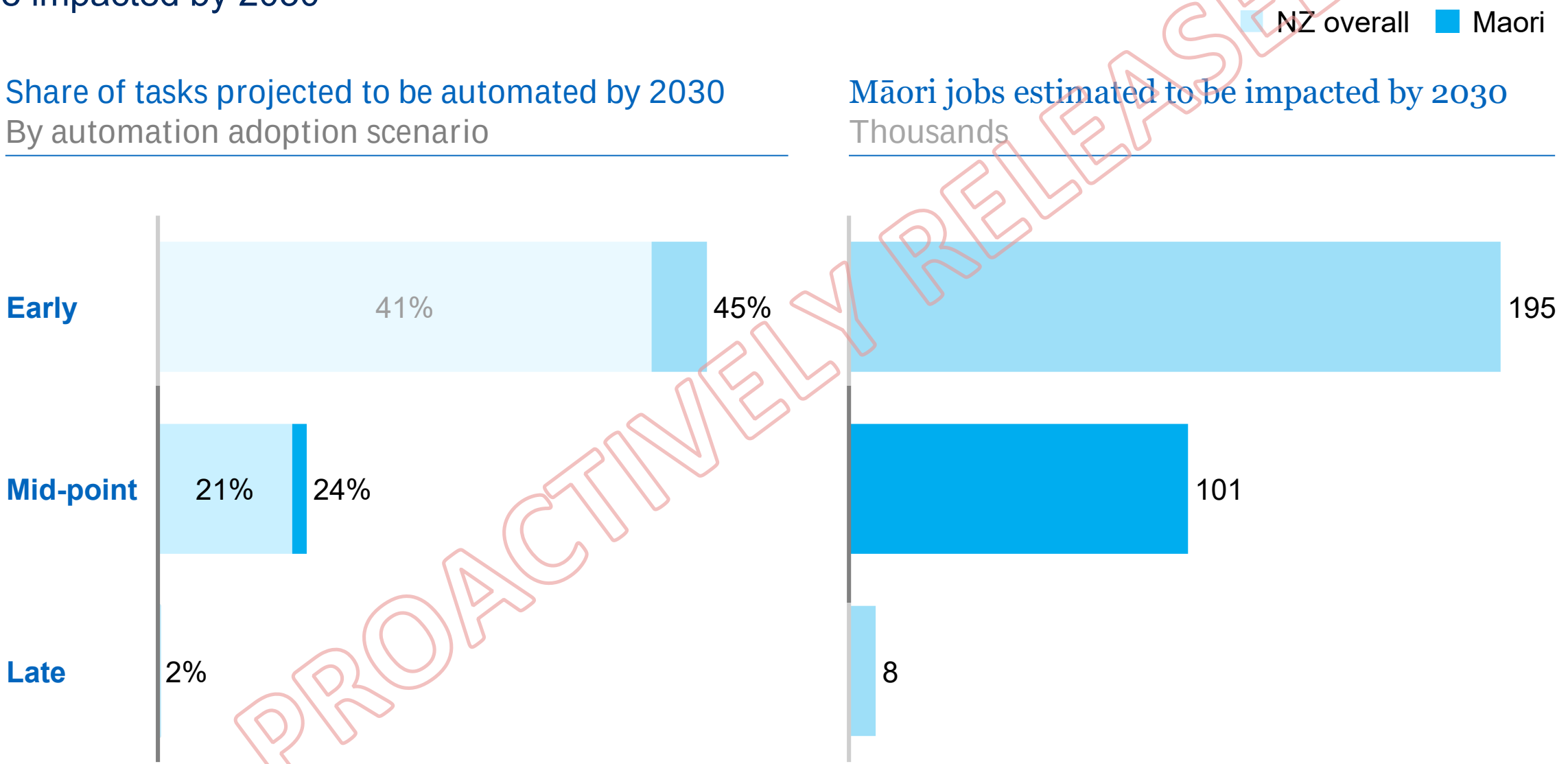


Technical automation potential may reach 60% of time spent by 2030, but adoption rate will be lower due to:

- Technical feasibility and pace of breakthroughs
- Cost of developing and deploying technologies
- Cost of labour and related supply-demand dynamics
- Benefits including and beyond labour substitution
- Regulatory and social factors

SOURCE: MBIE New Zealand, Stats NZ, ONET, Oxford Economics, McKinsey Global Institute analysis

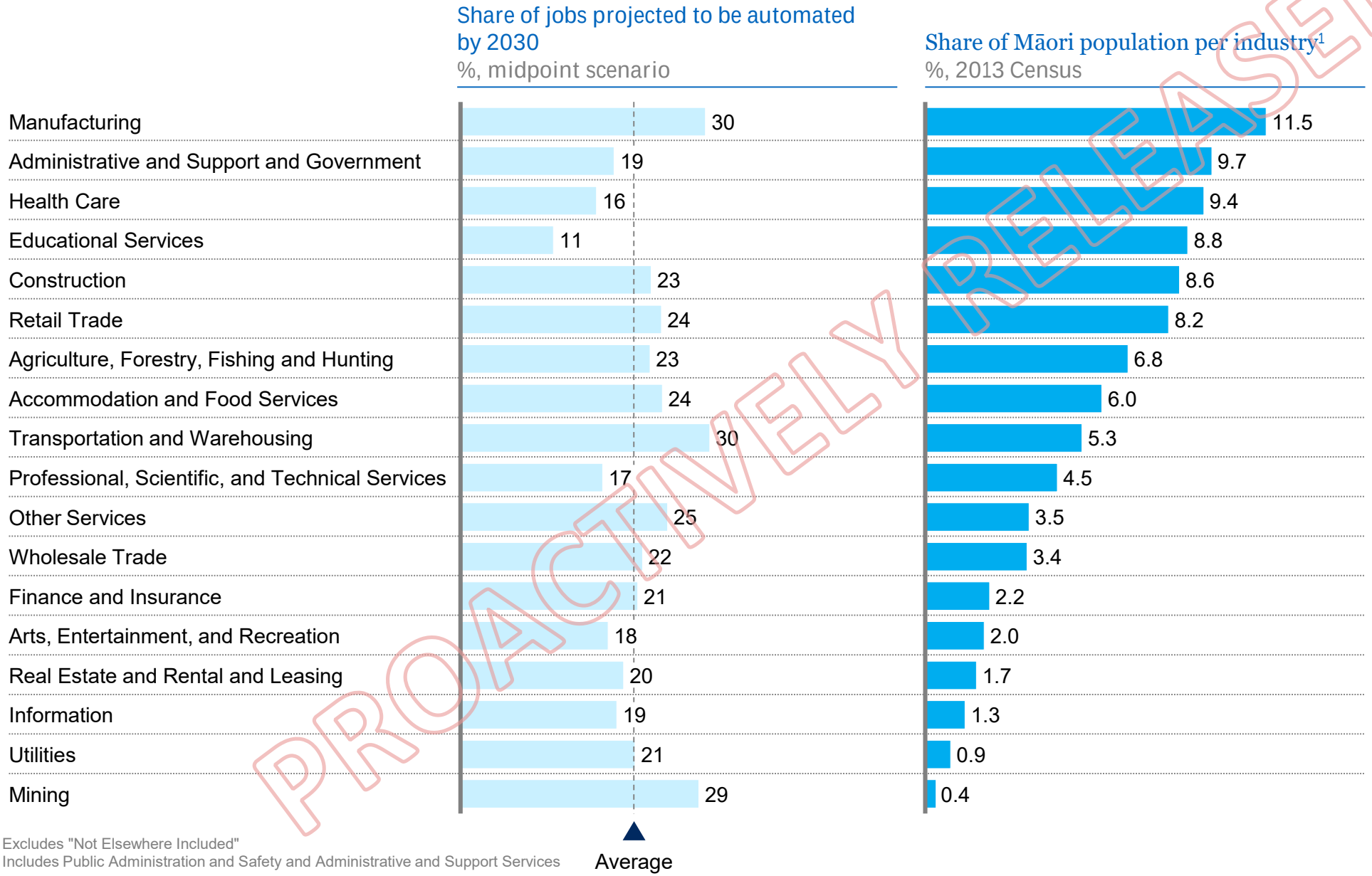
For the Māori workforce, our midpoint scenario estimates that 24% of work and ~100,000 jobs could be impacted by 2030



1 Includes Māori

SOURCE: McKinsey Global Institute (MGI)

Māori are not over-represented in high-automation industries

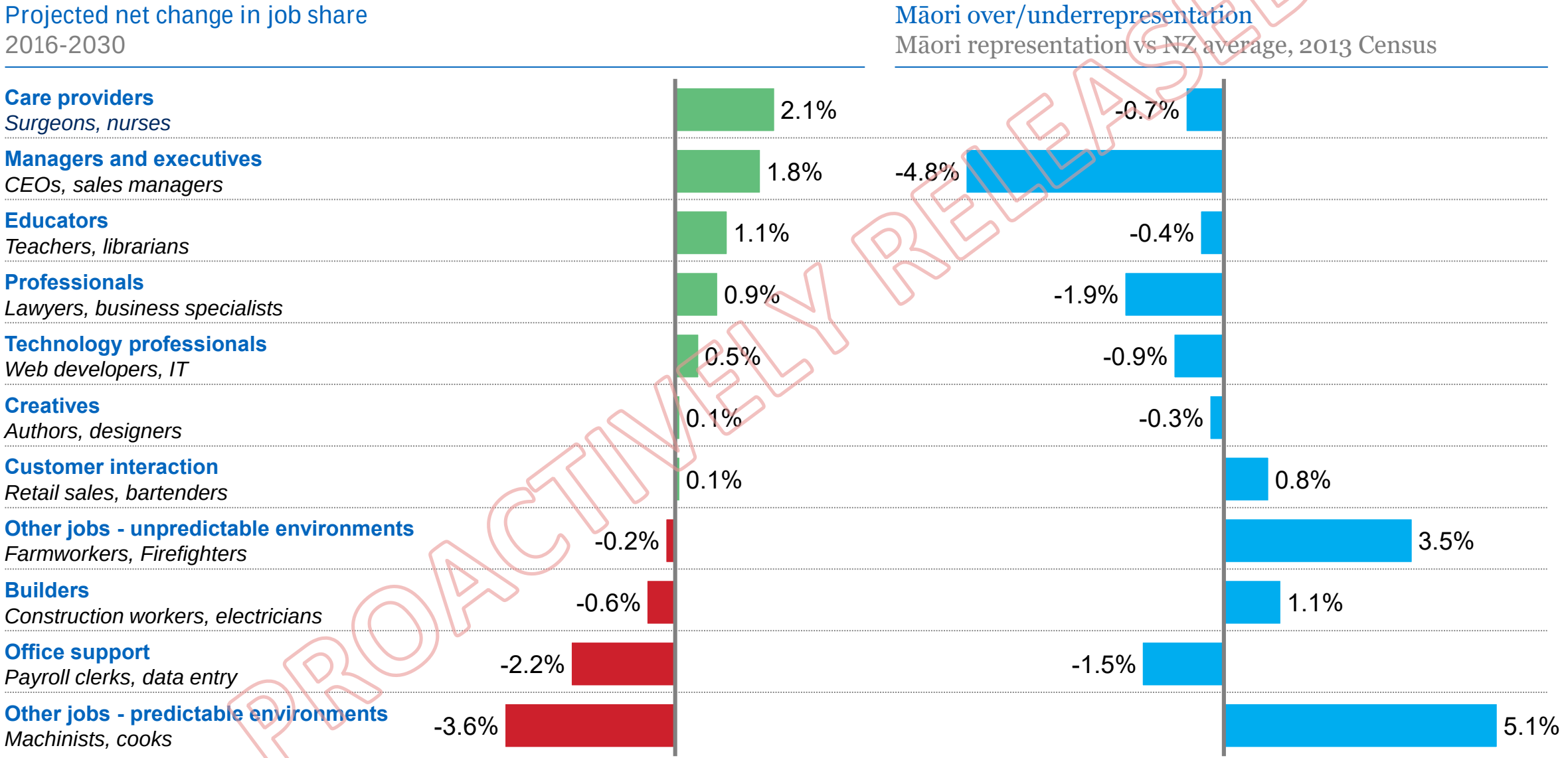


- Māori are overrepresented in high-automation industries **manufacturing, transportation** and **warehousing**
- However Māori are also strongly represented in **education** and **healthcare**, where automation will not be felt as strongly

1 Excludes "Not Elsewhere Included"
2 Includes Public Administration and Safety and Administrative and Support Services

SOURCE: MGI, Statistics NZ

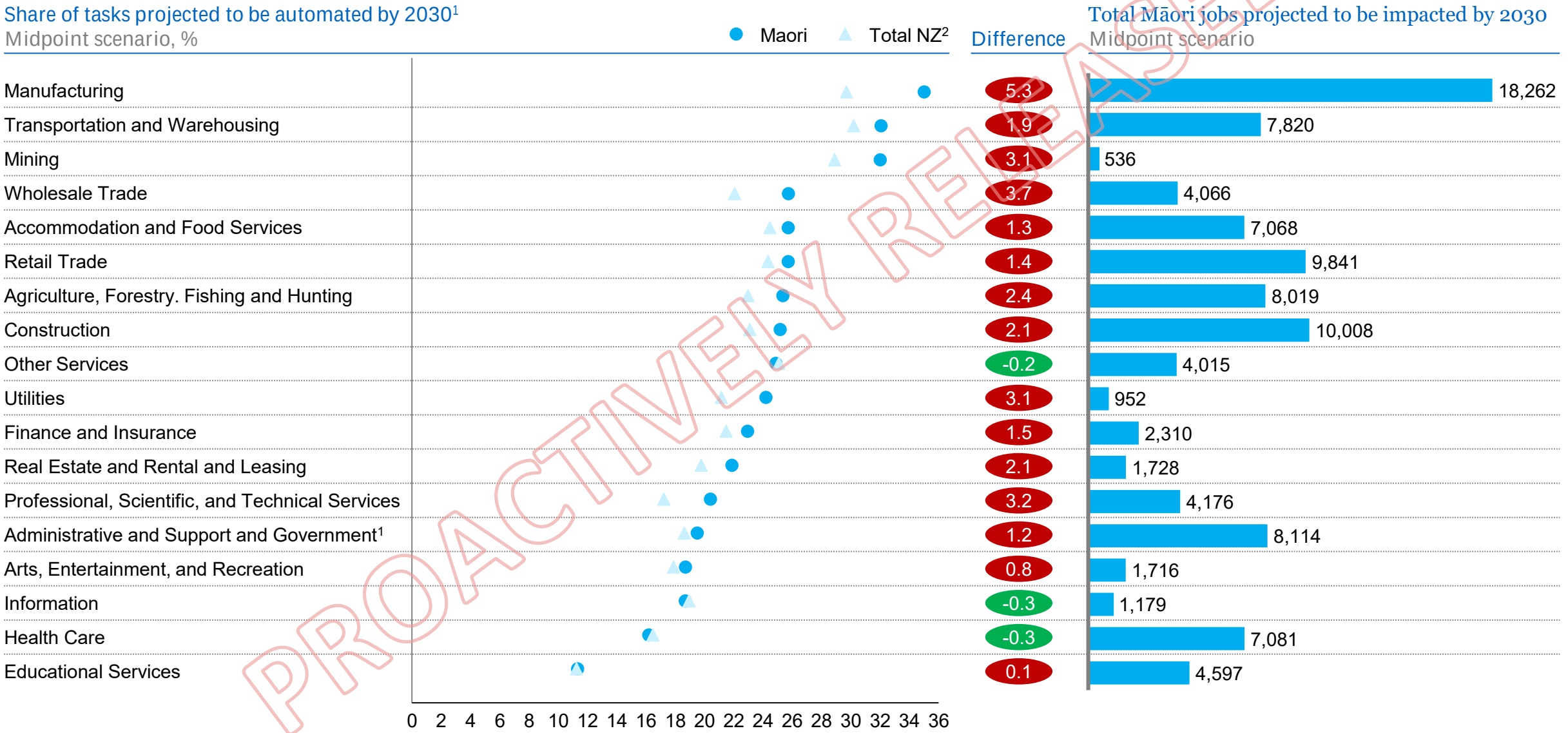
However, Māori are over-represented in high-automation occupations



Note: Doesn't include new occupations created

SOURCE: MGI Automation Model March 2018, Jobs Lost Jobs Gained December 2017; McKinsey Global Institute analysis, 2013 Census

Due to the roles they occupy within industries, Māori are more exposed to automation than NZ as a whole

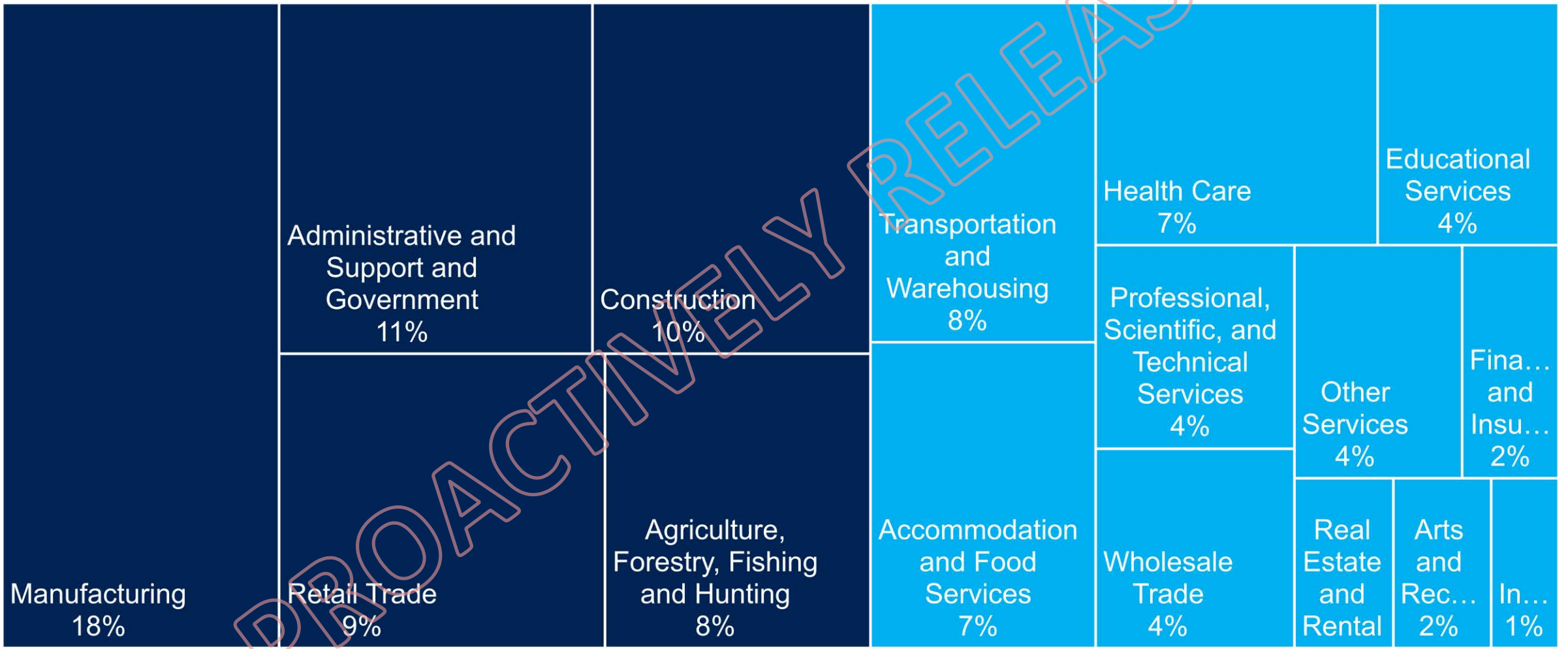


Note: 'Not elsewhere included' industry category has been allocated based on occupation mix
1 Includes Public Administration and Safety and Administrative and Support Services
2 Includes Māori

SOURCE: MGI, Statistics NZ

More than 55% of automation risk for the Māori workforce is concentrated in five industries

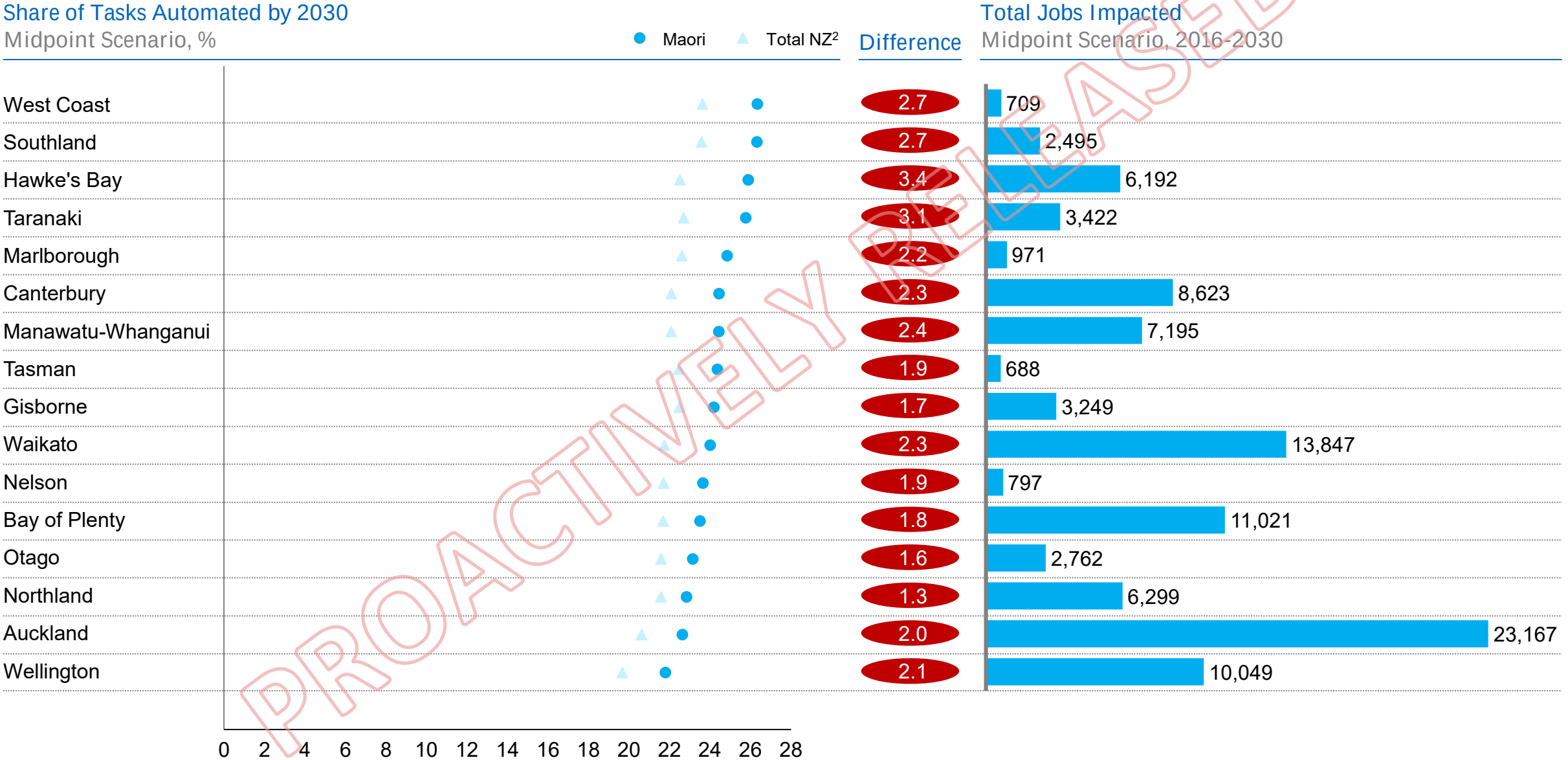
Share of total automated jobs by industry[1]



1 Jobs in industry likely to be automated as a share of total jobs automated (e.g. 18% of all jobs automated for Māori will be in manufacturing)

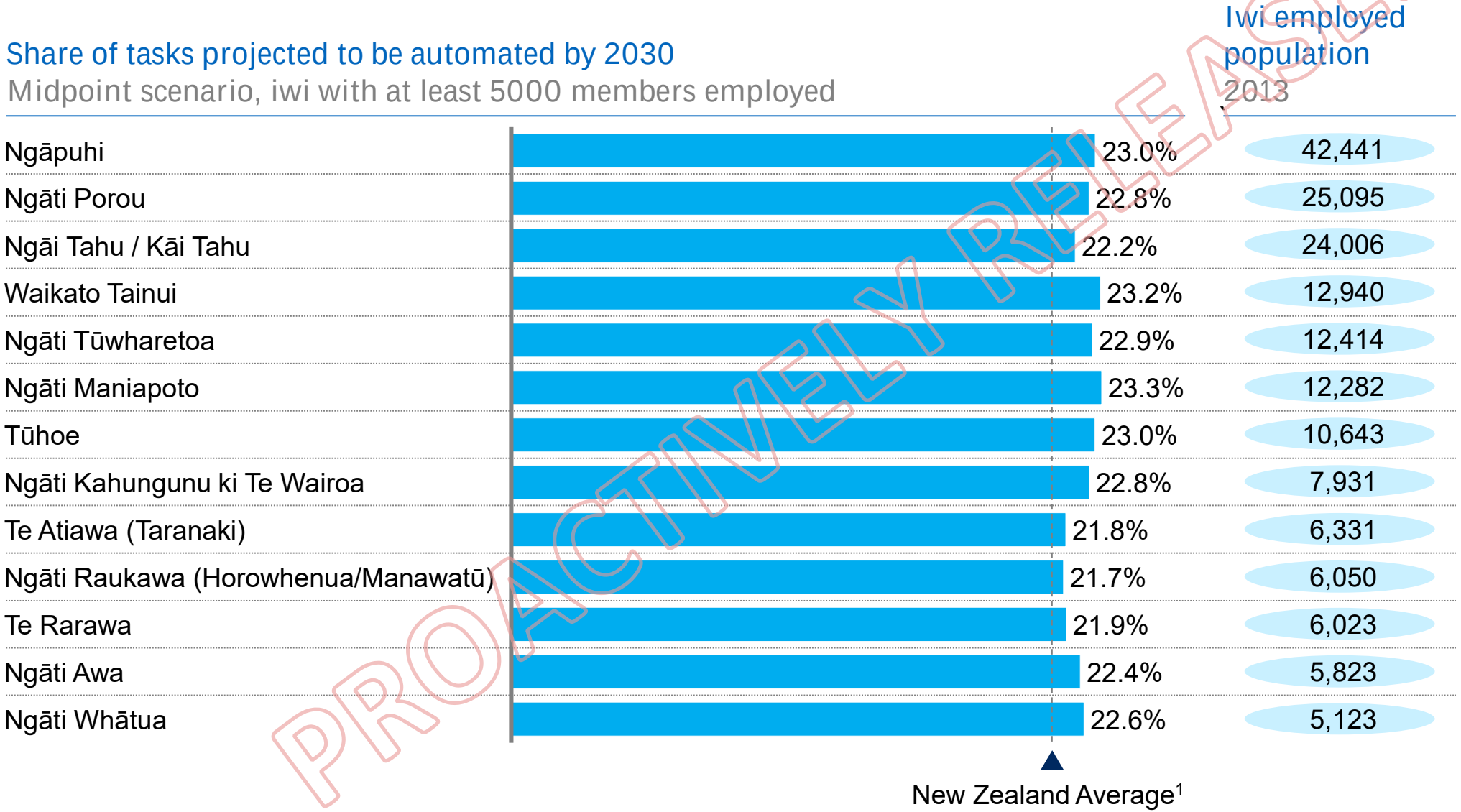
SOURCE: 2013 Census, MGI

The same profile applies to the regional split



Note: 24 jobs impacted in non-defined region have been allocated proportionally
1 Includes Māori
SOURCE: MGI, Statistics NZ

The largest 13 iwi will be similarly impacted by automation and will account for 60% of total Māori job impact



The largest 13 iwi will account for **~60% of jobs potentially impacted** by automation

1 Includes Māori

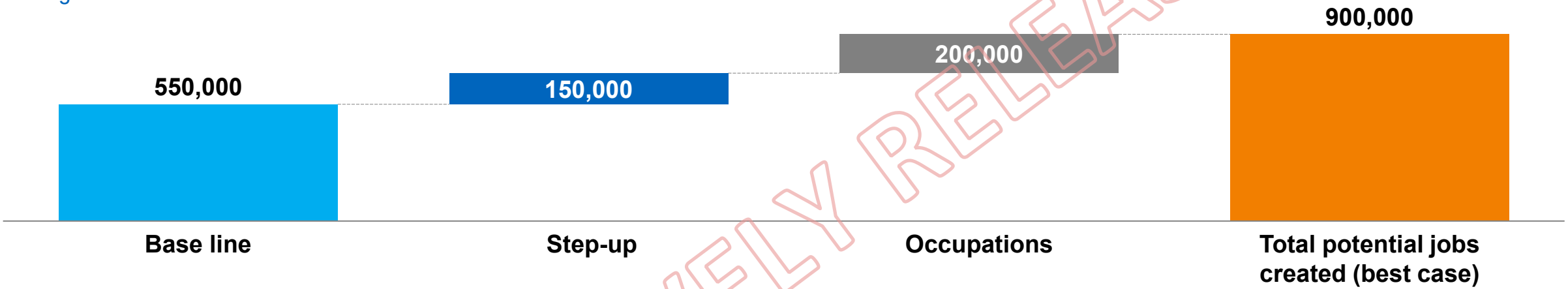
SOURCE: MGI, Statistics NZ

Contents

Across New Zealand 600,000-900,000 new jobs are expected to be created by 2030

Range of automation scenarios and additional labour demand from seven catalysts
2016-2030

Jobs gained



Economy follow observed patterns

1. Rising Incomes
2. Ageing and health care
3. Education
4. Spending on technology
5. Investment in real estate
6. Investment in infrastructure
7. Energy transitions

Societal and policy choices

1. Added investment on real estate and construction
2. Added investment on infrastructure
3. Added Investment: Energy transitions
4. Marketization of unpaid work

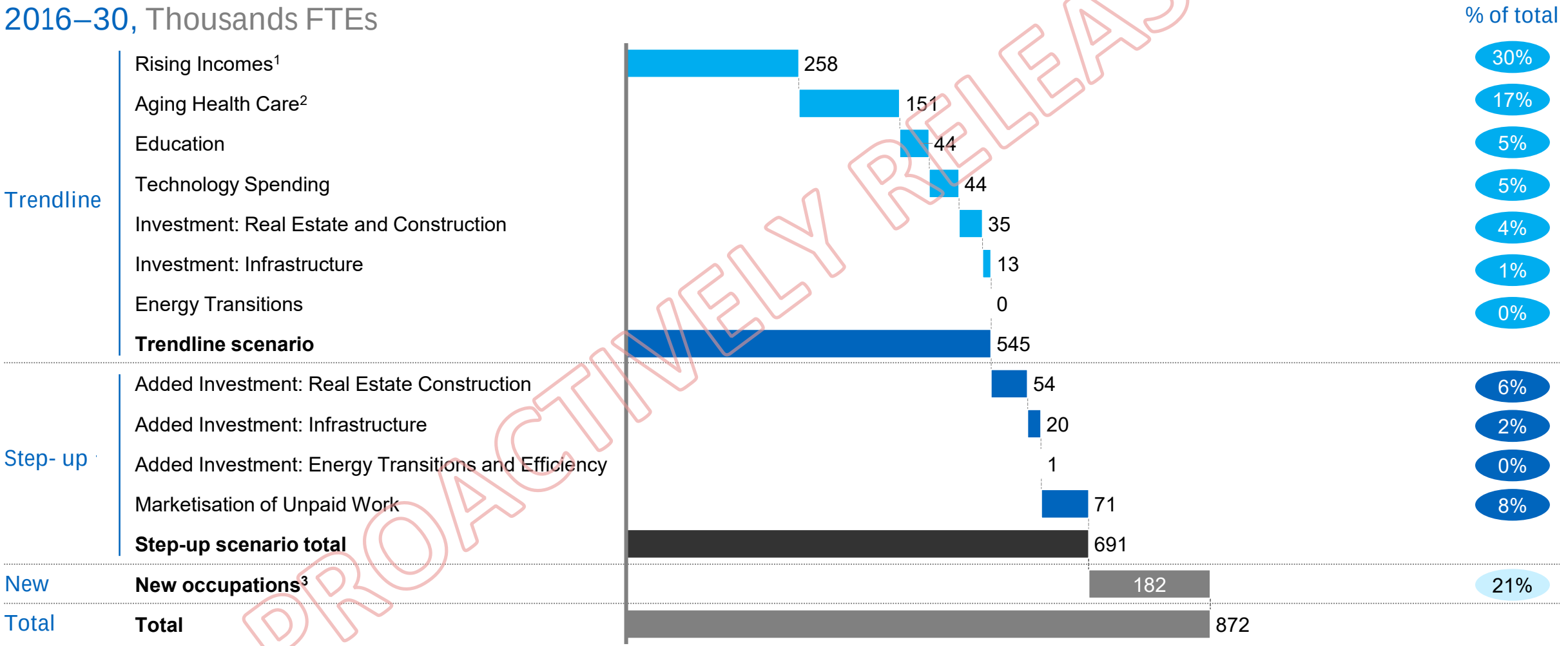
New work type/ occupations which currently do not exist[1]

NOTE: We identified seven catalysts of labour demand globally: rising incomes, health-care spending, investment in technology, buildings, infrastructure, and energy, and the marketization of unpaid work. We compared the number of jobs to be replaced by automation with the number of jobs created by our seven catalysts as well as change in labour force, between 2014 and 2030.
1Study has shown that on average, 0.5 percent of the workforce has been working in "new jobs' every year (Lin, Jeffrey, "Technological adaptation, cities, and new work," The Review of Economics and Statistics, issue 93,May 2011)

SOURCE: MBIE New Zealand, ONET, Stats NZ, Oxford Economics, McKinsey Global Institute analysis

Rising consumer incomes and ageing health care are expected to be the largest sources of job creation

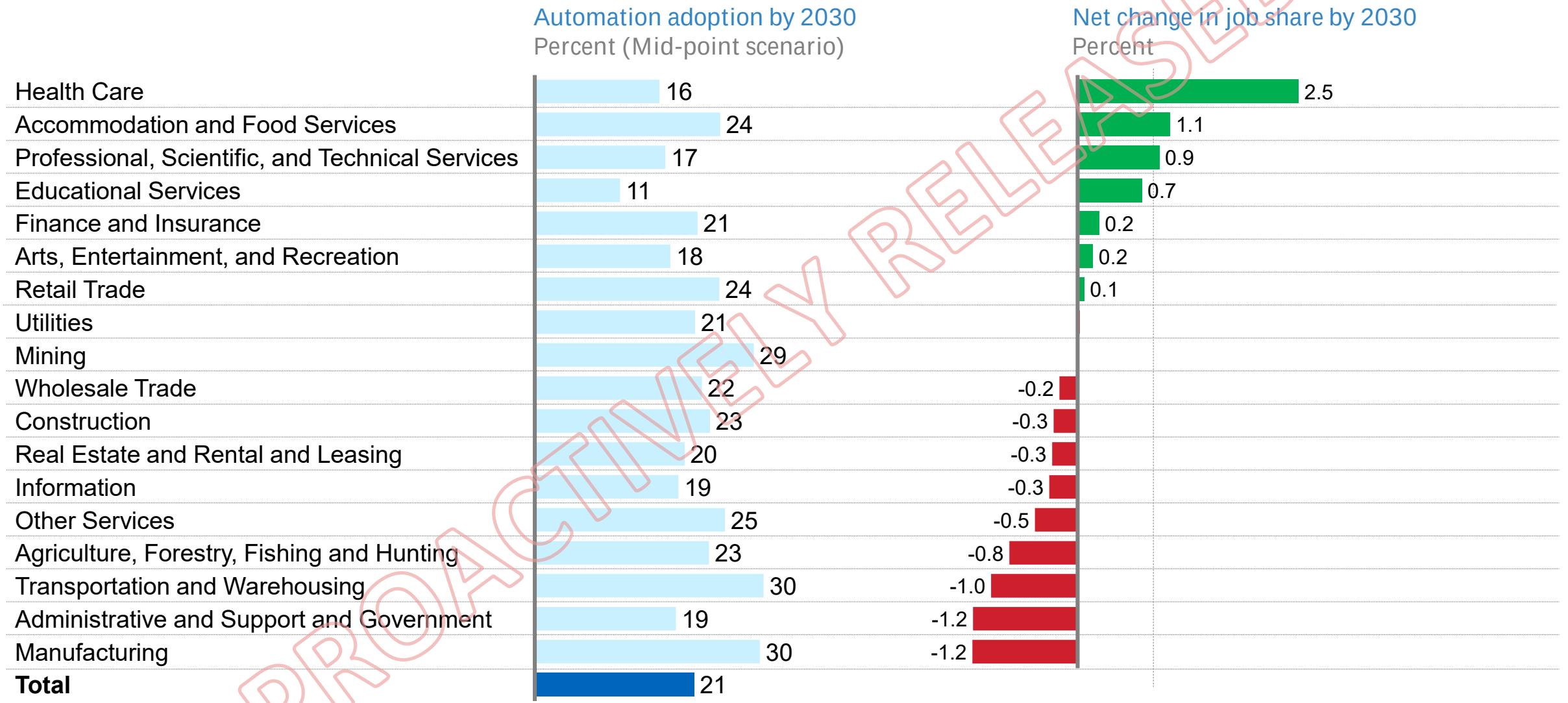
Potential jobs created from seven catalysts of labour demand and new occupations, midpoint automation, 2016–30, Thousands FTEs



1 Excludes jobs created by ageing and healthcare
2 Includes jobs created from increased income
3 Study has shown that on average, 0.5 percent of the workforce has been working in "new jobs' every year (Lin, Jeffrey, "Technological adaptation, cities, and new work," The Review of Economics and Statistics, issue 93,May 2011)

SOURCE: MBIE New Zealand, ONET, Stats NZ, Oxford Economics, McKinsey Global Institute analysis: MGI Automation Model March 2018, Jobs Lost Jobs Gained December 2017

Net, there are projected to be more jobs available for NZ, but in different industries



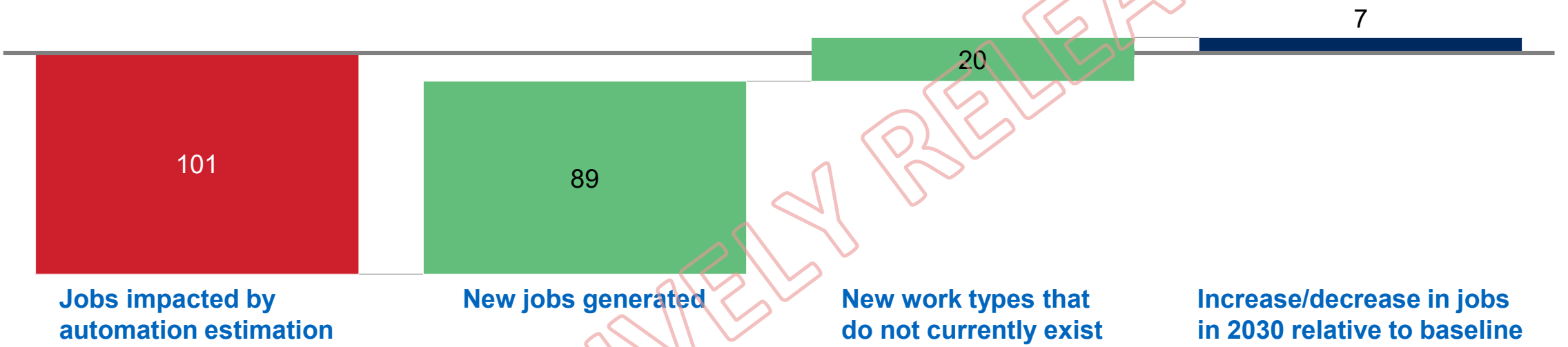
1 Mid-point automation adoption, step-up labour demand scenarios
2 Study has shown that on average, 0.5 percent of the workforce has been working in 'new jobs' every year (Lin, Jeffrey, "Technological adaptation, cities, and new work," The Review of Economics and Statistics, issue 93,May 2011)

SOURCE: Figure.NZ, Stats NZ, McKinsey Global Institute analysis: MGI Automation Model March 2018, Jobs Lost Jobs Gained December 2017

Māori are forecast to gain ~7,000 net jobs based on effects of automation and economic trends

Total projected change in Māori jobs from baseline 2030 population

Midpoint Scenario, thousands



Assumptions

Share of tasks automated in industry (midpoint adoption scenario) translates into job losses

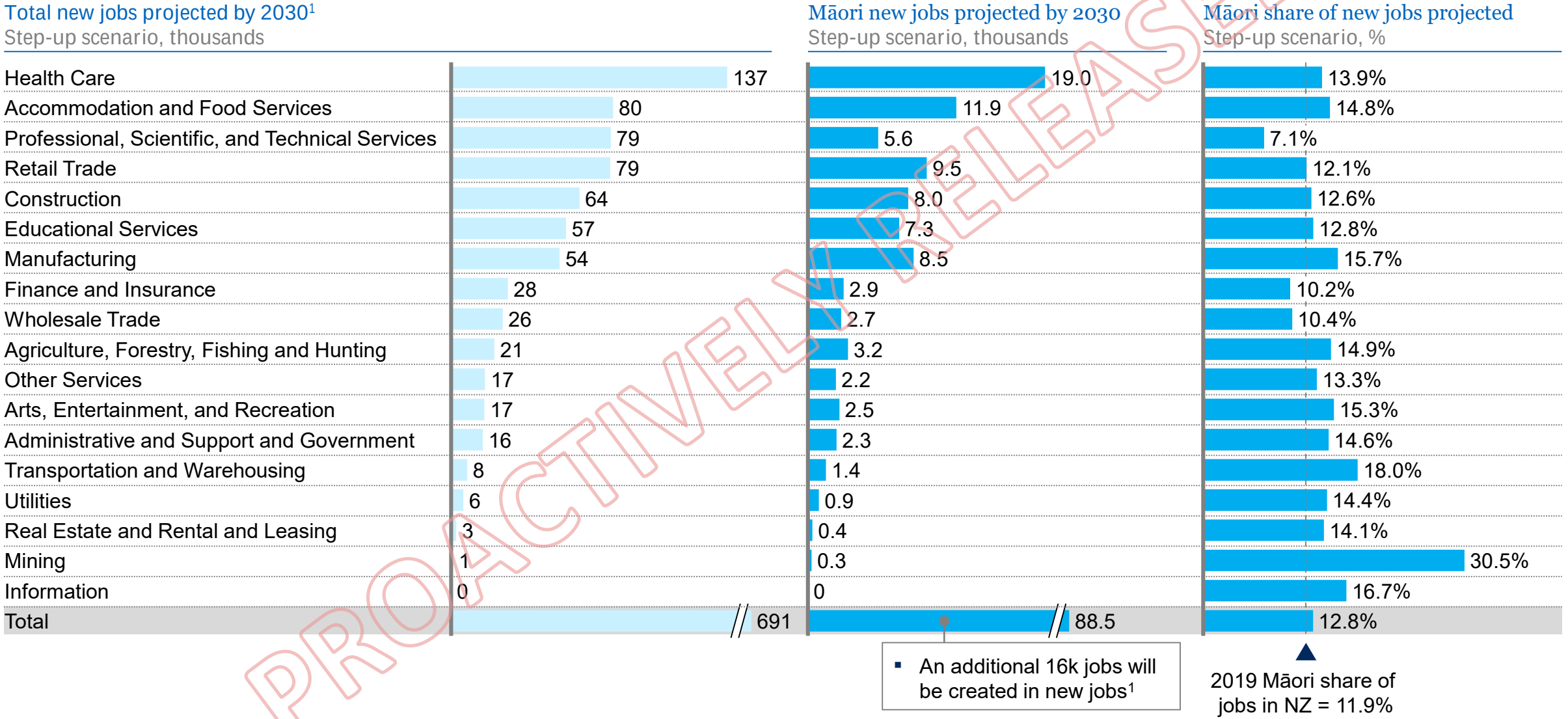
Economy follows latest growth trends (rising incomes, growth in education, health care, and technology, and policy and investment choices are made re infrastructure, and marketisation of unpaid work)

0.5% of workers in any given year work in new jobs that did not exist previously[1]

1 From: Lin, Jeffrey, "Technological adaptation, cities, and new work," The Review of Economics and Statistics, issue 93,May 2011

SOURCE: MBIE, MGI

Māori are forecast to benefit equally from new job gains

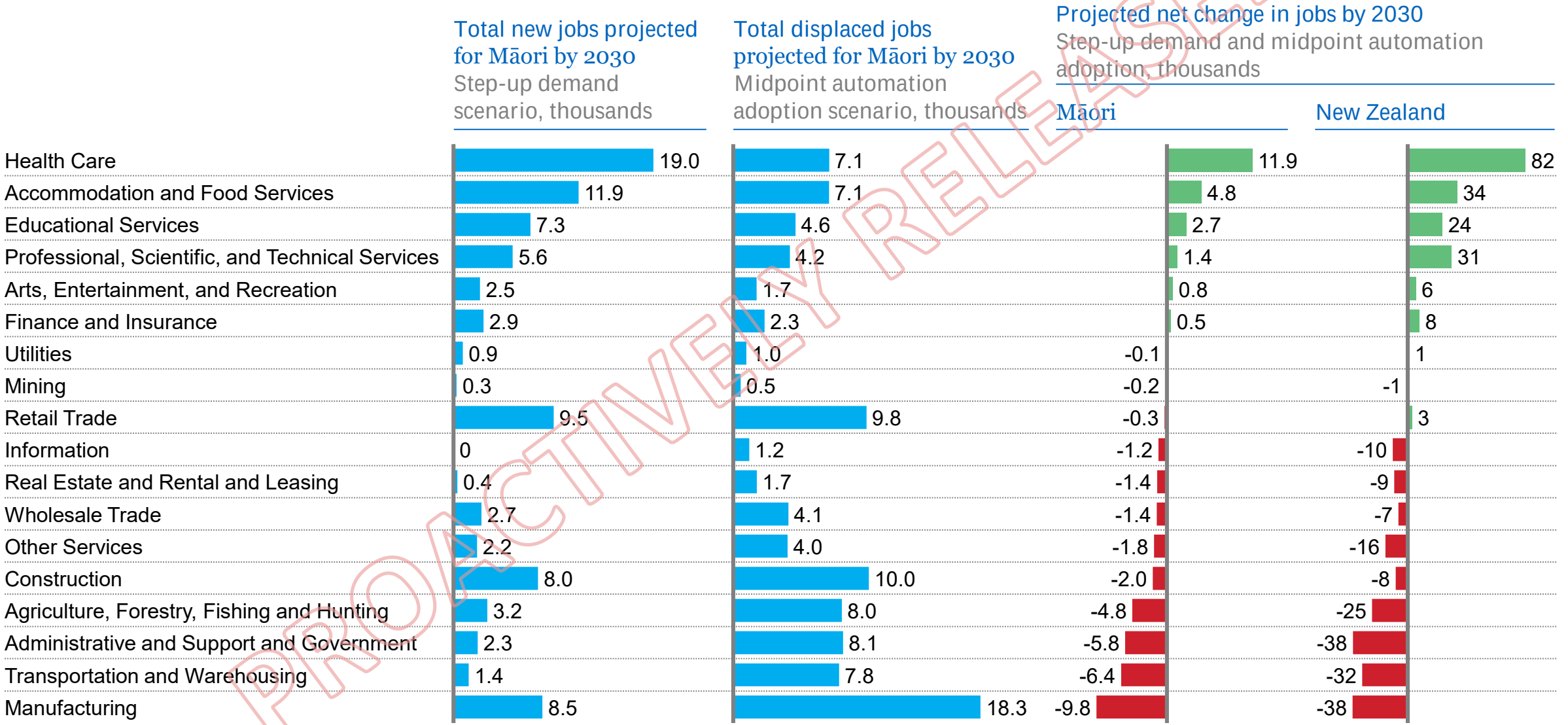


Jobs not classified by industry (1569) have been reallocated across industry based on occupation breakdown

1 Study has shown that on average, 0.5 percent of the workforce has been working in "new jobs' every year (Lin, Jeffrey, "Technological adaptation, cities, and new work," The Review of Economics and Statistics, issue 93,May 2011)

SOURCE: MGI Analysis, 2013 Census

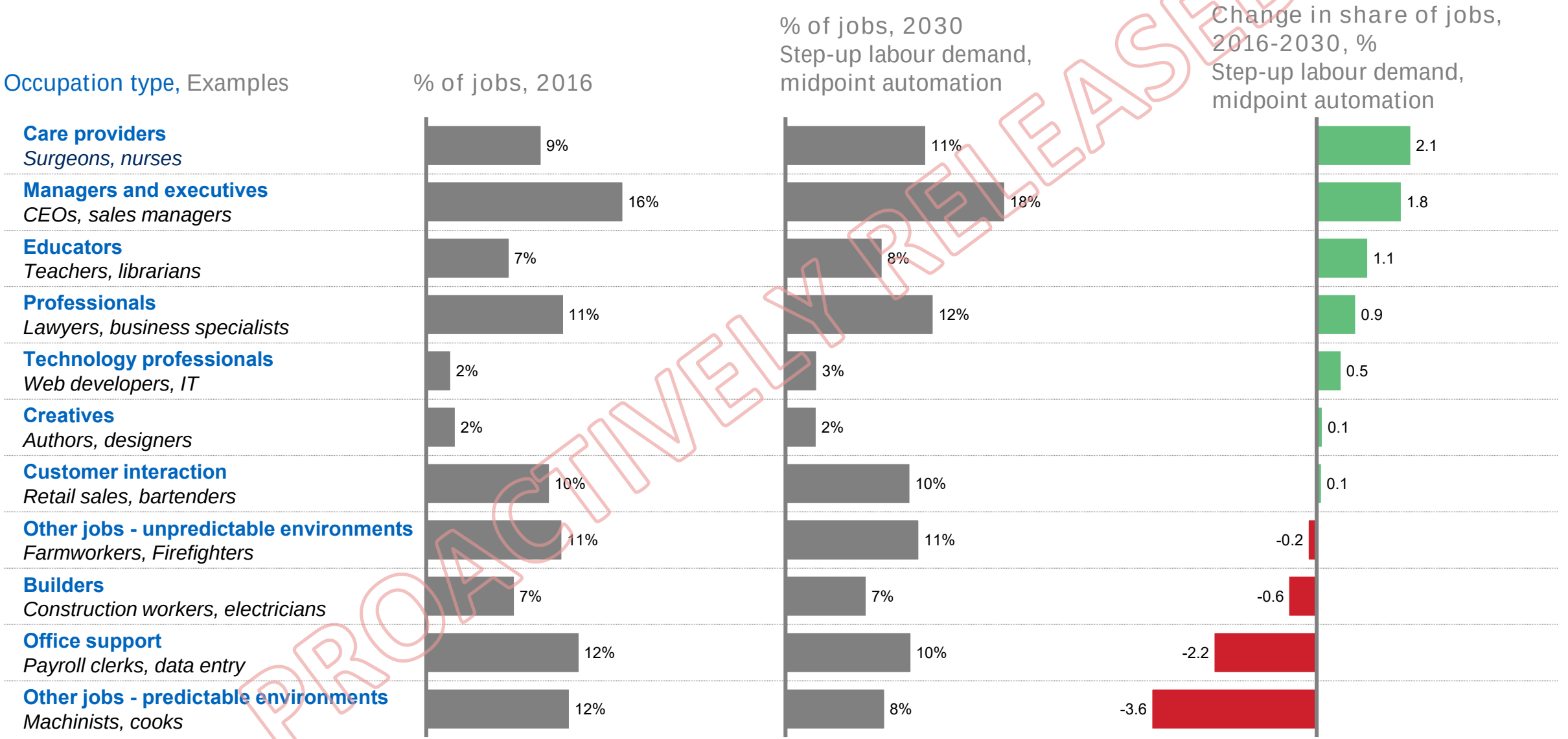
Māori job availability across industries is expected to shift



Note: Does not include gains from new jobs that don't yet exist as these cannot be allocated across industries accurately

SOURCE: MGI; 2013 Census

Overall occupation mix is expected to shift in favour of specialised occupations



Note: Doesn't include new occupations created

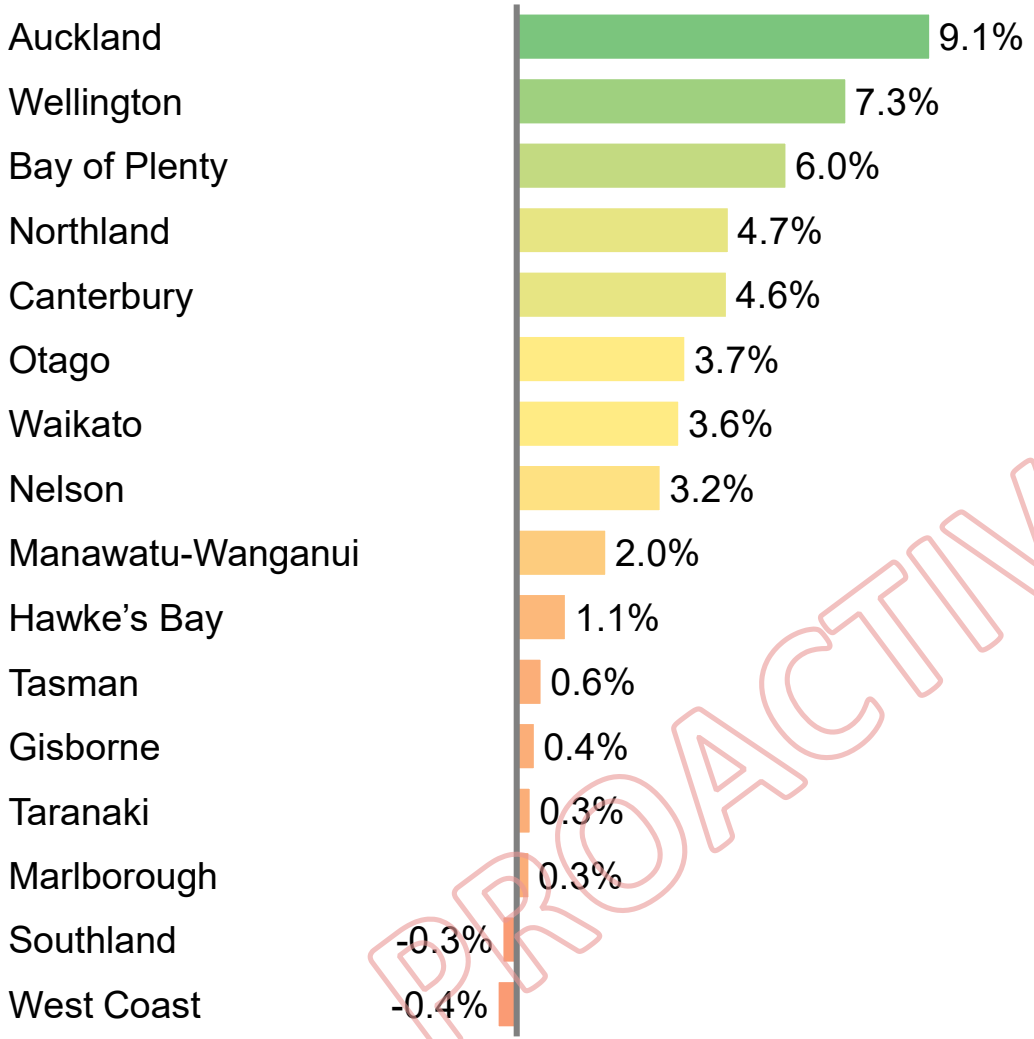
SOURCE: MGI Automation Model March 2018, Jobs Lost Jobs Gained December 2017; McKinsey Global Institute analysis

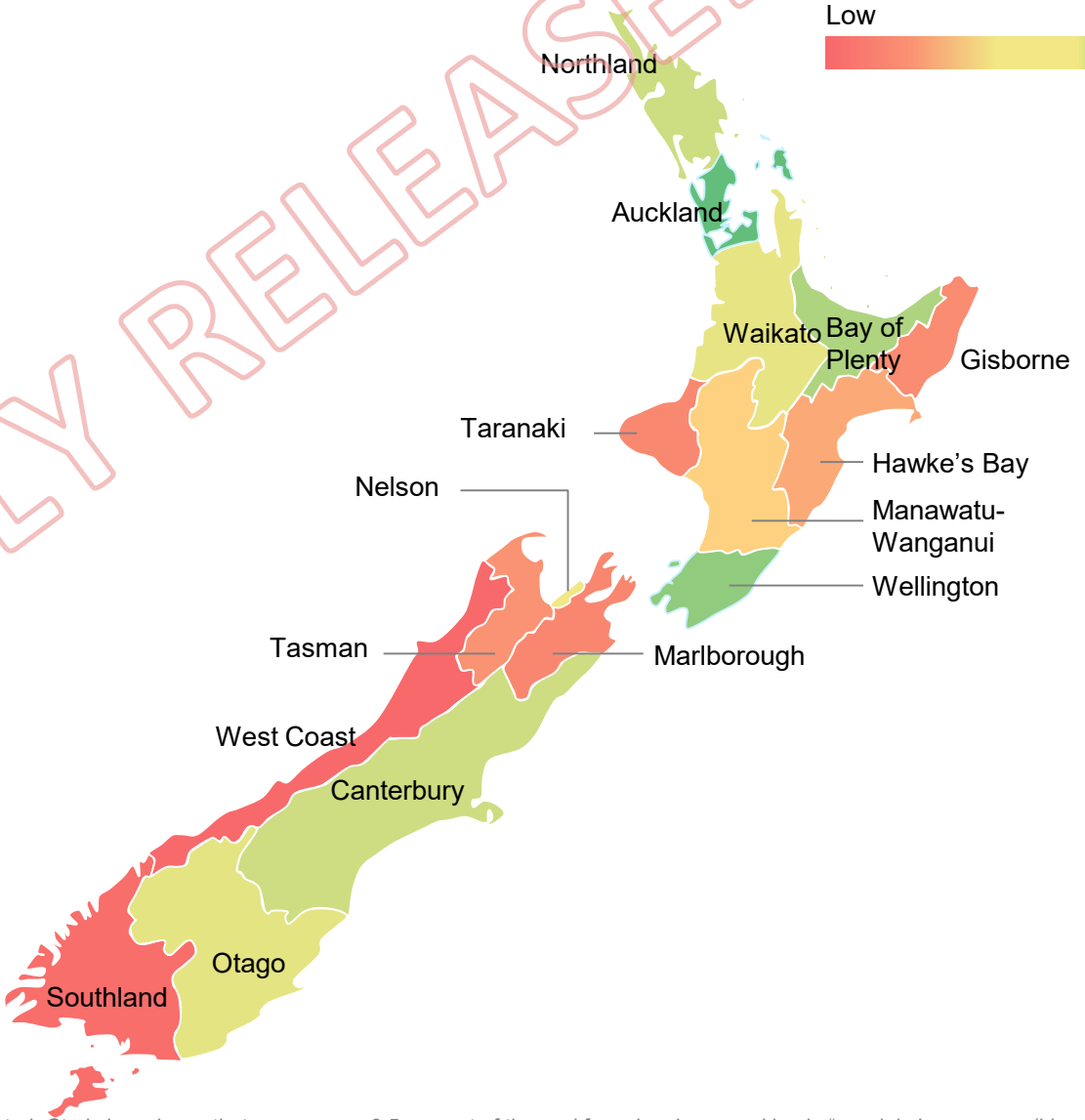
Nearly all regions across New Zealand are expected to benefit from net employment growth

DIRECTIONAL FUTURE IMPRESSION

Projected net change in jobs,[1] Midpoint adoption scenario, 2030

%





1 Includes 182k new jobs (unknown occupations) apportioned across regions based on their share of other (known) jobs created. Study has shown that on average, 0.5 percent of the workforce has been working in "new jobs' every year (Lin, Jeffrey, "Technological adaptation, cities, and new work," The Review of Economics and Statistics, issue 93,May 2011)

SOURCE: Figure.NZ, Stats NZ, Oxford Economics

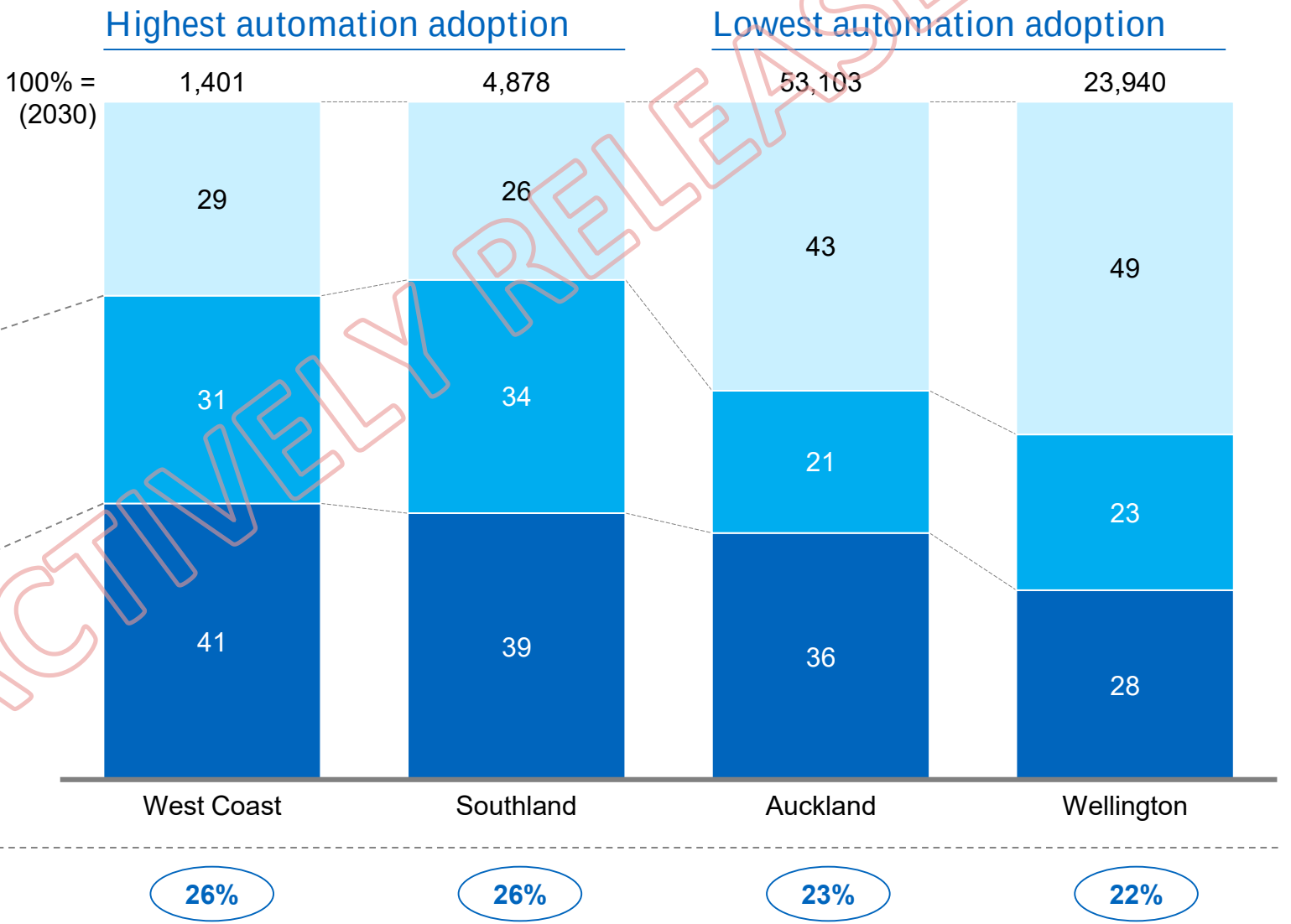
Regional Māori differences are driven by industry mix

Regional Employment Mix by Industry[1]

Low adoption industry (<20%)
- Educational Services
- Health Care
- Arts, Entertainment, and Recreation
- Administrative and Support and Government
- Information
- Real Estate and Rental and Leasing
- Professional, Scientific & Technical Services

Medium adoption industry (20-25%)
- Utilities
- Finance and Insurance
- Agriculture, Forestry, Fishing and Hunting
- Construction
- Accommodation & Food Services

High adoption industry (25%+)
- Other services
- Mining
- Manufacturing
- Transportation and Warehousing
- Wholesale Trade
- Retail Trade

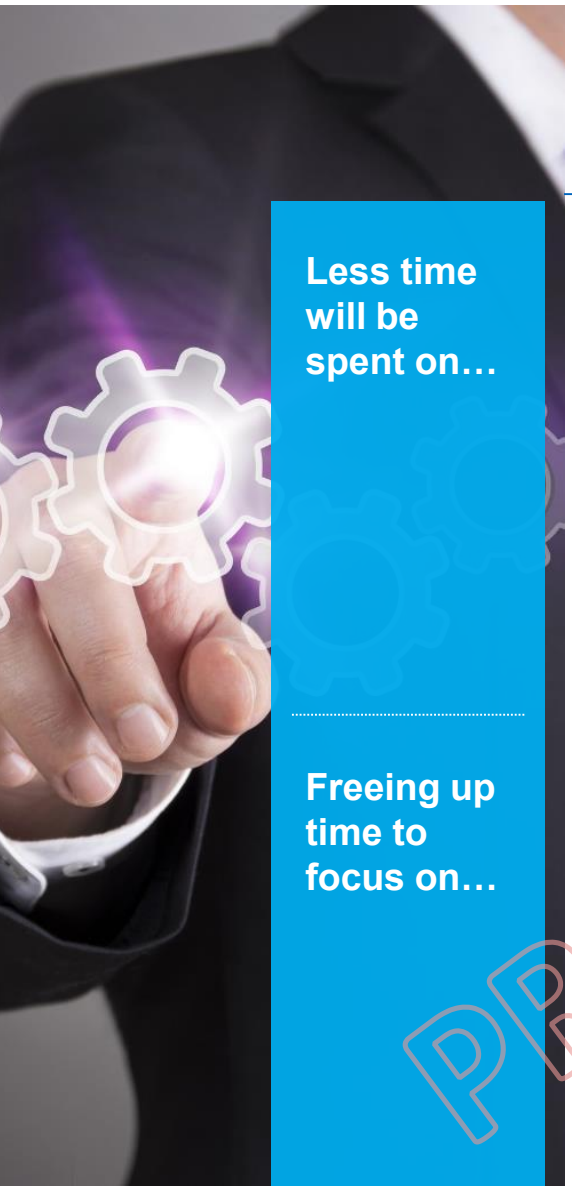


1 Based on 2013 census data

SOURCE: Figure.NZ, Stats NZ, Oxford Economics; MGI Jobs Gained Jobs Lost Model; McKinsey Global Institute analysis

The nature of jobs as know them will change, enabled to varying degrees by automation

ILLUSTRATIVE



Less time will be spent on…

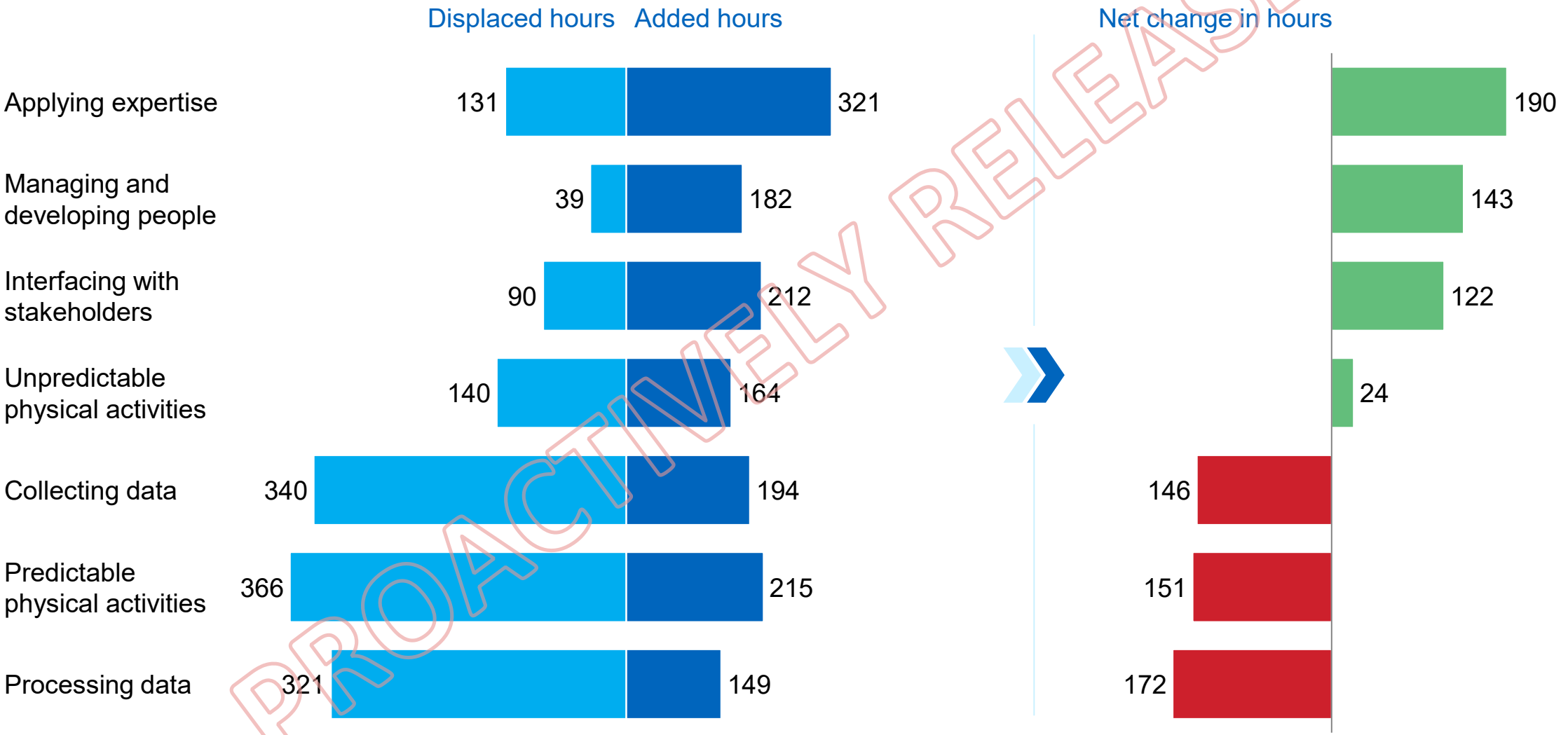
Freeing up time to focus on…

Construction worker, West Coast	Farm worker, Southland	Litigation lawyer, Auckland	Legislator, Wellington
Reviewing blueprints or specifications to determine work requirements	Packaging agricultural products for shipment / further processing	Researching relevant legal materials to aid decision making	Approving expenditures
Mixing substances or compounds needed for work activities	Operating irrigation systems and/or farming equipment	Preparing legal documents	
	Evaluating the quality of plants or crops	Documenting legal proceedings	
Signalling equipment operators to indicate proper equipment positioning.	Planting crops, trees, or other plants	Identifying implications for cases from legal precedents or other legal information	Maintaining knowledge of current developments in area of expertise
Moving construction or extraction materials to locations where they are needed	Transporting animals, crops, or equipment	Providing legal advice to clients	Representing the organisation in external relations
	Conferring with managers to make operational decisions		

Net growth in work will involve more application of expertise, management and interacting

Total work hours by activity type, 2030 net demand (Midpoint automation[1], step-up scenario)

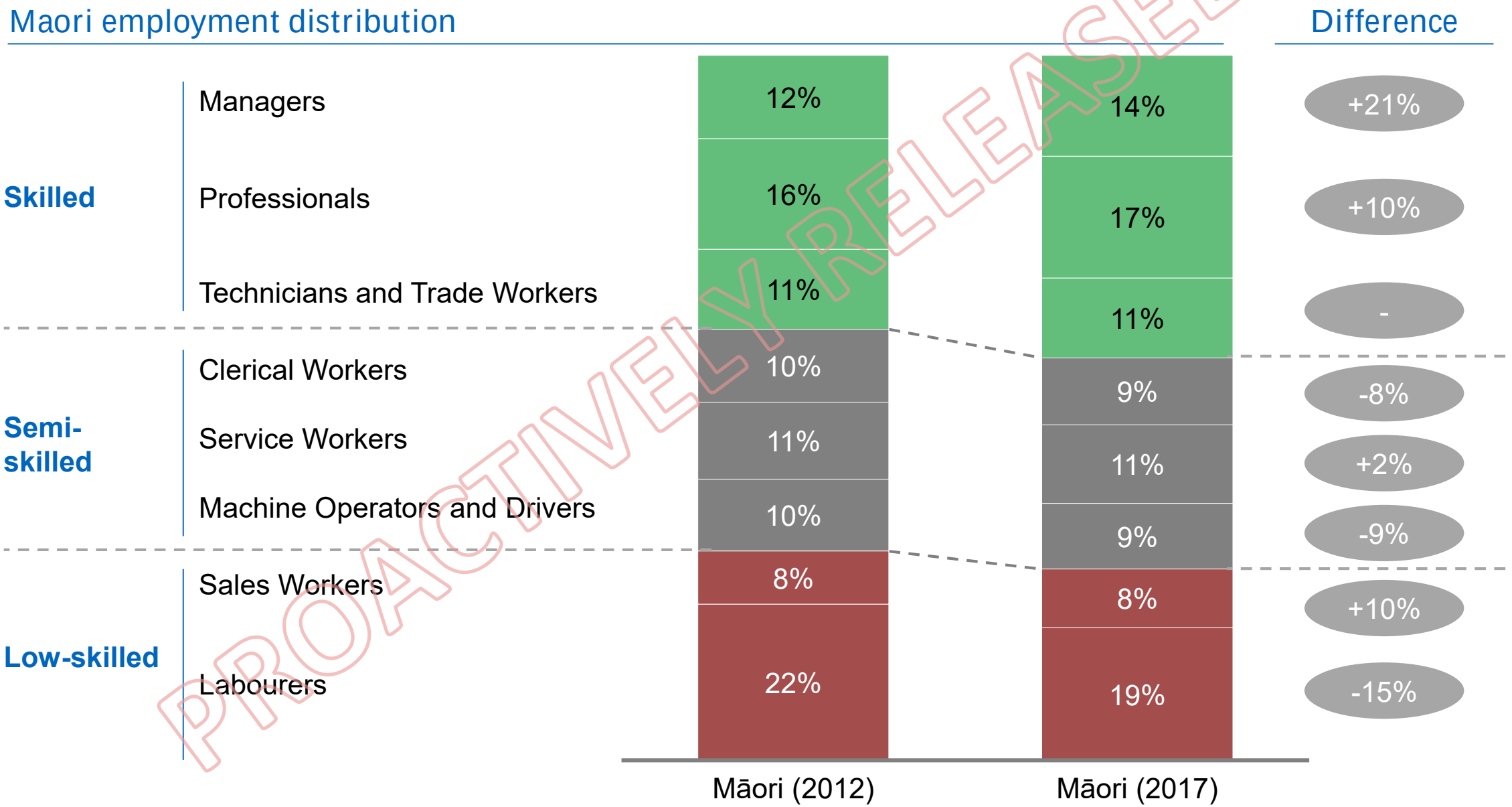
Million



1 Midpoint of earliest and latest automation adoption in the "step-up" scenario (i.e., high job growth).
Note: Doesn't include new occupations created

SOURCE: ONET skill classification, MGI Automation Model March 2018, Jobs Lost Jobs Gained December 2017; McKinsey Global Institute analysis

The Māori employment distribution has changed since 2012

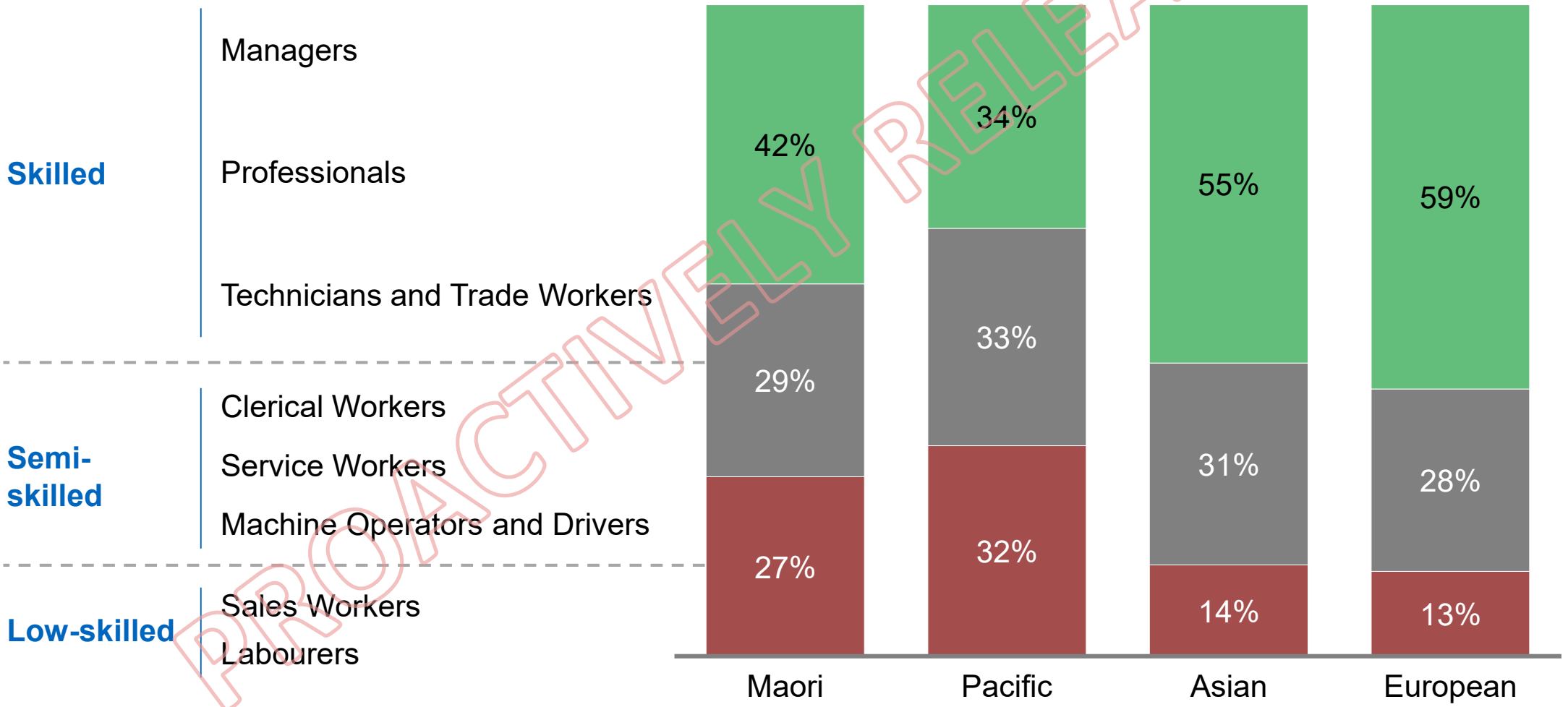


SOURCE: MBIE Māori Labour Market Report (https://www.mbie.govt.nz/assets/c71b557b32/2017-monitoring-report-maori-in-the-labour-market.pdf)

There is still variation in employment distribution between groups

Employment distribution by ethnicity

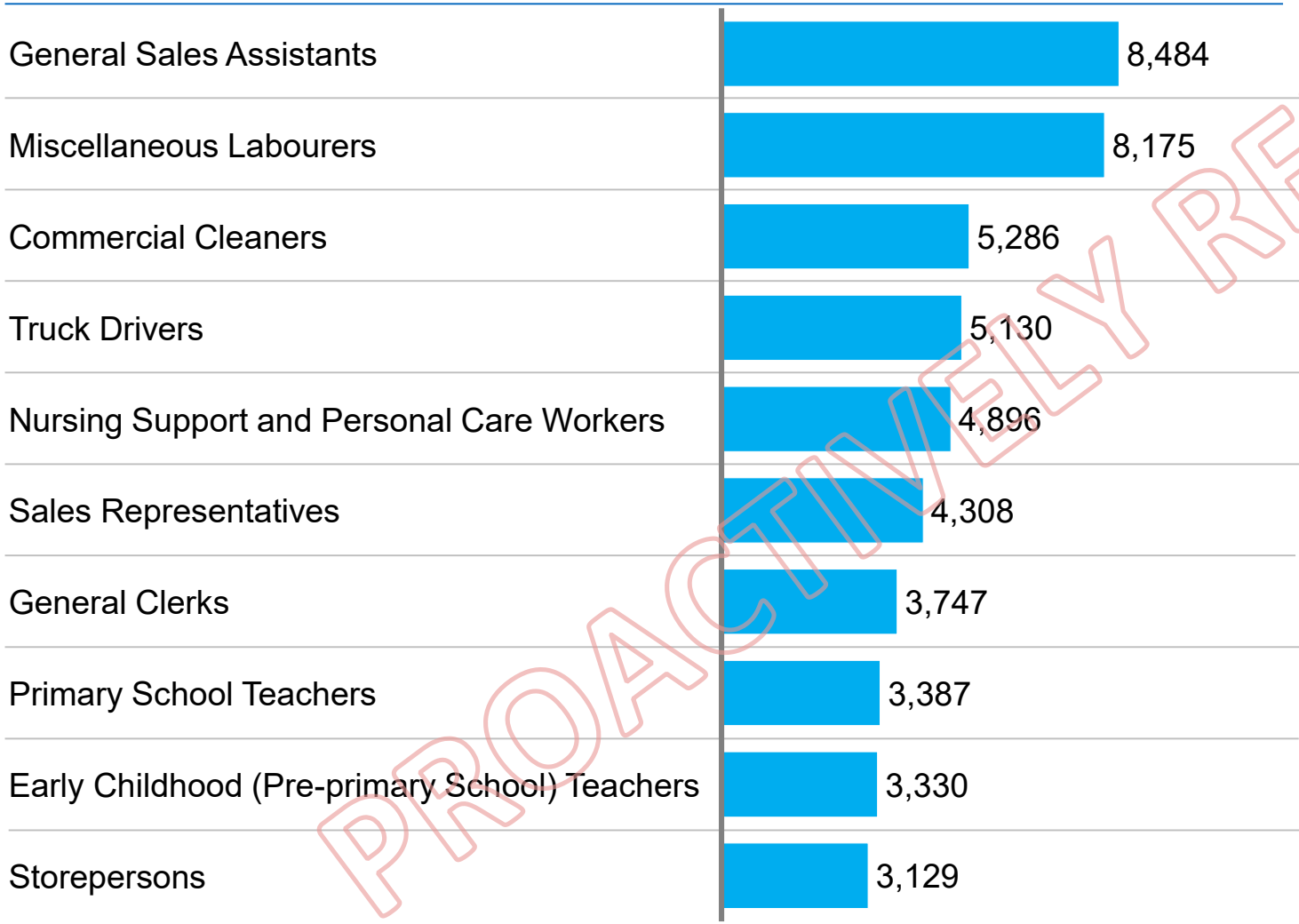
2017



SOURCE: MBIE Māori Labour Market Report (https://www.mbie.govt.nz/assets/c71b557b32/2017-monitoring-report-maori-in-the-labour-market.pdf)

Top 10 occupations for Māori are well-represented by BAC members

Top 10 Occupations for Māori
2013 Census



Key Employers	BAC Members
The Warehouse	Bunnings Warehouse
Downer	Auckland Airport
Spotless	Air New Zealand
	Fonterra
Ministry of Health / Manatū Hauora	
ANZ	Westpac
Ministry of Education / Te Tāhuhu o te Mātauranga	
The Warehouse	Bunnings Warehouse

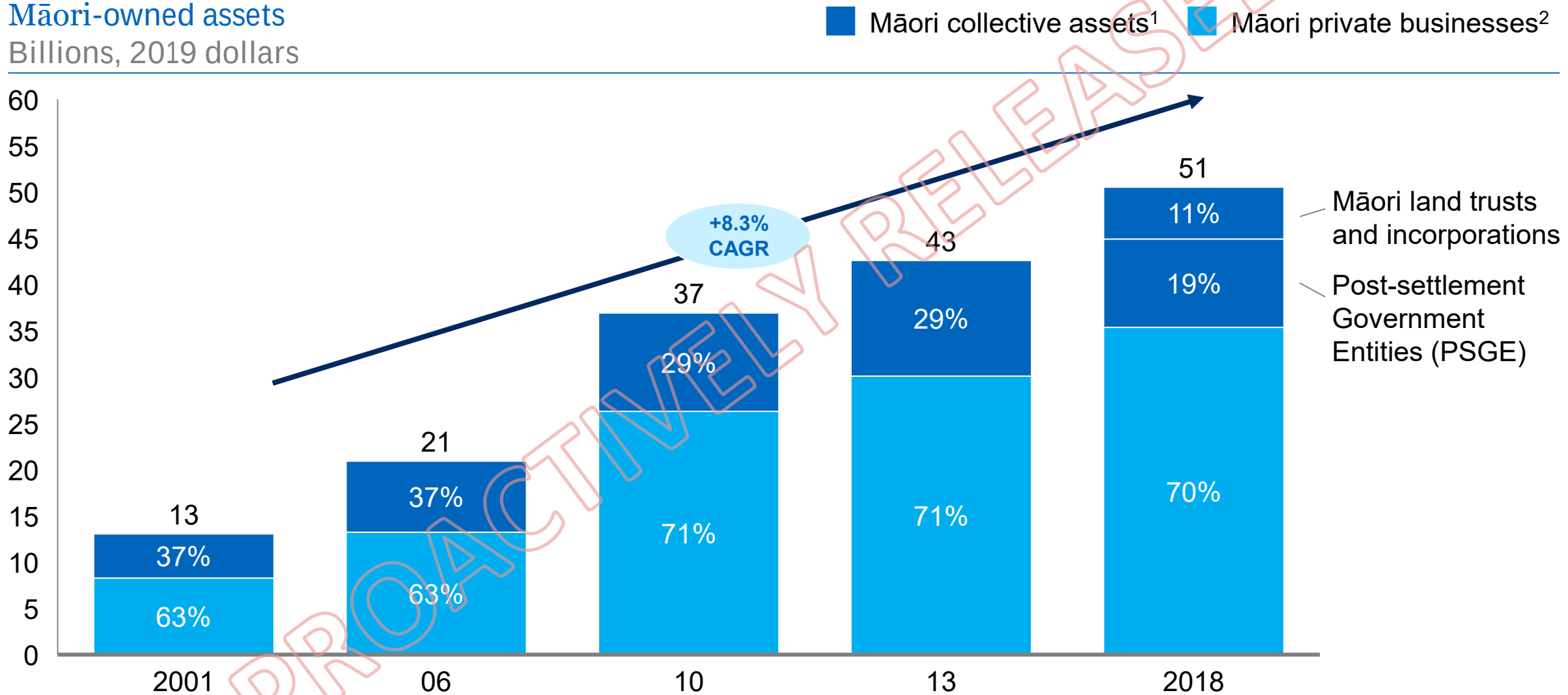
SOURCE: Statistics NZ

Contents

The Māori economy has a strong and growing asset base, two-thirds of which is privately owned

Māori-owned assets

Billions, 2019 dollars



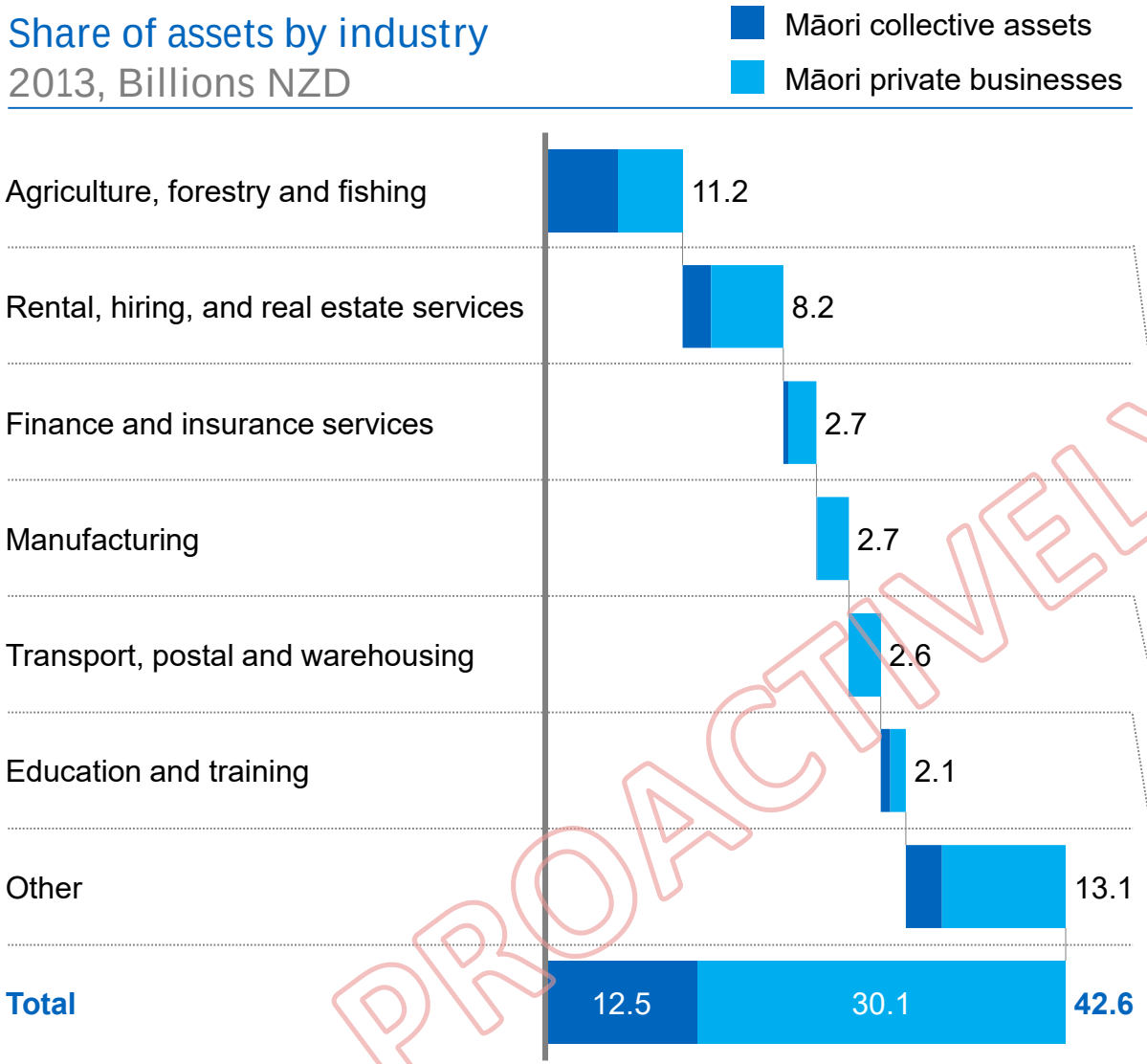
1 Assets owned by collective Maori entities, for example Maori authorities, land trusts, and Post-settlement Government Entities
2 Business assets of those who identify as Maori and are self employed or own a business with employees

SOURCE:
https://www.tpk.govt.nz/en/a-matou-mohiotanga/business-and-economics (2001/2006); Te Puni Kokiri Māori Economy Report 2013 (2010/2013)
https://www.chapmantripp.com/Publication%20PDFs/2017%20Chapman%20Tripp%20Te%20Ao%20Māori%20-%20trends%20and%20insights%20E-VERSION.pdf (2018)
NZTE Māori Economy Investor Guide (https://docs.wixstatic.com/ugd/f09098_5bf4b8058e8845038cd9b9d776c1c3f6.pdf)

Māori businesses could deploy automation across industries to boost productivity

PRELIMINARY

Share of assets by industry
2013, Billions NZD



Examples of automation in industry

Agriculture, forestry and fishing

- Turners and Growers has begun testing an automated fruit picker, which works at night and will help ease labour shortages[1]
- New Zealand start-up Halter is developing a system to remotely herd and move dairy cows, potentially increasing farm productivity and lowering costs
- NZ forests may deploy robotic cutting and extraction and use of drones for planting saplings[2]
- The Government has already implemented digital tracking and reporting of fishery catches, and fishing companies such as Sanford are investing in automated processing facilities on their boats

Manufacturing

- ~80% of man hours could be automated in agricultural processing,[3] which makes up 60% of Māori manufacturing assets

Transport Postal and Warehousing

- Self driving vehicles have potential to lower costs and lift value in the industry

1 https://www.technologyreview.com/f/613237/a-robot-apple-picker-is-using-machine-vision-to-harvest-fruit-in-new-zealand/
2 https://www.stuff.co.nz/science/102182695/robots-are-coming-to-nz-forests
3 McKinsey Report - The Impact of Automation on the Future of Enterprise and Nature of Work
SOURCE: Te Puni Kokiri Māori Economy Report 2013