Attachment Two: Report on the impacts of economic transitions on firms, workers, regions and households

The Impacts of Economic Transitions on Firms, Workers, Regions and Households

Literature Review prepared for the Future of Work Tripartite Forum

Draft version

Contents

1. Executive summary

This literature review explores the impacts of economic transitions on firms, workers, regions, and households. The purpose of this review is to define the problem that economic transitions pose for the labour market (and the key actors within that) and wider economy, and to identify particular impacts (pain points) that could be targeted through interventions within a just transitions process. It is important to acknowledge that economic transitions occur in a complex system of wider structural and social changes that can have a flow-on impact for families and individuals for years to come.

Based on a review of three important transition case studies (climate change, technology change, and the 1980s reforms) it is clear that the costs of adjusting to economic transitions can fall heavily on particular groups, such as Māori firms and workers, small businesses in exposed industries, and regions of Aotearoa with 'tight' labour markets. Economic transitions can:

- drive economic displacement
- change the mix of skills in demand
- increase costs of operating for firms, and
- reduce household wellbeing.

The findings of this review suggests that there could be a valuable role for Government, Māori, workers, and businesses to work in partnership to manage the disruptive impacts that economic transitions pose for our economy and labour market. Taking a just transitions approach through the Future of Work Forum (the Forum) presents an opportunity to learn from past experiences and do things differently. The Forum could help to strengthen a just transitions approach that is both *targeted* to those who bear the greatest costs and are least able to respond by themselves, and *flexible* so that responses are adaptable to the nature and severity of different transitional events.

Learning from past experiences and the key impacts noted in this review, we find that the key levers that comprise an effective just transition system include:

1. **Setting the direction** and managing the pace of change
2. **Planning for change** through undertaking proactive workforce transition planning
3. **Strengthening research and the evidence base** to identify international trends and **supporting the diffusion of ideas** and new technology
4. **Fostering responsive skillsets** and helping workers and firms to recognise transferable skills and deliver skills pipelines to enable transition-aligned growth
5. **Providing support to firms** to enable transition-aligned growth
6. **Managing distributional impacts** by implementing equity-based approaches, and
7. **Supporting economically displaced workers** through income support and back to work support.

These findings have helped to guide officials to develop an effective just transition policy suite for businesses and workers to be discussed at the 19 September Forum meeting and can be read alongside the paper '*The Gap Analysis of Policies and Programmes for a just transition*'. This review has also canvassed important information gaps where further research could be undertaken to sharpen the Forum's understanding of the impacts of transitions and help to inform the targeting and design of future just transition interventions in Aotearoa.

2. Outline of this review

In March 2022, the Future of Work Forum (the Forum) adopted an agreed definition of just transitions and commissioned officials to review existing evidence on the impacts of transitions on workers, firms, and households. Transitions are defined in this review as 'processes which result in the change in the economy from one state to another'[1], and three case studies of economic transitions as per this definition have been explored to identify groups that are most likely to be impacted by transitions and provide insights into likely impacts arising from future transitions. The three case studies are:

1. **climate change**, and the transition to a low emissions economy
2. **technology change**, and the transition to new ways of working achieved through automation and adopting new digital tools and equipment, and
3. **the 1980s economic reforms**, and the transition from a sheltered and regulated economy to a free market economy.

The findings of this literature review contributes to an evidence base to enable the Future of Work Tripartite Forum to identify where further work could be required to address the challenges that transitions present

The scope of analysis in this review is limited to *existing* research on the key impacts of transitions on firms, workers and households, and no new research has been undertaken. This review should be read alongside the companion paper: '*The Gap Analysis of Policies and Programmes for a just transition'*, as together these documents aim to set the foundations for well-informed discussions on just transitions challenges and opportunities at the Forum meeting in September 2022.

2.1 The key impacts of transitions explored in this review

To maintain an achievable scope for this review, officials have focused on the distributional impacts of transitions on firms, workers, regions, and households, and have not looked at experiences of transitions at the individual level.[2]

With this scope in mind, the review explores the impacts of transitions arising from the following possible outcomes of transition:

1. **labour market segregation**, which refers to the incidence of persistent differences in employment and working conditions in the labour market between groups (e.g., genders, ethnic groups), including both vertical job segregation (where particular employees are concentrated in the higher-status and better-paid positions) and horizontal job segregation (where different genders or ethnic groups, for example, work in different types of occupation).[3]
2. **skills-bias**, where changes in the labour market benefit workers with higher skills at the detriment of workers with lower skills, who are more likely to lose their jobs or see their wages diminished as a result of transitions.
3. **adjustment costs,** which in this context refers to how workers and firms can face different costs when adjusting to the impacts of transitions, such as differences in mobility and search costs associated with finding retraining and re-employment opportunities.
4. **differences in susceptibility to labour market fluctuations**, and how existing inequities between firms and workers can be exacerbated by transitional change.

[1] Based on MBIE. (2021). *Transition concepts literature review*. Chief Economists Unit.
[2] It is worth nothing that in reality there are a combination of factors that will influence how people experience economic transitions (e.g. rainbow community, refugee and migrant, disability, ethnicity, gender).
[3] Oxford. (2022). Occupational Segregation. Retrieved from URL: https://www.oxfordreference.com/view/10.1093/oi/authority.20110803100244561

3. Case study one: Climate change

The need to shift to a low emissions economy is an important example of an economic transition that is expected to reshape the labour market and is a primary example of where just transitions programmes and policies have been applied internationally.[4] The scope of analysis in this review is limited to the impacts of emissions reductions policies, due to limitations in robust evidence on the physical impacts of climate change on firms and the labour market.

Analysis of the impacts on firms, workers, and households has been broken down into:

- Regional impacts
- Impacts for Māori firms and workers
- Sectoral impacts
- Gender impacts
- Impacts on households
- Impacts on small businesses

3.1 Regional impacts

Rural New Zealand is more exposed to the impacts of the climate transition

Rural regions have a higher share of workers in emissions intensive industries and are expected to face greater impacts in the transition to a low emissions economy. The highest concentration of workers in high emissions industries are concentrated in Southland, Gisborne, Taranaki, and the West Coast.[5] Figure One below shows where high emissions industries are a significant source of employment at a regional level.[6]

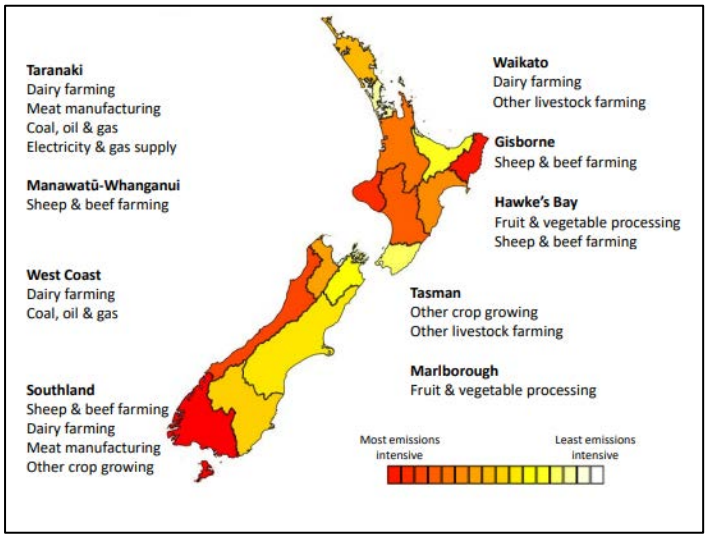

***Figure One**, important high intensity industries by region. Source: MBIE, 2021.*

The loss of fossil fuel related jobs will impact Taranaki and the West Coast the most, and Manawatu-Whanganui, the West Coast, Southland and Gisborne are heavily reliant on the agricultural sector.[7] Urban regions however, such as Auckland and Nelson, have the lowest shares of employment in high emissions industries.[8] The Climate Change Commission's

[4] For example, the sunsetting of mining operations in Germany, Pinker (2020), Just Transitions: a comparative perspective. Retrieved from URL: https://www.gov.scot/binaries/content/documents/govscot/publications/independent-report/2020/08/transitions-comparative-perspective2/documents/transitions-comparative-perspective/transitions-comparative-perspective/govscot%3Adocument/transitions-comparative-perspective.pdf

[5] MBIE (2021) *The emissions exposure of workers, firms and regions.* Retrieved from URL: https://www.mbie.govt.nz/dmsdocument/13781-the-emissions-exposure-of-workers-firms-and-regions

[6] As at [4]

[7] MBIE (2021) *The emissions exposure of workers, firms and regions.* Retrieved from URL: https://www.mbie.govt.nz/dmsdocument/13781-the-emissions-exposure-of-workers-firms-and-regions

[8] Sapere (2021). *Climate change and future skills needs.*

modelling of the impacts of the transition on jobs by region estimates that in most regions net job change will be positive, with the greatest impacts on regional employment materialising in the third emissions budget (2031-2035).[9]

Based on the available literature, the key impacts of the transition to a low emissions economy for regional communities and associated policy implications could include:

- **Regional disparities** and an uneven sharing of the costs and benefits in the transition between rural and urban regions of the country, where rural communities such as the West Coast could face the greatest disruption in the transition to a low emissions economy.
- **Higher adjustment costs for regional communities,** with an increase in mobility and search costs as workers are required to move between regions or increase their commute times to access alternative employment or retraining support if economically displaced.
- **Demand for Government supports** and efforts to undertake early transition planning to identify opportunities to diversify regional economies and adopt low emissions technologies.

Further work could be required to understand regional risk and resilience

To improve our understanding of regional impacts of the transition to a low emissions economy, further research could be focused on emissions intensity, regional employment structures, firm characteristics, and isolation index[10] to identify towns and communities that could be most exposed to the impacts of transitions (and have the least resilience to weather the impacts of change) at a more granular level.

3.2 Impacts for Māori firms and workers

The transition is likely to entrench inequities for Māori firms and workers

Māori workers are overrepresented in high emissions sectors, making up 23% of the workforce employed in high emissions industries and 14% for low emissions industries.[11] The higher share of Māori employment in the high emissions intensity industries is driven largely by relatively high employment shares in sheep and beef farming (where Māori comprise 36% of the total workforce); meat manufacturing; road and rail transport; and to a lesser extent, dairy farming. Together, these industries account for 74% of total Māori employment in high emission industries.

Māori workers have faced inequitable outcomes in previous economic transitions (explored later in this review), and research has shown that Māori can face educational and skills-based inequalities because of being underserved by education and training systems[12]. The Climate Change Commission found that education and training developed by Māori for Māori will be important for reducing existing inequities.

These findings suggest that Māori workers could face disproportionate impacts in the transition to a low emissions economy, raising questions about the accessibility of responsive retraining and re-employment support for Māori workers.

[9] As at [7]
[10] The Isolation Index is used by the Ministry of Education to determine the relative isolation of schools and early learning services. It currently uses weighted distances from population centres of 5,000 and 20,000 and 100,000 people, based on 2001 census data and old road data. Ministry of Education. (2022). The Isolation Index. Retrieved from URL: The Equity Index – Education in New Zealand
[11] Pinker (2020), Just Transitions: a comparative perspective. Retrieved from URL: https://www.gov.scot/binaries/content/documents/govscot/publications/independent-report/2020/08/transitions-comparative-perspective2/documents/transitions-comparative-perspective/transitions-comparative-perspective/govscot%3Adocument/transitions-comparative-perspective.pdf
[12] BERL (2019) Education Awa: Education Outcomes for Māori.

Māori employment outcomes are linked to the resilience of Māori employers

The extent to which Māori workers are exposed to job displacement or reduced demand for labour in certain industries will also depend on the types of change that Māori firms undergo as Aotearoa New Zealand transitions to a low emissions economy.

Māori businesses are overrepresented in emissions intensive sectors that are expected to face the greatest disruption from transitional change from climate change, such as primary industries, construction/manufacturing and transport.[13] Additionally, Māori businesses face disproportionate barriers to innovate and grow, and face challenges accessing capital and existing Government support.[14][15] The Te Matapaeroa Māori business report found that Māori businesses employ 43% Māori on average, three times the rate as for non-Māori businesses.[16] Therefore, the extent to which Māori businesses succeed in transitioning to low emissions ways of operating will shape both Māori firm and Māori labour market outcomes.[17]

Based on the available literature, the key impacts of the transition to a low emissions economy for Māori firms and workers and associated policy implications could include:

- **Labour market segmentation** and disproportionate impact for Māori workers based on representing a higher share of employment in high emissions sectors. This creates a strong mandate for labour market policies to rebalance Māori labour market dynamics and enable Māori workers to access skills pathways towards low emissions sectors that are more resilient to change in the transition to a low emissions economy.
- **Higher adjustment costs** where Māori workers may face challenges accessing training and re-employment support if economically displaced in the transition.
- **High emissions exposure among Māori firms,** potentially creating growing demand for Māori employers to have an enabling environment to transition their operations and workforce towards low emissions activities.
- **Links between outcomes for firms and workers,** where Māori firms' propensity to employ Māori workers means firm level interventions targeted at Māori businesses could be an effective lever for promoting Māori labour market resilience**.** Māori collectives are often mission-oriented, which means their success often has wider wellbeing implications.

More Māori-led approaches to understanding and meeting the needs of Māori workers and firms could be supported

Further work could be undertaken to understand whether current settings are likely to meet the needs of Māori workers and firms in a just transition, and how mana motuhake can be strengthened so that Māori are leading research to monitor changes in the labour market and championing actions to deliver solutions to transition challenges associated with climate change.

[13] BERL. (2021). Māori economy emissions profile. Retrieved from URL: https://berl.co.nz/our-mahi/maori-economy-emissions-profile
[14] Te Puni Kōkiri. (2021). *Māori Enterprise Resilience.*
[15] Anecdotal evidence from MBIE engagement with Māori Business networks on the Emissions Reduction Plan. (2021).
[16] Te Puni Kōkiri. (2019). *Te Matapaeroa*. Retreived from URL: https://www.tpk.govt.nz/docs/tematapaeroa2019-insightsmaoribusiness.pdf
[17] As at [15]

3.3 Sectoral employment impacts

This review distinguishes between the impacts on high-, medium- and low-emissions intensive industries

The impacts of the transition to a low emissions economy will be vastly different for each sector/type of industry. This review has adopted three industry groupings based on MBIE research published in 2021[18], which used an emissions intensity calculator to rank industries in the New Zealand economy based on their emissions intensity to develop four distinct industry groupings:

1. High-emissions intensity industries, which are expected to face the greatest disruption in the transitions to a low emissions economy.
2. Medium-high and medium emissions intensity industries, where the transition to a low emissions economy will have mixed impacts.
3. Low-emissions intensity industries, which are expected to face either minimal impact or experience growth because of the transition to a low emissions economy.

These industry groupings, in association with other research, have been used as a proxy for exploring how key sectors of the economy could be impacted by the transition to a low emissions economy.

For this report we have used these three emissions intensity groupings, as this is useful to acknowledge the impacts and vulnerabilities firms within these groupings could face. The classification system used is useful for this report but does not look to predict the specific impacts that high-emissions intensity industries will experience in the future. There may be second and third order effects that are not captured in this grouping system and other factors that contribute to the impact of the transition on individual firms.

3.3.1 High emissions intensity industries

High emissions intensity sectors are expected to face the most significant impacts

The high emissions intensity industry group in MBIE's research (2021) includes 23 industries that collectively account for approximately 10% of New Zealand's employment and fall into four broad groupings: agriculture; food manufacturing; heavy manufacturing; and distribution and extraction (of energy/fuel). Some of these high emissions firms, such as steel manufacturing, may not face much disruption and are not particularly vulnerable while they continue to get free allocations.

For high emissions intensity industries, the transition to a low emissions economy could see changes to the type of work undertaken and an incremental reduction in total employment. In the fossil fuel industry (including oil and gas extraction and coal mining) for example, the Climate Change Commission have predicted that the industry could experience net job loss of about 1,500 jobs by 2050 as New Zealand works towards net zero carbon emissions.[19] It is estimated that 500 of these jobs could be lost by 2035.[20] Similarly, agricultural activity in New Zealand contributes half of New Zealand's total emissions, mainly from biogenic

[18] MBIE (2021) *The emissions exposure of workers, firms and regions.* Retrieved from URL: https://www.mbie.govt.nz/dmsdocument/13781-the-emissions-exposure-of-workers-firms-and-regions

[19] Sapere (2021) *Climate change and future skills needs.*

[20] Climate Change Commission (2021) *Ināia tonu nei: a low emissions future for Aotearoa.* Retrieved from URL: Ināia tonu nei: a low emissions future for Aotearoa (amazonaws.com)

methane and nitrous oxide, and fundamental changes will be required to the agricultural sector if we are to meet our emissions targets. [21] As a result of structural changes in the agriculture sector, Climate Change Commission modelling suggests significant job losses across dairy farming, poultry farming, and deer farming, and that there could be about 3,000 fewer jobs in sheep, beef and grain farming by 2035.[22]

Workers in high emissions sectors have fewer qualifications

Qualification levels are an important factor that can dictate a worker's wages and employment opportunities. Emissions intensive industries have high concentrations of workers with low or no qualifications. [23] Figure Two below demonstrates that the share of workers in high emissions intensity industries with no qualifications is higher (at 29%) than that for workers in low emissions industries (at 14%).

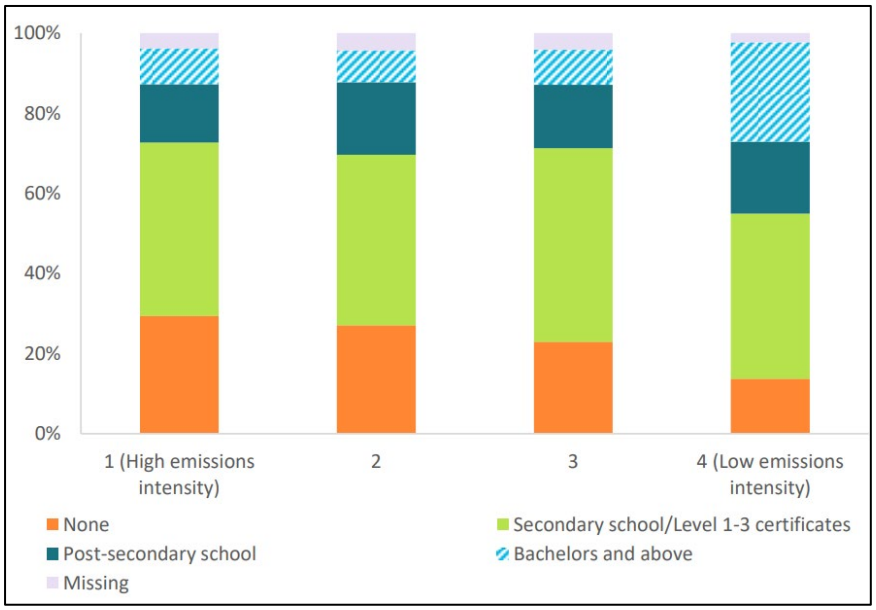

Figure two, Workforce highest qualification across high, medium-high, medium, and low emissions industry groupings. Source: MBIE, 2021.[24]

Lower qualification levels are particularly marked in specific emissions intensive industries. For example, the meat manufacturing industry has around 40% of workers holding no qualification and only 10% holding a tertiary qualification.[25]

The high proportion of workers in high emissions sectors with no or low qualification levels could result in these workers facing greater barriers to finding equivalent employment opportunities and a higher risk of scarring or being forced to accept a lower quality job because of the transition.[26]

Older workers in emissions intensive industries may face additional challenges

[21] NIWA. (n.d) *Climate Change and Agriculture.* Retrieved from URL: Climate change and agriculture | NIWA
[22] MBIE (2021) *The emissions exposure of workers, firms and regions.* Retrieved from URL: https://www.mbie.govt.nz/dmsdocument/13781-the-emissions-exposure-of-workers-firms-and-regions
[23] As at [22]
[24] MBIE (2021) *The emissions exposure of workers, firms and regions.* Retrieved from URL: https://www.mbie.govt.nz/dmsdocument/13781-the-emissions-exposure-of-workers-firms-and-regions
[25] As at [24]
[26] Ministry of Education. (2010). *Labour market outcomes of skills and qualifications.* Retrieved from URL: Report (swa.govt.nz)

The average age of workers in the high emissions industry grouping (38.5 years) and in low emissions industry grouping (39 years) is similar. However, within high emissions industries there is significant variability. For example, those working in the dairy industry on average are younger (32.5 years) while those working in road and rail transport are on average older (45.5 years).[27]

Older workers are more likely to have less flexibility in where they can work (for example, due to family considerations) and may find it more difficult to be redeployed, especially if they have been working in one industry for their entire career, and this industry becomes obsolete. Re-employment is more difficult for older lower-skilled workers.[28] Career support and gap training can help but early intervention is key for older workers.[29] While older workers will still be able to claim under the New Zealand Income Insurance Scheme when it is operational, workers over 65 years old are ineligible for Ministry for Social Development supports. This could mean that the effects of displacement can be greater for older workers.

3.3.2 Medium and medium-high emissions intensity industries

The impacts of the climate transition will be mixed for medium emissions intensity sectors

The medium and medium-high emissions grouping account for 18% of employment and represent wide-ranging business activity, including industries in manufacturing and transport, mining, hospitality and food services, and grocery wholesaling. This grouping also includes some agricultural industries such as aquaculture, and vegetable and fruit growing where the main emissions sources are from feed production for aquatic life and fertiliser use.

The Climate Change Commission's modelling suggests that the transport sector could experience notable changes to overall employment and skillsets that are needed. While there is expected to be gains of around 4,000 jobs in transport in the early periods (2022-2035), the later period (2036-2050) expects to see a loss of around 9,000 jobs, which would mean a net loss of 5,000 jobs by 2050 [30]. It should be noted that these estimates are associated with significant uncertainty and the actual churn of the labour market may differ based on the pace and scale of change.

3.3.3 Low emissions sectors

Low emissions sectors will grow and create demand for new skills pipelines

For low emissions sectors, the impacts of the transition are predicted to be minor or positive. The low emissions intensity grouping applied in MBIE research are predominantly industries from the services sector and account for 72% of New Zealand's total employment. Daily activities in these industries generally involve the provision of professional services in an office building environment which requires low energy use. Broad categories include the provision of banking, health, legal and education services, wholesaling and retailing, entertainment activities, and government administration. However, there are some exceptions to this. Low emissions firms may experience significant impact if they are reliant on supplying goods and services to high emitting firms that subsequently experience a contraction, for example, a business that sells sheet drenching chemicals or an accountancy firm that specialises in providing services to sheep and beef farms.

In sum, the impacts of the transition will be significantly different for each sector of the economy. At a high level, the available literature suggests that the impacts of transition to a low emissions economy for sectors and associated policy implications could include:

[27] As at [24]

[28] Office of Seniors. Retrieved from URL: https://officeforseniors.govt.nz/assets/Uploads/Older-Workers-Action-Plan-FINAL-WEB.pdf

[29] As at [24]

[30] Sapere (2021) *Climate change and future skills needs.*

- **Economic displacement**, where a shrinking workforce in high emissions and medium emissions intensity industries could result in greater job churn and economic displacement as the economy shifts from high emissions to low emissions activities. Economically displaced workers may also face challenges finding re-employment, particularly for those with no or low qualifications or older workers who have had long job tenure and may and less flexibility in where they can work.
- **Growing skills and capability to meet the needs of change**: The transitions could result in significant changes to the types of skills demanded by high, medium, and low emissions industries, requiring a pipeline of skilled workers to support industries to transition. This could require changes to the education and training system and a growing role for employers and industries to support in-work training to meet their capability needs.
- **Increasing demand for proactive planning processes** to allow industries to monitor transitional challenges that their industries could face and identify proactive solutions.
- **Growing demand among industries for access to affordable capital** to enable industries to invest in adopting lower emissions ways of working, particularly for high emissions intensity industries.

Further work could improve our understanding of where and when the impacts will fall for different sectors

Further work could be undertaken to explore the potential scale and timing of impacts as a result of policy change (e.g., expanded emissions pricing under the Emissions Trading Scheme) for key sectors of the economy, so that the transitions pathway for industries and identify how disruptions can be managed.

3.4 Impacts on gender

Women are under-represented in emissions intensive industries

MBIE research in 2021[31] found that there are significantly higher numbers of males employed in emissions intensive industries compared to females. Males account for two-thirds of workers in the two highest emissions intensive groupings, and there are some high emissions industries where males make up 80% of the workforce, such as in glass, metal, cement and non-metallic manufacturing and road and rail transport. [32] Analysis on gendered employment trends of New Zealand women in the energy sector has also found that women are under-represented in this sector, and where they were represented, they tended to be in the least skilled and lowest paid sub-sectors (e.g. in petrol stations).[33]

Gender segregation in high emissions sectors poses issues going forward, and highlights barriers to women in higher-growth, higher-paid sectors. Employment segregation between men and women in high emissions sectors can also contribute to inequitable outcomes if default responses target support at male dominated industries.[34]

Gender pay gaps persist in high emissions industries

[31] MBIE (2021) *The emissions exposure of workers, firms and regions.* Retrieved from URL: https://www.mbie.govt.nz/dmsdocument/13781-the-emissions-exposure-of-workers-firms-and-regions
[32] As at [34]
[33] MacArthur, J. & Dyer, C. (2021). *Transition Equality: gendered employment trends in New Zealand's energy industries*. Policy Quarterly, Vol 17, Issue 3.
[34] MBIE (2021) *The emissions exposure of workers, firms and regions.* Retrieved from URL: https://www.mbie.govt.nz/dmsdocument/13781-the-emissions-exposure-of-workers-firms-and-regions

In Southland and Taranaki, where the Just Transitions Partnerships approach is being deployed, the gender pay gaps are significantly higher than the national average:[35]:

- in Southland, men have median hourly earnings of $27.02 and women have median hourly earnings of $24.00, with a gender pay gap of 11.2 percent (against a national average of 9.1%.)[36]
- in Taranaki, men have median hourly earnings of $29.87, and women have median hourly earnings of $24.98 with a gender pay gap of 16.4 percent.[37]

Gender pay gaps in high emissions industries should be considered in just transition processes to ensure that policy responses do not entrench inequities between men and women's employment.

There could be significant secondary impacts of the climate transition on women's employment

In the Just Transition Partnership in Southland, the Southland Business Chamber is undertaking research to better understand the Tiwai-adjacent businesses and the impact that closing Tiwai would have on them.

This research has found that female dominated industries such as cleaning, laundry, and catering will also be affected by the closure of high emissions industries.[38] Women employed in these jobs in adjacent service sectors and supply chains are less likely to receive redundancy, or retraining opportunities, so policy interventions that target those directly affected by redundancies, while failing to acknowledge secondary impacts of closure, may entrench gender inequities.[39]

Transitions also impact family dynamics and unpaid work

Labour market interventions tend to look at employees as individuals, however 40% of workers have dependent children and therefore balance care responsibilities.[40] Families make decisions about who will take on the distribution of paid and unpaid work, and traditionally men work longer paid hours than women. In communities affected by industry job loss, women tend to seek more hours to compensate family income shortfalls. In times of economic downturn, we tend to see a rise in women's underemployment as much as unemployment levels. Experience has also shown that women are more susceptible to wage scarring (where losing a job impacts their income in the long term) and negative labour market impacts associated with economic shocks (such as the Covid-19 pandemic).[41] [42]

The available literature suggests that the key impact of the transition to a low emissions economy for women's employment, and associated policy implications include:

- **Gender segregation and gender pay gaps,** where focusing on replacing default responses and replacing 'like for like' jobs as we move towards a low emissions economy will inadvertently miss the opportunity to rethink fundamental labour market settings and contribute to inequitable outcomes.
- **Social impacts** on household dynamics and a greater distribution of unpaid care work being undertaken by women, having implications for underutilisation.

[35](Forthcoming). *Gender analysis of Just Transition Partnerships*. Tara Forde.
[36] Ministry for Women. (2021). *Gender Pay Gap.* Retrieved from URL: Gender pay gap | Ministry for Women
[37] As at [38]
[38] As at [38]
[39] As at [38]
[40] As at [38]
[41] StatsNZ. (2021). *Labour Market Statistics, December 2020 quarter.* Retrieved from URL: Labour market statistics: December 2020 quarter | Stats NZ
[42] For example, over two-thirds of the fall in employment between March and September 2020 was in female employment: MBIE paper Improving Labour Market Performance: Strategic Context, provided to EET Ministers on 11 March 2021.

- **Significant but unquantified secondary impacts** where adjacent service sectors where women are highly represented are affected by structural changes in the labour market and the closure/shrinkage of emissions intensive industries.

Targeted efforts may be required to address structural barriers for women entering high wage, low emissions forms of employment.

Further work could be undertaken into the scale of impacts and barriers for women moving into high wage, low emissions jobs

Further work could be undertaken to better understand the scale and severity of 'secondary impacts' of the transition to a low emissions economy, for women dominated sectors. This work could also explore how to design and deploy policy interventions that address gender segregation and gender pay gaps, to ensure that everyone benefits from the transition to a low emissions economy.

3.5 Impacts on households

Low-income households can face sharp distributional impacts of climate transition policies

Eurofound research[43] on the distributional impacts of European climate policies calculated household impacts of climate mitigation policies by income level, income source, household type and household composition groups. This research found that the effects of some climate change mitigation policies are likely to have regressive distributional effects making low-income households worse off relative to high-income households. For example, climate policy that results in rising energy costs (like a carbon tax) is likely to have a greater negative impact on low-income households, as energy/fuel bills make up a higher proportion of disposable income for low-income households, and these groups have fewer resources to use to switch to more energy efficient heating and transport options.[44]

The available literature on the impacts of climate policies on households is limited, but suggests that the key implications of the transition to a low emissions economy are:

- **regressive impacts for low-income households** as energy and transport costs rise, and
- **a 'lock in' effect** where low-income households are more constrained in responding to carbon price signals and may continue to use emissions intensive equipment and tools.

Further work could be undertaken to explore the impacts of climate mitigation policies on low-income households in Aotearoa.

3.6 Impact on small businesses

Small businesses are exposed to climate change transitions

In Aotearoa, approximately 97% of firms are small businesses.[45] The composition within high emissions intensity industries is no different largely comprising too of small businesses.[46]

Studies examining the resilience of businesses to shocks or transitions suggest that generally larger and more mature businesses are more resilient (MBIE, 2021). Small businesses are particularly prevalent in emissions intensive industries such as agriculture (dairy, deer, sheep & beef, other crop growing and other livestock farming), some types of

[43] Eurofound. (2021). Distributional impacts of climate policies in Europe. Retrieved from URL: Distributional impacts of climate policies in Europe (europa.eu)
[44] As at [46]
[45] MBIE. (2021). *Small Businesses in 2001*. Retrieved from URL: Small Business Factsheet 2021 (mbie.govt.nz)
[46] MBIE (2021) *The emissions exposure of workers, firms and regions.* Retrieved from URL: https://www.mbie.govt.nz/dmsdocument/13781-the-emissions-exposure-of-workers-firms-and-regions

manufacturing, and building and construction. This may leave these small businesses more vulnerable to the impacts of transitions and expose them to increasing operating costs over time.[47]

Small businesses face barriers to information, capability, and access to capital

At an aggregate level, the literature suggests small businesses are more vulnerable to the transition to a low emissions economy because of information, capability, and capital barriers**.** The types of barriers Include: a lack of information to support decision-making; uncertainty around policy direction; lack of viable technologies; lack of appropriate personnel; and uncertainty around the future of the Emissions Trading Scheme.[48]

In addition, small businesses face barriers in access to capital, with limited financial resources to dedicate to reducing their emissions. MYOB's periodic business monitor found that a third of small businesses struggled to access finance in 2020 and growing anecdotal and empirical evidence is demonstrating that Māori SMEs face distinct challenges accessing capital.[49] Market failures and sub-scale capital markets in New Zealand can also compound the access to capital barriers for SMEs, which could inhibit their ability to take up low emissions technologies.

Māori SMEs face distinct challenges to transition

As discussed earlier in this review, Māori SMEs have compositional differences - in relation to regional and sectoral distribution - that inform relatively high exposure to distributional impacts of climate change mitigation.

For example, Māori SMEs are disproportionately represented in high-emissions industries (such as transport, construction, and manufacturing) that require investment in vehicles, tools, machinery, infrastructure, and technology.[50] At the same time, the transition to a low emissions economy will likely create requirements to replace these assets with lower emissions technologies, requiring significant capital expenditure.[51] However, these firms also face distinct barriers in taking measures to respond to change, such as low-asset ownership and more severe access to capital barriers.

The high proportion of small businesses in high emissions industries, and the constraints they face in responding to the transition to a low emissions economy indicates that they may require additional support to successfully manage the transition. Based on current evidence, we see key impacts and associated policy implications relating to:

- **Supporting SME capability** to understand how to transition and adopt low emissions ways of working.
- **Addressing access to capital barriers** to transition for SMEs, particularly Māori SMEs.
- **Māori SMEs**, and delivering targeted support that is fit for purpose and meets the distinct needs of these businesses.

[47] As at [49]
[48] MBIE. (2022). Research from the Business Operations Survey 2021.
[49] BDO, (2019). Māori Business Survey retrieved from URL: https://www.bdo.nz/getmedia/d756d8ed-759d-4943-8768-915c1cfe1fb7/Maori-Business-Report-2020-FINAL_1.pdf.aspx ; The Reserve Bank. (2022). Improving Māori Access to Capital. Retrieved from URL: https://www.rbnz.govt.nz/have-your-say/improving-maori-access-to-capital
[50] BERL. (2021). *Māori economy emissions profile*. Retrieved from URL: https://berl.co.nz/our-mahi/maori-economy-emissions-profile
[51] As at [53]

3.7 Case study summary

Our findings suggest that the impacts of climate change mitigation policies will likely be felt heavily by emissions intensive industries, and we expect impacts to also materialise for associated workers, SMEs in supply chains and low-income households. There are also particular challenges for the Māori economy and workforce, which may support the case for Māori led approaches to monitoring trends in the labour market and developing targeted responses that are fit for purpose for Māori firms and workers.

Based on the findings in this section, the key policy implications for consideration by the Forum are:

- Developing responsive skillsets
- Fostering equitable approaches so that Māori firms and workers can leverage benefits and minimise disruptions in the transition to a low emissions economy
- Undertaking research to understand the timing and scale of impacts of climate mitigation policies for firms and households
- Taking a gender lens to address gender inequities through just transitions policies
- Working with high emissions intensity sectors to signal the direction of change and nature of the expected impacts and supporting the diversification and growth of low emissions sectors.

4. Case study two: Technological change

Technological change is a transition that can drive productivity improvements, higher wages, and economic growth. However, the gains experienced through technology change may not be evenly spread across the population, and technological transitions can result in shifts in the skills demanded and increase job churn as new technologies displace labour. This review has looked at four important impacts that technological transitions pose for firms and workers:

1. Technological disruption and job churn
2. Diffusion of technology
3. Skills shifts
4. Digital inequities

4.1 Technological disruption and job churn

Technology has disruptive potential for the labour market

Technological disruption is the advent of new technology that is used in such a way that it renders incumbent firms and operating models obsolete over years or decades.[52] Rapid or widespread disruptive changes are likely to impose significant adjustment costs for firms, employees and households.[53] The shift in traditional communications (from using telegraph, telephone for communication, towards using more rapid and effortless email and instant messaging) is an important case study of the disruptive potential of technological transitions. This transition has given rise to new occupations and left certain skills and professions obsolete, such as switchboard operators.[54]

[52] Sullivan, J. (2015). What is technology disruption? Retrieved from URL: https://www.hhg.co.nz/news/what-technology-disruption-will-affect-businesses-organisations/
[53] As at [55]
[54] CTU. (2019). *Submission of the New Zealand Council of Trade Unions Te Kauae Kaimahi to the Productivity Commission on the inquiry into Technology Change and the Future of Work.*

The existing literature on the impact of technology change highlights the disruptive potential for particular workers to be displaced by new technologies, resulting in an increase in overall job churn.[55]

There are a range of estimates on the scale of the impacts of technology on jobs

We do not have a single reliable and robust measurement of how technology change could affect jobs in Aotearoa. Frey and Osborne[56], estimated in 2013 that 47% of the workforce in the United States was at risk of automation. Other estimates of automation potential shift between less than 10% of the workforce and more than 50% of the workforce (see Figure three below).

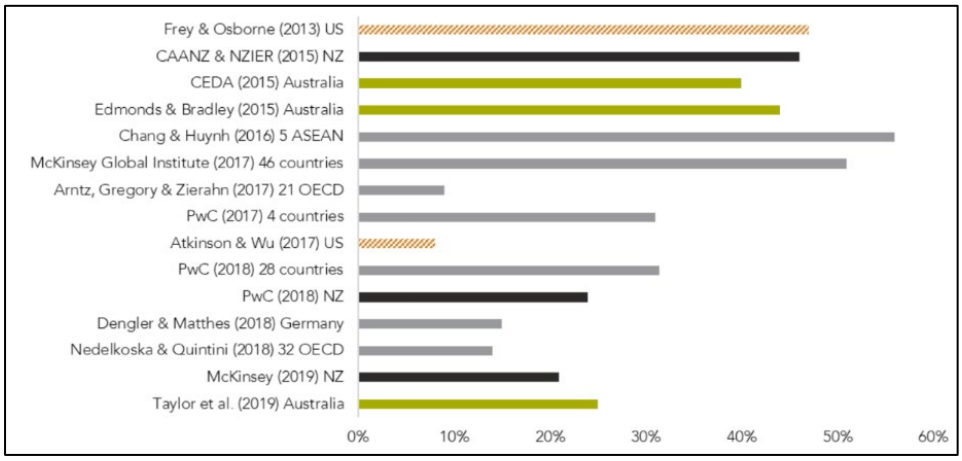

Figure three*,* estimates of the proportion of jobs that may be automated among key studies of the impacts of automation on the workforce. Source: NZPC (2019d) cited by the Productivity Commission, 2020.

The Future of Work Forum commissioned research in 2019 from McKinsey that created different scenarios of job creation and destruction in New Zealand caused by automation to understand that impacts on the workforce. In aggregate, they estimated that additional jobs (net of jobs lost) would be created by 2030. The work broke down the impacts of automation on the workforce by region, occupation type and industry, finding that around 21% of workforce activities will be automated by 2030 (in the central adoption scenario, vs 2% with late adoption, and 41% with early adoption).[57] McKinsey[58] also estimated that during the transition period, unemployment would be expected to rise to around 5.3% in the mid-point automation adoption scenario and up to around 6.1% under the early adoption scenario. While the scale and timing of technological disruption is uncertain, the McKinsey research undertaken for the Forum in 2019 presents the range of impacts on job churn and displacement rates resulting from technological transition.

Based on existing research, key impacts on firms of the workforce and associated implications include:

- having the right support in place so that economically displaced workers are supported back into decent and meaningful employment, and

[55] Productivity Commission. (2020). Technological change and the future of work (productivity.govt.nz)
[56] Frey, C. & Osborne, M. (2013). The Future of Employment: How Susceptible Are Jobs to Computerisation? Working Paper, University of Oxford, Oxford.
[57] McKinsey. (2019). *Evidence Base on the Future of Work.* Retrieved from URL: Presentation by McKinsey & Company: Evidence base on the Future of Work (treasury.govt.nz)
[58] As at [60]

- having mechanisms for monitoring the rate of technological change so that we are understanding if large scale displacement events are on the horizon.

4.2 Diffusion of technology

Technological transitions also present opportunities to improve productivity

The Productivity Commission[59] have found that New Zealand would overall benefit from technological change. The actual labour market impacts of technological transitions will depend on the diffusion of technologies and uptake by firms, and there is a significant difference between automation potential that has been modelled by the likes of Frey and Osborne (2013; what is technically feasible) and the actual adoption of new technology.

The Productivity Commission has highlighted that Aotearoa suffers from a lack of technological adoption rather than too much, and occupational churn is at historically low levels. [60] Based on proxy indicators, including productivity growth and business start-up rates, the Productivity Commission found that Aotearoa does not face rapid technological progress and adoption. [61] Instead of focusing on the disruptive potential of technological change, the Productivity Commission highlighted that new technologies can expand employment options, raise productivity and incomes, lower costs to households, and overcome barriers to participation in work.[62]

These findings suggest the importance of supporting the diffusion of technology to firms to leverage digital transitions and associated opportunities, rather than limiting technological uptake as a mechanism for shielding the economy from the impacts of technological transitions.

4.3 Skills shifts

Technological transitions can result in skills polarisation, reducing demand for certain skills…

It has been observed[63] that there has been a 'skill bias' in the technological progress seen since the 1960s, with employment shares in higher-skilled managerial and professional roles growing at the expense of shares in lower-skilled agricultural and production. Since the 1980s, digitalisation has been the dominant form of technical change causing the automation of many repetitive tasks, a process referred to as routine-replacing technical change. Routine-replacing technical change is hypothesised to lie behind the rise in employment shares of high- and low-skilled occupations in Europe and the United States in recent decades and falls in the shares of middle-skilled occupations, a phenomenon known as polarisation or "hollowing out" (Autor, 2015; Goos et al., 2014).

The trend of polarisation or hollowing out of routine tasks has also played out in Aotearoa New Zealand. In New Zealand, the employment shares fell for both middle-skilled and low-skilled occupations over 1991-2011. It is expected that occupations relying on physical labour, particularly in predictable or repetitive tasks are most at risk of being displaced by automation, while managers, professionals, care providers and educators have a much lower risk of automation.[64] Automation could also increase income inequality because of a divergence in labour demand and wages, where net demand for managers, professionals, service and retail workers will increase while demand for administrative workers and trade and manual labourers will decrease.

[59] Productivity Commission. (2020*). Technology change and the Future of Work. Retrieved from URL:* Technological change and the future of work (productivity.govt.nz)
[60] Productivity Commission. (2020*). Technology change and the Future of Work. Retrieved from URL:* Technological change and the future of work (productivity.govt.nz)
[61] As at [63]
[62] As at [63]
[63] E.g., e6ced642-en.pdf (oecd-ilibrary.org)
[64] Nedelkoska and Quintini, 2018

…while increasing the demand for skills in emerging areas

Globally, there is expected to be 149 million jobs created in digital technology spaces by 2025.[65] These include software development, cloud and data roles, data analysis, cyber security and privacy and trust roles. In 2019 in New Zealand there were 98,583 workers in IT occupations and the national average salary for these workers is $92,250.[66]

Several studies find New Zealand has a shortage of trained workers for technology sector jobs.[67] In November 2020, there were over 2000 jobs posted on LinkedIn for specialist senior IT roles.[68] Skills shifts are not predominantly about the rise in demand for technology developers – as artificial intelligence builds the capability to complete less routine and more cognitively complex tasks, the skills demanded from human labour are likely to shift towards areas where AI is less capable, namely socio-emotional skills, critical thinking, and creativity. The education and skills system needs to be responsive to a future that is both more 'high tech' and 'high touch', creating demand for both technical digital skills and human centred skills.

The key impacts of technological transitions on skills and associated implications include:

- shifting skills demand where there is weakening demand for routine tasks that are more readily automated, and
- growing demand in emerging tech areas, and the need for a responsive education system that enables learners to attain fundamental digital skills, while also recognising and developing human centred transferrable skills.

4.4 Digital inequities

The gains from technological transitions are not evenly shared across the economy and labour market. Transitions can reinforce existing inequalities, and this section explores the inequitable impacts of technological transitions through a focus on challenges for elderly workers, Māori technological transitions, and gender disparities in the tech sector.

4.4.1 Elderly workers

Older workers are more likely to face challenges attaining digital skills

There are currently around 750,000 people aged over 65 in New Zealand, with this number expected to increase to 1.2 million by 2034.[69] At the same time, the ability to access and use digital technologies is highly related to age:

- 25% of people aged 65 and older and 35% of people aged 75 and over do not have access to the internet,
- Age Concern NZ estimates that 200,000 people, or 30% of seniors don't use the internet, (compared to only 3% of people under 65),
- 30% of people aged 70 and over are not confident using digital devices, and
- 33% of people aged 60-69, 50% aged 70-79 and 79% aged 80 and over lack essential digital skills.

[65] NZTech. (2021) *Digital Skills Aotearoa Report*. Retrieved from URL Digital-Skills-Aotearoa-Report-2021_online.pdf (nztech.org.nz)
[66] As at [68]
[67] Nedelkoska and Quintini, 2018
[68] NZTech. (2021) *Digital Skills Aotearoa Report*. Retrieved from URL Digital-Skills-Aotearoa-Report-2021_online.pdf (nztech.org.nz)
[69] Office for Seniors. (2022). Digital Inclusion for Older People. Retrieved from URL: Digital Inclusion for Older People - Techweek

The Covid-19 pandemic highlighted how lack of access or ability to use the internet can exacerbate the risk of becoming isolated. Seniors were very concerned that a lot of services were moving to digital platforms.[70] An increased reliance on charity Age Concern services was apparent during Covid-19 lockdowns.[71] Digital Seniors[72] is just one of the charities working in this space to help seniors overcome IT issues and develop their digital skills.

4.4.2 Māori technological transitions

There are barriers to Māori leveraging opportunities in the tech sector

The lack of Māori within the technology sector is a significant issue and inequities in education and training have resulted in Māori being over-represented in jobs that face greater risk of becoming obsolete due to technology change and under-represented in the technology sector.[73]

BERL has estimated that over half of the working Māori population are in lower-skilled jobs, and almost half are in jobs that have a high risk of being replaced by automation.[74] Māori remain under-represented in degree and post-graduate degree level courses in computer science and information technology, indicating persisting gaps in the pipeline of Māori entering and leading in the technology sector.

The gaps in Māori leadership in the technology sector and decision-making means Māori are often the consumers and users of telecommunications rather than architects and innovators.[75] This has flow on effects in terms of digital access. For example, telecommunication projects are usually commercially driven based on population size and density, and without capable Māori leadership making key decisions, projects that serve rural Māori are limited.[76]

These findings have implications for the need for Māori-led transformative change to build technology capability and leadership across the tech sector.

4.4.3 Gender inequities

Technological transitions could reinforce gender inequities

Women are disproportionately represented in roles at greater risk of automation. Automation and outsourcing of services will impact on retail, customer services and other low-paid sectors that are often female dominated. Women tend to be concentrated in clerical or administrative roles which are most at risk of automation.[77]

In addition to facing the greatest impacts of transitional change, emerging technology sector job clusters are in predominantly male-dominated STEM (science, technology, engineering, and mathematics) fields, risking a further entrenchment of occupational gender segregation. Women are increasingly gaining qualifications in science fields, but there remain significant gender gaps in other STEM-related fields such as engineering, technology, and mathematics.

In summary, women are less likely to leverage the benefits of employment in the tech sector and are more likely to face distributional impacts, emphasising that tackling gender inequalities should be a priority to achieve just transitions.

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[70] Times-Age. (2017) *Bridging the Digital Divide.* Retrieved from URL: Bridging the digital divide - Wairarapa Times-Age6
[71] ANZ (2020). *Need for Urgent Technology Education Amid Covid-19*. Retrieved from URL: Need for Urgent Technology Education Amid Covid-19 (anz.com)
[72] Digital Seniors. Retrieved from URL: Digital Seniors - Helping Seniors with technology, in New Zealand
[73] MBIE (2019). Evidence base for the Future of Work Priorities.
[74] BERL, (2020). Whano. Towards futures that work: How Māori can lead Aotearoa forward. Retrieved from URL: http://www.maorifutures.co.nz/wp-content/uploads/2020/07/Tokona-Te-Raki-Whano-2020.pdf
[75] Kamira, R. (2020). How Māori can bridge the digital divide in the post-Covid world. Retrieved from URL: https://thespinoff.co.nz/atea/28-04-2020/how-maori-can-bridge-the-digital-divide-in-the-post-covid-world
[76] As at [78]
[77] Going-Digital-the-Future-of-Work-for-Women.pdf (oecd.org)

4.5 Case study summary

Based on the findings in this section, the key policy implications for consideration by the Forum are:

- Education curricula and training provision to take account of employer's future needs, enabled by more proactive and future-focused workforce planning.
- Increasing support for technology adoption and diffusion, to enhance productivity and innovation.
- The need for skills to underpin the absorption of new technologies, having the right system settings in place to support job matching across the labour force.
- The need for a responsive skills system to develop a pipeline of capability and leadership in the technology industry with equitable access and representation.
- There are digital inequities in New Zealand, which mostly impact elderly people, Māori and women.
- The need for all workers in the labour market to have foundational digital skills to respond to the changing nature of work and developing human centred skills that develop skills that are not easily replaced through automation and AI.

5. Case study three: the 1980s reforms

A rapid economic transition in New Zealand took place during the 1980s, induced by a programme of free-market reforms to move away from a highly regulated and protected economy. Many government departments were restructured into commercially oriented organisations (some of which were then privatised), the financial market was deregulated and controls on foreign exchange were removed.[78] The reforms of the 1980s are often used as a case study of an economic transition where the negative impacts of change for affected groups was significant, and not managed in a way that effectively shielded those who faced the most severe disruptions through change. Three key impacts of the economic transition of the 1980s are explored in this review:

1. Impacts on Māori and Pasifika employment
2. The impact on households
3. Industrial and regional impacts

5.1 Impacts on Māori and Pasifika employment

Inequities in education and employment have undermined Māori and Pasifika resilience to economic transitions

The impacts of the economic transition in the 1980s are seen as one of the most prominent events in recent history that demonstrate how labour market inequities for Māori and Pasifika can be exacerbated by economic transitions.[79] At the time of the 1980s reforms, Pasifika people faced disadvantages in the labour market driven by the terms that they migrated under (e.g. by offering temporary work visas to Pasifika people to work in low-skilled occupations) and the features of New Zealand's economic and social landscape that hosted Pasifika migrants.[80]

The labour market position of Māori at the time of the 1980s reforms was a consequence of colonisation and the measures introduced such as the Tohunga Suppression Act 1907 and the Māori Lands Administration Act 1900 that curtailed Māori economic and employment potential.[81] Māori and Pasifika have been underserved by education and training [82] resulting

[79] New Zealand History, (2021).
[80] MBIE (2020). White Paper. Assessing the impacts of a COVID-19 triggered recession on Māori and Pasifika. A policy perspective to enable a more transformative COVID-19 recovery for Māori and Pasifika.
[81] BERL, (2020). Whano. Towards futures that work: How Māori can lead Aotearoa forward. Retrieved from URL: http://www.maorifutures.co.nz/wp-content/uploads/2020/07/Tokona-Te-Raki-Whano-2020.pdf
[82] BERL. (2019). *Education Awa: Education Outcomes for Māori.*

in structural inequities at the time of the 1980s reforms where Māori and Pasifika workers were disproportionately represented in jobs deemed low-skilled, such as those in construction and manufacturing.[8384] The economic reforms of the 1980s shone a light on the inequitable labour market conditions faced by Māori and Pasifika.

The employment rate demonstrates the severity of the 1980s reforms on Māori and Pasifika

The key indicator that is used to demonstrate the impacts of Māori and Pasifika employment inequities that resulted from the 1980s transition is unemployment rate by ethnicity. As seen below in Figure Four, Māori and Pasifika unemployment reached 25% by 1992 compared to a national rate of 10%.[85]

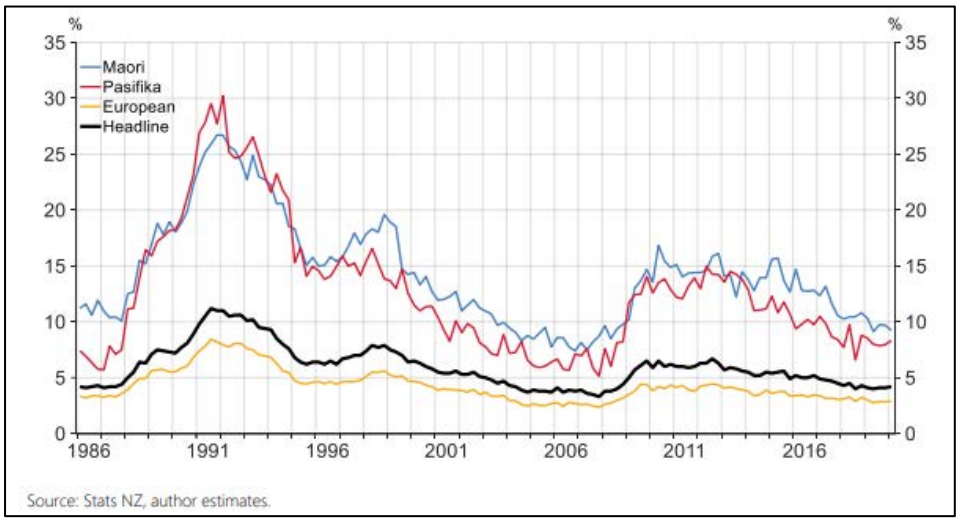


Figure four, Unemployment by ethnicity, sourced from RBNZ (2022).

The closure and downsizing of businesses in the late 1980s and 1990s affected a disproportionately high percentage of Māori workers, as Māori were highly represented in some government-managed industries, including forestry, railways, road works and the Post Office.[86] [87]

In addition to the high unemployment rate, Māori and Pasifika faced greater difficulties finding new jobs, and in some cases faced structural unemployment where jobs of a similar nature to their previous roles no longer existed in their rohe.[88] [89] There were also longer-term unemployment spells, with Māori and Pasifika employment figures taking much longer to bounce back from the transition.[90] The disproportionate impacts of the 1980s reforms has been attributed by the Reserve Bank[91] and MBIE[92] to be a consequence of Māori and Pasifika workers having lower skills attainment in education on average. This meant Māori and Pasifika had greater difficulties finding re-employment in the contracted labour market and meeting a higher benchmark for skills, education, and experience with greater

[83] As at [84].
[84] As at [83]
[85] As at [84]
[86] Love, M. & Love, T. (2010). *Ngā umanga – Māori business enterprise - History of Māori enterprise*. Retrieved from URL: http://www.TeAra.govt.nz/en/photograph/24544/tomoana-freezing-works-closure
[87] Keane, B (2010). *Te rāngai mahi – Māori in the workforce - Mid-1980s–2000s.* Te Ara - the Encyclopedia of New Zealand, http://www.TeAra.govt.nz/en/te-rangai-mahi-maori-in-the-workforce/page-5
[88] Te Puni Kōkiri. (2009). Implications of a Recession & Motu. (2015) Economic Liberalisation and the Mobility of Minority Groups: Evidence from Māori in New Zealand.
[89] MBIE. (2020). *Assessing the impacts of a COVID-19 triggered recession on Māori and Pasifika*: A policy perspective to enable a more transformative COVID-19 recovery for Māori and Pasifika.
[90] As at [92]
[91] Reserve Bank. (2019). The impacts of job displacement on workers by education level. Retrieved from URL: https://www.motu.nz/our-research/productivity-and-innovation/firm-productivity-and-performance/the-impacts-of-job-displacement-on-workers-by-education-level/
[92] As at [92]

competition in the labour market for fewer equivalent jobs. These factors resulted in many Māori and Pasifika displaced workers settling for lower quality employment with lower earnings.[93]

Overall, the transitioning of New Zealand's economy to a free-market economy and the movement away from secondary processing and manufacturing demonstrates how labour market inequities and segregated labour markets for Māori and Pasifika can lead to severe and sustained employment disruptions.

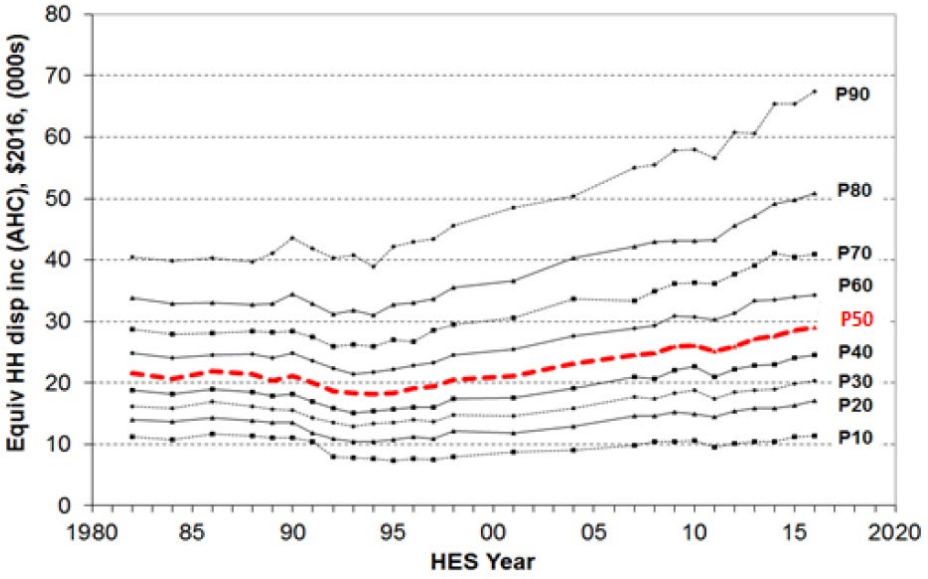
This review has found that the key impacts of the 1980s transition for Māori and Pasifika employment and associated policy implications, are primarily related to disproportionately harm Māori and Pasifika employment[94] due to:

- Māori and Pasifika workers being employed in sectors which were disproportionately impacted by the 19080s transition,
- Māori and Pasifika workers being in more exposed positions within the labour market which makes them more at risk of redundancy and poor long term labour market outcomes
- Māori and Pasifika workers having fewer recognised transferrable skills to support them to find reemployment.

5.2 Impacts on households

The 1980s reforms significantly impacted household wealth

The 1980s reforms and associated policy measures, such as the 1982 wage freeze had significant impacts on household incomes. Figure five illustrates that disposable household incomes were relatively stable with small margins between percentile groups prior to New Zealand's economic recession in 1991-93.[95] The 1980s reforms correlate with flattening disposable income growth for lower-income deciles (below the red line) compared to the upper income deciles, with income inequality growing rapidly for households following the 1980s reforms.



[93] As at [91]
[94] MBIE. (2020). *Assessing the impacts of a COVID-19 triggered recession on Māori and Pasifika*: A policy perspective to enable a more transformative COVID-19 recovery for Māori and Pasifika.
[95] As at [97]

Figure five, Real equivalised household Incomes after household costs at Decile Boundaries.[96]

The 1980s reforms and the closure of key forms of employment in particular regions also impacted housing, and housing markets slumped in regions that were most severely impacts by the reforms. In addition, the Housing Corporation offered to buy houses from people who had to move for a new job, which had the perverse effect of depressing the market for those who stayed behind.[97]

The impacts of transitions on household units are extremely significant when also taking account of rising costs of living seen through the consumer price index, the collapse in regional house prices (household equity), and an increase in costs of living (New Zealand's consumer price index and inflation spiked to a high of 18.4% in 1980)[98]. The decrease in disposable incomes, depressed housing markets coincided with exogenous factors such as rising costs of living to have an inequity deepening impact on household units.

The 1980s reforms had social impacts for household units

At a household level there are also accounts of the social impacts of the 1980s reforms on overall wellbeing and quality of life. In mid-1986 a Social Impact Unit was established within the State Services Commission to undertake research and minimise the negative aspects of widespread job losses that resulted from the 1980s reforms[99]. The Unit and other entities compiled a range of social impact assessments and reviews for several main urban areas and for rural communities, predominantly the East Coast Region, Northland, Waikato (Huntly and Te Kuiti), Tutira (north Hawke's Bay), West Coast, North Otago and Southland between December 1986 and February 1987. This research[100] identified the social, lived impacts of the reforms on households such as impacts on mental health and wellbeing, changing household dynamics, and an overall increase in poverty indicators such as housing and food insecurity.

Overall, key impacts of the 1980s transition for households, and associated policy implications include:

- impacts on family finances and income distribution between households, and
- significant social impacts in terms on mental health, family dynamics and whanau wellbeing.

Further work could be undertaken to better understand the complexities of economic, structural, and social change during the 1980s reforms and the findings of the Social Impact Unit research to draw out important lessons to consider for just transitions work going forward.

[96] MSD (2017). Real equivalised household Incomes after household costs at Decile Boundaries 1982-2016.
[97] Matthews, P. (2017). Rogernomics, 30 years later. Retrieved from URL: https://www.stuff.co.nz/national/politics/91005330/towns-full-of-weeping-women-rogernomics-30-years-later
[98] Reserve Bank (2006). Retrieved from URL https://www.rbnz.govt.nz/-/media/project/sites/rbnz/files/publications/bulletins/2006/2006mar69-1hodgetts.pdf
[99] Pomoroy, A. (2019). Insights from the eighties: early Social Impact Assessment reports on rural community dynamics. Retrieved from URL: https://www.nzaia.org.nz/annpomeroy.html
[100] Melser, P.; Lloyd, J.; Moore, C.; & Levett, A. (1982) Patea after the freezing Works: An Assessment of the Social and Economic Impact of the Closure of the Patea Freezing Company Technical Report No 12, Town and Country Planning Division, Ministry of Works and Development, Wellington. Taylor, N.; Abrahamson, M.; & Williams, T. (1987) Rural change: issues for social research, social assessment and integrated rural policy Discussion Paper, Centre for Resource Management, University of Canterbury and Lincoln College, Canterbury

5.3 Industrial and regional impacts

The 1980s reforms led to large scale industrial changes

The de-licensing of the meat-freezing industry in 1980s, and the softening of restrictions on road transport led to the closure and decline of many large-scale industrial operations. The opening up of trade, including the removal of farm subsidies, and the increase in manufactured imports reduced demand for locally manufactured products resulting in fewer manufacturing jobs.[101] Manufacturing's share of employment has steadily declined in New Zealand since the 1970s – from 25% of jobs in 1976 to 10% in 2013.[102] In addition, small firms including local producers were affected by the international downturn in commodity prices for key export items, such as meat and wool, which made many freezing works unviable and saw significant closures and consolidations across New Zealand impacting farmers and rural local economies that serviced the farming sector.

As a result of the rapid conversion of government departments into State Owned Enterprises (SOEs), 4732 people had taken voluntary redundancy and another 100 went for early retirement, amounting to close to 5000 redundancies in one week, largely in small town and rural New Zealand.[103] In all, 19,133 departmental workers in Lands and Survey, Forestry, the Electricity Division, Civil Aviation, State Coal, and the Government Accommodation Board were affected by the changes. These changes spelt significant impacts for workers and regions across the country, however, these costs were not evenly distributed.

Particular regions faced severe impacts based on tight labour markets and few sources of employment

The industrial and regional impacts of transitions of the 1980s reforms were severe for specific small towns in Aotearoa New Zealand. Many small towns continue to experience economic impacts from policies that originated in the 1980s. The Social Impact Unit saw higher adjustment costs for workers in regionally isolated areas with tight labour markets and focused on identifying needs at a regional level where adjustment costs were higher. The closure of a place's most significant employer, such as the freezing works or manufacturing plant, often began a domino effect as smaller businesses had to downsize or close as they adapted to the reduced demand in the town.[104]

Regions most affected by these changes included forestry towns Tuatapere and Tapanui, where the forest workers were laid off having flow on affects for local shops and mining communities such as Ohai and Nightcaps.[105] Similarly, in Pātea and Moerewa, the Freezing Works closures coupled with isolation from alternative forms of employment led to a high proportion of working-age people leaving these places for jobs elsewhere and younger generations leaving the towns after finishing schooling, resulting in the local populations declining. Evidence has shown that Pātea still endures a permanent shock to its population and outcomes from the closure.[106] Town vibrancy, economic viability and labour supply

[101] In 1976 manufacturing accounted for 25 per cent of jobs in New Zealand, but by 2013 it accounted for less than 10 per cent of national employment [Source: Productivity Commission Working Paper, *New jobs, old jobs: the evolution of work in New Zealand's cities and towns* October 2019].
[102] Coleman, A., Maré, D., Zheng, G. (2019) *New Jobs, Old Jobs: the evolution of work in New Zealand's cities and towns*. Productivity Commission Working Paper and HLFS Regional Employment Data. Statistics New Zealand.
[103] Matthews, P. (2017). Rogernomics, 30 years later. Retrieved from URL: https://www.stuff.co.nz/national/politics/91005330/towns-full-of-weeping-women-rogernomics-30-years-later
[104] Howard, Quintin, NZTA *Back to the future 2015 The death and life of small New Zealand towns* *https://planning.org.nz/Attachment?Action=Download&Attachment_id=3160*
[105] A at [106]
[106] Grimes, Arthur and Chris Young (Motu) Spatial Effects of 'Mill' Closures: Does Distance Matter? Motu working paper 2009 https://motu-www.motu.org.nz/wpapers/09_12.pdf

remain problematic in some places, demonstrating the severe impacts that economic transitions can have on regionally isolated communities that rely on a small number of large employers.

Based on existing research, the key impact of the 1980s transition for regions and associated policy implications include:

- managing the pace and scale of change to allow affected industries to plan and respond to changes, and
- the importance of policy levers to nurture new industry and investing in transition aligned growth opportunities to diversify local employment opportunities in exposed regions.

Further work could be undertaken to understand regional risk and resilience to economic transitions to learn from the experiences of the 1980s reforms and proactively map regions less resilient to economic changes (such as the transition to a low emissions economy).

6. Summary and key findings

This literature review explores the impacts of economic transitions on firms, workers, regions, and households. Based on a review of three important transition case studies - climate change, technology change, and the 1980s reforms – the review's key findings are:

- The impacts of past transitions have not fallen equitably across the population, and the costs of adjusting to economic transitions can fall heavily on particular groups. For example, Māori firms and workers are often hit hardest and longest in terms of the impacts on employment and asset ownership.
- The impacts of climate change mitigation policies will likely be felt heavily by emissions intensive industries, and we expect impacts to also materialise for associated workers, SMEs in supply chains and low-income households.
- Technology transitions are expected to shift skills demand over time and change the nature of work, raising the bar for workers to improve digital literacy, gain human centred transferrable skills, and attain formal recognition of skills.
- Absent of careful management, rapid economic shifts such as the 1980s reforms can have deep and sustained impacts on regional labour markets, with severe impacts in regions with a heavy reliance on exposed industries.
- The social impacts of transitions can be harmful to individual and whānau wellbeing, resulting in reductions in disposable income, increasing costs of living, energy hardship, increasing food insecurity, impacts on mental health and wellbeing, and changing household dynamics.

These findings suggest that future economic transitions, if poorly managed, are likely to continue to deepen inequities in the economy and labour market.

Taking a just transitions lens presents an opportunity to do things differently, and proactively working to rebalance the labour market and supporting at risk firms could ensure the costs and benefits of transitions are shared more equitably. For example, a just transition approach presents an opportunity to address gender segregation and pay gaps in the transition from high emissions activities to low emissions activities, rather than replacing like for like (e.g., male dominated high emissions energy sector to a male dominated low emissions energy sector).

There are limitations to this review given resource and time constraints, and the absence of granular information on the impacts of transitions for particular firms, workers, regions, and households in Aotearoa. However, the review has started to canvass what we do know about the impacts of transitions and identify what we don't know. Further work could be undertaken to fill information gaps by exploring:

- Regional exposure to economic transitions to identify towns, communities, and firms most at risk of poor labour market outcomes.
- The household impacts of climate change mitigation policies and associated policy responses that could support low-income households to transition.
- The expected timing and scale of the costs of policy interventions (e.g., ETS pricing) that businesses could face in the transition to a low emissions economy.
- The impacts of transitions on particular population groups e.g., younger workers, Pasifika, recent migrants.
- The needs of high emissions intensity firms and industries (both large firms and SMEs in supply chains) in the transition to a low emissions economy.
- Using forecasting tools/modelling to improve our understanding of the impacts of transitions on the labour market and future skills requirements.

Further detail on possible work is outlined in Appendix One. Work in these areas could sharpen the Forum's understanding of the impacts of transitions and help to inform the targeting and design of future just transition interventions in Aotearoa.

Given that there are a range of other international and national events that trigger a transition, beyond the case studies in this review, we consider it necessary to have a just transitions approach that is both *targeted* to those who bear the greatest costs and are least able to respond by themselves, and *flexible* so that responses are adaptable to the nature and severity of different transitional events.

Learning from past experiences and the key impacts noted in this review, we consider that the key levers that support a flexible and targeted just transitions system should include:

1. **Setting the direction**: The pace of change can have significant impact on firm and labour market outcomes, highlighting the need for direction setting, regulatory certainty and predictability around the nature and timing of transitions.
2. **Planning for change:** Proactive transition planning is an important lever to chart transition pathways for particular industries, workers and regions, and social dialogue can empower affected groups to identify challenges and solutions.
3. **Strengthening research and evidence base to identify international trends and supporting the diffusion of ideas and new technology**: Aotearoa can struggle with the diffusion of technology and ideas, and further work could be required to raise awareness of transitions, support research and development, and incentivise the adoption of new tools and business models.
4. **Fostering responsive skillsets**: Education and training systems are fundamental in transitions to help workers and firms recognise transferable skills, help workers to access reskilling opportunities, and help firms access talent pipelines to enable transition aligned growth
5. **Providing support to firms**: Many firms will be well positioned to transition by themselves with the right information, but many others will require improved access to capital and complementary training and advisory support to have the resources and expertise to respond to undertake transition aligned growth.
6. **Managing distributional impacts**: Transitions deepen labour market inequities, justifying the need for equity-based approaches that rebalance workforce dynamics and remove systematic barriers for certain workers and firms in transitions

7. **Supporting economically displaced workers**: Differences in mobility, search costs and wage scarring highlight the importance of income support and back to work support for economically displaced workers.

These findings have helped to guide officials to develop an effective just transition policy suite for businesses and workers to be discussed at the 19 September Future of Work Forum on just transitions.

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Appendix one: Future research areas

Table One: Future research areas

Target	Title	Description	Purpose/gap that it fills in our understanding of transitions
Regional insights	Exploring placed based risk and resilience to economic transitions	Undertake research (using the IDI, RSLG info, regional isolation index) to explore regional exposure to economic transitions by undertaking granular analysis of: • Regional employment structures • Regional firm characteristics, and the 'thickness' of labour markets and industry diversification • The emissions exposure of firms and workforce	This work would support our understanding of how just transitions policy interventions (such as regional diversification projects) could be targeted to the regions, towns and communities that are most exposed to transitions and least able to respond by themselves.
Labour market forecasting	Refining estimates of the impact of transitions on jobs and skills requirements	The most complete and recognised method of estimating the economic impacts of change is through Computable General Equilibrium (CGE) modelling (This adopted by He Pou a Rangi/the Climate Change Commission to analyse the impacts of climate policy). CGE modelling can give indications of the increases in job churn, especially in relative terms when comparing different scenarios. Coupled with place-based indicators about the strength and resilience of local labour markets, such proxies could be used to signal hot spots of displacement risk and the presence of adjustment costs and skills requirements in economic transitions.	Further work using forecasting tools/modelling could strengthen our understanding of the impacts of transitions on the labour market and future skills requirements.
Low-income households	Exploring the impacts of climate change mitigation policies on low-income households.	Apply a similar methodology to Eurofound research on the *Distributional impacts of climate policies in Europe* to improve our understanding of the impacts of climate mitigation policies in Aotearoa for low-income households by income level, ethnicity, income source, and household composition.	This could provide insights into the design of climate policies, and the need for complementary just transitions interventions that could be required to manage the impacts of climate change for low-income households.

Lived impacts of transitions	Develop persona journeys to chart individual experiences of transitions	Develop persona journeys for firms and workers facing the impacts of economic transitions to consider different transition pathways, the impacts of transitions on individual wellbeing, and to identify important intervention points for government.	Persona journeys could be useful for understanding the social impacts of transitions, getting a picture of what transitions can look like in practice for affected groups, and to stress test current policies and programmes under different scenarios.
Women's employment	Applying a gender lens to just transitions interventions	Undertake further work to understand the impacts and opportunities to address gender segregation and gender pay gaps in the transition from high emissions activities to low emissions activities.	This work could highlight linkages between the work of the Forum on just transitions and the Women's Employment Action Plan.
Māori-led research	Explore just transition for tangata Māori	Allocate resources so that Māori can lead research to explore the impacts of economic transitions, monitor changes in the labour market, and provide better information on the types of support could enable tangata Māori to transition equitably through times of economic change.	This could allow the Forum's to make space for Māori to be leading research into the impacts and opportunities of transitions for Māori.
Firm level impacts	Understanding the needs of high emissions intensity firms in the transition to a low emissions economy	Undertake qualitative research with businesses to discuss the impacts of the transition to a low emissions economy and understand what support businesses are looking for to transition.	This could provide insights into how Government can manage the impacts of the transition for exposed businesses.
	The costs of climate change for businesses: Horizon scanning	Undertake modelling to determine the scale and timing of costs/impacts of climate mitigation policies (e.g., emissions pricing) for businesses.	This work would support direction setting and increase businesses awareness of what the impacts of climate change mitigation will be, and when the pain points are likely to occur.