Future of Work Tripartite Forum Research

Insights into emissions-intensive, trade-exposed businesses

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May 2023

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Glossary

Abbreviation	Stands for
EITE	Emissions-intensive, trade-exposed
ETS	Emissions Trading Scheme
GIDI	Government Investment in Decarbonising Industry
ITP	Industry Transformation Plan

Executive summary

There is a collective desire to ensure that New Zealand transitions to a low emissions economy in a way that delivers a 'just transition' while avoiding economic shocks and job destruction in the process. Key work initiatives related to this collective desire include the Just Transitions Partnerships programme led by the Ministry of Business, Innovation and Employment (MBIE) and the development of an Equitable Transitions Strategy under the Emissions Reduction Plan, co-led by MBIE and the Ministry of Social Development. Achieving a Just Transition necessitates a full understanding of the challenges and likely solutions to ease the transition to a low-emissions economy. Towards that objective, the Future of Work Tripartite Forum is seeking to better understand the steps that emissions-intensive, trade-exposed (EITE) businesses have, and are, taking to transition to a low-emissions economy, their views of what their future looks like with current and proposed settings, as well as the barriers and possible solutions to transition to a low-emissions economy, in a way that ensures a 'just transition'. MBIE contracted Sapere to conduct this research.

Our approach

We interviewed leaders of emissions-intensive, trade-exposed businesses (EITE) businesses in New Zealand (*n=11, response rate of 92%).*[1] Interviews were conducted in a semi-structured format, guided by a series of questions, while also encouraging interviewees to provide any relevant insights beyond the purview of our questions. The key areas we sought to discuss with participants included:

- the business' progress on its decarbonisation journey
- perceived comparisons with international suppliers of similar products
- views on importation effects (where relevant) if the business ceased operations in New Zealand
- challenges associated with remaining competitive in its markets
- barriers and challenges associated with decarbonisation
- the prospective role of new technologies, and challenges adopting those technologies
- an understanding of what a policy and business landscape conducive to decarbonisation looks like
- recommended changes to the Future of Work Tripartite Forum
- areas for further research to support the identification of challenges and opportunities associated with transitioning to a lower-carbon future.

Interview findings were analysed and have been presented in this report in a structure consistent with the key areas of discussion.

[1] 12 businesses qualified for the survey, 11 participated in detailed interviews, and all were given the opportunity to review the final draft.

Key findings

Although this work was principally an exercise in exploration, we were guided by a series of questions, the answers to which are set out below.

Where companies sit in terms of decarbonisation

Broadly, participants articulated a perception that they have come a long way on their decarbonisation journeys. Decarbonisation goals are being achieved by technological step-changes that have reduced the carbon intensity of core processes. Concurrently, the electrification of vehicle fleets has also assisted with the decarbonisation of EITE firms. However, a smaller contingent of participants described their progress towards decarbonisation as "embryonic" and hampered by the general availability of technology or the commercial viability of relevant technologies.

Perceptions of how your company compares with the international suppliers of similar products

Generally, participants noted that their progress had been greater than, or comparable to, their international counterparts. Some participants described their carbon intensity profiles as "world-leading", meaning they perceived their emissions intensity to be considerably lower than businesses producing the same, or similar, products in other jurisdictions. However, it was also articulated that other jurisdictions had done a better job of incentivising decarbonisation and carbon sequestration, and participants were therefore falling behind some of their international competitors.

Whether NZ would need to import those products if your company were to cease making the products in New Zealand and would importing the products increase emissions globally

All (importing) participants noted that importation of their product would be necessary if their businesses were to cease operations in New Zealand. In most cases, participants advised that products would have to be imported from Asian jurisdictions where there is little to no regulation regarding carbon emissions. Consequently, carbon leakage (increased global emissions) would likely occur following their cessation of New Zealand-based processing.

Other challenges your company face that impact your ability to be competitive

In an international setting, (exporting) participants advised that competition with businesses operating in jurisdictions without legislation like the Emissions Trading Scheme (ETS), or an equivalent carbon pricing mechanism, was challenging, as those businesses typically have a cost-based advantage. No participants thought that the marketing advantage of the regulation we have in New Zealand was a net advantage in their markets. However, in some cases, it may be a necessary factor to maintain the level of access currently achieved.

The key barriers/challenges your company faces in achieving its decarbonisation goals

Most barriers cited for further progression relate to the commercial availability of technology. For some EITE businesses, the technology does not yet exist to decarbonise their core processes. For others, the technology exists, but it is not yet commercial or scalable to the extent it can substitute current processes. In cases where technology exists, participants expressed difficulty in attracting the level of capital investment required. Saliently, developing a business case for investing in new technologies is undermined by regulatory uncertainty and unpredictable changes to the ETS baseline. The long-term

certainty of regulatory impacts on business cases for large-scale decarbonisation investments is critical to attract the capital to implement the technologies. This capital is often competed for in a global market (often an internal market), and other jurisdictions provide greater certainty. Moreover, in other jurisdictions, EITE businesses receive strong incentives for emissions abatement, that are generally not available in New Zealand. Other barriers cited included the long-term price trajectory of renewable energy and the security of the supply chain for alternative fuels.

An operating environment that is supportive of company success

Participants described a conducive operating environment as being one of regulatory stability and certainty, as this would ease the attraction of capital investment in decarbonising technologies. A desire for nuance and bespoke policymaking, tailored to the particulars (technology curve) of each EITE business, was also expressed, but mixed views were reported on this issue with some not favouring it at all. Some participants indicated that a bespoke operating environment could reflect the risk of carbon leakage (and reflect the need to reduce global emissions because of any regulatory framework).

Changes recommended to the Future of Work Forum

Participants advised that expanded funding opportunities for decarbonisation would be welcomed. This was generally expressed as a significant expansion of the Government Investment in Decarbonising Industry (GIDI) funding programme. Financial incentivisation of carbon sequestration schemes, such as those found in the USA, was recommended. Participants also suggested mechanisms, such as altering the forestry sector Industry Transformation Plan (ITP), to ensure a reliable supply of biomass and biofuels. All participants agreed (or proposed) that regulatory certainty would be a positive development. We note that participants generally responded to this question holistically in terms of all government action, as compared to specific objectives or responsibilities of the Future of Work Programme.

Further research needed to identify the challenges and opportunities associated with transitioning to a lower-carbon future

Several areas of research were identified by participants, including: (1) the economic impacts of EITE business shrinkage or closure (including global emission increases); (2) supply chain resilience and availability of alternative fuels, and of alternative technologies; (3) New Zealand's strategic resilience in the global economy; (4) long-term economic supports for coal communities as New Zealand moves away from fossil fuels; and (5) afforestation research that establishes a pathway to native afforestation without negatively impacting productive exotic afforestation.

A note on this report

This work was proposed by Business NZ and the BusinessNZ Energy Council. The purpose of this report is to better understand the steps that emissions-intensive, trade-exposed (EITE) businesses have taken, and are taking, to transition to a low-emissions economy, and their view of what their future looks like with current and proposed settings. The barriers and possible solutions to transition to a low-emissions economy, in a way that ensures a 'just transition', are also canvassed.

EITE businesses are defined by high levels of process emissions and international trade. In the New Zealand context, EITE businesses are not necessarily related by shared processes or customer bases. Instead, they are defined in the Climate Change Response Act (2002) and may be eligible to apply for an allocation of NZ Emissions Trading Scheme (ETS) units. Emissions-intensive businesses typically have high levels of fuel, energy, and process-based emissions, when contrasted with the revenue generated from their primary business activities. In parallel, trade-exposed businesses are defined quite broadly and include all industrial activities, unless those activities do not involve international trade, or if it is not economically viable to import or export the output from their activities. This can mean the business competes domestically with overseas-based competitors, or exports and competes in international markets.

Our sampling and reporting strategy

We survey and report the perspectives of EITE business representatives: We do not seek to analyse, verify, nor refute the perspectives provided by EITE business representatives in this report. We intend to provide EITE business perspectives, unedited and uninfluenced by our interpretations. We have drawn out common themes and issues and noted where there is uniformity of viewpoints or a diversity of opinion, or where there are outliers. Respondents included chief executives, country managers and executives responsible for global carbon reduction, decarbonisation projects and other functions. In many cases multiple engagements occurred with different parts of each business.

We sampled the 12 largest EITE businesses for this report. At the time of writing, there are around 75 businesses in New Zealand receiving industrial allocations.[2] Of these businesses, 12 were sampled, based on their size. Of these 12, 11 agreed to participate, giving us a response rate of 12 per cent.

Sampled EITE businesses operate in a range of sectors: Businesses sampled operate in dairy, mining, construction, refinery, paper and pulp, agriculture supply, and forestry.

We sought to interview managers and decision-makers: To obtain the insights sought, we asked to interview executive level decision-makers and sustainability managers. This meant businesses had some discretion in providing interview participants. As such, some interviews (*n=3)* involved only one representative from the business, while others (*n=8)* followed a group-style format. Generally, a broader range of insights were generated from multiple participant interviews.

[2] https://www.epa.govt.nz/industry-areas/emissions-trading-scheme/industrial-allocations/decisions/

Some quotations are edited for confidentiality: Quotations are used throughout this report to provide a contextual and evidential basis for our findings. Extensive efforts have been made to provide these quotes in a raw, unedited, form. However, due to confidentiality and the protection of commercially sensitive information, some alterations have been required. Participants have been included in consultation on the draft of this report.

Decarbonisation progress

Participants were asked to provide their perspectives on where they were on their 'decarbonisation journey'. For the most part, participants indicated that they had come a long way on their journeys and were doing comparatively better than some of their international counterparts. Respondents noted that they have strategies in place, have made progress in implementing these strategies and broadly agree with the assessment that the carbon price will rise, emissions will fall, and that this will impact business processes.

Most EITE businesses are far into their decarbonisation journeys

For the most part, participants expressed a positive sentiment regarding their decarbonisation journey. Most articulated a view that they had made significant progress towards decarbonisation.

> "We are almost fully decarbonised on the process side of things."

Moreover, many noted that their progress was comparatively greater than that of their international counterparts because their emissions intensity is lower than comparable businesses operating in other jurisdictions.

> "Our carbon profile is one of the best on the planet. Our carbon emissions are well below the global average. World-class really."

However, it was also noted that there was still an opportunity to further reduce emissions intensity through sustained investments in incremental changes.

> "I guess we are a long way along that journey, we've done the obvious stuff, but there are opportunities more along the incremental side of things."

Some are at an early stage

A small sample of participants described their decarbonisation journey as early stage, where they are just beginning to research opportunities to reduce the emissions arising from their core business activities.

> "If I were to answer honestly, I would say that we are at an embryonic stage of the decarbonisation journey."

These participants also explained that they were in the process of developing new projects and initiatives that would decrease their emissions output.

> "We have plans and have been making some small changes, installing solar panels and the likes. But we are looking at projects to reduce our carbon footprint."

EITE businesses are tracking well against international competitors

Most participants noted that their progress was greater than, or comparable to, their overseas counterparts. However, others noted that they lagged behind their overseas competitors, due

to better incentives being offered by governments in other jurisdictions.

> "Governments elsewhere have invested in mills, and the policy reflects that. We're essentially competing against firms with direct financial incentives to decarbonise. They have incentives that actively encourage investment in technology and emissions reduction plans."

Decarbonisation is reliant on technological step-changes

Participants advised that, despite there being an incremental component (core, large-scale, process), decarbonisation largely relies on significant step-changes in different processes, technology availability, and capital.

> "In a large industry, you're reliant on step changes – that means looking out for different grades of products, new emissions-reducing technologies, and capital investment. "

As highlighted later in the report, EITE businesses in New Zealand must overcome certain barriers including, issues related to technology adoption, the domestic policy environment, a continued reliance on gas for core processes, sustained and reliable access to biofuels, and the consenting process, to achieve these technological step-changes.

Some firms have hit a decarbonisation ceiling

Some participants explained that they have decarbonised as much as possible given the present landscape of available technologies and, as such, have hit a barrier to further reductions in emissions.

> "The chemical reaction required to produce **[product]**, the raw material emits CO2, and we can't change that chemical reaction. In all the research we have done and seen it just isn't possible."

For these firms, there are limited actions and investments that can be made to reduce their carbon emissions incrementally further. Instead, they are required to await the development, or commercial availability, of emissions-reducing technologies, and make a choice to invest heavily in a new core process. Some respondents expressed concerns that incremental policy changes to increase incentives to decarbonise, in the face of this technological future, will threaten the existence of the businesses or threaten their continued presence in New Zealand.

Drivers of decarbonisation

Participants were asked to provide their motivations for transitioning to a low-emissions model. Four main reasons were provided: financial rationality, market rationality, policy, and continued investment.

Decarbonisation is financially robust

Some participants pointed out that it is financially sensible, in many cases, to transition towards a low-emissions model. Specifically, these participants referenced opportunities arising from transitioning their vehicle fleets away from diesel and towards electricity.

> "It's financially rational to change our fleets, as electricity is currently cheaper than diesel. It's about the operational savings we experience, electricity vs diesel."

In other words, the prospect of operational efficiencies can encourage EITE businesses to

initiate or expedite their transition to a low-emissions model.

The market expects decarbonisation from businesses

Across the spectrum of participants, there was a view that the demand of the market is a key driver of decarbonisation. As market awareness of climate change and altering customer perspectives orient towards climate change mitigation, demands change. In response, EITE businesses need to be seen to decarbonise to remain competitive.

> "Our markets do care and ask about our sustainability credentials."

> "If our customers want low-carbon products, there is a strong driver for us to find these technologies."

Although market demands are not the sole driver of decarbonisation in EITE businesses, it was frequently cited as significant by those delivering retail products. However, it was not cited by exporters who export into commodity markets. In those cases, there was no perceived benefit, other than the threat of regulations that require it in destination markets (and therefore access to those markets).

Policy and regulation incentivise decarbonisation

Regulation, specifically that within the ETS, was also cited as a factor encouraging decarbonisation. Participants noted that the scheme had prompted decarbonisation activities.

> "I don't think there is much denying the ETS has been effective in encouraging businesses like ours to decarbonise."

Importantly, however, it was also noted that uncertainty or instability in policy may also prohibit decarbonisation activities. As such, many participants advocated for long-term certainty from the government, particularly around the ETS.

Decarbonisation can permit access to investment capital

To ensure their continued decarbonisation, some participants advised that they required sustained (or significant) capital investment. Although there are several factors impacting the investment landscape, participants noted that to be on a 'path of continued decarbonisation' was required to receive investment. Investment sources varied, from internal markets for the allocation of decarbonisation capital globally, to funds that specifically target these investments, to government sources and market funds.

> "If we want investment, we need to be able to demonstrate to investors that we are on a path of continued decarbonisation."

Many respondents cited the long-lived nature of the capital investment required, especially in core processes. Once implemented, there are limited changes that can be made in some cases. In other cases, there are incremental changes that can be achieved. EITE businesses require investment to decarbonise, while having to engage in decarbonisation to attract investment.

Further opportunities for decarbonisation

Participants were asked to identify areas of opportunity for further decarbonisation. Four main areas were identified, including the electrification of processes, decarbonisation of

vehicle fleets, moving to an entirely renewable grid, and the expansion of alternative fuels.

Decarbonisation can occur via the electrification of processes

Some participants advised that there is opportunity, theoretically, to electrify their core business processes.

> "We can electrify parts of our business now, and there are opportunities in our processes, but the electricity requirements are too high for us at the moment."

Realising process electrification opportunities is contingent on reduced electricity requirements, which indicates a step-change in technology may be needed. In other words, some EITE businesses are awaiting the arrival of technologies that facilitate the electrification of their core processes. However, in some cases, the grid investment required for the electrification of processes is not feasible or financially viable. This can, in part, be attributed to the cost of connecting to the electricity grid when located in rural and regional locales of New Zealand. With several EITE businesses being regionally based, this could be considered an ongoing barrier to decarbonisation via electrification.

...and moving vehicle fleets to alternative fuels

A sample of participants explained that they had identified technologies, and possible solutions, to permit the decarbonisation of their vehicle fleet, including electrification and hydrogen technologies.

> "The technology we are looking at now will allow us to use a blend of hydrogen and diesel in our trucks, so we can run on dual fuels. The trucks we have at present should be able to handle that."

Of electric and hydrogen-powered vehicles, hydrogen was viewed as the most favourable option, as this technology can be retrofitted to existing vehicle fleets. Electricity, on the other hand, would require the purchase of new vehicles. That said, it was also advised that there are challenges related to obtaining a reliable source of hydrogen fuels, especially in the more rural parts of New Zealand.

> "Hydrogen diesel is probably the first step for us, but in the Hawke's Bay, there is no infrastructure for that. At this stage, we would probably have to produce the hydrogen ourselves."

Moving to an entirely renewable grid would support decarbonisation

A small group of participants, whose businesses had electrified processes and operations, advocated in favour of moving the electricity grid to entirely renewable sources, eliminating the use of coal at Huntly power station. Although participants were unclear of the pathway towards such a goal, it was stated that:

> "If the grid was to be 100 per cent renewable, that would significantly reduce our carbon intensity."

Such a significant change to New Zealand's electricity grid would require national level decision-making. Beyond petitioning the government for change, the role of EITE businesses in moving to an entirely renewable grid is limited.

...as would expanding access to alternative fuels

Some participants advised they were involved in projects involving the assessment, and potential use, of alternative fuels such as hydrogen, biogas, and biodiesel.

> "We have a couple of different projects going on at the moment, one that has some potential is looking at different feedstocks – different fuels to power our processes. That has the potential to decarbonise us quite a lot."

It should be noted, however, other participants spoke about the use of alternative fuels, specifically biogas, and expressed concerns regarding the reliable supply of good quality fuel alternatives.

Some respondents expressed that gas as a transition fuel is a common step in overseas jurisdictions, with a lower carbon footprint than coal, and that carbon intensity is increased if this opportunity is not properly thought through. This is true both of core industrial processes directly and once electrified, through the carbon intensity of the grid.

Barriers and challenges of decarbonisation

Participants were asked to identify barriers and challenges to decarbonisation. Access to (commercially viable) technology was the most frequently cited barrier. However, the unavailability of sufficient or secure biofuel supply, consenting processes, and New Zealand's investment landscape and access to capital were also identified as significant barriers.

Adopting decarbonising technologies is demanding

Accessing and adopting technologies required for decarbonisation is hampered by several factors: (1) the mere existence of the technology, (2) its commercial viability, (3) the level of required capital expenditure, and (4) difficulties obtaining investment.

In some cases, the technology does not exist

According to a minority of participants, their core business processes cannot be replaced with lower carbon alternatives, as the requisite technology does not yet exist.

> "We have technology scouts out all of the time, and we've done a lot of our own research, you cannot heat **[product]** to the temperatures needed without coal or gas."

> "The technology horizon for decarbonising our core processes is still a bit away."

For these participants, decarbonisation efforts involve incremental change. Significant reductions in process-based carbon output, however, are reliant on a technological step-change outside the control of the EITE business.

In others, the technology is not commercially available or scalable

For some participants, there was an acknowledgement that technology that would reduce emissions in their businesses does exist. However, it is either commercially unavailable or does not offer the scalability required.

> "A lot of things around technology is there on the horizon, but they are not available on scale, and can't be used to replace a key part of our production. These are very real challenges."

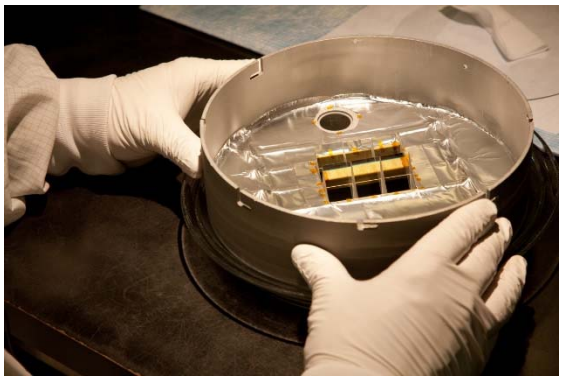
Consequently, EITE businesses are required to wait for commercially available and scalable technologies that would facilitate a step-change in their emissions output. As such, several participants advised that they had made significant investments in identifying and researching the efficacy of various technologies.

Technology demands significant levels of capital expenditure

In cases where technology is commercially available, participants advised considerable capital expenditure is required to acquire and implement it. Although, in some cases the costs of these technologies could be recouped in long-term savings.

> "We bought an electric shovel last year, it cost somewhere in the region of $10 million. The operational savings will eventually cover the cost of the technology, but it's a significant capital expenditure."

This means that EITE businesses must attract investment, often from overseas, often in competitive environments, in order to acquire the technologies required to ensure their continued decarbonisation. Attracting overseas investment for New Zealand EITE businesses can be challenging, especially when policy in other jurisdictions can offer a higher, more stable, return on investment.



The New Zealand policy environment makes attracting capital investment difficult

All participants cited uncertainty in the New Zealand policy environment as a significant detriment to receiving investment for emissions reducing technologies.

> "When it comes to capital investment, that has been a bit shy over the last 10 years, and it's mainly down to policy uncertainty."

> "We can't make long-term investment decisions because of frequent changes to the ETS. It can absolutely destroy a business case, and we don't know what it will look like."

EITE businesses find it challenging to attract the capital investment required to invest in carbon-reducing technologies and processes, due to the changing nature of the emissions policy landscape. Specifically, if the ETS emissions reduction baseline were to reset at a lower level, then the business case for investing in a new emissions reduction technology may reflect a significantly reduced return. For this reason, some participants advised, *"Our investors look at New Zealand as somewhere too complicated and expensive to do business."* Some

participants also expressed specific concerns regarding the resetting of the ETS baseline.

> "We could be in a situation where something new gets implemented, the ETS gets reset, and we lose the value of what we have implemented."

The prospect of unfavourable regulatory change diminishes the rationale for investment and can thereby prohibits decarbonisation activities. These decarbonisation investments might still be made by the parent companies, but not in New Zealand; rather, they will be invested in jurisdictions with a policy environment that encourages it and provides long term certainty over the business case returns.

Some EITE business continue to rely on gas

Several participants advised that, even though they had made significant progress in their decarbonisation journeys, they remained reliant on the use of gas. EITE businesses experience two issues relating to the continued use of gas:

There are limited commercially viable technologies in their field to replace gas

The ability to eliminate the use of gas entirely was articulated as an exogenous issue imposed by a lack of commercially viable technology. For example, hydrogen technologies were cited by multiple participants as potential alternatives to gas, but as yet it did not make commercial sense to implement them.

> "So many EITE companies aren't sustainable without gas."

> "We have eliminated coal, but there are some technical barriers to totally removing our reliance on fossil fields, such as gas. There's just not an obvious replacement for it at the moment."

Gas is required for transition

Some participants also noted that technologies and fuel alternatives were available to prohibit their use of gas, but gas was still needed to sustain their transition. The implication is that if gas were unavailable, EITE decarbonisation would be impeded.

> "We're reliant on gas as a bridging technology. We need it to ensure that during our transition we are still able to meet the demands of our market and support our stakeholders."

Access to biofuels is unreliable

Some participants reported the use of biomass as an alternative fuel source, principally to coal, and cited it, theoretically, as a promising means to achieving their decarbonisation goals. However, it was also noted that access to biomass is unreliable,

> "Other businesses are looking to use wood by-products instead of coal, and that creates supply pressures for us too."

> "We have a plant in Australia that was all biomass, but that's quite uncertain now. There's a problem with the reliability of supply, and the quality of the supply too."

There is a limited market for biofuels and there are no facilities within New Zealand to convert waste wood into a combustible fuel source, meaning New Zealand-based EITE businesses looking to use biofuels would have to rely on international supply chains. It should also be noted that biomass cannot burn at a sufficiently high temperature to cover the core processes of all EITE businesses in New Zealand.

The consenting process can obstruct decarbonisation activities

A small sample of participants advised that they had embarked on energy generation projects, which would have reduced their reliance on fossil fuels. However, the implementation of these projects had been frustrated by objections received during the consenting process.

> "We had an appeal from the local iwi and from **[an environmentalist organisation]**. The iwi was concerned that a wind farm would spoil the look of the landscape, and **[the environmentalist organisation]** hates our industry because our products ultimately support the dairy industry."

Objections to consents were not identified as the primary obstruction, however. Participants suggested that the barrier faced was the lack of real partnership in consenting, which prevented streamlining the process.

The policy and business landscape

Participants were asked to identify any changes to the policy or business landscapes that would assist them in achieving their decarbonisation goals. Several suggestions were identified, including the expansion of public funding for decarbonisation projects to ensure sustained access to biofuels.

More recognition of carbon leakage is needed

Participants mostly felt the potential for carbon leakage was underappreciated by policymakers. Saliently, it was felt that policymakers did not understand that the closure of EITE businesses in New Zealand would shift emissions to overseas jurisdictions with weaker emissions regulations and higher emissions intensity and transport requirements.

> "If EITE businesses have to go overseas, then the government loses all control over our carbon emissions. There needs to be some recognition of that."

> "We need to be looking at global emissions here as a consequence of our closure."

In other words, global emissions need to be considered as part of the impacts stemming from EITE business closure in New Zealand. Participants also noted that consideration should also be given to the importation effects that would arise from the closure of their businesses. Without the presence of EITE businesses in New Zealand, it may be necessary to import products from other parts of the world with limited, or no, controls on carbon emissions.

> "If we weren't here, imports of our product would be essential. There are no substitutes for it. It would most likely come from Southeast Asia, where there are few controls on carbon emissions, so that would likely equate to carbon leakage."

Reliable access to biofuels is required

Participants suggested there is a role for the government in overcoming the supply issues associated with biofuel access. One participant noted that identifying means for transforming forestry slash into biofuel would be simultaneously serendipitous for their industry and for communities affected by recent flooding events.

> "We're busting to use biofuel if the government can facilitate that. Surely, we can figure out a way to use forestry slash as a biodiesel, same as the tallow we export at the moment. It's not necessarily a long-term solution, but it would have an immediate impact."

Consenting must become more streamlined

Some participants identified the slow and frustrating process of obtaining consent as being a significant barrier to some of their decarbonisation initiatives. Those participants, in general terms, expressed a view that the consenting process needs to be streamlined and simplified if they are to continue their decarbonisation journeys.

> "I know the RMA is being reformed. Whatever comes out of it, the consents process needs to be streamlined. It takes too long and is quite cumbersome, it makes it more difficult for us to establish alternative energy sources."

Expanding GIDI funding would be supportive of decarbonisation

Although participants largely cited GIDI funding as a good scheme, it was also described as 'insufficient' for the scale of work required for New Zealand to meet its emissions reduction targets. As such, participants indicated that there is a need for additional funds that will support EITE business investment in emissions reduction technologies and processes.

> "GIDI funding is a good use of the ETS fund, but it isn't really large enough for the scale of the challenge we are facing."

> "We need to see a change in mentality if we want businesses to remain here. The GIDI fund is there, but it is inaccessible to anyone on a journey to reduce emissions. It's really there for businesses already with low emissions profiles."

Although participants did not provide advice on specific changes to the GIDI fund, their perspectives indicate that the scope of businesses eligible for funding should increase to recognise all businesses engaged in some form of emissions reduction activity.

Bespoke legislative approaches would reflect the nuance of EITE businesses

Given how few EITE businesses are in operation in New Zealand, several participants suggested that there is an opportunity for a tailored or bespoke approach to policy formulation. Policymakers could consider individual arrangements with each business, suited to

their individual needs and capabilities, and in particular the technology horizon that they face.

> "A bespoke agreement with each EITE business would be useful. A blanket approach isn't any good.
>
> "There is an element of bespokeness [sic] in the industry, but there is too often a blanket approach to everyone. There should be consideration of options to alleviate the level of assistance across all EITE firms."

This view was not universal. Some respondents felt that this was not a good idea and preferred a set of rules that were certain and without discretion.

Policy certainty and stability would support the investment environment

Pointing, mainly, to the challenges associated with obtaining capital investment for emissions-reducing technologies, participants stated that they are hoping for a level of certainty and stability from policymakers. This was frequently expressed as an issue of 'unending fiddling' with the ETS.

> "Fiddling with the ETS rules could make our payback of a project look worse. How can we plan long-term when the ETS is so uncertain?"
>
> "The ETS allocative baseline resets every five to 10 years, making it difficult to sustain investment in emissions reductions technology."

From a policy perspective, participants expressed a clear preference for some stability or certainty in the ETS, so that they could confidently develop business cases for investments in emissions reducing technologies. Put differently, the present levels of stability and certainty are insufficient for EITE businesses to develop a robust business case and seek the investments in technology.

Recommended changes and future research

Participants were asked to pinpoint areas for potential future research that could help identify the challenges and opportunities associated with transitioning to a lower-carbon future.

The economic impacts of EITE business closure or shrinkage should be better understood

Some participants advised that economic impact analyses and research were required to understand the effects on regional communities, should their business have to cease operations, or continue operating in a significantly reduced form. Informing this perspective was a view that in many regional communities the EITE business was one of the few, or in some cases sole, providers of good-quality, well-paying, and stable employment.

> "We are supporting jobs in regional New Zealand. We're around 3 per cent of local GDP and 5 per cent of local employment. It might not sound like much, but these communities will feel it if we have to close."

Participants were of the view that this research would better inform policymakers of the wider employment and wellbeing impacts that may arise due to altering emissions-based policies in a way that is unfavourable to the function of EITE businesses.

Understanding New Zealand's strategic resilience would highlight the importance of EITE businesses

Participants expressed concern that policymakers do not fully appreciate the extent to which EITE products are used and depended on in domestic markets. Accordingly, there was a lack of understanding as to the impact the closure of EITE businesses may have on the strategic resilience of New Zealand.

> "We need to ensure the government understands how widespread these products are used. Without them, there is a risk to New Zealand as it becomes even more dependent on imports from elsewhere."

As such, it was suggested that further research into the strategic reliance of New Zealand was required, with a specific focus on what the implications would be of depending on imports to supply the products produced by EITE businesses, assuming those based in New Zealand faced closure. Several participants identified the closure of Marsden Point as a contemporary example of how the absence of an EITE business can have unintended consequences, such as the shortage of food grade carbon dioxide – which must now be imported from overseas to meet domestic demand.

Further research may bolster New Zealand's supply chain resilience

Participants, particularly those in the forestry and wood processing sectors, indicated there would be value in further research that aims to identify issues, and make recommendations towards, bolstering New Zealand's supply chain resilience. They noted that supply chain disruption, especially during the last three years, had been among the biggest challenges facing their continued operation in New Zealand. One participant specified that the research should focus on factors enabling investment in the sawmill sector because their business is reliant on access to sawmill residues.

Research could support the development of native afforestation without impacting productive exotics

Insights from participants representing forestry and wood processing businesses indicated that more research into afforestation would support more strategic decision-making regarding the forestry ITP. Participants advised that the afforestation of native forests should not come at the expense of planning economically viable exotic forests. This means more research into the most economic locations for native and exotic forests respectively.

> "Part of the ITP is calling for afforestation using native and exotic forests. The planting of natives shouldn't be happening in locations where it would make economic sense to plant exotics. We need to have a better grasp of those locations and plan accordingly."

This domain of further research would focus on understanding how to balance the cultural and environmental imperatives of native afforestation with the economic imperatives of exotic and productive afforestation.

Supporting coal communities requires research and planning

Some participants expressed concern over the potential impacts on coal communities that are likely to arise as part of a low-emissions transition. It appears that a transition away from coal will lead to increased levels of unemployment and deprivation in certain parts of New Zealand. As such, some participants noted that it was important that further work be done to understand how to mitigate the economic and social impacts of decarbonisation and emissions reduction.

> "There are heaps of money being thrown at oil and gas communities in Taranaki after the ban on further exploration was announced. We've not seen the same response for coal communities to support them during the transition period. There needs to be some work done to understand how these communities can be best supported."

This sentiment alludes to the importance of understanding the distributional impacts of a transition to a low-emissions economy upon certain communities and regions of New Zealand. At the time of writing, this is one objective of the Equitable Transitions Strategy.[3]

Researching incentives for carbon sequestration could lead to effective policy development

Participants whose businesses also operated in other international contexts suggested researching the options around a tax incentive scheme for carbon sequestration. The participants felt that such a scheme would improve emissions by incentivising investments in carbon capture. Pointing to a similar scheme operating in the USA, one participant noted:

> "The US government focus right now is on carbon sequestration. We can receive tax credits, which really arrive in the form of payment, for permanent carbon capture."

Research in this space would examine carbon capture options and mechanisms for incentivising firms to invest in carbon capture technologies and processes, rather than focusing on emissions reduction.

Understanding potential carbon leakage outcomes

Some respondents expressed a view that the New Zealand government should be wary of

[3] https://www.mbie.govt.nz/business-and-employment/economic-development/equitable-transitions-strategy/

achieving decarbonisation goals by cutting emissions intensive business activity domestically. This is because cut emissions would likely be offset to other jurisdictions with limited controls on emissions outputs. Consequently, carbon leakage could occur, and global emissions could increase, via the cessation of EITE business operations in New Zealand. As such, participants suggested that further research be undertaken to fully understand, and potentially forecast, carbon leakage arising from the closure of EITE businesses.

Concluding remarks

EITE businesses are at various stages of their decarbonisation journey. Some consider themselves ahead of the curve of emissions reduction in an international context, while other place themselves at the early stages of their journey. In all cases, EITE businesses recognise the importance of decarbonisation, for commercial and non-commercial imperatives, and recognise opportunities in further reductions in emissions. Opportunities identified by EITE businesses include the electrification of core processes (where technology permits), moving vehicle fleets to alternative fuel sources, the use of biofuels and other alternatives, and moving New Zealand to an entirely renewable electric grid. However, the ability of EITE businesses to continue to reduce emissions is limited by the commercial and general availability of technology, an uncertain policy environment, a necessitated reliance on fossil fuels, the congested consenting process in New Zealand, the future expected price of renewable energy sources and sustained access to biofuels and other fuel alternatives.

To pave a way forward for decarbonisation, EITE businesses suggested that the policy landscape recognise the potential for carbon leakage, consider ways to ensure reliable access to biofuels, recognise the technology curve for each business and the access to international capital to make step changes, better manage the consenting process, expand funding opportunities for decarbonisation activities, consider bespoke legislation for different EITE businesses, and aim for overall policy certainty. EITE businesses also suggested further research be undertaken to understand the economic and social impacts of EITE business closure, New Zealand strategic and supply chain resilience, potential carbon leakage outcomes, and incentives for carbon sequestration programmes, such as those found in the USA.

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