Submission by


to the

**Ministry of Business, Innovation and Employment**
on

# Draft Advanced Manufacturing Industry Transformation Plan

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# AI Forum New Zealand Response to the Draft Advanced Manufacturing Industry Transformation Plan

## Introduction

1. The AI Forum New Zealand (the AI Forum) thanks the Ministry of Business, Innovation and Employment for the opportunity to respond to the draft Advanced Manufacturing Industry Transformation Plan.

## Background

2. Digital technologies are a critical enabler of Advanced Manufacturing. Software is required for smart manufacturing whether for advanced business processes, sensors, automation, robots, digital manufacturing (such as 3D printing), visualisation technologies, and the internet of things.
3. The Digital ITP is therefore relevant for the advanced manufacturing sector's digital transition described as the Fourth Industrial Revolution (Industry 4.0). The initiatives across both ITPs are designed to be mutually reinforcing'.
4. The AI Forum worked with the New Zealand Government to establish an AI Strategy for Aotearoa New Zealand within the Digital Technologies ITP. The Digital Technologies ITP was released as Draft for public consultation in February 2022.
5. Seeking to build a thriving AI ecosystem in New Zealand founded on trust, equity and accessibility, the AI Strategy is organised around six key areas called 'cornerstones' that together are the framework for action and set out our priorities for AI in New Zealand.
6. The AI Forum has published the *Trustworthy AI in Aotearoa AI Principles*,[1] and, as the work is restarting, is reconvening its Working Group on creating guidelines for trustworthy AI, which will include updated industry input and provide practical advice and guidance on how to put the principles into practice.

[1] https://data.govt.nz/assets/data-ethics/algorithm/Trustworthy-AI-in-Aotearoa-March-2020.pdf

## Overall Responses

### Related Work Programmes

7. The AI Forum strongly advocates the inclusion of the *Trustworthy AI in Aotearoa Principles and AI Strategy*[2] in the Advanced Manufacturing ITP. This will strengthen the principles, avoiding rework and limiting divergence away from work on AI's use in industry already completed and in progress.

### Partnership is a Driving Principle for ITP Creation

8. The AI Forum is concerned that the partnerships noted on Page 14 of the ITP do not include the member groups of the NZ Tech Alliance, even though advanced manufacturing is heavily reliant on advanced technologies. Also, see response to Priority 4 below.

### SECTION 4 – PRIORITIES AND ACTIONS FOR TRANSFORMATION - Page 28 & 35

*Improving the uptake of advanced technologies and processes requires complementary initiatives*

9. The AI Forum would be happy to work with the Government and its partners in support of the initiatives, helping initiatives such as 14DN reach a wider audience.

*Demonstrate the value of advanced technologies:*

10. The AI Forum is keen to make advances in this area and we see a big crossover between the virtual and physical worlds, for example, the use of AR/VR in testing prototypes and AI analysis in manufacturing and business processes are both emergent ways to avoid unnecessary waste and set up costs for new manufacturing tooling and processes.

## ITP Priorities

### PRIORITY 1 - Improving the Understanding and Perceptions of Advanced Manufacturing

### Initiative 1 - Improve the Understanding and Perceptions of Advanced Manufacturing

11. The AI Forum strongly recommends promoting AI standards and guidance allowing Advanced Manufacturing to better the human experience and support the ITP's stance that rather than posing a threat, this kind of advancement managed well improves the employment prospects and life experiences of those involved.

[2] https://data.govt.nz/assets/dataethics/algorithm/Trustworthy-AI-in-Aotearoa-March-2020.pdf

## PRIORITY 2 – Increasing Investment in Advanced Technologies and Processes to Lift Productivity and Wages

### Initiative 4 - Support greater capital investment in advanced technologies & Initiative 5 - Improve access and visibility to finance & funding opportunities *& Priority 5 - Creating a Leading Sustainable Circular Net-Zero Emissions Sector*

12. In its submission to the Dept of Internal Affairs, November 2021 on '*Towards a Digital Strategy for Aotearoa*' [3] the AI Forum said:

> "Investment – The Strategy would benefit from setting higher goals and stronger measures for public and private investment in digital products, services, research and development. Many governments, including Singapore, Australia, and Canada, have allocated significant budget investment to accelerate digital adoption."

13. The AI Forum considers the draft ITP's actions underplay New Zealand's ability to attract global environmental, social and governmental (ESG) investment linked to sustainable manufacturing because:

    a. Globally USD 700 billion in ESG funding has been made available in the last 2 years – and it's growing at 33% annually;

14. The productivity gap between NZ and Danish manufacturing noted in the draft ITP paper is indicative of the scale of the potential growth (and RoI) associated with investment in NZ advanced manufacturing.

15. Denmark and NZ share some significant similarities, i.e. they are both stable, have similar populations, and are well-educated and technology minded communities, with broadly similar social welfare systems with free public healthcare and education. Agriculture also underpinned the Danish economy until the 1960s (when the impact of European Community agricultural trade constraints encouraged manufacturing in Denmark) and both have strong environmental advocacy.

16. Denmark has an obvious logistical and geographical advantage over NZ for trading manufactured goods.

17. In contrast, NZ manufacturers tend to be small by international standards making attracting international investment difficult. Combining the ITP's aims with a government backed structured investment package might help overcome this.

## PRIORITY 3 – Making Innovation, R&D and Science Work for Advanced Manufacturing

### Initiative 7 - Strengthen advanced manufacturing eco-systems & Initiative 8 - Aotearoa New Zealand Centre for Advanced Manufacturing Excellence & Initiative 18 - Connect with global leaders in sustainable advanced manufacturing

18. Presently, Australia is building Digital Capability Centres (DCCs). Given that costs and set up times of projects like this are often prohibitively high, the AI Forum identifies the possibility building, in the first instance, an equivalent virtual capability.

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[3] https://aiforum.org.nz/reports/digital-strategy-for-aotearoa/

19. While this may not garner all of the benefits of physical assets, the benefits of being able to reach the whole NZ population with a blend of a virtual world experience combined with real world lived experience stories would go a long way to delivering equivalent benefits in a shorter time span.

20. It is easier to connect with in-demand people globally in a virtual world.

## PRIORITY 4 – Attracting and developing a diverse high-skilled high-wage workforce

### Initiative 12 – Individual Development Plans & Initiative 14 – Attraction Strategy Increasing Diversity

*Te Ao Maori Learnings from - AI for Environment Report*

21. During the research for its *AI for Environment Report,* the AI Forum identified a range of projects and initiatives centring on tikanga and mātauranga Māori vital to a thriving AI ecosystem — including data collection and labelling methodologies, clear indicators of success, and governance frameworks.

22. These projects are building blocks capable of contributing to a thriving AI for the environment ecosystem in the Aotearoa/New Zealand context.

23. The following are examples relevant to the *Advanced Manufacturing ITP* and the AI Forum would be happy to work with the Government, and the people and organisations creating these solutions, to producing these as Case Studies:

    a. **Understanding community needs**: Project Kainga brings together communities and experts to find tikanga-based, community-relevant solutions to climate change, including incorporating sensing and monitoring technology to collect data. ('Where Tikanga Meets Technology,' Merata Kawharu, Leonie Jones and Paul Tapsell);

    b. **Building mātauranga into environmental indicators**: Te Mahere Wai o Te Kāhui Taiao, the Wellington region Mana Whenua whaitua implementation plan to return mana to freshwater bodies, sets out target states for freshwater across forty-two tikanga (attributes);

    c. **Mauri-centred decision-making frameworks**: The Mauri Model is a decision-making framework that uses the concept of mauri as the measure of sustainability. The Mauri Model and mauriOmeter are currently used by various groups including Te Arawa River Iwi Trust, which uses custom computer software to analyse raw data from real-time sensors and other data sources;

    d. **Knowledge labels that protect and support Māori data**: A key part of te ao Māori approaches to data includes ensuring Māori communities directly benefit from the use of their knowledge and genetic resources, which are often harnessed by others for commercial gain - co-led by Maui Hudson (Whakatōhea), Director of the University of Waikato Te Kotahi Research Institute); and

    e. **Storing data in Aotearoa**: For many Māori data experts, it is important to consider the jurisdiction/locality where data is stored.

PRIORITY 5 - Creating a Leading Sustainable Circular Net-Zero Emissions Sector

Initiative 15 - Map Emissions and Waste Profile & Initiative 17 – Net-Zero Emissions Advanced Manufacturing

24. The *AI for Environment Report* (May 2022) created by the AI Forum in association with NZStats and Ministry for the Environment outlines the current national data capabilities (and inadequacies) for measuring and monitoring environment outcomes (including waste, emissions and related impacts). The impacts are key, as emissions and related waste reduction methods differ in impact on the environment.

25. Therefore, to achieve the stated outcome: '*Understand at a granular level the advanced manufacturing sector's emissions and waste profiles, and opportunities and barriers for reduction, to inform ITP actions and initiatives*' the AI Forum recommends investment be made in achieving the key recommendations in that report.[4]

26. Also relates to: Page 55: *Aotearoa New Zealand is a test-bed for net zero-carbon advanced manufacturing*

## Recommendations

27. The AI Forum recommends MBIE amend the Advanced Manufacturing ITP to:

    a. Include *Trustworthy AI in Aotearoa Principles and AI Strategy*;

    b. Include the member groups of the NZ Tech Alliance as partners and ecosystem participants;

    c. Ensure the inclusion of the AI Forum New Zealand in the development and support of the initiatives described in the ITP;

    d. Recognise the value of the AI Forum's involvement in advanced technology demonstrations;

    e. Promote AI standards and guidance in advanced manufacturing developments;

    f. Recognise New Zealand's ability to attract global ESG investment;

    g. Ensure Government backing for structured ITP investment packages;

    h. Investigate virtual equivalents of Digital Capability Centres;

    i. Recognise and incorporate projects centring on tikanga and mātauranga Māori;

    j. Incorporate mechanisms that support measurement of the environmental impacts of the advanced manufacturing sector, including emissions and waste generation , recycling and waste disposal.

[4] https://aiforum.org.nz/wp-content/uploads/2022/05/AI-for-the-Environment-Report-2022.pdf