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# Executive overview

Building the business case for professional enviromental training – a Phase 1 landscape scan

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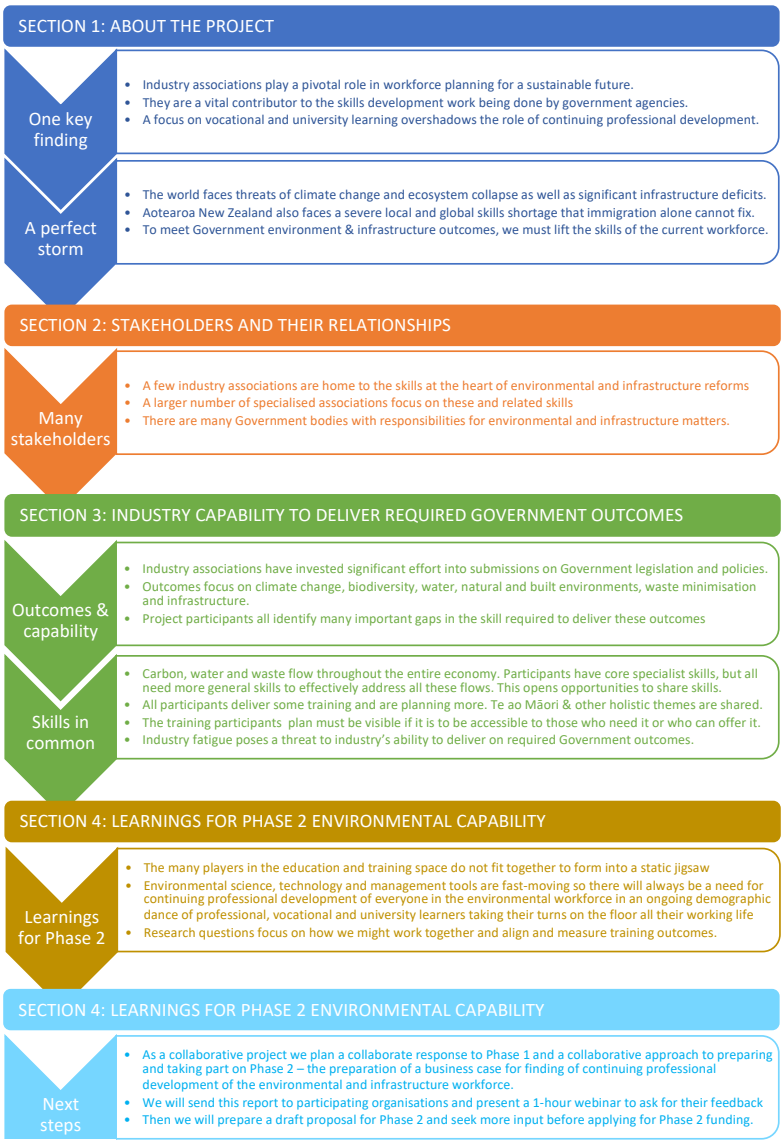
## Background

Sustainability challenges are increasingly demanding a well-trained workforce in the Aotearoa New Zealand construction sector. Transitioning to a low-carbon economy and building resilience to climate change effects requires sustainability and environmental management capabilities on all levels of the construction industry workforce. This requires a holistic approach that is embedded in te ao Māori. While improvements in vocational training and university education can address the need for suitably trained graduates, the majority of the workforce that needs to be upskilled in the coming years consists of existing participants in the industry. Although some further vocational and university education, such as postgraduate qualifications and micro-credentials, can play a role here, most of the education needs would have to be met by continuous professional development (CPD) offerings.

The Phase 1 landscape scan identifies the government requirements for industry capabilities in the environmental field, industry capacity to deliver on these expectations and how gaps could be filled involving industry associations. A visual executive summary provides an overview of the findings of the landscape scan (Feeney, 2023, p. V). The landscape scan relies heavily on the analysis of the submissions to government consultations made by four major industry associations (Carbon and Energy Professionals, Civil Contractors New Zealand, WasteMINZ, Water New Zealand). While these are critical stakeholders in the industry, additional information about specific expert areas would benefit the analysis and could be included in a future Phase 2 of the project.




Visual Executive Summary from Clare Feeney. (2023). Building the case for professional environmental training – a Phase 1 landscape scan.

## Stakeholders

Sustainable systems require holistic and interdisciplinary solutions. Many stakeholders are involved with their own speciality areas, but also in a wider context as consumers of sustainable management practices, and are thereby in need of staff with the necessary environmental training. Currently this workforce is heavily immigration dependent and struggles to keep up with workforce development needs.

National and local government agencies act as both regulators and consumers of construction industry services. This creates a significant demand for their staff to be up to date with current environmental management methods. The different construction-sector industries have complementary skills, with a need to manage environmental challenges across disciplinary boundaries. Finally, industry associations, environmental consultants and education organisations provide knowledge and training needed to address these issues. Table 1 provides a list of stakeholders (Feeney, 2023, p. 6).

Table 1: List of stakeholders (Feeney, 2023, p. 6)


2

**CORE INDUSTRY ASSOCIATIONS**: Carbon and Energy Professionals; Civil Contractors New Zealand; WasteMINZ; Water New Zealand

## RELATED INDUSTRY ASSOCIATIONS

1. ACENZ: Association of Consulting Engineers NZ
2. Apōpō (IPWEA: Institute of Public Works Engineering Australasia)
3. AWIS: Association of Women in Science
4. Business New Zealand
5. CAANZ: Chartered Accountants Australia and New Zealand
6. CIWEM: Chartered Institution of Water and Environmental Management
7. Coastal Society
8. EcoSoc: NZ Ecological Society
9. EIANZ: Environmental Institute of Australia and NZ
10. Engineering New Zealand
11. Freshwater Society
12. Groundwater Forum
13. HydroSoc: NZ Hydrological Society
14. IANZ: International Accreditation New Zealand
15. IECA: International Erosion Control Association
16. Infrastructure NZ
17. ISCA: Infrastructure Sustainability Council Australasia
18. LGNZ: Local Government NZ
19. Marine Science Society
20. NAWIC: National Association of Women in Construction
21. NZARM: NZ Council of Trade Unions
22. NZGBC: NZ Green Building Assn
23. NZILA: NZ Institute of Landscape Architects
24. NZIS: NZ Institute of Surveyors
25. NZPI: NZ Planning Institute
26. Regional Sector Special Interest Group (SIG) Network, with 25 specialist groups
27. RMLA: Resource Management Law Association
28. Surface Water Integrated Management (SWIM) (SIG)
29. SBN: Sustainable Business Network
30. SBC: Sustainable Business Council
31. Taituarā: Association of Local Government Professionals
32. Trade and Industrial Waste Forum
33. UDINZ: Urban Development Institute of New Zealand
34. Water Industry Operators Group
35. Wetlands Society
36. Zero Waste Network

## LEADING GOVERNMENT AGENCIES

1. Ara Ake
2. BRANZ: Building Research Association of NZ
3. CIP: Crown Infrastructure Partners
4. Climate Change Commission
5. ConCOVE: Construction & Infrastructure Centre of Vocational Excellence
6. Construction Sector Accord
7. DOE: Department of Education
8. DIA: Department of Internal Affairs
9. DoC: Department of Conservation
10. EECA: Energy Efficiency and Conservation Authority
11. Energy Academy
12. EPA: Environmental Protection Authority
13. ESR: Institute of Environmental Science and Research (CRI)
14. Te Waihanga InfraComm (Infrastructure Commission)
15. Just Transition Unit
16. Manaaki Whenua Landcare Research (CRI)
17. MBIE: Ministry of Business, Innovation and Employment
18. MfE: Ministry for the Environment
19. MPI: Ministry for Primary Industries
20. NEMA: National Emergency Management Agency
21. NIWA: National Institute of Water and Atmosphere (CRI)
22. PCE: Parliamentary Commissioner for the Environment
23. Productivity Commission
24. Regional Councils (11)
25. Statistics NZ
26. Taumata Arowai
27. Te Pūkenga
28. Territorial authorities (61, excluding unitary councils)
29. Tertiary Education Commission
30. Te Uru Kahika – Regional and Unitary Councils Aotearoa
31. Toitū Envirocare
32. Treasury
33. Unitary councils (6)
34. Waka Kotahi: New Zealand Transport Agency
35. Waihanga Ara Rau: Construction and Infrastructure Workforce Development Council
36. Water Services Entities (10 to come)

## Required Government Outcomes

While government policy and regulations of environmental topics are extensive and complex, major concepts such as carbon emissions, waste reduction and protection of water and the natural environment can be identified as regularly occurring and unifying themes. All of these have in common that they relate to specific, measurable physical streams such as carbon emissions, energy used, or waste sent to landfill. As such they are addressable with scientific research, sustainability accounting and regulations based on verifiable improvements.

Feeney (2023, p. 10) has listed the government's required outcome areas in alignment with the priorities in the World Economic Forum's 2023 global risk assessment:

- climate change
- biodiversity
- water
- natural and built environments
- waste minimisation
- infrastructure

Table 2: Outcomes the government seeks (Feeney, 2023, p. 11)

Table 2 Seven clusters of outcomes the Government seeks

| Outcome focus area | Purpose |
|---|---|
| CLIMATE CHANGE | **Climate Change Response Act 2002**[12]<br>Section 3 Purpose (edited excerpts only)<br>• develop and implement clear and stable climate change policies that contribute to the global effort under the Paris Agreement to limit the global average temperature increase to 1.5° Celsius above pre-industrial levels; and allow NZ to prepare for, and adapt to, the effects of climate change<br>• enable NZ to meet its international obligations under the 1992 United Nations Framework Convention on Climate Change (UNFCC), the 1997 Protocol to the UNFCC and the 2015 Paris Agreement<br>• reduce the emission of greenhouse gases and assist New Zealand to meet its 2050 target and emissions budgets |
| BIODIVERSITY<br>Te mana o te taiao | **The Aotearoa New Zealand Biodiversity Strategy 2020**[13]<br>The strategy sets a strategic direction for the protection, restoration and sustainable use of biodiversity, particularly indigenous biodiversity, from 2020 to 2050 and supports Aotearoa New Zealand to meet its international obligations under the United Nations Convention on Biological Diversity.<br>**The objective of the National Policy Statement for Indigenous Biodiversity**[14] is to maintain indigenous biodiversity across Aotearoa New Zealand so that there is at least no overall loss in indigenous biodiversity after the commencement date. |
| WATER<br>Te mana o te wai | **The National Policy Statement on Freshwater Management 2020** (amended February 2023)[15] and the **Water Services Act 2021**[16]<br>Both of these refer to the hierarchy of obligations in Te Mana o te Wai that prioritises:<br>• first, the health and well-being of water bodies and freshwater ecosystems<br>• second, the health needs of people (such as drinking water)<br>• third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future. |
| NATURAL AND BUILT ENVIRONMENTS<br>Te oranga o te taiao | **Natural and Built Environments Bill 2020**[17] (part of a series of bills in the ongoing reform of the Resource Management Act)<br>Section 3 states that the purpose of the Act is to uphold te Oranga o te Taiao (the wellbeing of the natural environment) and that the purpose must be achieved in a way that protects the health of the natural environment; and subject to the previous clause, enables the use and development of the environment in a way that promotes the well-being of both present and future generations. |
| WASTE MINIMISATION | **Waste Minimisation Act 2008**[18]<br>Section 3 states that the purpose of the Act is to encourage waste minimisation and a decrease in waste disposal in order to protect the environment from harm; and provide environmental, social, economic, and cultural benefits.<br>Section 43 provides that territorial authorities must adopt a waste management and minimisation plan that includes objectives, policies and methods for achieving effective and efficient waste management and minimisation. |
| INFRASTRUCTURE | **The New Zealand Infrastructure Strategy 2022-2052**[19]<br>The Strategy has five objectives to achieve a thriving New Zealand. These aim to provide national infrastructure that enables a net-zero carbon emissions Aotearoa, supports cities, towns and regions to flourish through better long-term planning, pricing and good public transport, strengthens resilience to shocks and stresses and moves New Zealand to a circular economy by setting a national direction for waste, managing pressure on landfills and waste-recovery infrastructure and developing a framework for the operation of waste-to-energy infrastructure. |

While these issues require complex solutions, Section 4.6. of the landscape scan (Feeney, 2023, p. 20) identifies the following interrelated themes common to them:

- a holistic approach to environment and economy that embeds te ao Māori
- water-sensitive land use and infrastructure planning
- multi-partner collaborations
- data management and reporting
- visible and accessible training
- a Just Transition to a low-emissions, skills-based and circular economy
- industry fatigue (detailed below in Industry Capabilities)

These complex demands for workforce capabilities have to be met with appropriate skills-development strategies. This becomes increasingly more important with government bodies starting to communicate detailed expectations.


4

Regarding skills development in the industry, the Government procurement rules for projects of more than $9 million contract value require specifically:

- Rule 18, Construction Skills and Training, says (p. 35) that agencies must include questions about the skills development and training practices of the supplier and their sub- contractors. The explanation for this is that a Government priority is "to grow the capability and capacity of the construction workforce. Government is committed to working with industry to deliver the right people, at the right time, with the right skills, to meet current and future needs in the construction sector … Evaluating a supplier on their skills development practices gives an incentive to suppliers to invest in and increase their workforce by employing and training more apprentices. It can also encourage suppliers to create employment opportunities (or opportunities to upskill) for targeted groups such as Māori, Pasifika and women to increase the diversity of the construction industry. This also means that suppliers who do not invest in developing the workforce are not able to undercut those who do on price. When evaluating a supplier's practices, you should look at what recruitment, retention, training and skills development they do in general. You should consider all levels and construction professions, including but not limited to apprenticeships and equivalent training. You should also look at what further recruitment, skills development and training suppliers would commit to doing over the course of the contract."

It is expected that the effect of these rules will trickle down to smaller projects and will influence sustainability standards in the private sector (Feeney, 2023, p. 22). Given the complexity of major construction projects, these expectations can only be met by an industry-wide, holistic approach to environmental management and education to prepare the workforce.

## Industry Capabilities

Several industry associations currently offer continuous professional development (CPD) in the environmental field, but, as this has grown organically from the needs of their specific industries, no overarching strategy connects the offerings between industries and the wider tertiary education sector. Industry fatigue has been identified as a significant problem as industry associations struggle to find the resources to address these big questions on their own (Feeney, 2023, p. 29). In a time of serious skills shortages, it is even more difficult to commit employees' time to further education, increasing the skills gap further. Some overseas education offerings are being used by New Zealand professionals, but these options sometimes lack relevance for New Zealand conditions and regulations, restricting their usefulness.

Table 3: Keywords summarising the skills needs identified by project participants (Feeney, 2023, p. 13)

| Carbon and Energy Professionals | Civil Contractors New Zealand | WasteMINZ | Water New Zealand |
|---|---|---|---|
| Knowledge and understanding of how emissions come about and how to:<br>• quantify them<br>• plan to reduce them<br>• set out the practical steps required to implement those plans.<br>Renewable energy.<br>Energy efficiency.<br>Carbon accounting and reporting.<br>Energy efficiency and process engineering skills.<br>Career pathway planning.<br>Credible professional credentials consistent with ISO17024, the international standard.<br>Ease of access to knowledge so that:<br>• larger organisations and the public sector can embed these skill sets<br>• medium and smaller organisations can readily access them.<br>Enhanced business understanding of the business value, competitive advantage and wider economic benefits of investing in decarbonisation. | Te ao Māori, mātauranga Māori, treaty issues, te mana o te wai.<br>Resource management.<br>Climate change, whole-of-life emissions reduction, energy and fuel efficiency in manufacturing and vehicle fleets.<br>Water and materials efficiency.<br>Research, specifications for construction and demolition waste avoidance, reuse and recycling.<br>Supply-chain sustainability, sustainable procurement and tendering.<br>Using ISO 14064 greenhouse gas accounting and verification to calculate embodied carbon in infrastructure.<br>Emissions reduction guidance for transport and water construction.<br>Climate-resilient, green infrastructure.<br>Decarbonising heavy machinery and heavy vehicle fleets.<br>Workflow planning and workforce skills development.<br>How to tap into the knowledge of ageing professionals before it is lost as they exit the workforce. | Te Tiriti, te ao and mātauranga Māori and resourcing Māori participation.<br>Legislative framework for zero waste.<br>Circular economy and waste hierarchy.<br>Landfills; recycling; reuse and repair; organic materials; waste to energy; product stewardship; import / export / levy systems; properties of materials.<br>Construction and demolition waste.<br>Supply-chain management and chain of custody for recovered materials.<br>Hazardous waste, contaminated soil.<br>Waste reduction for climate-changing emissions across the economy.<br>Land-use planning training on the Natural and Built Environment and Spatial Planning Acts.<br>Developing Waste Management and Minimisation Plans.<br>Efficient data collection, verification and storage of data.<br>Environmental reporting, ISO14001.<br>Waste infrastructure asset management.<br>Food waste reduction. | Te mana o te wai, te ao Māori, mātauranga Māori, resourcing mana whenua to be active partners in co-governance, co-management, co-design and co-delivery of sustainable water services and outcomes.<br>Iwi workforce development.<br>On-site wastewater and stormwater systems training and qualifications.<br>Water-related building consent training.<br>Efficient trade waste-management and compliance monitoring and reporting.<br>Training for laboratory staff, environmental experts and process engineers to comply with drinking requirements.<br>Land-use planning training on the Natural and Built Environment and Spatial Planning Bills that gives effect to te mana o te wai.<br>PFAS and other emerging contaminants.<br>Guidelines, consenting, management frameworks, monitoring and reporting requirements for drinking water and wastewater. |
| Environmental Communications Ltd | Current and intergenerational wellbeing; value and resourcing of industry associations to deliver training; the fundamental unit of land-use planning and management of both natural and built environments must be the surface water catchment and its associated (and not always congruent) underground | | |


6

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| | waters, together with their freshwater and coastal receiving environments; measuring and monetising outcomes across all four wellbeings: social, cultural, economic and environmental. |

Ideally, new environmental regulations and education to upskill the workforce accordingly should go hand in hand, but this also runs into capacity constraints. Influencing policy development through submissions is very resource intensive for industry associations; as such, submissions can be very complex and require expert input. While the industry and specifically major industry associations have promising capacity in the CPD field, a holistic, New Zealand-wide strategy would need additional resources and deliberate efforts to coordinate CPD strategy across the whole construction industry. While there are currently CPD offerings provided by industry associations and others, these are not strategically aligned with each other.

Table 4: Training available and planned by project participants (Feeney, 2023, pp. 17–18)

| Available training | Training plans |
|---|---|
| **Carbon and Energy Professionals** | |
| Current training (all online):<br>• Energy Management for Facilities Managers<br>• Energy auditor training<br>• Preparing a Carbon Inventory<br>• Identifying Carbon Reduction Opportunities<br>• Carbon Auditor Training (Auditing GHG Inventories)<br>• Continuous Commissioning Specialist<br>• Commercial Building Energy Specialist (HVAC & Controls)<br>• Optimising Process Heat Systems Training<br>• Advanced Industrial Energy Systems Optimisation<br>• Business Case Workshop (Finance): How to present the financial benefits of a project | CEP is in the process of remodelling its training certification framework. Step 1 is to develop or revisit 25 training modules on core topics. CEP has published a request for proposal to invite trainers and industry experts to help develop the future training modules and assessments. |
| **Civil Contractors New Zealand** | |
| Civil Trade Certification is a nationally recognised accreditation programme for civil contractors. It combines a recognised trade qualification with certified hours of practical experience and leads to registration as a Certified Tradesperson. Current areas for civil trade certification are:<br>Road Construction & Maintenance<br>• Earthworks<br>• Road Construction<br>• Road Maintenance<br>• Non-Structural Concrete<br>• Forestry Earthworks<br>Pipeline Construction & Maintenance<br>• Trenched<br>• Trenchless | CCNZ is currently reviewing their members' university qualifications and professional training needs.<br>Based on my own environmental training experience with civil (horizontal) construction firms, below are common training topics for professional and vocational site staff:<br>• erosion and sediment control<br>• pollution prevention and spill response of contaminants such as sewage, concrete, bitumen, emulsion, paint, hazardous substances and other substances<br>• avoiding physical damage to water bodies<br>• biodiversity: minimising damage to flora and fauna |

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|---|---|
| • Water<br>• Wastewater & Stormwater<br>Road Surfacing<br>• Bituminous Mixes<br>• Chipseal<br>• Slurry<br>• Binder Manufacturing<br>• Bituminous Mixing Operation<br>• Bituminous Spraying Operation<br>• Road Marking (Testing) | • biosecurity: preventing the spread of plant or animal pests and diseases such as kauri dieback and myrtle rust<br>• identifying and minimising damage to cultural heritage sites<br>• identifying, managing and disposing of contaminated soil and spoil<br>• working on unstable land or in sensitive or remote areas<br>• controlling dust, vibration and litter |

| Available training | Training plans |
|---|---|
| WasteMINZ | |
| WasteMINZ has not hitherto offered training itself, although its sector groups have been active in developing numerous fact sheets, position statements, technical guidelines and other informative resources.<br>WasteMINZ regularly hosts webinars and workshops, designed to connect members and improve the overall knowledge across the sectors, and promotes relevant external training to its members, such as 'Train the Trainer' workshops. As well as hosting speakers and exhibitors, its annual conference also runs relevant pre-conference workshops. | Summarised below are the needs noted in **Section 4.2**:<br>• Te Tiriti, mātauranga Māori and developing genuine relationships with mana whenua<br>• Legislative framework for waste in Aotearoa<br>• The role of local authorities in managing and minimising waste<br>• Circular economy, waste hierarchy and community engagement/education<br>• Current waste management practices in New Zealand for a variety of waste types and management methods<br>• Management of contractual relationships<br>• Measuring impact and forward planning<br>• System design<br>• Health and safety, including hazardous waste<br>• Project management<br>• Technical capabilities<br>• Work-based opportunities<br>• Waste minimisation skills for office-based workers in councils, Ministry for the Environment, consultancies, research and management jobs in the community sector, and in recycling companies. |
| Water New Zealand | |
| In recent years, Water New Zealand has employed a Training Development Manager and has produced a competency framework[i] for use by the water industry, developed on a role-by-role basis. It also offers the following training courses, accessed from the page at https://www.waternz.org.nz/training: | Water New Zealand's 2020 Water Workforce Development report[ii] recognises (p. 14) the need to undertake a gap analysis of sector skills and capability to identify the required recruitment and training needs and to inform the development of targeted training programmes. |


8

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| • Cultural Significance and Importance of Wai Module: 4–6-hour online training over four weeks<br>• Short online courses with Digital Badges<br>• Stormwater 101<br>• Drinking Water 101<br>• Drinking Water 201<br>• Small Water Supplies 101<br>• Backflow 101<br>• Wastewater 101<br>• Sampling 101 | Water New Zealand members volunteer their time to a wide range of special-interest groups, which may be accessed from the menu on its homepage. Collectively these address all three piped waters as well as groundwater, rivers, climate change and other key issues the water sector faces.<br>Several of these groups are considering training needs. The Stormwater Group (of which I am a long-time member) is committed to implementing the Stormwater Training and Sector Development Strategy, discussed in **Section 4.5**. |

## Next Steps

It is proposed that Phase 2 of the project will investigate how the industry participants and education providers can collaborate in a dynamic system capable of adapting to constant innovation in the environmental field. This will lead to a collaborative CPD strategy that avoids both duplication of efforts and the leaving of gaps (Feeney, 2023, p. 3). Mapping the skills required as a reflection of work processes will help with deduplication and the identification of gaps (Feeney, 2023, p. 25).

Feeney suggests in Table 7 of her report that it is important to elicit input from project participants to ensure Phase 2 can meet their capability needs, and that the scope of Phase 2 should be:

- Comprehensive with respect to Government outcomes
- Directly relevant and useful to the project participants and their members, the environmental practitioners who will be its direct beneficiaries
- Directly relevant and useful to other beneficiaries

These recommendations emphasise that it is crucial to keep the scope of Phase 2 manageable and well aligned with the key influences on environmental CPD in New Zealand. Feeney suggests industry associations should play the major role in leading this work, but, while identifying gaps in the current knowledge, Feeney (p. 33) admits: "In particular need of testing is my assertion that industry associations are the cost-effective key to professional training, as they are the cornerstone of my approach, and hence of the Phase 2 business case for funding."

A critical research question for Phase 2 will be whether industry associations alone can fulfil the need for future environmental management CPD, or if other participants in the education sector or government organisations should play a role. Furthermore, Feeney suggests that the following questions could be explored during Phase 2 (Feeney, 2023, p. 40).

1. How well would the high-level summary of the Government's diverse environmental and infrastructure outcomes serve to inform an outcome monitoring framework? How might we need to make it fit for purpose?
2. What specialist environmental skills are needed by which groups, to deliver these outcomes?
3. Realistically, how well would the hologram method help to map the vast array of specialist skills that core industry associations require to deliver on Government outcomes? What else might cost-effectively help us to do this?
4. Who could help us find effective representation of biodiversity skills in this process?
5. Who could help us find effective representation of catchment planning, land-use planning and resource management skills in this process?
6. What processes and relationships do we need to identify the accompanying vocational and educational needs?

7. How can we deliver these skills (capability) in the most timely and cost-effective way?
8. What monitoring and evaluation systems, platforms and support will we need?
9. What kind of Learning Management System or systems would work for a collaborative training venture as envisaged for Phase 2? How can we make our training visible and accessible to those who need or can offer training? What kind of provisional or permanent home might the LMS need?
10. What might an overall continuing professional development (CPD) strategy look like if it is to help us identify, develop and deliver the interrelated skills that environmental and infrastructure professionals know they need to deliver the Government's required outcomes?
11. What would it take to leverage the contribution of industry associations to deliver the professional CPD training their members so urgently need?
12. Who could help us estimate time commitments and agree on methods to help us to genuinely work as a collaborative, constructive and creative team?
13. How might our work inform a Just Transition for the whole of the environmental workforce, professional and vocational, to support a smooth and timely transition from the legislative settings of the past into those of a sustainable future?
14. What support will we need to identify appropriate funding sources for Phase 3 delivery?

Feeney suggests the formation of a pilot group, surrounded by a wider learning group, to explore these questions. The specific funding models for environmental CPD in New Zealand would also need to be investigated further, as some specialities, although critically important, are so niche that only a few practitioners would require them, making full cost-recovery challenging (Feeney, 2023, p. 41)

## References


Clare Feeney. (2023). Building the case for professional environmental training – a Phase 1 landscape scan. A report by Environmental Communications Ltd, funded by and prepared for ConCOVE, the Centre of Vocational Excellence for Construction and Infrastructure, August 2023.

World Economic Forum. (2023). Global Risks Report 2023. https://www.weforum.org/reports/global-risks-report-2023/


[i] Find out more about Water New Zealand's competency framework from the page at https://www.waternz.org.nz/competence

[ii] Waihanga Ara Rau and Assurity. (2020). *Mahere Whakamahinga Workforce Activation Strategy for the Electricity Supply Industry and Water Services Industry*. Version 2, August 2022. https://wearewater.nz/download


10