Sustainability and Research Context Paper for Waipapa Taumata Rau's Sustainability Strategy Development

Background

Universities are key actors in the transition towards carbon neutral, sustainable societies and to achieving the objectives of the UN Sustainable Development Goals (SDGs). They are also critical to achieving Aotearoa's goal of net zero carbon emissions by 2050. Taumata Teitei lists sustainability as one of our four interdependent research areas and challenges the UoA to reimagine what we do, embracing new areas of scholarship and research in emerging disciplines and occupations. The strategy sees mātauranga Māori aiding a commitment to a global sustainability imperative with kaitiakitanga woven into everything we do. Taumata Teitei commits us to achieve net-zero carbon status (by 2030) and to publish meaningful metrics of the University's progress towards overall sustainability.

Waipapa Taumata Rau staff undertake research into sustainability incorporating a broad range of projects with colleagues from an equally broad range of disciplines. Because of the nature of the challenges that sustainability brings, our research increasingly focusses on transdisciplinary work engaging with a range of community stakeholders as well as scholars representing a range of disciplines. At the same time, Taumata Teitei also challenges us to conduct research in a more sustainable manner. That is, we must measure the environmental impacts of the many research activities undertaken and take concrete steps to reduce these impacts and to achieve our net-zero carbon status goal recognising that sustainability also requires us to consider biodiversity loss, depletion and pollution of fresh water, long-lasting organic contaminants etc.

Our carbon footprint

The GHG Protocol Corporate Standard (https://ghgprotocol.org/corporate-standard) classifies Green House Gas (GHG) emissions into three 'Scopes'. From the UoA perspective, Scope 1 emissions are those that originate from university sources, for example our own vehicles. Scope 2 emissions come from sources like electricity used by the University but not generated by us. Scope 3 emissions refer to those that occur because of consumption connected with our activities, for example emissions associated with the production of purchased materials.

The challenge universities like ours face is that this third scope includes business travel (e.g., academic and professional staff flying to conferences) and international student mobility. Estimates of the UoA GHG emissions audit in 2019 suggest that 78% (70,000 t CO_2) come from international student and staff travel. In fulfilling sustainability goals, we need to consider how to reduce our carbon footprint. The University of Copenhagen, for example will reduce the climate footprint per FTE by 50% by 2030. Determining targets like this requires an agreed and measurable baseline. Establishing such a baseline is critical to enable the UoA to develop a plan to reduce Scope 3 emissions. It also raises the question of our ability to offset the carbon that we continue to produce.

We thus have three sustainability questions to address:

1. how do we respond to the research imperatives sustainability brings?
2. how do we modify the way we undertake research to significantly reduce the ecological footprint of our work?
3. how do we attract international students to study with us in environmentally sustainable ways?

Taumata Teitei states that we will deepen our global networks to enhance the international outreach of our staff and students and proposes how targeted international relationships will enhance our reputation as global leaders in signature research areas. However, this push to internationalise our research and our teaching comes at an environmental cost. The THE *Race to Net Zero How Global Universities are Performing* report (https://www.timeshighereducation.com/digital-editions/race-net-zero-how-global-universities-are-performing) notes that universities in Australasia wanting to attract the top international staff and students will need to demonstrate their environmental credentials to prospective staff and students. This means thinking about how to deal with the challenges around Scope 3 emissions.

The following summarises ideas drawn from a selection of strategies from universities in Europe, the UK, Australia, and Aotearoa related to the three research sustainability challenges outlined above. Research initiatives concerned with investigating sustainability are considered first, followed by those directed at undertaking research in a sustainable way.

Researching Sustainability

Sustainable Development Goals (SDGs)

Numerous universities claim that their sustainability research is globally leading explainable in part by different definitions about what sustainability research encompasses. Sydney, Manchester, and Bristol for example have adopted the UN Sustainable Development Goals (https://sdgs.un.org/goals) as a common language and framework to bring together researchers from across their Universities who work on sustainability. Monash's Sustainable Development Institute (https://www.monash.edu/msdi) brings together researchers and practitioners from across Monash, academia, industry, government, and the community in transdisciplinary partnerships to help achieve the United Nations 17 Sustainable Development Goals. Taumata Teitei commits us *to be world-leading in extending the reach and significance of the Sustainable Development Goals (SDGs),* considering Earth systems, biodiversity, water, food, land, human economic systems, and unplanned urbanisation. SDGs provide a means to highlight activity in the University related to sustainability but also to promote research and learning directed at the SDGs by guiding funding decisions. The University's ranking is assessed against the 17 SDGs by the THE University Impact Rankings (https://www.timeshighereducation.com/world-university-rankings/impact-rankings-faqs) with the UoA ranking 6th overall in 2022.

Transdisciplinary research

Sustainability research is promoted by universities as interdisciplinary and often considered a model example of how transdisciplinary research should be conducted. Transdisciplinary Sustainability research therefore follows Taumata Teitei's goal to *identify and prioritise where University transdisciplinary excellence is matched to community needs*

and develop work plans to achieve shared outcomes. Sustainability research will promote partnerships with Māori, third sector groups, local and central government, industry, and philanthropists (just as examples), and enable the development of sustainability policy. Some universities are dedicating research funding to sustainability projects. The UoA could allocate funding resources from the transdisciplinary portfolio to sustainability research. In addition, the UoA might consider the approach taken by other universities that are redirecting savings from carbon reduction measures, including reductions in the number of business flights, to sustainability research funding.

Sustainability Research Centres

Universities have often developed research centres as either overarching umbrella organisations for sustainability research or as collections of centres specialising in different aspects of sustainability research. Such centres fulfil transdisciplinary goals but must also balance generality, thereby attracting a broad range of researchers, with the ability to create greater impact in selected areas. Some universities are proposing to make sustainability a greater focus for innovation services through the equivalent of Uniservices at the UoA. The UoA has research disciplines aligned with environmental sustainability, such as Environment, Marine Sciences, and Engineering, and there are successful sustainability-related research groups and initiatives: The Energy Centre, Geothermal Institute, Centre for Biodiversity & Biosecurity, George Mason Centre for the Natural Environment, NZ Centre for Environmental Law, and Climate Centre are just some examples. New research centre proposals are part of the Hīkina kia Tutuki Grand Challenges fund process to establish University Research Centres.

Finally, some universities articulate distinct pathways: Monash specialises in circular economy while Sydney centres sustainability around Caring for Country, and there are many other examples from Australia and elsewhere. The UoA could centre a sustainability strategy on kaitiakitanga.

Campus laboratory

The campus or living laboratory for sustainability provides researchers, staff, and students, with the opportunity to use the university estate to research real word environmental problems. Universities see this as providing value for the institution as well as transitioning to a more sustainable university. The laboratory provides a means to engage with industry in sustainability research, encourage entrepreneurship around sustainability, and to communicate sustainability knowledge and research excellence to the broader community.

Leadership

Teaching in sustainability research leadership is included by several universities as part of a sustainability strategy and forms part of curriculum development, including the post-graduate research curriculum.

Sustainable Research

Travel by staff (Refer to *Staff and Student Travel Research* Context Paper and *Carbon and Climate* context paper)

Air travel is one of the most significant ways that universities are contributing to the climate crisis. The problems posed by university business travel, are exacerbated by the

remoteness of Aotearoa's location. International collaboration is seen as essential for academic work, particularly for academic career development. Reducing air travel can be perceived as a radical change as it is intricately tied to an academic career path.

Achieving the goals outlined in Taumata Teitei relies on attracting the best researchers from around the world and enabling international experiences for students as well as engaging internationally in areas of research strength. These goals may clash with the impact of international air travel on climate change unless new ways of working are applied. The challenge for the University community world-wide is to carry through the commitment to sustainability while maintaining the quality of academic work and the conduct of University business. This means that change from pre-COVID practices is essential to meet UoA sustainability commitments.

Overseas travel is deeply engrained in the expectations of academics and institutions. It is considered integral to developing international networks, knowledge exchange and furthering an academic career. However, it also predominantly the privilege of small percentage of people with one estimate suggesting that 15% of academics globally are responsible for 70% of conference travel (https://files.eric.ed.gov/fulltext/EJ1300566.pdf). Shifting expectations around overseas travel may create a more level playing field. The pressure to travel can negatively impact on academics with caring (often women), community obligations, or academics with disabilities. There is an opportunity to reduce travel and ensure remaining opportunities are more equitably distributed amongst the research community.

Universities propose three sets of approaches. First, they propose to support the development of innovative ways of collaboration and knowledge-sharing that reduce the need to travel. Building on the online experience necessitated by COVID, new forms of virtual conferences and engagement are suggested. These include using webinars on a regular basis, delivering keynote speeches and other presentations online and holding virtual research meetings. For the UoA, this may require reassessment of Te Rautaki Matihiko, the digital strategy to forefront the need to support the establishment of new communication technologies.

Second, universities are proposing proportional reductions in the number of kilometres flown per year (requiring the determination of a baseline as noted above). ANU has a target of 20% by 2025 https://www.anu.edu.au/research/research-initiatives/anu-below-zero/our-strategy/reducing-greenhouse-gas-emissions). Most air miles are flown by senior academics, who arguably need to travel least. One study based on a Canadian university found no correlation between frequency and distance flown, and citation metrics (https://doi.org/10.1016/j.jclepro.2019.04.109 see Sustainability of Staff and Student Travel context paper). Some universities are looking at carbon caps that decline with increasing seniority while others are prioritising types of travel. Fieldwork for example might be seen as essential travel whereas conference participation is not. The University of Southampton is proposing a 'points-based system', that differentially values forms of travel (fieldwork versus conferences), using a 'decision tree', which helps individuals to decide whether to travel based on a set of questions (e.g., https://tyndall.ac.uk/about/travel-strategy/). Some universities have prohibited domestic air travel.

Third, some universities are employing carbon offsetting related to travel. The University of Oregon, for example encourages the use of high quality, third-party verified carbon

offsets to help address emissions from travel (https://fa.oregonstate.edu/sustainability/carbon-offsets-osu-funded-travel) as does the University of Melbourne (https://sustainablecampus.unimelb.edu.au/energy/carbon-offsets-bank/flights).

At the core of such shifts are changes in the way university business is conducted and the academic culture. International engagement must continue but equally the nature of this engagement must change. This is our chance to innovate in how such engagement occurs, with colleagues participating in a world-wide initiative to reduce university carbon footprints. Several universities emphasise how both the conduct of research and research into sustainability must become a collective practice (https://doi.org/10.1371/journal.pcbi.1008148).

Inbound P/G student travel

Postgraduate student travel is currently merged with inbound international students. Much of their subsequent travel is included in business travel as this is purchased through the University system. Taumata Teitei has goals around postgraduate student enrolment as well as sustainability so the tension between the two must be resolved through mechanisms that sustain our carbon neutral achievements.

Outbound mobility

In recent years, there has been considerable growth in outbound student mobility from countries in the Anglosphere, including Aotearoa. UoA has promoted overseas study, research, or internships via the 360 International Team. There are many benefits associated with study abroad including exposing students to new knowledge, technologies, and methods and initiating the development of research networks, which may lead to more meaningful collaborations in the future. However, growing concern within the international education sector has led for calls to significantly reduce the negative ecological footprint of internationalisation. These include short-term mobility reduction and increasing internationalisation at home (https://www.universityworldnews.com/post.php?story=20200108084344396).

Consumables

The GHG emissions associated with Scope 1 and 2 research activities are much less than those incurred by travel but still important to consider. The University of Copenhagen indicates a reduction in the use of environmental and health hazardous substances in research and teaching (https://sustainability2030.ku.dk/biodiversity--chemistry/).

Other sustainability goals

As indicated, along with carbon reduction, sustainability needs to consider biodiversity loss, depletion and pollution of fresh water, long-lasting organic contaminants etc. Research activities will need to be considered in relation to sustainability commitments in these areas. One way to help achieve sustainability goals may involve greater sharing of research infrastructure among Aotearoa's universities and research institutes. The University of Oxford undertook a study that included downstream impacts of university operations on biodiversity. They found that "the supply chain for research activities (such

as for chemicals, medical products, organic tissue and plastics)" had the biggest impact on biodiversity (https://www.nature.com/articles/d41586-022-01034-1).

Conclusion

Taumata Teitei asks that we reimagine what we do when thinking about sustainability research and scholarship, with Mātauranga Māori helping us deal with the global sustainability imperative. Taumata Teitei commits us to a net-zero carbon status by 2030 meaning we must measure the environmental impacts of the research activities we undertake and take concrete steps to reduce these impacts. The questions posed in this context paper, how do we respond to the research imperatives sustainability brings, how do we modify the way we undertake research to significantly reduce the ecological footprint of our work, and how do we attract international students to study with us in environmentally sustainable ways, have a variety of answers some of which will be informed by the practice of others. The research community needs to decide on which solutions work best for us. This requires careful consideration but also timely decisions since global sustainability must be responded to.