

Carbon and Climate context paper for Waipapa Taumata Rau's Sustainability Strategy Development

This context briefing paper outlines considerations about carbon identified as most relevant to the development of the Sustainability Strategy and associated plans. Noticeable changes have occurred in the last three years both in Aotearoa New Zealand and internationally. Anticipation and close monitoring of these changes has driven the work of the University to date to ensure adequate alignment and readiness for effective action and leadership. There are two key areas that have seen the most developments, these are: New Zealand legislation and policy, international best practice. In addition, media coverage of climate related issues has increased significantly across a wide range of platforms, especially of events such as climate strikes and the Covid-19 pandemic – due to likelihood of zoonotic origins. In addition, sector specific practices have been highlighted by international rankings such as the Times Higher Education Impact Ranking launched in 2019.

In Aotearoa New Zealand, policy changes are being implemented at all levels of government and across ministerial and other portfolios as a result of the Carbon amendment Act introduced in 2019. The [Carbon Neutral Government Programme](#) (CNGP) was announced in October 2021 to accelerate the reductions of emissions within the public sector. The programme is overseen by MfE, MBIE, EECA and requires government agencies to achieve carbon neutrality by 2025 via immediate ambitious reduction programmes and residual offsetting. The CNGP includes a dedicated tool for target setting and guidance for measuring and reporting. Appendix A shows the sources of emissions government agencies must include in their reduction plans. Universities and tertiary institutions are encouraged to take part although not mandated. There have also been developments in how the private sector will need to contribute to New Zealand's overall target of Net-Zero by 2050. One example that will likely have implications for the University is MBIE's [Building for Climate Change Programme](#), launched in 2020, with the overall aim of reducing carbon emissions generated by the construction and operation of buildings¹. Future changes and developments include the release of the first Emissions Budget and associated Emissions Reduction Plan, both due in 2022.

International guidance for best practice has also evolved in recent years. One of the most significant developments has been the launch, in November 2021 (on occasion of COP26), of the first global [Net-Zero Standards](#) by the Science Based Target initiative (SBTi)². Although the SBTi was originally established in 2015 to help accelerate the reductions from the corporate sector, increasingly other organisations including in the public sector have chosen to align with the guidance and tools, which are free to use³. The proposed trajectory is that organisations must *halve their emissions before 2030 to be able to reach Net-Zero before 2050*. The introduction of these standards for validating net-

¹ The programme includes a Whole of Life Carbon Emissions Reduction Framework that proposes embodied carbon in buildings be assessed as part of the building consent process, and eventually be required to meet a cap. [The procurement guide to reducing carbon emissions in building and construction](#) was released in June 2021 as part of the programme and introduces carbon briefs, assessment and reporting to the procurement process.

² SBTi is a global body of scientific collaboration between CDP, the United Nations Global Compact, World Resources Institute (WRI) and the World Wide Fund for Nature (WWF)

³ Reputable carbon reduction certifications as well as CNGP based their tools on SBTi's methodology and guidance

zero targets was a step towards achieving a common net-zero definition as the term had been used in different ways and with different meanings until now, limiting the benefits of collective impact.

Once an organisation has set emission targets, the two most widely recognised ways to measure and report progress are the ISO 14064-1 (ISO) and the Greenhouse Gas Protocol (GHG). These were established over two decades ago and initially focused on direct emissions (i.e., emissions resulting from the organisation's own activities or assets – e.g., burning fossil fuels, refrigerant use) and those from purchased energy (e.g. electricity from the grid). The most recent updates in both ISO and GHG introduced requirements for organisations to monitor and report beyond their boundaries and include 'significant' indirect emissions within their entire value chain - from products and services purchased and sold. To implement this the organisation must first develop a 'significance criteria' to clearly outline which indirect emissions to include and justify any exclusions.

Risks and opportunities from climate change are also evolving issues of the past decade both within the public and corporate sectors. In 2015, the international [Financial Stability Board](#), at the request of G20 Finance Ministers and Central Bank Governors who sought to review how the financial sector could take account of climate related risks, established the industry-led [Taskforce on Climate-related Financial Disclosures \(TCFD\)](#). In 2017, the TCFD released its first report, including a framework for companies and other organisations to better understand and price material risks and opportunities from climate change. Implementation guidance (including for non-financial organisations) was updated in October 2021 with added recommendation to include indirect emissions (category 3 and above).

In New Zealand, there were two outcomes resulting from this. The country's [first national climate change risk assessment](#), published in 2020 and the passing of [legislation in late 2021](#), that made disclosure of climate change related risk mandatory for publicly listed companies and those in the financial sector. The government's [External Reporting Board \(XRB\) is currently developing climate -related disclosure standards](#) that will be published in late 2022. Although at this stage there is no mention of any expectations for the tertiary education (TE) sector, it seems reasonable to assume the same sort of approach, at least initially, as for the CNGP (i.e. for the TE sector to be encouraged to participate). Also following TCFD's recommendation for all non-financial institutions with public debt or equity to disclose. Another aspect to consider is whether the University's engagement with financial institutions interested in understanding their clients' vulnerabilities and risks related to climate change might see any requirements for disclosure.

The [Ministry for the Environment's climate-related disclosure report](#), released in October 2021, is an example of how the public sector uses the TCFD framework to communicate risks and opportunities.

One final point to make is the increased and constantly evolving attention the financial sector is placing on not just carbon and climate disclosures but on the overall reporting of sustainability. It is anticipated that within the next few years, International Sustainability Disclosure Standards will be developed. In November 2021 the [International Financial Reporting Standards](#) modified its constitution to create dedicated International Sustainability Standards Board to develop these. In New Zealand, MBIE published a report about [international trends on sustainability reporting](#) which provides some key points about an anticipated shift to mandatory sustainability reporting and the implications for Aotearoa.

The University has been closely following the developments outlined above, not only in the last five years but for decades prior with the monitoring of energy conservation and efficiency since 1979. Internal monitoring of carbon emissions begun in 2011⁴ with a set of five measures and corresponding metrics. These were, energy and water, waste, paper consumption and 'work-related staff and students air travel'. In 2019 in anticipation of both regulatory and non-regulatory changes ahead, including the expectation for more recent baselines (2015 or later) the University started to work on updating and improving the understanding of its carbon profile by preparing the first carbon emissions inventory aligned with latest international standards ISO14064-1:2018. The work was strongly guided by Taumata Teitei (University Strategy 2030) and Te Rautaki Tūāpapa (Estate Strategy - 2030), both involving extensive stakeholder engagement, as well as by input from a number of consultations carried out by the Sustainability Team since 2010 including focus groups and annual surveys.

Transparency has been a prominent theme of stakeholder input, as has been accountability, indicating that the developments in both New Zealand's regulatory space and international best practice previously described are reflected also in the expectations of the University's stakeholders.

Appendix B provides a summary of the University's first carbon inventory (baseline 2019). A full report is expected to be released once external verification is complete before the end of the year⁵. The external audit and verification to ISO14064-1:2018 are both key to informing the development of the Net-Zero Carbon strategy. First, because compiling the baseline to be compliant with rigorous international standards involves sound internal scrutiny of existing data as well as implementing measures to address gaps and in some cases making immediate improvements evidencing good alignment with University's overall strategic commitments around data governance. Second, the process required significant collaborative work between all areas of Operations and the Estate – in particular, Property Services FM and Space Planning, Procurement, Planning and Information Office and International Office as a result of recognising that if an activity or service involves or influences decisions around fuel, transport, land, energy, water, waste, buying and selling products and services etc. then it involves carbon and it has sustainability attributes attached to it. This collaboration forms the basis for future work once the Net-Zero Carbon Strategy priorities are identified.

Below are some key points identified in the carbon baseline inventory 2019:

- Most of the University's carbon emissions are of 'indirect' source with over three quarters resulting from air travel with work related staff and student travel and international students representing over 35% and 43% of the total respectively. Combined, these two measures represent 78% of the University's baseline emissions.
- Staff and student commuting; staff working from home; freight and couriers; are three measures for which no sufficient data for 2019 were available, but are expected to be part of carbon monitoring and reduction programmes when these are implemented.
- Systems to collect, access and make carbon data available to stakeholders are critical to the success of any carbon reduction programme, this is especially challenging when so much of the data are secondary coming from suppliers and other third parties.

⁴ Prior to carbon, there was close monitoring of energy, especially electricity.

⁵ Note: 02 Feb 2022 update. This process has been completed. Inventory report, verification and assurance statement now available.

- There are also some emission sources not included but expected to be significant, including those related to construction; digital services and IT products; and food.

As mentioned, the work to date provides good insights and a reliable baseline that will inform the Net-Zero Carbon Strategy. Subsequent inventories will be compiled and reported once those strategic priorities are identified including the level of ambition for the Net-Zero target. The 2019 data provides a benchmark set of figures based on the last full year prior to the Covid-19 pandemic impacting on emissions. In order to provide some further insight and place carbon emissions into the wider context of the impact of the pandemic world and what this means for the University, appendix C shows data available for the top ten emission sources for 2019 alongside preliminary data available from 2020.

The carbon inventory is not the only piece of information to be taken into consideration as part of the Net-Zero carbon strategy development. Indigenous ways of knowing and understanding are essential to the process and indicators are being explored as part of the work of the Sustainable Estate and Operations Working Group.

The **international tertiary education sector** has also been responding to the developments of recent years. To better understand these trends, the Sustainability team conducted specific benchmarking in 2019 - updated 2021. This exercise involved reviewing publicly available information of over 50 Universities categorised according to membership - UNZ, G8, U21, key LERU- as well as standing in THE Impact rankings. The results showed a strong trend towards carbon neutrality commitments with longer term (2050) and interim (2030) targets as well as commitments to publicly report according to recognised international standards, most having opted for ISO 14064-1 and GHG or nationally mandated standards. Only two Universities made explicit reference to indigenous knowledge in carbon and climate related documents. A more recent trend, which coincides with the update of international standards to current date requires material indirect emissions to be included in monitoring and reporting programmes, is that universities in Aotearoa and around the world are starting to include emissions such as work-related air travel in their inventories. Expectation is also building around international students' air travel with [Times Higher Education recently publishing a report](#)^[1] making a strong call for inclusion. For most of the institutions reviewed, all of these changes will take some time to adjust and respond to. In contrast, the University of Auckland's is well placed to lead the space both in terms of the level of ambition and included measures as well as the integrated and well-informed, across-university collaborative approach.

^[1] "Therefore, there seems little reason why the flights (or other journeys) that international students take to study abroad should not be included; and if they are not, there is an argument that carbon emissions are being significantly undercounted". In: The Race to Net Zero, how global universities are performing. THE, October 2021, p.17.

Appendix A

Table 4: GHG emissions sources reported under the CNGP

All scope 1 emissions	All scope 2 emissions	Mandatory scope 3 emissions and material scope 3 emissions
<p>Category 1 Direct GHG emissions</p>	<p>Category 2 Indirect GHG emissions from imported energy</p>	<p>Categories 3, 4, 5 and 6 Indirect GHG emissions from transportation, products an organisation uses or supplies, or other sources</p>
<p>Examples:</p> <ul style="list-style-type: none"> Fuel use (eg, aviation fuel, biofuel and biomass (N₂O, CH₄), coal, diesel, light and heavy fuel oil, LPG, natural gas, petrol) Refrigerant and other gas use (eg, HVAC, medical gases) Composting Wastewater treatment plant (owned) Solid waste facilities (owned) International operations (scope 1) Agriculture and forestry (eg, enteric fermentation, fertiliser use, forest growth, forest harvest) 	<p>Examples:</p> <ul style="list-style-type: none"> Purchased electricity Purchased heat or steam International operations (scope 2) 	<p>Mandatory scope 3 emissions:</p> <ul style="list-style-type: none"> Staff travel for work (eg, domestic and international air travel, hotel stays, taxi, private car, public transport, rental vehicles) Freight transport Staff working from home Transmission and distribution losses Water supply Wastewater services Waste to landfill <p>Material scope 3 emissions:</p> <ul style="list-style-type: none"> All other scope 3 emissions material to the organisation (if less than 1% of total inventory, can be excluded)
<p>Biogenic emissions mandatory to report but separated from scope 1</p>		
<p>Examples: Biodiesel (the CO₂ from the biofuel proportion), Bioethanol (the CO₂ from the biofuel proportion), Biomass (the CO₂)</p>		

Source: [MfE, 2021 Carbon Neutral Government Programme, A Guide to measuring and reporting greenhouse gas emissions](#)

Appendix B – The University of Auckland – Greenhouse gas emissions inventory – Baseline 2019 – Summary

Activity	Activity Description	Category	Calculated emissions (t CO ₂ e)
Accommodation - NZ and International	Work related (staff and students)	Category 3: Indirect emissions from transportation	591.5
Air travel (domestic, long and short haul)	Work related (staff and students)	Category 3: Indirect emissions from transportation	29230.2
Air travel long and short haul (average)	International students inbound	Category 3: Indirect emissions from transportation	35921.3
Bus travel (city)	Tamaki - City loop Student Bus (only relevant for 2019)	Category 3: Indirect emissions from transportation	30.0
Refrigerant and other gases	(large) Equipment eg. Chillers; lab gases & other	Category 1: Direct emissions and removals	186.0
Fuel petrol and diesel	UoA Vehicles, fuel cards	Category 1: Direct emissions and removals	152.5
Diesel stationary combustion	Fire pumps, generators	Category 1: Direct emissions and removals	34.7
Electricity	Purchased electricity (incl low/zero carbon)	Category 2: Indirect emissions from imported energy	6864.5
Electricity distributed T&D losses		Category 4: Indirect emissions from products used by organisation	525.3
Enteric Fermentation Dairy Cattle	Leigh Marine Lab	Category 1: Direct emissions and removals	24.7
Enteric Fermentation Sheep	Liggins Research Farm Laboratory, Wai-o-tapu.	Category 1: Direct emissions and removals	120.0
LPG stationary commercial		Category 1: Direct emissions and removals	2.8
Natural Gas distributed commercial		Category 1: Direct emissions and removals	5146.6
Natural Gas distributed T&D losses		Category 4: Indirect emissions from products used by organisation	601.1
Steam generation CO ₂ e	Purchased from ADHB	Category 2: Indirect emissions from imported energy	341.0
Paper use - default	Reams of paper used	Category 4: Indirect emissions from products used by organisation	162.5
Taxis and rental cars		Category 3: Indirect emissions from transportation	162.1
Waste, recycling (transport only) and composting			991.2
Water supply	Mains	Category 4: Indirect emissions from products used by organisation	13.7
Wastewater for treatment plants (average)			186.1
Total			81,290
Mandatory* total (programme certification)			44,665
* Staff and Student Commuting, WFH, Freight and couriers to be included in reduction programmes but not included in this inventory as no sufficient data were available for 2019			

Appendix C – The University of Auckland – Greenhouse gas emissions inventory – Top 10 baseline emissions 2019 and changes in 2020

The University of Auckland – Top 10 carbon emissions	tCO ₂ e		% change
	2019*	2020**	
Air travel long haul (average)	59,887.87	3,007.27	-94.98
Electricity	6,856.54	6,430.12	-6.22
Natural Gas distributed commercial	5,146.61	5,339.02	3.74
Air travel short haul (average)	3,255.88	290.36	-91.08
Air travel domestic (average)	2,007.80	843.00	-58.01
Natural Gas distributed T&D losses	603.34	625.89	3.74
Electricity distributed T&D losses	525.31	492.99	-6.15
Waste disposal recycling of Paper	426.07	TBC	
Waste landfilled LFGR Mixed waste	388.75	TBC	
Steam generation CO ₂ e	341.00	TBC	
Total	81,290	17,503.94	-78.47

* Data externally audited and verified

** Preliminary data, not audited nor internally reported at this stage. 2020 figures for air travel **exclude** international students as no data available at this stage. However, figures expected to have decreased very significantly due to NZ's border closures