

University approaches to reduce business sector travel emissions

Research report

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ANU Travel Lab

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Abstract

The following report provides findings from interviews with 15 universities to understand how other universities were approaching their goals of reducing academic travel emissions, as well as any outcomes of their efforts. The research was conducted to inform the change program to reduce travel emissions of the Australian National University (ANU). Reducing emissions from university flying is a relatively new strategic goal for the sector, and most of the institutions we interviewed have only begun to make significant effort in recent years.

When interviewees were asked about specific measures to reduce travel emissions that they implemented or were considering, several universities described internal carbon pricing mechanisms as one solution. These included carbon budgets and flight levies, carbon taxes or surcharges with funds raised often going towards sustainability initiatives of the university. For the universities that purchased carbon offsets, some acknowledged the ethical concerns with offsets purchased on the international market, with one university noting that their students were questioning the types of offsets the university was investing in. Other universities prioritised reducing emissions by restricting travel, or prioritising land-based travel where this was feasible or equitable.

A frequent theme that emerged from the research was the inherent complexity and goal conflicts that culminate in an inability to create change to air travel practices within universities. Air travel is considered fundamental to university cultures and norms that prioritise internationalisation and networking as a measure of success and career advancement. Building networks, seeking funding and attending conferences are all seen as essential to progress in an academic career, and for university rankings. University rankings are also linked to the ability and need to attract international students, and these contradictions and goal conflicts were raised by the majority of the participants. Interviewees described a need to implement a collective and cultural approach to change.

Interviewees discussed various barriers and enablers when attempting to create change and reduce travel emissions within their institutions. The need to build relationships and have ongoing engagement with staff over time, was frequently discussed by interviewees. The need for visible support and commitment from leadership was also frequently raised in the interviews and identified in the literature. The nature of decision making, disaggregated structures within universities and the goal conflicts discussed above, make implementing low carbon travel particularly challenging in universities.

Transparency, accessibility and the visualisation of data emerged as a significant theme discussed across all of the interviews. The importance of having data was described as assisting with engagement, decision making and enabled the ability to influence, as well as providing transparency and accountability to meet their targets. The process of collecting data from various sources was also raised as a particular challenge for the universities.

The interviewees also frequently discussed their concerns about the impact of reduced opportunities for networking on the career opportunities of early career researchers (ECRs). Interviewees expressed a desire to include tailored solutions that did not disadvantage ECRs. People with caring responsibilities or disabilities who may be limited in their ability to choose alternative forms of transport, such as trains or buses due to time or physical constraints, was also raised as an issue of concern by the interviewees. Universities interviewed in the UK are also required to undertake an equality analysis, and this process illuminated a number of additional issues to ensure safety for women and LGBTQI+ people when travelling to certain countries, for example, with accommodation choices. The universities interviewed were largely conscious of equity issues, with some universities actively addressing equity concerns within their low carbon travel plans. There was no mention of other potential impacts, such as external investment or public policy influencing universities travel emissions management, which may occur in future if it has not already.

All universities achieved emission reductions as a result of the COVID pandemic. It was not possible to isolate the impact of institutional travel emission reduction efforts from the COVID backdrop, but it is evident that COVID was a significant factor in the reduction of travel emissions. While it is too early to draw any strong conclusions about the outcomes of the universities' programs from this research, the findings point to a need for strong institutional leadership, effective collaboration across organisational and disciplinary groups, and a willingness to re-examine fundamental assumptions about the role of travel in university work.

1. Introduction

.. if we are to tackle academic travel, then we must aim to remove the structures of life and survival that make caring for the environment appear punitive to academic careers and academic status amongst peers (Baer, 2018, p. 303).

The aviation sector is a growing source of greenhouse gas emissions, with figures on emission contributions from the sector varying between 2.5 to 5 percent of global emissions before COVID-19 (Lee et al., 2021; Ritchie, 2020; Tseng et al., 2022). Air travel has enabled hypermobility for a small percentage of the population (Gössling et al., 2009), and academics are among the percentage of the population who fly frequently (Higham et al., 2022). A survey from the Royal Melbourne Institute of Technology (RMIT) in 2016 found that the average Australian academic takes 1.7 overseas trips and three domestic trips for business purposes annually (Baer, 2018).

There is a body of research on the need to reduce flying emissions in the university sector, for example, Glover et al. (2017); Higham et al. (2022); Nursey-Bray et al. (2019); Tseng et al. (2022). Further discussion about the literature can be found in the introduction to the literature conducted by the Australian National University (ANU) Travel Lab (Blackmore & Martin, 2023). The drivers of academic flying have been comprehensively considered through the literature, with air travel seen as fundamental for research, for international and domestic students, to develop networks, to seek funding and to attend conferences. The research reported here, which includes interviews from 15 universities located in Europe, the United Kingdom, New Zealand, North America, Canada, Japan and Australia, intends to build on the academic flying literature and to assist ANU to meet their goal of reducing emissions from air travel by 50 percent on 2019 baseline figures (ANU, 2023). None of the participants were representatives of universities in the Global South, which is a limitation of the research.

It is acknowledged that 2019 was a peak year for air travel, with a 3.6 percent increase in the total number of passengers carried from the previous year (ICAO, 2019)¹. The United States ranked first as the most frequent flyer in 2019 (based on revenue tonnes-kilometres), with China ranking second and Australia ranking 17th.²

Travel emissions from flying reduced globally throughout the pandemic; however, emissions from air travel are increasing to almost pre-pandemic levels, with recent figures showing aviation emissions reached 80 percent of pre-pandemic levels in 2022 (International Energy Agency, no date). Budd and Ison (2020) discuss the opportunity that COVID created for change in the transport sector and propose the concept of "Responsible Transport", which they describe as,

Responsible Transport delivers safe, secure and equitable mobility that embeds social, economic and environmental wellbeing at the head of post-Covid transport policy,

¹ International Civil Aviation Organisation (2019). Presentation of 2019 Air Transport statistical results. <https://www.icao.int/annual-report-2019/Pages/the-world-of-air-transport-in-2019-statistical-results.aspx>

² Ibid.

planning and operations and enables individuals to make considered transport choices (Budd & Ison, 2020, p. 3).

The lessons from COVID in relation to self-isolation and taking responsibility for “personal and others health and well-being” (Budd & Ison, 2020, p. 3) are applied in the concept of Responsible Travel.

The literature also discusses the challenges for the university sector to reduce travel emissions due to the fundamental cultures, cognitive norms and practices as described in the transport cultures framework of academic flying developed by Tseng et al. (2022) . This framework outlines cognitive norms, such as career achievement and internationalisation; material cultures such as transport and information technology; and norms and practices, such as academic conferences that continue to be a significant culture of academic life (Tseng et al., 2022, pp. 2-3). The transport cultures framework also includes individual actions and notes that academics can experience challenges and dissonance in relation to individual actions to reduce flying that includes a concern that reducing travel will affect academic research and competitiveness (S. Tseng et al., 2023, p. 4).

The ANU is no exception to these norms, material cultures and practices of academic life, and Australian universities in general have the added challenge of the tyranny of distance, being further away from Europe, the United Kingdom and the United States, but closer to Asia and the Pacific. This distance is a challenge for Australian universities, due to limited low carbon transport infrastructure, such as high-speed trains, particularly in regional areas with limited options for train travel, unlike in Europe. Glover et al. (2019, p. 463) also found that the majority of Australian academics felt that air travel was necessary to build international networks, and that Australian academics considered themselves at somewhat of a disadvantage, in comparison to academics located in the Northern hemisphere. Research from a university in New Zealand corroborates this concern (Hopkins et al., 2019).

Australian universities, like many universities globally are also reliant on international students for funding, and international education is one of the largest export sectors for Australia, contributing \$26.6 billion to the Australian economy in 2022.³ International students also have very few options, other than flights to arrive in the country and will often need to return home for family visits. The following report will discuss internationalisation in more detail from the interviews conducted.

Business Travel (not including commuting) is one of the top 3 emissions sources of ANU Scope 1, 2 and partial Scope 3 (waste and business travel) emissions, therefore there is significant impetus and support from leadership to reduce emissions from business travel across the university (ANU, 2023). Travel emissions for the ANU decreased significantly over the pandemic as can be seen in **Figure 1**, yet travel emissions are quickly increasing to 2019 levels. Based on the current trajectory, projected emissions in 2024 will not be on track to meet the Australian National University’s target for net zero emissions by 2025 discussed below.

The ANU emission reduction targets are ambitious, with the intention to reach net zero emissions by 2025 and below zero emissions by 2030.⁴ The Below Zero strategy states there is an intention to reach this target by firstly reducing emissions, offsetting as a last resort, using only “high quality carbon credits on Australian land” and through “ANU connected carbon removal activities” on ANU land.⁵ The ANU have also recently launched their Environmental Management Plan (EMP) 2022 – 2025 that references the Below Zero program as leading the work with emissions reductions and the overall goal to reduce scope 3 emissions by prioritising travel and waste (ANU, 2022, p. 20).

³ Department of Education. Education export income, calendar year 2022. <https://www.education.gov.au/international-education-data-and-research/education-export-income-2021-calendar-year>

⁴ ANU (2022) ANU Below Zero Program. Strategic Plan. <https://sustainability.anu.edu.au/files/2023-06/1%20-%20BZ%20strategic%20plan-2022-2031.pdf>

⁵ Ibid, p.2

ANU Travel Emissions (Actual and Target)

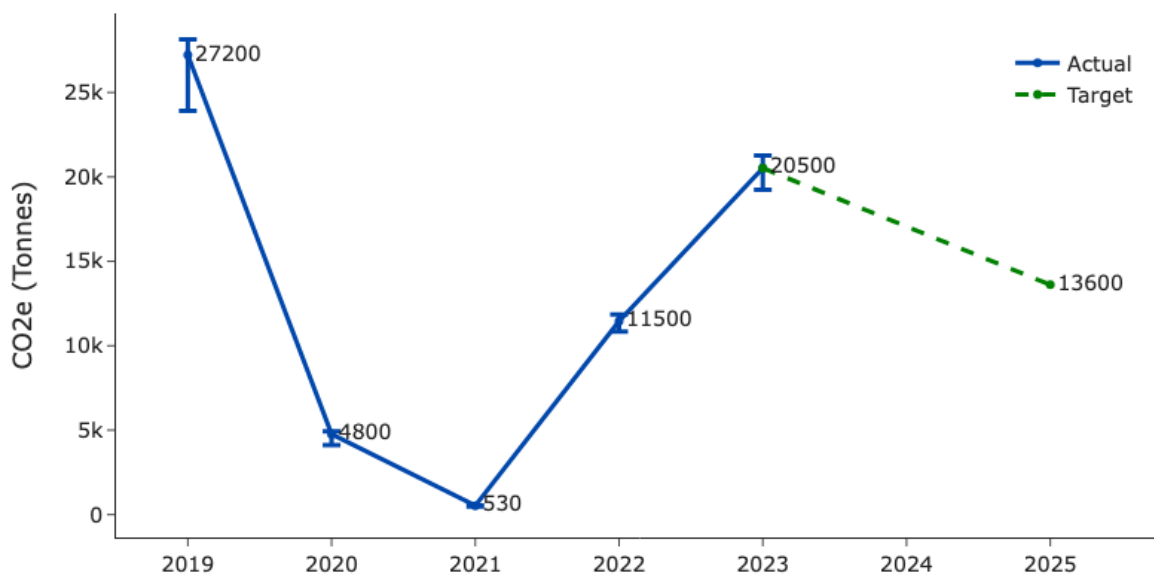


Figure 1. ANU university travel CO2e emissions

Note: The solid line is the actual data, and the dashed line is the linear projection to the target 50% reduction since 2019.⁶

The ACT government has also ambitiously committed to reducing emissions (from 1990 levels) in the territory by 50-60 percent by 2025 and has a strategy in place to achieve net zero emissions by 2045.⁷ The ACT government’s strategy is informed by considering the ACT’s share of the global carbon budget, and they have calculated that the remaining budget for the ACT is 28 mega tonnes (Mt) of CO2-e. The ACT government have calculated that based on the current spend of 4 Mt CO2-e each year (as of 2018), the budget would be expended in approximately seven years. However, the ACT climate change strategy does not include air travel emissions in their targets.

ANU have mandatory responsibilities for disclosures on greenhouse gas emissions and climate risk. The university is currently required to report their carbon emissions, inclusive of business travel, under a series of mandatory and voluntary reporting frameworks such as the Australian Public Service Net Zero strategy⁸, the National Greenhouse and Energy Reporting scheme⁹ and the Federal Climate Change Disclosure program.¹⁰

⁶ ANU Travel CO2e Emissions. Viewed 13 February 2024. Access restricted to ANU staff and students. <https://travelemmissions.anu.edu.au/>

⁷ ACT Government (2019) ACT Climate Change Strategy 2019-25. https://www.environment.act.gov.au/_data/assets/pdf_file/0003/1414641/ACT-Climate-Change-Strategy-2019-2025.pdf

⁸ Department of Finance (2021) APS Net Zero by 2030. <https://www.finance.gov.au/government/climate-action-government-operations/aps-net-zero-emissions-2030#2030-target-policy-scope>

⁹ Clean Energy Regulator: Viewed 5 February 2024. National Greenhouse and Energy Reporting (NGER) scheme. <https://www.cleanenergyregulator.gov.au/NGER>

¹⁰ Department of Finance (2021) Commonwealth Climate Disclosure. <https://www.finance.gov.au/government/climate-action-government-operations/commonwealth-climate-disclosure>

An online survey was conducted for the ANU community in August 2020, which found support for investigating university wide travel.¹¹ ANU has identified ‘critical enablers’ to support the reduction of travel emissions university wide that includes, leadership, tools and measures (co-design process), organisational systems (communication, data visualisation, travel booking systems), career development opportunities and the built environment (infrastructure and technology).¹² The ANU has also developed a voluntary pilot program that assists staff to consider emissions when making travel bookings.¹³ This voluntary program is essentially an individual approach to reducing emissions by firstly asking staff to reconsider the travel if it is not necessary, and to reduce the need to travel for ANU related activities. This approach aligns to the Responsible Travel concept to firstly make the individual consideration of whether travel needs to occur (Budd & Ison, 2020, p. 3). If travel is considered necessary, the ANU suggests travelling without flying if alternative modes of transport are available.

The research reported here extends earlier work at the ANU to reduce travel emissions. The initial idea for the research was to understand the impact that travel emission reduction strategies from other universities have had (whether planned or unintended) and what insights they have gained throughout the design and implementation process. As will be discussed in this report, the research did not find definitive outcomes from the change journey that other universities have been on to reduce travel emissions, largely due to the interruption to travel due to the COVID-19 pandemic. The research revealed that most universities were grappling with disengagement as a feature when attempting to implement a broad program across large universities, some with very disaggregated structures in place. This points to the need for a multi-pronged strategy to address this complex challenge. Our findings are consistent with the academic flying literature with the interviewees who participated in our research raising many similar concerns, such as internationalisation and effects on early career researchers.

2. Methods

This qualitative research project was based on semi-structured interviews. Participants were key staff members who had been involved in travel emissions reductions programs and policies at other Australian and international universities and other research organisations.

A list of 20 universities of interest was developed. This included universities that were identified in the literature review as being leaders in either research or program implementation, as well as those that ranked highly in sustainability rankings or who were involved in air travel collaborations. These universities were all located in the Global North. Invitations were sent to the list of 19 universities and one research institute to participate in an online, semi-structured interview. From these 20 invitations, 14 people either agreed to participate or connected us with a colleague who then agreed participate in a research interview. One additional person declined an interview but agreed to respond to questions via email. Interviewees included academics and professional staff involved in sustainability initiatives or leading these initiatives. Interviews were conducted between August and October 2023. The majority of interviews lasted between 30-60 minutes. Appendix 1 includes the interview guide for reference.

The interviews were transcribed and coded into broad themes using NVivo (Appendix 2). There were 46 codes and subcodes that emerged from the data with some themes prevalent across all the interviews, and that are discussed in further detail in this report. Significant themes from the interviews included discussions on data, internationalisation, staff engagement, specific measures, roles and responsibilities, organisational culture, and equity considerations.

¹¹ FAQs – Climate action in practice: new emissions reduction goal for travel. Viewed 5 February 2024. <https://sustainability.anu.edu.au/FAQs-Climate-action-in-practice-emissions-reduction-goal-for-travel>

¹² Ibid.

¹³ ANU. *Voluntary pilot program*. Viewed 5 February 2024. <https://sustainability.anu.edu.au/node/246>

The codes were further analysed by two of the authors, using content analysis with the use of Word to export the codes from NVivo and interrogated further using Excel to provide an overview of the main themes recurring from the interviews. The following data from the interviews includes broad coverage of how the universities are approaching the reduction of travel emissions within their institutions. As the interviews were limited in number to 15, data saturation was not reached, and further insights or themes may have emerged with additional interviews or surveys (Saunders et al., 2018). However, the findings do point to similar challenges across those interviewed in relation to the importance of data accessibility and transparency to enable engagement with staff, disengagement from the broader university community to sustainability initiatives, conflicts with internationalisation strategies of universities, and concerns about the impact of a reduction in travel on early career researchers (ECRs).

The following section will outline the specific findings from the research, with broader institutional findings provided in section 8. Throughout this report, PI refers to the number assigned to each interview participant to ensure anonymity.

3. Reporting, data visualisation and transparency

Across the interviews, transparency, accessibility and the visualisation of data emerged as a significant point of conversation. Interviewees discussed the importance of having data to enable discussions with staff, to assist with decision making, to influence, to provide transparency, accountability and enable engagement and curiosity (PI01, PI06, PI07, PI12, PI08). Data was also linked frequently with engagement (PI01, PI03, PI05, PI06, PI12) and comments included the use of data as a starting point for conversations, academics wanting metrics and measurables, getting input from staff after presenting data and regular reporting and visualisation of data and statements such as, “you won’t get behaviour change without the data” (PI05). Regular reporting and visualisation of data was also stated as helping with messaging and behaviour change (PI06). As discussed by one interviewee:

So making data accessible or at least the visualisations let’s say accessible to everyone is also a priority to us because at least in my mind if people can see the data and maybe understand how it’s been evolving also maybe on the level of departments or institutes I think that generates interest and curiosity and I also believe that it really engages people more and make them maybe more willing to participate if they see that there’s actually an effect in the data (PI12).

This particular university (PI12) was also working on a public dashboard for emissions data to the broader public. Accessibility and accuracy of data was also discussed across interviews, both in relation to travel data that is in a form that is accessible and useful, and in relation to who can access the data (privacy issues) (PI02, PI07, PI12). PI12 were also collecting data at a granular level and could break down the data according to academic level (Professor or PhD), and whether they flew economy or first class, as well as the purpose of the trip. Some universities had difficulty breaking down the data for ECRs (PI06) and noted that data on frequent flyers is easier to get (PI05, PI06, PI13). Visualisation of data was also important as an engagement tool for the workshops and to justify the research and funding within the department (PI07).

The reporting of data and processes for collecting data was also discussed across several universities. Universities discussed ways of collecting data, with some using multiple sources, such as travel agencies, Concur (expense management system), human resources (HR) and external organisations for emission calculations. Others collected data from automated processes, for example running data from Concur and their business travel account from the bank through Python for quarterly reports (PI13). One university had individual data sourced from HR such as salaries and gender, and they indicated that there were gender differences with who is flying (PI07). They could also use this data to know individual trips and said, “we can then go to the department and show them data about their department, about each individual, or about the whole department” (PI07).

The university stated above, appeared to have significant levels of data they were able to collect, but overall, there was a need to streamline the travel booking process to get more comprehensive and consistent data, with one interviewee stating:

So, the way we've approached it is that we've got a preferred supplier which is [name of supplier] and we worked with them to get a report in the kind of format that we wanted, which is a really good quality report. It's got an enormous amount of detail on travel, so that's a preferred supplier. So, where people are supposed to use. But there's very little mandated at [PI05], very little that's mandated. So, you know the departments are supposed to, but then there's still two other contracted suppliers, which is like a lower-level supplier, but they're allowed to use them. (PI05)

This interviewee discussed additional challenges with travel data indicating the disparate processes in place for booking travel within the university with some departments using the preferred supplier, and others using contracted suppliers that provided less detailed information on travel bookings. The reports that were generated from travel bookings (an E-expense report), also necessitated a manual process of determining what codes related to travel, with staff sometimes using incorrect codes (PI05). On top of that process, the interviewee noted a third source of data, that required additional data mining to find any useful flight data from the information stating:

...then we've got another category of data which is taking an extract out of travel from the university's financial system that they use and taking the report, which can literally be 30,000 lines for a month and reducing that to about 100 flights. So that's a bit of data mining to try and find flights in that and that's where people have gone and used some other rogue suppliers they weren't supposed to use that were preferred nor contracted. And they do that. And also where they've used a credit card. So that would be a Barclaycard transaction and trying to find out which of those are flights. So that's easy to reduce the first, the first you know 28,000 and then you just have to look at sort of 2000 entries and try and get about 100 flights out of that (PI05).

The above example indicates the level of reporting needed for accurate data requires resourcing, and thus a need for streamlined travel bookings and consistent processes across the university to ensure that accurate data can be collected.

Several universities were using 2019 as a baseline, which coincided with a peak period of travel as discussed in the introduction (PI07, PI08, PI10, PI13). Most were seeing emissions increasing near to that peak period to become the “new normal” (PI08, PI12). One university had a key performance indicator to reduce flight emissions by 25 percent on 2010 levels by 2030 (PI13). Only one university interviewed stated they were using a 2006 baseline, which was the earliest baseline from the interviews. Another university discussed how they had to revise their emissions reduction goal due to poor baseline data stating:

Also there were some problems, I think so now I don't remember but a goal was set to decrease carbon emissions from flying by 60% between 2015 and 2025 I think but the problem then is that a few years later they realised that they perhaps didn't actually have really good baseline numbers so it was hard to compare '25 to 2015 because we weren't or they weren't very sure about the 2015 numbers. So, it was revised so it became like decreasing flying – or perhaps it was 40% from 2015 to 2025 and they kept the carbon emission target, but it became 60% reduction from 2019 to 2025 because emissions had risen in the meanwhile. (PI07).

Our findings showed that universities are using different methods and systems for reporting, with varying levels of data availability, data quality and resourcing. At this stage many universities are at the

start of their journey to accurately report travel emissions. As with other new domains of emissions reporting, it is likely that there is a wide range in accuracy of reported university business travel emissions. Given the common sector-specific challenges discussed by participants and lack of sector relevant resources, there appears a need for development of best practice to support universities.. The research found that having access to accurate data was important, and that the transparency and sharing of data supports conversations and travel reduction initiatives over the longer term (PI01, PI06, PI13). Another interviewee was sensitive to naming and shaming frequent flyers (PI05) with the use and collection of flight data, even though this appears to be an accepted strategy in Sweden with the *flygskam* (flight shame) campaign (Dey & Russell, 2022; Goodwin, 2020). Andersen (2022) found a rejection of flight shame narratives in public debate in Norway, and concludes that although it can polarise debate, it also has the potential to lead to a rethinking of flying as an accepted norm or social practice (Andersen, 2022, pp. 13-14).

4. Internationalisation and students

As discussed in the introduction, international students contributed \$26.6 billion to the Australian economy in 2022¹⁴ and it is a significant export sector for Australia, which prior to COVID-19 was the third largest export after iron ore and coal (Baer, 2022, p. 105). Baer (2022, p. 105) highlights how the reduction of funding from government sources for universities since the 1980s has necessitated the need for full fee-paying international students, with most students attending Australian universities from China, but increasingly from the Global South. Full fee-paying international students have become a key source of revenue for Australian universities, which is considered an unequal exchange by some scholars, as predominately money is moving from the Global South to the Global North (Baer, 2022, pp. 110-111).

Baer (2022, p. 111) points out that there are other implications for the students who arrive “lured to leading Australian universities”, but who are then taught by sessional staff and postgraduates on contracts, rather than the academics who attracted the research funding. Other implications for international students in Australia, are of course in relation to the shortage of housing options, particularly since COVID-19 and a reliance on part time work, all of which can lead to the exploitation of international students.¹⁵

Clearly there are significant concerns with the overreliance on revenue from international students, both from an emissions perspective and for the welfare of students arriving in Australia. One of the interviewees stated that emissions from student air travel is the largest source of their emissions (PI11) and yet this is rarely considered across many universities’ sustainability plans as noted by one interviewee who stated:

This is just the unfortunate truth of so many sustainability tenets and initiatives, many of them run contrary to typical business practices. Let’s just say in the clash between sustainability and existing cultural and business practices one of them is far more of an unstoppable force than the other is an immovable object. (PI02).

Shields (2019, p. 599) modelled greenhouse gas emissions associated with international student mobility from 1999 and 2014 combining three datasets and found that emissions were “substantial and growing.” Shields found the annual emissions from student mobility is comparable to certain countries’ annual

¹⁴ Department of Education. Education export income, calendar year 2022.

<https://www.education.gov.au/international-education-data-and-research/education-export-income-2021-calendar-year>

¹⁵ Lucas, Adam (2023) International students hit all-time high during Australia’s worst housing crisis in decades. Australian Institute of International Affairs.

<https://www.internationalaffairs.org.au/australianoutlook/international-students-hit-all-time-high-during-australias-worst-housing-crisis-in-decades/>

emissions. The countries used for the comparison were Latvia (13.94 megatons) and Jamaica (15.47 megatons) on the lower estimate, to Croatia (30.42 megatons) and Tunisia (39.72 megatons) on the higher estimate (Shields, 2019). Only one interviewee stated that their university included international travel from students in their target in 2021, noting that half the students come from outside the UK, from China, Australia, and the US (PI09). However, they did not say how they measured emissions from student travel which is likely more difficult to measure than university business travel.

Half of the universities interviewed identified the clash between the need to attract international students and the need to reduce air travel emissions (PI01, PI02, PI03, PI04, PI07, PI11, PI13). One university noted the difficulty in thinking long term on this issue due to the immediacy of budgetary constraints and the operational pressures to teach all arriving international students (PI01). Another point raised by several interviewees was the need to be globally connected, with institutional strategies linked to this (PI06, PI07, PI11) and the contradictions inherent in this as stated by one interviewee:

.. we can't on the one hand be telling researchers and others to be connecting more and attending international conferences, we can't pin promotion on those kinds of metrics, which from my understanding is the way that things are currently set up and at the same time be saying, you have to fly less. (PI06)

University prestige is linked to rankings and the ability to attract international students, which was identified as a goal conflict for some interviewees (PI02, PI07, PI13). One university also discussed the previous cap on international students had increased from 15 percent to 20-25 percent as part of the universities business strategy (PI13). The issue of academic culture norms that dictate a need for international conferencing and collaboration was seen as difficult to shift (PI02). Much of the literature also discusses these career norms, with a “fear of not flying” being perceived to impact academic career advancement (Nurse-Bray et al., 2019).

Interviewees also discussed that students want to work at a university that takes sustainability seriously (PI04) also in Görlinger et al. (2023, p. 7), with some students advocating for change by refusing to fly for courses (PI09). A few universities stated they are rethinking the need for travel as part of courses and for intercultural experiences (PI09, PI14), but this was also seen as a struggle as one interviewee stated:

..intercultural experiences is an important aspect of all undergraduate students while they're here at [university] so whether it's an embedded trip within a course or just a domestic or international, there's got to be some sort of I guess international intercultural experience for the student. So that does kind of add to the well you need to have this experience but then how are you going about it and there is a cost to it. (PI14).

As discussed earlier, COVID had a significant impact on reducing travel and some universities stated there were fewer international students since COVID (PI01, PI03). Another interviewee also discussed debates within the literature about having locally based researchers do field work, instead of flying researchers around (PI13).

Career achievement for academics is strongly linked to internationalisation. In a survey conducted with 301 Australian based academics, air travel was seen as a necessity in the life of a successful academic and was linked to practices such as presenting, meeting, and networking at conferences (Glover et al., 2019). The importance of face-to-face meetings was a strong theme through the research with virtual options seen as sub-optimal, in comparison to in person meetings, particularly for academics located in regional Australia (Glover et al., 2019, p. 465).

5. Equity, diversity and early career researchers

Reducing travel emissions from academic flying has the potential to create opportunities and increase equity and inclusion through the use of online and virtual conferences that were previously inaccessible for researchers on low incomes, with disabilities or caring responsibilities (Sarabipour, 2020; Wu et al., 2021). However, there is also concern that reducing air travel will impact women, ECRs and people with caring responsibilities and lead to limitations in career development and increased time needed to get to places with the use of other forms of transport.

Research from the University of British Columbia (UBC) found that individuals at the start of their career were responsible for fewer emissions than senior academics and there was a correlation with higher salaries and higher emissions (Wynes et al., 2019). The research conducted by UBC found that there was no positive correlation between academic success (using the h-index adjusted for academic age and discipline) and air travel, leading the authors to conclude that “green” academics can reduce their travel emissions, with minimal impact on their careers (Wynes et al., 2019, p. 966).

These results are however contradicted by Berné et al. (2022, p. 8) from a survey of academics in France, found that researchers who fly more frequently by plane do have higher publication rates and a larger h-index. Chalvatzis and Ormosi (2020, p. 49) also found that citations are positively associated with travelling to attend conferences for European academics, but not for North American academics (based on a selection of economic conferences), thus suggesting location is a factor.

Despite the research from UBC finding no correlation between academic success and air travel, the perception among academics found in the literature and through the interviews, points to a belief that reduced air travel will harm academic careers, in particular for early career academics. Glover et al. (2019, p. 469) point out that, “any attempt to disrupt the perceived need for academic air travel must grapple with the measures of success in academic culture that create and maintain the norms of air travel.” The need for structural and institutional change that facilitates academic staff to make sustainable choices, while also progressing in their academic career is echoed by Chalvatzis and Ormosi (2020).

Interviewees when asked about equity in the interviews frequently discussed concerns about potential impacts on networking and other opportunities for ECRs (PI01, PI02, PI03, PI04, PI05, PI06, PI08, PI11). Some of the comments made from interviewees included the consideration of involving ECRs in tailored solutions to ensure that they are not disadvantaged when reducing air travel. There is a belief that reduced travel opportunities would negatively affect the ability of postdoctoral staff and PhD candidates to develop networks (PI06), with one interviewee stating:

We also recognise too that it's fine for me as an older professor, established with my communities, research communities around the world but for early career researchers it's very hard to build those communities and sense of connectedness and start collaborative projects when you're doing it through the screen like this because you miss out on that serendipitous moment where you have a coffee together after a conference presentation or you meet other people you weren't planning on meeting and things build in a way that don't build through a screen. (PI03)

The data from one university suggested that travel was mostly undertaken by staff in senior positions with 20 percent of staff responsible for 80 percent of the emissions who were “mostly full professors and otherwise associate and assistant professor up and coming who want to network” (PI07). Research from Berné et al. (2022, p. 8) identified that the majority of travel undertaken by postdoctoral researchers was to present results at conferences, therefore establishing visibility. However, senior researchers did not fly to conferences as regularly, but tended to fly further to maintain their career reputation and status.

Another university interviewee noted that travel occurs due to "who the donor wants to meet" (PI05). This appears to be consistent with the statements from interviewees at other universities, and is also consistent with the ANU travel emissions data, which found that academics are the most frequent travellers in ANU, followed by higher degree research (HDR) students.¹⁶

One university when asked if early career perspectives were brought up in discussions noted that it was frequently discussed at a high level and that it was "quite controversial" stating:

there was always an argument by the senior researchers, professors and senior researchers that it's important topic, but we have to be careful with early stage researchers because of their own career chances so we can't really reduce flying. That was one part of the argument and the other one was everybody wants to see me, I have to go to the conferences, I'm a bigshot and important. But the smart ones there didn't use that argument so much, they used the early stage researchers. (PI04)

Another university discussed how their early career network were having conversations about the next generation of academics and what the university looks like, in a future dominated by climate change. The interviewee reflected on how academia could be redesigned to consider the challenges of climate change for ECRs (PI08). One interviewee discussed how there was concern from the deputy Vice Chancellor about negative consequences from reduced travel on research and ECRs (PI11). Two universities also discussed how ECRs had higher ambitions to reduce emissions (PI01, PI04). Overall, the interviewees expressed concern for ECRs and suggested that tailored solutions, such as additional budgets for ECRs are needed to ensure equity.

Some interviewees also discussed their concern about staff with caring responsibilities and families and the potential impact for these staff members if they are required to take other forms of transport, thus increasing the time away from home (PI09, PI12). One university discussed their use of a mandatory central provider for travel bookings. The interviewee stated there was some pushback to this but noted that their policy to undertake low carbon travel includes three exemptions to ensure that diversity and inclusion is considered, stating:

If you're disabled, then there's no expectation at all that you'll comply with that. If you have childcare arrangements again fine, fly if you need to. The third one is more general, there's some other reason that you don't want to declare which means that it's difficult for you then by all means. So, we try to set a principles-based framework, I suppose. (PI09)

One university discussed how business class travel is essential for people with some disabilities, therefore it would not be appropriate to have a "blanket ban" on business class travel, noting that "again, that's not to wriggle out of having that kind of ban but just to communicate it in such a way that isn't ableist or exclusive or anything. Just really brought out all the nuances" (PI06).

A couple of universities located in the UK mentioned that there is a legal requirement to undertake an equality analysis for any new policy that will impact on people (PI05, PI09). One of these universities provided more detail about the requirements under the Equalities Act (2010) in the UK¹⁷ and the process they went through for the equality analysis stating:

we tried to go through systematically and say is this better or worse? So, we did actually say that in a world that was previously dominated by travel in a world that has more virtual, that potentially does have a helpful impact if you're disabled or have

¹⁶ ANU Travel CO2e Emissions. Viewed 13 February 2024. Access restricted to ANU staff and students. <https://travelemisions.anu.edu.au/>

¹⁷ Equality Act 2010. <https://www.legislation.gov.uk/ukpga/2010/15/contents>

young children because you might be able to join things that otherwise you couldn't join, at the same time identifying negative things. (PI09)

Going through this process, identified a number of other issues not raised by other interviewees including the need to provide exemptions to the use of a central provider for booking hotel accommodation in certain regions, due to a need to consider safety for women or LGBTIQ+ people (PI09).

The other UK based university included a number of exemptions in their travel policy, similar to those discussed above to consider family commitments (including single parents) and disability as examples. The interviewee noted that it wasn't just a consideration, but a requirement and a cost for the university, for example with the need to pay for childcare costs for people attending conferences (PI05). There was also acknowledgement from two universities that reducing travel could also open up opportunities for some people enabling increased participation in events that may be offered online, instead of in person (PI09, PI12).

Another discussion that arose across several interviews was in relation to fairness and carbon budgets within departments and schools (PI04, PI08). One university discussed the experience of a university in Switzerland that had a carbon budget for the entire university and raised the issue of "who gets how much budget" (PI04), noting that it is a fairness issue. The interviewee raised questions around whether people who do field work will get more of the carbon budget, or if young researchers will get more the carbon budget (PI04). Another university was trying to get local schools to take on a carbon budget and to "work amongst themselves how to deal with that" (PI08).

6. Specific measures and targets

The following section will discuss some of the measures used by universities to reduce travel emissions. Many universities had targets in place to reduce travel emissions, and some of these universities had similar targets to ANU – to reduce travel emissions by 50 percent on a 2019 baseline (PI02, PI13). Travel emissions have clearly reduced since COVID and one university suggested that they could be more ambitious, but they were not sure about the "appetite" that exists for doing so (PI05). Another university discussed the challenges with reducing travel emissions and expressed concern that there would be pushback with targets stating, "how can you reconcile that academic freedom to go and do the research and the teaching anywhere with targets?" (PI09).

The main measures in place from other universities to reduce travel emissions were carbon budget or offset measures¹⁸, internal carbon pricing (Table 1), flight levies or surcharges and travel caps. All of the universities differed in the measures they were implementing and many of the universities interviewed were either considering implementing measures such as travel caps and offsets, or they had reservations about introducing these, due to potential difficulties in gaining support for such measures.

Five universities interviewed had implemented a type of carbon budget or offset program, with several differences in these discussed below (PI03, PI06, PI09, PI12, PI14). The remaining universities that were interviewed did not discuss carbon budgets, caps or offset programs and this question was not specifically asked in the interviews; however, questions around the types of measures universities had implemented was asked (Appendix 1). When carbon budgets or offsets was raised by the interviewee, there was some variation in thinking and support for carbon budgets, which will be discussed here.

As noted, there were differences in the type of carbon budgeting or offset programs in place between universities. These include a carbon neutral program where the carbon accounting is done by the property services team (PI03), offsetting air travel and getting "fairly robust offsets at the market price" (PI06), an offsetting program using land bought by the university for this purpose, due to not "liking" offsets bought in the market (PI09), and offsets for all business travel (using international offsets) (PI14). One university (PI12) did not have an institution wide carbon tax on air travel, yet the interviewee, a

¹⁸ Climate Active (2019) Carbon Offsets. <https://www.climateactive.org.au/what-climate-active/carbon-offsets>

sustainability manager stated that some departments of the university developed voluntary carbon pricing systems, noting that for each department the pricing scheme was “slightly different”, and they were redistributing the funds from the scheme for different purposes. For example, for student projects relating to sustainability and the creation of a virtual hub (PI12). The interviewee also remarked that,

we don't have a structured compensation system in place because [the university] as a whole is still debating whether that even makes sense for the air travel project because it's kind of a hot topic or tricky topic. (PI12)

Although this university (PI12) had a type of internal carbon pricing system in place, with funds redistributed, they do not have an institution wide carbon tax on staff air travel in place. Barron et al. (2020, p. 3) undertook a review of higher education institutions (HEI) who implemented internal carbon pricing and discussed the key differences as “carbon charges, proxy carbon pricing approaches and carbon funds.” The difference in these internal mechanisms and the administrative effort, costs and other benefits is included in Table 1 below (Barron et al., 2020, p. 3).

As can be seen in **Table 1**, there are certain benefits for universities to implement internal carbon pricing mechanisms including for student learning, engagement and behaviour change and generating funds for sustainability projects. Barron et al. (2020) also found a growing number of higher education institutions in the US are adopting internal carbon pricing, and there are potential benefits and limitations. They suggest a “creative experimentation and data sharing” approach with benefits largely accruing through the “institutional changes needed to implement them” (Barron et al., 2020, p. 12).

Another study of carbon management strategies from 96 universities in the UK, US and Canada found that early adopters of voluntary carbon offsets implemented more carbon management practices sooner than non-adopters. The majority of universities involved in the study also prioritised reducing emissions and none prioritised offsetting emissions alone (Lewis-Brown et al., 2023, pp. 6-7). This is consistent with at least one interviewee, who discussed the need to reduce emissions first, then offset emissions if travel could not be reduced (PI09). A survey conducted by FlyingLess also found less support for carbon taxes, caps or offsets (Görlinger, 2023, p. 89).

Table 1. Internal carbon price tools

| | Carbon Charge | Proxy Price | Carbon Fund |
|--|--|--|---|
| Description | Fee on carbon emissions (optional rebate) | Virtual price on carbon emissions of a project | Share of budget to generate fund |
| Emission Scope | Scope 1 & 2 or 3 for air travel | Scope 1 & 2, Scope 3 purchasing | Scope 1 & 2 or 3 for air travel |
| Timeline Focus | Present Emissions | Future Emissions | Present Emissions |
| Scale | Institutional/Sector | Project by Project | Institutional |
| Institutional Role | Operational | Planning, Risk, Evaluation | Mitigation projects or Offsets |
| Financial Focus | Operational Expenditures (plus future design and constr.) | Design and Construction, Purchasing | Budgets |
| Impact | Across the Institution | Targeted Projects | Fund Use |
| Primary Data Requirements for Implementation | Unit-level energy metering (for buildings) | Present and future project costs | Emissions inventory |
| Accounting Level | Unit/Department | Project | Unit-level or above |
| Administrative Level of Effort | High | Depends upon project number and scope | Low (for fund itself) |
| Typical Size of Price Signal | Business: \$2–\$20/ton Academia: \$10–40/ton | Business: \$2–\$893/ton Academia: \$10–\$268/ton | Zero (not passed to consumers) |
| Program Cost (to institution) | Administration, net cost of implemented measures | Added net cost of any new options selected, limited administration | Total value of fund minus cost savings, administration |
| Primary Visibility | Departments Air travelers Student engagement | Facilities and finance staff Student projects | Departments Fund recipients |
| Revenue for projects | If not revenue neutral | No | Yes |
| Other Potential Benefits | <ul style="list-style-type: none"> · Student learning · Promotes dialog · Funds/promotes low carbon investment · Promotes energy efficiency investment · Drives behavioral changes · Manages risk of carbon regulation | <ul style="list-style-type: none"> · Student learning · Promotes low carbon investment · Promotes energy efficiency investment · Promotes long term thinking (LCC) · Engages vendors · Manages risk of carbon regulation | <ul style="list-style-type: none"> · Student learning · Promotes dialog · Generates funds for climate, efficiency, and sustainability projects |

One university interviewed noted that students are also questioning the types of offsets that their university is investing in. This same university also looked at local projects and recognised the need for transparency, but is currently investing in international projects, which they described as “verified offsets” (PI14). The other university that was purchasing their own land for offsets described the idea behind using their own land for offsets stating:

we thought right, well we’re a research and teaching organisation so if we do it ourselves either by buying the land or by long-term partnerships with people we can build in research and teaching, we can actually research the thing that we’re also trying to do. We can have our students go and visit the land and that’s starting to happen now, it’s very popular. (PI09)

Another university interviewee supported the idea of a carbon budget stating, “I like this idea of the carbon budget so much because it fits in with our way of thinking of a financial and of a time budget, we all know there are limitations and now there is an additional limitation, which is the carbon” (PI04). The same interviewee also suggested using sanctions if overshooting of a carbon budget occurred, stating “I wouldn’t probably phrase it as a sanction but if you overshoot you are responsible to take out the CO₂ out of the atmosphere and that costs around – if you do it seriously – around €600 to €800 per ton of CO₂ and that would be the price if you overshoot” (PI04).

For universities that had not implemented or discussed any type of carbon budget or travel caps, a few of them were in various stages of considering the option (PI04, PI06, PI07) while some universities had reservations about travel caps and discussed the arguments likely to be raised against it, stating that it was unlikely to be supported (PI01, PI02, PI13). It was noted that travel caps were not supported in a

survey conducted by PI02. PI13 also raised arguments against travel caps, noting impacts on university rankings and financial benefits for the university.

6.1 Pricing emissions

Some universities had what was described by the interviewees as a flight levy, surcharge, carbon price or tax with funds often redistributed towards sustainability initiatives and strategies (PI05, PI06, PI08, PI10, PI12, PI14). The language used to describe the flight levies across the universities who had them in place, differed, but they all served to price carbon emissions essentially. One university went into some detail about how their travel policy, which was part of their sustainability strategy, included a flight levy and flight reductions (PI05). They started with a 20 percent reduction, then followed with a 10 and 5 percent reduction in flights, culminating in an overall reduction of 35 percent. The interviewee discussed some of the challenges of having a flight levy alone stating:

I think if you had one of those without some of the other elements, I think you would lose the full package. So, the flight levy alone isn't really good if you're just saying we'll pay a levy because you're paying... a levy is a tax on flying, but we try not to use the word tax for no good reason actually. Sometimes good to just call it what it is. So, we're taxing flying, but if you just tax then people will say well, I'm happy to pay my way out of that. But if you link the tax to a reduction target, then it's not enough to pay. You also have to think about behaviour change as well as how would you reduce the flying as well. (PI05)

The interviewee felt that things should be priced, stating “I think putting a price on something makes people talk, makes them think, you know” (PI05). The interviewee was also not concerned whether the talk was negative or positive saying, “So money's got departments talking and even talking negatively is still talking. And so that's quite good. Grumbling is also talking, and I think there's been this sort of acceptance over the year of like, Oh, there's a flight levy” (PI05). However, they also stated that the flight levy created a significant amount of work initially as they had no system in place for processing the levy. It was set up as an internal re-charge to departments and the initial thinking around the flight levy was to change behaviour, as well as providing a funding source for the sustainability strategy. This university initially recommended a low flight levy to avoid “burdening departments” (PI05) and there was a general sense from the interviewee of somewhat reluctant acceptance from staff about the flight levy in place, rather than enthusiastic engagement. This was potentially amplified by the fact that this university was described as being a “devolved institution” into separate colleges and departments, not unlike ANU.

Another university with approval from leadership to implement an internal carbon price, discussed their thinking on implementation with the use of the display on the travel booking platform to display the carbon emissions per flight and default to the lowest emission flight as a first option for travellers. The interviewee stated that this would be a way of “socialising the idea of an internal carbon price” (PI06). Since 2020, this university has been offsetting travel emissions and stated that “we try to get fairly robust offsets at the market price in as much as you can, given what I think came out of ANU, the research about the problems with offsets but we do our best” (PI06).

Other examples from the interviews included, PI08 who had a business travel carbon mitigation program in place for awareness raising and they also raised funds for departments that are contributing to the program for things like Zoom rooms. They also encourage hybrid and remote work to get people to question one or two flights that they may be taking (PI08). PI10 also implemented a five percent surcharge on air travel with funds going towards their sustainability fund to support initiatives to reduce emissions. This university used a travel agent who added the extra five percent on the price of travel and paid it back to the sustainability fund every quarter (PI10). PI14 also charged approximately AUD \$38 for international flights and AUD \$17 for domestic flights across 38 schools. The flight levy was championed by the President of Sustainability and the interviewee described the implementation of this stating,

...there wasn't a whole lot of pushback because this was just this is what we're doing. How each school offsets I guess the cost, how that hits their budget is determined within each school so the university, we are a very decentralised organisation. We follow a - RCM [Responsibility Centre Management] model where the responsibility for the budget, both savings and revenue, are generated inhouse so they are responsible for that. The university does provide some general funds but that's something that each school and centre has to account for. (PI14)

When asked in the interview how they came up with the flight levy price, the interviewee stated that it came from what offsets were costing "generally", presumably in the market. Again, the implementation and cost of this was largely left to each individual school.

Other universities discussed their progress on a flight levy (or carbon tax as it was described), with one interviewee stating that they pressed for an in-house carbon tax, which they described as a flat fee applied during the reimbursement process and charged to each department for every flight that is taken (PI02). However, the interviewee stated that this was not supported by leadership as they were concerned about the implementation of it and flagged a requirement to go through the official policy process. The leadership of this particular university were also concerned about it not having any impact on the rates of travel (PI02). Another university, (PI12) had no institution wide carbon tax on air travel, but they did have internal pricing systems where departments have set up voluntary measures with funds redistributed within the departments.

6.2 Avoiding air travel emissions

Some universities were implementing travel restrictions and travel hierarchies to assist in decision making and avoid emissions through land transport (PI05, PI09). This was discussed by two UK based institutions, noting the ability to use fast trains, as stated by one interviewee:

There's a travel hierarchy so that you should be thinking about, you know, your emissions. And there's just a few restrictions. So it was: don't fly domestically and don't fly to Paris or Brussels. And that's because we've got the Eurostar, which has got pretty good links to those two places. So, the Eurostar also goes to Amsterdam, for instance, and we decided not to include Amsterdam because it doesn't have the regular number of trips that Paris and Brussels did. So, we started quite small, you know, and then there are still loads of exceptions. (PI05)

The other UK based university discussed how they had implemented a policy that restricts domestic air travel, and they promoted the use of trains to staff stating, "in the UK it's difficult to get work done on these short duration flights whereas on the train potentially you can go first class and you can get a lot of work done" (PI09). This university mentioned how some staff were concerned that train travel was more expensive than flights, as well as noted concern from staff about the time taken to travel by train, taking away from time with family. The interviewee stated the restriction on UK based travel by air was contentious, but that "compliance has been reasonable" (PI09). This university also restricted first class travel by air but allowed first class travel by train. PI05 also felt that the class of travel was an important tool to reduce emissions as it made travel less appealing, stating:

I do feel that class is really important because I think that if you thought tomorrow morning you thought you were going get on an economy class flight and go to Thailand. And then from Thailand onto somewhere else because you had a connecting flight and they were all going to be economy, you would be feeling a little less excited about the trip than when you thought I'm going to get on business class and I'm going to have a lovely comfortable night sleep. (PI05)

Other universities had less restrictive policies but promoted combined trips, restrictions on travel for short durations and encouraged other forms of transport, such as trains (PI05, PI06, PI11, PI12). There were anecdotal reports of some staff refusing to fly, and instead looking to online meetings, with people feeling more comfortable with the use of Zoom (PI06). This university was also funding Zoom rooms for departments that were contributing to a business travel mitigation program. The interviewee went on to state that if they can encourage staff to avoid taking one to two flights per year, they would see a reduction in emissions (PI06).

For the ANU, given the frequency of buses that travel to Sydney, restricting flights to Sydney is an option. Factoring in the door-to-door time to travel by air vs bus to Sydney, it may be the case that it is the same (or less time) to travel via bus. Like PI09, this could also be encouraged as a way to get work done, particularly as flights to Sydney are the most frequent domestic travel journey for ANU staff, generating 57 kg CO₂e in 2023.¹⁹ The combining of international trips is also an option for staff to consider for international travel, given the distance of Australia to Europe, the UK and the US in particular. The US is also the most frequent international travel destination for ANU staff, followed by the UK.²⁰

The geographic distribution of research and other university activities is also a consideration. As noted in section four, one interviewee mentioned debate in the literature about engaging locally based researchers to undertake fieldwork (PI13). Other interviewees mentioned emissions budgets in grant and other funding applications (PI07, PI12), that may encourage earlier consideration of travel emissions when planning activities.

6.3 Virtual technology substitution

Many universities ask their staff to consider whether any proposed travel could be substituted with virtual attendance.²¹ However, our interviews highlighted the complexity of determining in which cases this is most appropriate, including for which type of events (for example, meetings or conferences), formats (hybrid or online) and which classification of staff (early career, senior researchers or leadership). There were often challenging time zone differences that also need to be considered with online attendance. While interviewees noted an increased staff willingness to connect online following COVID (PI03, PI08, PI14), there was also mention of digital fatigue (PI02), and an acknowledgement of the importance of serendipitous connections that are enabled by face-to-face conference attendance (PI03, PI14). From the universities interviewed staff were generally left to make this decision themselves. In some cases, schools or departments were incentivized to encourage staff to choose hybrid and remote engagement over air travel (PI01).

Some universities were proactive in investigating and investing in improved software, hardware, support and skills development services to enhance virtual collaboration and conferencing experiences. Two interviewees described taking a coordinated approach to reviewing university video conferencing capabilities and planning for enhancements through upgrades and internal research and development (PI09, PI11). Others described the emerging challenge of ensuring adequate access to these high-end technologies and services across the university, particularly where upgrades had been sourced at the school or department level (PI12, PI14). One interviewee (PI04) argued that there were three key needs in relation to virtual communications which would be best met by centrally pooling resources: These included, access to high quality technologies; access to skills training; and real time ICT support during virtual engagements. A number of interviewees elaborated that the skills training component needed to

¹⁹ ANU Travel CO₂e Emissions. Viewed 5 February 2024. Access restricted to ANU staff and students. <https://travelemisions.anu.edu.au/>

²⁰ Ibid.

²¹ See, for example, the ETH Zurich Flight Decision Tree, the UC Berkeley Sustainable Travel Guide, and the Oxford Travel Policy.

cover training on how to use new technologies, how to design virtual events and collaborations, and skills in chairing both hybrid and virtual events (PI04, PI09, PI11).

van Ewijk and Hoekman (2020) undertook an analysis of travel emissions for three International Society for Industrial Ecology global conferences where half of the attendees travelled from the continent where the conference was held. Their analysis identified unsurprisingly that the majority of emission reductions are achieved through an entirely virtual conference. However, significant reductions were also found through multi-site conferencing where attendees travel to a conference hub that is video linked, thus reducing long haul flights (van Ewijk & Hoekman, 2020, p. 781). The use of three sites achieved the highest emission reductions, more than land transport alone or a carbon tax (van Ewijk & Hoekman, 2020, p. 784).

7. Engagement, communication and stakeholder responses

Interviewees were asked if they had any recommendations around engaging stakeholders or learnings from stakeholder responses during the engagement processes. Some of these insights focused on engaging leadership or co-design approaches at the faculty level, whereas other interviewees shared insights that covered more general internal engagement experiences including consultation approaches and communications strategies.

One university attempted to make the most of staff being “stuck on campus” over the COVID years to engage widely with staff on the issue of business travel emissions (PI11). This interviewee shared that their thorough engagement strategy resulted in the criticism that the university was “obsessed with air travel” and their initial traditional approaches added to “consultation burnout”. They have since broadened their communications to represent the wide array of sustainability actions being undertaken within the university as well as implementing a “net carbon zero walk”, with information displays dispersed along an allocated walking path on campus. The interviewee described adapting their strategy as:

to pick a path that doesn't come with the baggage [of consultation burnout], that allows people to engage in a way that doesn't feel like it's taking time away and somewhere we can fill their cup rather than drain it. (PI11)

A number of interviewees highlighted the importance of building relationships to have ongoing engagement with staff over time (PI05, PI06, PI11, PI14) particularly as various measures were designed, implemented and unintended impacts were identified. One university that implemented a combined budget for travel and conference attendance in 2023 described an example of a negative, unintended outcome in which a staff member helped organize a conference in her local city but was unable to get her attendance at the conference funded by the university, as her department's budget allocation had been exhausted, largely by international flights. This interviewee went on further to describe the importance of positive, ongoing relationships between the sustainability team and departmental staff and was grateful that staff felt comfortable informing him of these stories to provide ongoing support to the process of travel reductions, stating:

It's great that we're starting to be trusted to – people come to us and tell us these stories and then we can try and insert ourselves into the conversation with the department and say look, the opportunity here is to think about 2024 and 2025 now so what would you do differently? When would you have the conversation about what total call on your financial budget is there? How would we integrate thinking about emissions into that? How would we think about equity? How do we have these conversations about early career academics versus more senior academics and who

gets the travel? How many local conference attendance tickets does one international flight to Europe actually equate to? Being able to prompt these conversations and then support them to come up with the rules that they will set for 2024. Support them to help do a review of that as the year progresses and then continuous improvement from 2025 and onwards. (PI11)

One communication strategy raised by interviewees involved identifying the potential co-benefits to the individual of reducing air travel, including through highlighting positive stories (PI04, PI05). In keeping with this approach, some universities have been exploring positive perceptions of reduced air travel through staff survey engagements (PI01, PI12).

Other interviewees highlighted their use of staff surveys to gauge support for different types of measures and for reducing travel emissions in general (PI02, PI04, PI09). One of the universities in this study used real time survey visualisation tools and found the immediate feedback to be a useful way to understand support for various measures and achieve consensus across the university (PI06). Two universities found their survey respondents were more ambitious regarding university emissions reduction targets than expected, particularly ECRs (PI04, PI12) while others emphasised the polarised attitudes evident in their survey findings (PI05, PI13). One interviewee questioned whether concern about perceived, or actual pushback was a valid reason to avoid reducing travel emissions and suggested universities should instead work harder to bring people along (PI05).

Negative reactions or criticism by staff has been a reality for many universities. A number of interviewees raised the importance of engaging with critics in the planning process, to surface and attempt to address their concerns (PI01, PI06, PI09). For universities that adopted a bottom-up element to their travel reduction strategy, an important function of early information sessions or workshops was providing time and space for staff to air and process grievances and emotions (PI04, PI09) with one explaining “it’s a very, very emotional topic and I completely underestimated that” (PI04). Another interviewee reflected:

We allowed time. I think there’s a thing about grief...I never termed it that, but there was that thing about allowing people that space to go hey, this isn’t fair and it’s not (PI01).

The broader context is also important. At one university the messaging around flying less happened during a period of financial difficulties and was seen to contribute to a downward spiral for some staff (PI11). They stated:

...people feel like oh there’s a voluntary redundancy scheme going on at the moment, will there be forced redundancies now I’ve been told not to fly? I’m worried that I will be losing colleagues and we’ll be losing our international standing, and all of these things tend to reinforce each other and so people have this negative mindset and then those communications around air travel and go oh here’s another thing that we can’t do and they started having a downward spiral (PI11).

For other universities, communications tended to be embedded within the travel booking process or focused on a particular measure, for example, flight levies rather than the overarching goal to reduce travel emissions (PI05, PI08, PI10). Multiple interviewees described broad acceptance and support for the environmental motivations of their travel reduction measures, even if there was some criticism or questioning of specific components (PI08, PI09, PI12). However, some interviewees were conscious of the negative perception of flight reduction programs being motivated primarily by university costs savings (PI03, PI11).

8. Institutional level findings

Travel decarbonisation efforts are ultimately about creating change. Many interviewees described grappling with how to get support for their travel decarbonisation programs or were trying to understand why the change process was so challenging. For example, several interviewees highlighted the importance of commitment and support from university leadership (PI04, PI11, PI12, PI07, PI13, PI05), which has also been identified in recent literature on reducing flying emissions in academia (Görlinger et al., 2023; Schreuer et al., 2023).

One interviewee reflected that their progress over seven years had now stalled in the absence of clear communication from leadership that travel reduction was a priority (PI12). At another university, a strategically selected project sponsor from the university leadership was able to navigate through internal concerns that reducing travel would negatively affect research outputs, with the interviewee explaining the support of someone within the senior leadership team had been “really pivotal and massively supportive of driving this through” (PI11).

Some universities had comprehensive strategies for creating change that incorporated working at multiple levels within their institutions, with one interviewee discussing the development of a strategic framework to inform their travel decarbonisation efforts after observing the failures of both a relatively isolated top-down directive, as well as years of effort (PI04). Another two interviewees emphasised the importance of working iteratively between university leadership and individual employees and departments (PI09, PI11), with one describing his work as providing the “connective tissue” between the strategic frameworks developed by leadership and what this means at a department level (PI11).

A further theme evident in both the literature and interviews is the enormity of the challenge at hand. As outlined in the introduction, S Tseng et al. (2023) have documented the culturally embedded nature of academic hypermobility with implicated cognitive norms at the individual, disciplinary and institutional levels. This view of academic travel and emission reductions was described by the majority of interviewees as complex and thus requiring a cultural and collective approach to change (PI01, PI02, PI03, PI06, PI07, PI11, PI12, PI13). One interviewee (PI01) describes the scope of change required as an absolute step change and would like to work with ECRs to collectively envisage a different kind of academia, where travel is the exception. The issue of ECRs arose frequently across the interviews, when asked about equity and diversity in the interviews as discussed in section 5 of this report.

While universities were selected for inclusion in this study based on their active engagement with business travel decarbonisation, we found diversity across the strategies employed, the approach to reporting, ambitions, length of time engaged with the issue and progress each university had made. Approximately half of the universities interviewed had been acting over many years by monitoring travel emissions, engaging with staff, students and collaborative networks, as well as implementing select measures and policy changes (PI01, PI04, PI09, PI11, PI12). The research also pointed towards difficulties in collecting particular types of data, such as personnel data to analyse travel of ECRs and flight data to derive accurate emissions (PI02, PI06). Several universities utilised multiple sources of data to get a more accurate picture of travel emissions (PI07, PI12, PI13) with one university remarking that they needed to clean up data from a travel agent for that data to be useful and needed to revise emission reduction goals due to poor data quality (PI07).

The commonly expressed experience from interviewees of the challenges in obtaining high quality data sufficient to derive accurate emissions, varying reporting methods and priorities, suggests that there is more work to be done to improve university travel emissions reporting methods and accuracy.

Multiple universities had undertaken an initial effort of research and strategy development and were either about to embark on further action and implementation or had found their progress stalled as funded projects concluded, or as university leadership focused on other priorities, including the financial fallout from COVID (PI02, PI03, PI06, PI13, PI15). Other universities again were less focused on an initial comprehensive investigation and approach to business travel decarbonisation and had instead selected

specific measures to implement, such as flight levies and surcharges, that are essentially internal carbon pricing (PI05, PI08, PI10, PI14).

Engaging with universities from multiple continents also highlighted the influence of geographic and political contexts on universities' travel decarbonisation programs. One interviewee referred to the recent passing of the Swiss Climate Law as impetus for increased ambition in their university's travel decarbonisation program and targets. Another highlighted the role of the New Zealand Carbon Neutral Government Program²² in providing funding and an obligation to undertake comprehensive carbon audits, including business travel related carbon emissions as a publicly funded institution. The quality and availability of land-based travel alternatives are significantly different across the universities interviewed, with one Japan based interviewee observing "thanks to bullet trains, air travel is not so popular in Japan for a short or middle distance, up to 500 or 600 kilometres."

Geographical remoteness is a particular barrier to travel reduction programs highlighted across multiple interviews, particularly for universities based in Australia and New Zealand, although one interviewee provided a reminder about the privileged position of academics in the Global North with travel stating:

even though we're [Australia and New Zealand] seen as quite remote there's actually a whole flotilla of other academics and people collecting research and undertaking research that are more remote than us either geographically in terms of smaller islands like the Pacific Islands and again there's plenty of other similar-sized territories and also academics who are perhaps in institutions that don't offer funding or in a country where travelling is really out of the mix (PI01).

While the interviewees were not specifically asked about business risk, there was some concern about impacts specific to the university sector. Concerns raised included the geography of research and teaching activities, the inclusion of an emissions budget or other measures in research funding applications and public funds management (PI07, PI09, PI12). One university mentioned they were working with their national science organisation about sustainability criteria on funding grants (PI12). Another university spoke of publicising their news relating to emissions management (PI11). These responses show that travel emissions management is a strategic concern for universities, with universities each looking for options to reduce travel emissions in ways applicable to their business model and organisational structure, while minimising risk to culture and university income.

8.1 Organisational culture - barriers and disengagement

Recent literature has highlighted significant institutional and organisational barriers that continue to limit the success of many travel emissions reductions programs (Görlinger et al., 2023; Müller, 2023). Glover et al. (2017) and Tseng et al. (2022) have also discussed the fundamental goal conflicts that persist at both an individual and institutional level. For institutions, there is a tension between internationalisation and decarbonisation, while for individual employees there remains a tension between decarbonisation and conducting and disseminating globally relevant research. Several interviewees also noted the impact of these goal conflicts discussed further in section 4 (PI04, PI05, PI06, PI07, PI12, PI13).

Müller (2023) found that the autonomy inherent within universities, in which individual employees (and schools or faculties) have the authority to make decisions, led to a gap between commitments and enforcement of policies. However, autonomy can also be beneficial for engagement. Hejjas et al. (2018, p. 329) found that a lack of autonomy drove disengagement in Corporate Social Responsibility (CSR) initiatives, thus greater ownership and choice of initiatives was important to enable engagement.

²² Ministry for the Environment. Viewed 5 February 2024. Carbon Neutral Government Programme. <https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/carbon-neutral-government-programme/>

The value of autonomy is reinforced by universities having an array of disciplines and faculties represented in one institution. For example, when discussing how travel decarbonisation programs were developed and approached at their institutions, many interviewees highlighted a range of informal and formal structures embedded in universities, and diverse travel needs and profiles that complicated their efforts and make universities distinct from many other types of organisations (PI01, PI02, PI03, PI04, PI05, PI06, PI07, PI12). Multiple interviewees referenced their experiences with, or plans to, work at the school or faculty level to build an understanding of their travel needs and purposes, and to tailor solutions to their needs, with one interviewee explaining:

..in terms of travel behaviour so one department might travel more because they're doing field work somewhere and the other department mainly travels because they have conferences or exchanges with other researchers. One solution does not fit all so you have to tailor the solutions to the individual departments, maybe find those low-hanging fruits, where can you cut emissions? Where can you reduce air travel best?
(PI12)

An additional consequence of this institutional culture of autonomy is what Müller (2023, p. 11) describes as “the responsibility dilemma” which refers to the question of who is responsible for reducing travel emissions? One interviewee (PI01) described the impact of this when her collation of extensive workshop data was met with significant interest, but no action, as there was no “authority to then go, okay, this is the next step.” This aligns with notions of agency, in particular, perceptions of limited agency, that were evident throughout some interviews (PI02, PI12). Görlinger et al. (2023) notes that while organisational structures are not directly under the control of the academic, nor are broader socio-political conditions under the control of the university, there is a role for collective action and advocacy to attempt to influence and create more supportive structures for reducing flying in academia.

There is also an unwillingness at the institutional level to implement substantial mandatory, travel reduction measures, thus individuals and departments are by default tasked with voluntarily flying less (Görlinger et al., 2023; Müller, 2023). While some individuals and departments will respond to a voluntary guide or invitation, others may choose to remain disengaged completely. One interviewee described a significant struggle to obtain even low-level engagement from many departments stating,

the only issue though [is that] departments are under no obligation to look at this kind of thing right now and there's one kind of issue with so many climate declarations, is that they're good statements of intent but there's very little of a boot to them. It's very much 'we aspire to' and much less 'okay, we need to or else'. (PI02)

The issue of disengagement with sustainability initiatives within organisations is not a new phenomenon. Hejjas et al. (2018) utilised case study and interview data within multinational organisations to understand employee's individual engagement with CSR initiatives and found that employees existed on a spectrum of actively engaged to actively disengaged with CSR initiatives. The authors found that this disengagement was also not a reflection of a lack of pro-sustainable behaviour of employees, as some employees were actively engaged in pro-sustainable behaviour outside of work, but had no interest in interventions at work (Hejjas et al., 2018, p. 329). One interviewee also discussed the disengagement and shifting priorities of leadership noting that “the university is now more aligned to the sustainable development goals” (PI13).

Wynes et al. (2019, p. 965) also found that “green’ academics, those from sustainability and climate change disciplines did not fly less than their “non-green” counterparts, thus supporting the premise that academics who are environmentally aware, do not necessarily adopt pro-environmental behaviours.

As discussed throughout this report, flying as a norm is embedded in academic culture, which makes it difficult for academics to not fly. This is the case, even as some individuals want to reduce their flying, but feel stuck in social norms and practices (Jacobson et al., 2020). Hopkins et al. (2019) interviewed academics at one New Zealand university and found that travel as an academic is underpinned with

notions of efficiency: where travel fits into existing work pressures and requires time for organising travel, preparing presentations, as well as the time spent actually travelling to participate in packed agendas. The authors also found that there are specific bodily manifestations of travel for academics that reinforce the "logics of internationalisation, globalisation and neo liberalisation" (Hopkins et al., 2019, p. 480). Hopkins describes this stating:

Mobilities create, construct, and (re)enforce dominant subject identities; "the jetsetter," "the successful academic," "the globally recognised scholar." They inform and are informed by dominant notions of "the good academic" with activities linked to becoming "part of the club" as much as the production or dissemination of research. To do so, our participants put their "body on the line," enduring embodied emotional effects/affects that include, but are not limited to tiredness, dis-orientation, aches, pains, bleeds, loneliness, and anxiety. These are compounded by discourses of efficiency, leading to chaining practices to prove the "value" and "worth" of the travel. (Hopkins et al., 2019, p. 480)

Hopkins et al. (2019) conclude that there is a need to question the purpose of academic travel within institutions and beyond virtual substitutions, to improve the bodily and emotional well-being for academics.

8.2 Institutional roles and responsibilities

Discussions with interviewees regarding the academic and professional positions of people involved in their travel reduction programs revealed a broad range of roles and departments. This provided further evidence of the extent to which business air travel, and attempts to influence it are deeply embedded, but also that responsibility is disaggregated within academic institutions. The myriad roles included sustainability officers, change managers, finance and procurement officers, data analysts, travel booking teams, researchers, university councils, climate action committees, departmental project champions, ally groups, and cross-university networks.

Professional teams responsible for travel reduction often involved multiple departments, and a number of interviewees described their teams as being under resourced to deal with the breadth of the issue and tasks involved (PI02, PI03, PI05).

...before we were just in the midst of things and really struggling to get these recharges out as quickly as we could and you know, developing consistencies in our systems, so there really just wasn't the space to engage as much as we should have been. It has all been me at this stage and I think the engagement is quite time consuming and that's harder, as I'm also supposed to be managing the sustainability strategy, the roll out of that (PI05).

Part of the challenge as described by several universities was the devolved nature of universities, where there might be support for initiatives, but they are difficult to implement with decisions needing to go through various processes (PI01, PI05, PI02, PI06, PI09). One interviewee described the challenges as:

It's that idea of one hand doesn't know what the other's doing and if we are going to actually grapple with what it would mean to be more sustainable as an institution then we have to go through the process of understanding what that looks like and then putting structures in place to reflect that rather than being like contradictory messages and structures. (PI06)

Another university likened it to two types of systems, a top down, command and control operating system with the resources, and a bottom up "adaptive operating system" seeking change (PI09). Further discussion on this from the interviewee noted that, "you got to go to both" and that and too many

sustainability initiatives just do the bottom-up work, without authority. The interviewee further elaborated on the metaphors used stating:

..for me you've got to bounce around between those two in a methodical way. I think that's what we did [unclear 31:18] authority that there should be review. And then we went to, what I would say the adaptive operating system, lots of discussions, ideas, testing things. Hey what would happen if we did this? Oh, that's a bad idea, isn't it? Oh right. Go back to the command-and-control system in a way saying well I've narrowed down the options to these things, and then go back out to the adaptive operating system again saying well we've narrowed it down to this, what do you think? Then increasingly narrow the channels of the degrees of freedom of what you're talking about. (PI09)

Some interviewees were acutely aware of the internal hierarchies and dynamics at universities, particularly in situations where their specific role was judged by others to lack authority or credibility. Finding and engaging respected senior academics who were prepared to be public allies was one strategy adopted (or planned) to manage this challenge (PI04, PI06, PI13) as described by the following interviewee who highlighted the need to have support from academics to be taken seriously:

..when there was something really important where I thought I need somebody with a professorship hat, I had a delegate - well renowned climate scientist. He's one of the top shots and he's also very supportive. I thought this is going to be a very critical meeting so I asked if he could join me, which was very helpful because then he had this hat, and it was a peer to peer thing and they couldn't bring the argument as admin you have no clue (PI04).

Multiple interviewees described the importance of cross-university networks as a means both of collective action as well as practical and emotional support (PI01, PI02, PI04, PI06, PI12, PI13). These networks are regionally based (including multiple in Australasia, North America and Switzerland) and differ on whether membership consisted predominantly (or exclusively) of staff in research or professional roles. One interviewee described what was most useful about this cross-university network noting the many benefits:

So, there's a number, the first is the ability to use everyone else's good ideas, quite frankly. That survey I reference a lot because I think it can be more broadly applied to research-intensive institutions so it's basically a bit of evidence I can take and use. Hearing about other people's experiences is quite handy. Last but not least it's just the comfort of knowing that you're not tackling this gigantic whacky problem on your own. Climate action, especially within an institutional context, it can feel really damn isolating. It's very challenging in a lot of ways because so many structural elements in many ways are working against climate action. So, it also is a little bit of a support group, functions a little bit as a bonus like that. (PI02)

For others the collective action and regionally specific lens was important, as described by the following interviewee:

Then very early on in that piece it became evident that really anything that we did internally need to have a bigger vision around it and be more collective. It seemed very clear there would be an Australasian geographical bias or lens around this discussion and narrative and how we were going to effect change (PI01).

There was a clear theme from the interviews that implementing change within the university structure was difficult due to the disaggregation of the work to staff and departments without authority to create change. Even with support from decision makers, the process of change appears to be slow and inefficient for many of the universities interviewed.

Conclusion

This research has provided a summary of the key findings regarding what universities are doing to reduce travel emissions. While there are important lessons for institutional emissions reduction programs, there is limited evidence to quantify the effectiveness of these measures, as they have not been in place for long in most cases, and any impact is overshadowed by the interruption in travel patterns caused by the COVID-19 pandemic. However, the research does indicate that voluntary action by individuals that are not supported by collective and institutional measure, is not likely to lead to significant emissions reduction across the institution.

There are some key similarities found across the universities interviewed, particularly in relation to data collection and transparent reporting that will enable messaging and engagement with staff. But there was also diversity in the scope, ambition, approach and progress of university emission reduction efforts among the universities interviewed. Given the difficulties with access to accurate data that some universities discussed, the methods and quality of university sector travel emissions reporting is yet to mature. As discussed in the methods section, we did not conduct interviews with universities located in the Global South and the findings of this research may differ if additional research was undertaken with universities located outside the Global North.

The issue of data was frequently linked to engagement with staff across many of the interviews. There was also a need for adequate resourcing of sustainability teams (and analysts for data collation and reporting). Often these roles are left to interested persons within the institution, but the research found that there was a need for a wide range of staff and institutional embeddedness to reduce travel emissions. There were also sensitivities in communicating across established university hierarchies. The importance of both internal and cross university networks was repeatedly highlighted and valued as a source of support, resource sharing and collective advocacy for structural change.

Most of the universities interviewed also discussed the inherent conflicts with reducing travel emissions on one hand, and a broader strategic focus on attracting international students and encouraging international collaboration. For most universities (except for one), international student travel fell outside of the scope of reporting yet travel emissions from international students was a large and growing source of emissions. There were concerns about the unknown magnitude of international student travel emissions from the interviewees and the contradictions of international students and ideas about research excellence were known.

The universities interviewed implemented various methods to reduce travel emissions that could be described as carbon budgets, offsets, internal carbon pricing, flight levies, travel caps and avoiding air travel. The language that the universities used to describe measures to reduce travel emissions differed, but the majority of them were essentially pricing carbon emissions, with or without restrictions (caps) on business travel. Some of the universities were purchasing offsets from the international carbon market (PI06), but the majority of universities were not doing this and had instead implemented some form of internal pricing mechanism, with funds raised from this often redirected to sustainability initiatives or strategies.

ECRs also emerged as a frequent discussion point, with many interviewees expressing concern about career impacts for ECRs and suggesting tailored solutions to resolve this. Most interviewees discussed how flexibility will be needed for equity considerations, including for people with caring responsibilities, people with disabilities and for women and LGBTIQ+ people. Some universities in the UK were required to undertake an equality analysis, which resulted in some beneficial outcomes, as discussed in section five of this report.

Creating change in the culture of academic hypermobility was also widely recognised by the interviewees as complex requiring action at multiple levels over time. Our research highlighted the importance of commitment and engagement from university leadership as well as broad engagement within and between universities to co-create actionable transformational knowledge. Understanding academic

travel as a cultural norm that is institutionally embedded, also required work across multiple levels of the university.

The research also revealed some significant organisational barriers to successfully reducing emissions at universities. These barriers included goal conflicts with respect to internationalisation and career progression, a high degree of decision-making autonomy, a lack of a sector relevant approach, and a failure of institutions to resolve who is responsible for emissions reductions. These issues led to implementation being largely left to the voluntary actions of interested individuals.

Distributed decision-making in universities is a necessary response to the disciplinary diversity and goal complexity inherent to universities. It is a clear indicator that a coordinated response and a willingness to reexamine the fundamental assumptions that underly our cultural norms are required at three levels: institutional, school or discipline, and individuals.

REFERENCES

- Andersen, I. V. (2022). (Don't) be ashamed during take-off and landing: negotiations of flight shame in the Norwegian public debate. *Journal of Sustainable Tourism*, 1-21.
<https://doi.org/10.1080/09669582.2022.2127745>
- ANU. (2022). *Dhaagun - Environmental Management Plan 2022-2025*.
https://www.anu.edu.au/files/review-strategy/documents/EMP_2022-2025_v2.pdf
- ANU. (2023). *Climate action in practice: new emissions reduction goal for travel*.
<https://sustainability.anu.edu.au/climate-action-in-practice-emissions-reduction-goal-for-travel>
- Baer, H. A. (2018). Grappling with flying as a driver to climate change: Strategies for critical scholars seeking to contribute to a socio-ecological revolution. *The Australian Journal of Anthropology*, 29(3), 298-315. <https://doi.org/10.1111/taja.12291>
- Baer, H. A. (2022). How Environmentally Sustainable Is the Internationalisation of Higher Education? A View from Australia. In K. Bjørkdahl, Franco Duharte, A.S. (Ed.), *Academic Flying and the Means of Communication* (pp. 103-132).
- Barron, A. R., Parker, B. J., Sayre, S. S., Weber, S. S., & Weisbord, D. J. (2020). Carbon pricing approaches for climate decisions in U.S. higher education: Proxy carbon prices for deep decarbonization. *Elementa: Science of the Anthropocene*, 8. <https://doi.org/10.1525/elementa.443>
- Berné, O., Agier, L., Hardy, A., Lellouch, E., Aumont, O., Mariette, J., & Ben-Ari, T. (2022). The carbon footprint of scientific visibility. *Environmental Research Letters*, 17(12), 124008.
<https://doi.org/10.1088/1748-9326/ac9b51>
- Blackmore, K., & Martin, B. (2023). *Reducing emissions from university air travel – an introduction to the literature*. Australian National University.
- Budd, L., & Ison, S. (2020). Responsible Transport: A post-COVID agenda for transport policy and practice. *Transp Res Interdiscip Perspect*, 6, 100151.
<https://doi.org/10.1016/j.trip.2020.100151>
- Chalvatzis, K., & Ormosi, P. L. (2020). The carbon impact of flying to economics conferences: is flying more associated with more citations? *Journal of Sustainable Tourism*, 29(1), 40-67.
<https://doi.org/10.1080/09669582.2020.1806858>
- Dey, C., & Russell, S. (2022). Still Flying in the Face of Low-carbon Scholarship? A Final Call for the CSEAR Community to Get on Board. *Social and Environmental Accountability Journal*, 42(3), 208-222.
<https://doi.org/10.1080/0969160X.2022.2094983>
- Glover, A., Lewis, T., & Strengers, Y. (2019). Overcoming remoteness: the necessity of air travel in Australian universities. *Australian Geographer*, 50(4), 453-471.
<https://doi.org/10.1080/00049182.2019.1682319>
- Glover, A., Strengers, Y., & Lewis, T. (2017). The unsustainability of academic aeromobility in Australian universities. *Sustainability: Science, Practice and Policy*, 13(1), 1-12.
<https://doi.org/10.1080/15487733.2017.1388620>
- Goodwin, J. (2020). Should Climate Scientists Fly? *Informal Logic*, 40(2), 157-203.
<https://doi.org/10.22329/il.v40i2.6327>
- Görlinger, S. (2023). *Toolbox FlyingLess - Flight Reduction in Academia*.
<https://doi.org/10.5281/zenodo.10076446>
- Görlinger, S., Merrem, C., Jungmann, M., & Aeschbach, N. (2023). An evidence-based approach to accelerate flight reduction in academia. *npj Climate Action*, 2(1).
<https://doi.org/10.1038/s44168-023-00069-y>
- Gössling, S., Ceron, J.-P., Dubois, G., & Hall, M. C. (2009). Hypermobile Travellers. In S. Gössling, & Upham, P. (Ed.), *Climate change and aviation : Issues, challenges and solutions*. Taylor & Francis Group.
- Hejjas, K., Miller, G., & Scarles, C. (2018). "It's Like Hating Puppies!" Employee Disengagement and Corporate Social Responsibility. *Journal of Business Ethics*, 157(2), 319-337.
<https://doi.org/10.1007/s10551-018-3791-8>

- Higham, J., Hopkins, D., & Orchiston, C. (2022). Academic Aeromobility in the Global Periphery. In K. Bjørkdahl, Franco Duharte, A.S. (Ed.), *Academic Flying and the Means of Communication* (pp. 185-207). Palgrave Macmillan. https://doi.org/10.1007/978-981-16-4911-0_8
- Hopkins, D., Higham, J., Orchiston, C., & Duncan, T. (2019). Practising academic mobilities: Bodies, networks and institutional rhythms. *The Geographical Journal*, 185(4), 472-484. <https://doi.org/10.1111/geoj.12301>
- International Energy Agency. (no date). *Aviation*. <https://www.iea.org/energy-system/transport/aviation>
- Jacobson, L., Åkerman, J., Giusti, M., & Bhowmik, A. (2020). Tipping to Staying on the Ground: Internalized Knowledge of Climate Change Crucial for Transformed Air Travel Behavior. *Sustainability*, 12(5). <https://doi.org/10.3390/su12051994>
- Lee, D. S., Fahey, D. W., Skowron, A., Allen, M. R., Burkhardt, U., Chen, Q., Doherty, S. J., Freeman, S., Forster, P. M., Fuglestvedt, J., Gettelman, A., De Leon, R. R., Lim, L. L., Lund, M. T., Millar, R. J., Owen, B., Penner, J. E., Pitari, G., Prather, M. J., . . . Wilcox, L. J. (2021). The contribution of global aviation to anthropogenic climate forcing for 2000 to 2018. *Atmos Environ* (1994), 244, 117834. <https://doi.org/10.1016/j.atmosenv.2020.117834>
- Lewis-Brown, E., Jennings, N., Mills, M., & Ewers, R. (2023). Comparison of carbon management and emissions of universities that did and did not adopt voluntary carbon offsets. *Climate Policy*, 1-17. <https://doi.org/10.1080/14693062.2023.2268070>
- Müller, A. (2023). Decarbonizing business travel: a qualitative exploration of the (mis-)alignment between knowledge organizations' climate strategies and travel practices. *Journal of Sustainable Tourism*, 1-25. <https://doi.org/10.1080/09669582.2023.2247575>
- Nursey-Bray, M., Palmer, R., Meyer-Mclean, B., Wannier, T., & Birzer, C. (2019). The Fear of Not Flying: Achieving Sustainable Academic Plane Travel in Higher Education Based on Insights from South Australia. *Sustainability*, 11(9). <https://doi.org/10.3390/su11092694>
- Ritchie, H. (2020). *Climate change and flying: what share of global CO2 emissions come from aviation?* <https://ourworldindata.org/co2-emissions-from-aviation>
- Sarabipour, S. (2020). Virtual conferences raise standards for accessibility and interactions. *eLife*, 9, e62668. <https://doi.org/10.7554/eLife.62668>
- Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., Burroughs, H., & Jinks, C. (2018). Saturation in qualitative research: exploring its conceptualization and operationalization. *Qual Quant*, 52(4), 1893-1907. <https://doi.org/10.1007/s11135-017-0574-8>
- Schreuer, A., Thaller, A. E., & Posch, A. (2023). Reducing air travel emissions in academia: an exploration of universities' manoeuvring room. *International Journal of Sustainability in Higher Education*, 24(9), 102-117. <https://doi.org/10.1108/IJSHE-03-2022-0070>
- Shields, R. (2019). The sustainability of international higher education: Student mobility and global climate change. *Journal of Cleaner Production*, 217, 594-602. <https://doi.org/10.1016/j.jclepro.2019.01.291>
- Tseng, S., Higham, J., & Lee, C. (2023). Towards post-COVID-19 responsible academic air travel. *International Journal of Sustainability in Higher Education, ahead-of-print*(ahead-of-print). <https://doi.org/10.1108/IJSHE-09-2022-0313>
- Tseng, S., Lee, C., & Higham, J. (2023). The impact of COVID-19 on academic aeromobility practices: Hypocrisy or moral quandary? *Mobilities*, 18(3), 445-467. <https://doi.org/10.1080/17450101.2022.2121658>
- Tseng, S. H. Y., Lee, C., & Higham, J. (2022). Managing academic air travel emissions: Towards system-wide practice change. *Transportation Research Part D: Transport and Environment*, 113, 103504. <https://doi.org/10.1016/j.trd.2022.103504>
- van Ewijk, S., & Hoekman, P. (2020). Emission reduction potentials for academic conference travel. *Journal of Industrial Ecology*, 25(3), 778-788. <https://doi.org/10.1111/jiec.13079>
- Wu, J., Rajesh, A., Huang, Y.-N., Chhugani, K., Acharya, R., Peng, K., Johnson, R. D., Fiscutean, A., Robles-Espinoza, C. D., De La Vega, F. M., Bao, R., & Mangul, S. (2021). Virtual meetings promise to eliminate the geographical and administrative barriers and increase accessibility, diversity, and inclusivity. <https://doi.org/10.1101/2021.07.07.451408>
- Wynes, S., Donner, S. D., Tannason, S., & Nabors, N. (2019). Academic air travel has a limited influence on professional success. *Journal of Cleaner Production*, 226, 959-967. <https://doi.org/10.1016/j.jclepro.2019.04.109>

Appendix 1: Semi Structured Interview guide

What are other universities doing to reduce carbon emissions from business travel?

Who: Staff from other universities who are working on travel emissions reductions programs, policy and/or research within their own institutions.

Aim: to extend our understanding of travel decarbonisation programs, policies and approaches undertaken at other universities, particularly around what did or did not work well, and insights gained through the implementation process that provides more nuance and detail than what is already publicly available.

Length: 20 -60 minutes

Approach: Due to the likely varying foci of carbon reduction travel programs at each university and due to interviewees being in different roles, some interviewees may not feel able to provide responses to some of the topics we are interested in asking about.

We will communicate during interviews that we are interested in their knowledge and that we are comfortable focusing on what they think is important during the interviews, so the interviewees do not feel constrained by our questions.

Run sheet/schedule for the interview

Instructions are italicised as this text is. Text to read as script is as this text here is.

| Time/ Qu | <i>Instructions and dialogue</i> | Description of key activity /notes |
|---------------------|---|---|
| | <i>Greet interviewee and thank them for making time for the interview. Clarify time commitment. Have they received the Information Sheet? Any questions? Check if written consent has been provided? If not suggest we start recording then obtain verbal consent.</i> | Greetings, sound check |
| | <i>Start recording</i> | Start recording |
| | I have now started recording. <i>For the recording – seek VERBAL CONSENT if no written consent provided</i> | Verbal consent (if needed) |

| | | |
|------|---|--|
| | <p><i>Brief intro to our research project and Below Zero</i></p> <p>Like many universities, ANU is embarking on a program to reduce carbon emissions, including from business travel. To support this effort, we are seeking insights through this research from staff at other universities about how they have tackled this challenge, and the outcomes of these efforts.</p> | |
| | <p><i>Explain that we have a series of questions, but invite the interviewee to direct the conversation to topics they think are most useful.</i></p> <p>I have a range of questions, but we probably won't get to everything, so please feel free skip over anything you don't feel you can contribute to. What you know is more important than my questions here so feel free to adjust them... we're keen to hear about any learnings you may have.</p> | |
| role | <p>Would you be able to tell us a bit about your role at the university and particularly in relation to your university's travel decarbonisation programs?</p> | |
| | <p><i>Then ask a series of questions based on the following list:</i></p> | |
| Q1 | <p><i>On your approach/es to reducing travel related carbon:</i></p> <p><i>Note what we understand are the carbon emission from air travel reduction programs at the university the interviewee works at, so they can confirm, correct and/or expand.</i></p> <p>Am I on track with understanding your approach here?</p> | |
| Q2 | <p>Length of time the program has been underway</p> | |
| Q3 | <p>Now onto asking about outcomes so far.</p> <p>A) Have you been able to assess the impact of your program/s and approaches yet? (Prompt if needed – what changes have you observed and or what have you learnt?)</p> <p>B) What have you learned from the implementation process? (Prompt if needed- could you talk a little about pros and cons or positives and negatives of your approach so far? Have you identified any major sticking points? What have/could you do about these?)</p> <p>C) How have you grappled with the equity dimensions of flight reduction programs?</p> | |

| | | |
|----|--|--|
| Q4 | <p>Reception of staff and students. Including College/Department/discipline level responses if appropriate.</p> <p>How have staff and students responded to the travel initiatives? (Prompt – can you tell us anything about how the new policies/measures were received when first put in place?)</p> | |
| Q5 | <p>Roles and Actors involved.</p> <p>We realise that it takes lots of different actors to bring about change in travel carbon/implement programs like this. What roles in the organisation and key people helped set up and enact your (travel related carbon reduction) approaches at UNIVERSITY? This could of course include certain people or certain roles inside or outside of your organization. Were there any key players that you would have liked to have involved who weren't involved?</p> | |
| Q6 | <p>Engagement.</p> <p>Do you have any recommendations for us about how to engage stakeholders?</p> | |
| Q7 | <p>Policy context</p> <p>Can you tell us more about the circumstances in which this policy/program/approach arose? Were there any particular circumstances or context that has had a significant impact on the success or otherwise?</p> | |
| | <p><i>Experiences with specific measures. Unlikely to address all of these questions/details in one interview.</i></p> <p><i>NB These may fit in “naturally” as follow up questions in the discussion around outcomes/implementation process.</i></p> <ul style="list-style-type: none"> • What rewards, incentives or penalties have you provided/put in place? • Have you provided new services or systems (or infrastructure) to support travel emissions reduction? • Equality analysis? • Carbon fee associated with travel? <ul style="list-style-type: none"> ▪ has it changed behaviour and/or has it been a useful funding mechanism? ▪ where have the funds been directed? ▪ Did you consider a carbon budget, or cap-and-trade system | |

| | | |
|-------------------------|--|--|
| | <ul style="list-style-type: none"> • Rules and/or guidelines <ul style="list-style-type: none"> ○ Combining multiple purposes of travel to reduce individual trips <ul style="list-style-type: none"> ▪ What goes into that thought process? ▪ What barriers are there to combining trip and how can they be removed? ○ Including recommendations in the travel management system <ul style="list-style-type: none"> ▪ flying options with lower emissions - who pays the extra money? ▪ slower travel modes (rail, bus, car etc) - who "pays" for the extra time? | |
| <p><i>Q for end</i></p> | <p><i>Anything we've missed?</i> Is there anything you thought we would ask about that we have missed? Or anything else we should keep in mind?</p> | |

Appendix 2. NVivo Codes

What are other universities doing to reduce travel emissions?

| Name | Description | Files | References |
|--|--|-------|------------|
| Academic careers | Linked to academic flying framework – discussion about careers | 5 | 7 |
| Conferences | | 10 | 17 |
| Covid | | 11 | 21 |
| Creating change | Discussions about creating change, challenges, specifics | 8 | 41 |
| Cultural, partnerships, geographical influences incl. colonisation | Points about cultural differences, impacts of geography/location, politics, impacts related to colonisation, relationships between countries/regions | 11 | 19 |
| AUATC | | 2 | 6 |
| Data | Discussions about data (mostly difficulties) | 12 | 43 |
| Travel data | Travel data specific | 11 | 37 |
| Engagement | Engaging within the university, individual and group 'engagement' examples, approaches, strategies, learnings | 10 | 48 |
| Communication & messaging | Engagement specifically related to communication and messaging | 8 | 17 |
| Equity, diversity, inclusion & ECRs | References to equity considerations, analysis, impacts, approaches | 14 | 30 |
| Funding | Research funding, program funds | 8 | 14 |
| Goals, outcomes & targets | Types of goals and targets | 8 | 21 |
| Assessment of impact | Q. Have you been able to assess the impact of your intervention? | 4 | 4 |
| Implementation | What have you learned? Pros and cons of the approach? Sticking points? | 6 | 15 |

| Name | Description | Files | References |
|---|--|-------|------------|
| Institutional support | Broad coverage of institutional support (or lack of). Includes sub codes below. | 12 | 36 |
| Authority and credibility | Perceived authority and credibility of the person/position creating and/or communicating the travel reduction measures and/or approach and/or target etc | 6 | 8 |
| Department specific | Specific to departments/schools | 11 | 27 |
| Individual and collective decision making | References to the type of decisions or thinking the university expects or hopes individuals to do. For example, comments that a researcher should question meeting in person | 6 | 10 |
| Project champions | Where specific project champions are mentioned | 3 | 4 |
| Roles and actors involved | The types of roles/actors involved at universities | 13 | 51 |
| Top-down support | reference to support (or lack of) by senior leadership. | 5 | 9 |
| Virtual technologies & IT | IT technologies and infrastructures crucial to institutional support | 9 | 18 |
| Voluntary vs mandatory measures | | 3 | 6 |
| Internationalisation & students | Comments about internationalisation as a university and international students as norms. | 11 | 27 |
| Other travel & infrastructure | Other local travel options, trains, infrastructures to support change | 7 | 12 |
| Pledges | | 2 | 3 |
| Public information | Reference to interviewer questions around the public information available on university websites. | 6 | 9 |

| Name | Description | Files | References |
|---|---|-------|------------|
| Reception by staff students or groups | What has been the response of staff, students and/or departments/schools/groups to the intervention? | 13 | 42 |
| Exceptions and prioritisation | Examples of exceptions (to travel/emissions reduction policy) and prioritisation approaches/thinking; dealing with exceptionalism; discussions about exceptions; might also include what people perceive as barriers to reducing flights? | 5 | 12 |
| Frequent Flyers | | 5 | 12 |
| Personal & emotions | Referencing personal values or behaviour or decision making related to travel | 3 | 3 |
| Uncertainty | Where uncertainty is discussed | 2 | 2 |
| Values | | 5 | 9 |
| Recognition & rankings | Recognition and rankings/standing of university | 4 | 6 |
| Research (incl. surveys) | References to travel research undertaken | 7 | 14 |
| Specific program or policy or intervention | Below sub codes include specific mentions of programs/approaches | 0 | 0 |
| Carbon budget, trading or offsets | Reference to all mentions of carbon budgets, offsets or trading. | 11 | 20 |
| Emission reduction target | Specific emissions reductions related to travel | 5 | 6 |
| Energy efficiency & other energy projects | Where energy efficiency is mentioned as part of broader programs | 3 | 5 |
| Incentives | Carrots, rather than sticks | 3 | 3 |
| Transparency, responsibility & accountability | Transparency or accountability measures in relation to travel emissions - including targets, measures, data, pledges | 4 | 7 |
| Travel practices & norms | Comments relating to travel practices & norms as per flying framework | 8 | 18 |

| Name | Description | Files | References |
|--|---|-------|------------|
| Flight levies or taxes | Where flight levies or taxes are mentioned | 9 | 35 |
| Travel booking system | Travel booking systems (including outsourced) to support flight emissions reduction | 5 | 14 |
| Travel guides, policies & restrictions | Comments relating to travel policies, guides and restrictions on travel, for example trains must be taken between London and Paris. | 9 | 21 |