

ANU Below Zero Air Travel

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Recommendations to the ANU Battery Storage and Grid Integration Program

19 October 2023



Tina and Adrian Brown's Murray cod mural. Photo by Adam Spence.

<https://citynews.com.au/wp-content/uploads/2018/06/Tina-and-Adrian-Browns-Murray-cod-mural-photo-by-Adam-Spence-ANU.png>

Agenda

Scope of project & boundaries

Recommendations in the areas of

- Data - Better data & reporting
- Policy - Allocate the carbon budget
- Research - New thinking is required

Spice levels (ISO. 5P1CE)



Emissions reduction a global problem

- A costlier path of higher resistance
- Currently fossil fuel consumption and climate emissions are offset costs to the past and future respectively
- Fossil fuels accrued over millennia, and our climate emissions are future costs
- Emission costs will continue to rise due to the projected climate impacts of past and current emissions (Portner et al., 2022).
- **This is an adaptive challenge.**

Below Zero = Decarbonising Academic Development

- Academia values global connections as fundamental to its growth and development which drives the behaviour of frequent international travel
- Current levels of aeromobility come with a high environmental cost now and into the future
- Academics have many reasons to think they should be exempt from reductions
 - Flying for a worthy cause
 - Highly competitive job market
 - Tenure is believed to be achieved by attending events despite the evidence against it
 - It is part of the culture - everyone does it
- Solutions lie in the collective action rather than reliance on individual sacrifice

Higham, J. and Font, X. (2020) 'Decarbonising academia: confronting our climate hypocrisy', *Journal of Sustainable Tourism*, 28(1), pp. 1–9. Available at: <https://doi.org/10.1080/09669582.2019.1695132>. And anecdotes from cohort members and ANU staff

Recommendation: Record and Analyse GHG Emissions

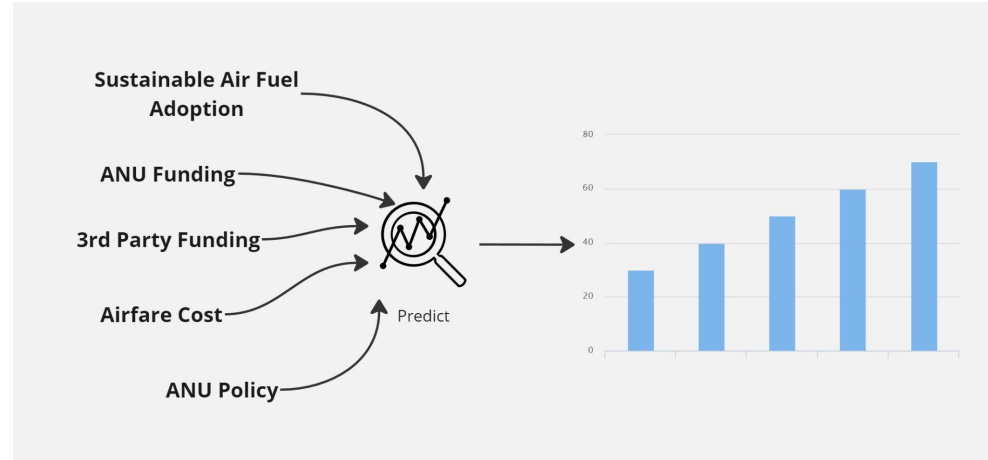
- Record emissions data from all ANU, third party and personally funded travel
 - Current reporting does not include travel into ANU (e.g. visiting academics, international recruitment, international students)
- Analyse the drivers of reduction in travel in 2023
 - What are the factors that had a big impact?
 - Is the current reduction trend sustainable?
 - How can reductions be made without disadvantaging any group?
- Publish your data internally and externally to ensure accountability

Recommendation: Model future scenarios



Influencing factors:

- ANU and 3rd Party funding
- Airfare cost - international fares around 50% higher than pre-pandemic levels*
- Sustainable Air Fuel adoption
- ANU policy changes



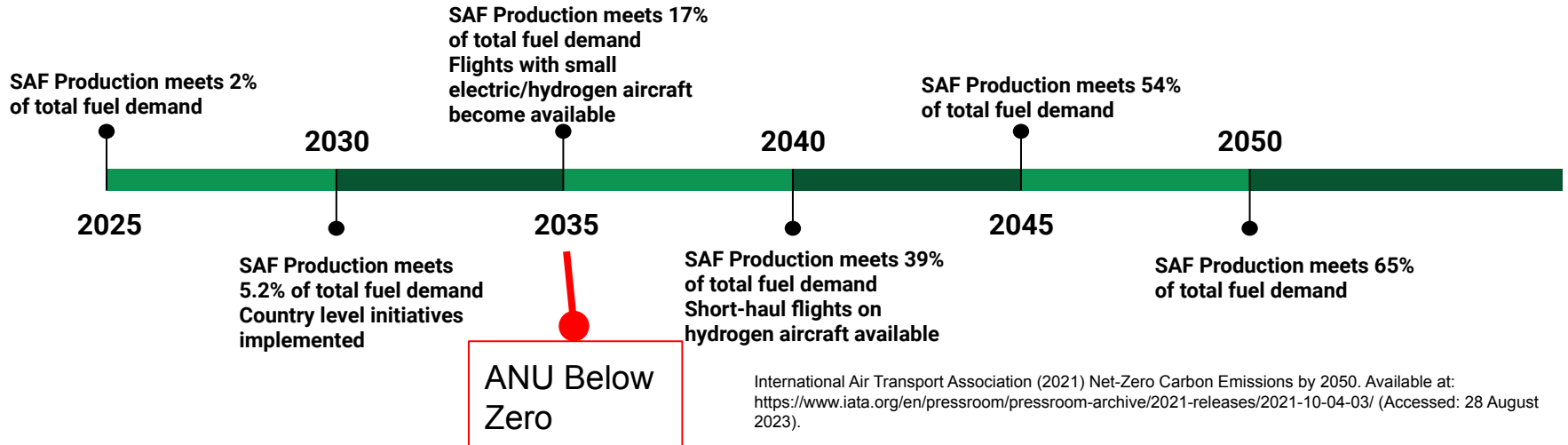
Use the scenarios to shape ANU policy or plan for mitigation if targets are not achievable

* Barrett, J. and Visontay, E. (2023) 'Why Australians are paying 50% more for air fares than pre-pandemic even as jet fuel costs drop', *The Guardian*, 30 May. Available at: <https://www.theguardian.com/australia-news/2023/may/30/why-australians-are-paying-50-more-for-air-fares-than-pre-pandemic-even-as-jet-fuel-costs-drop> (Accessed: 10 October 2023).

Recommendation: Defer



- The International Air Transport Association (IATA) announced net-zero carbon emissions target by 2050
- The plan behind the target mainly relies on increased production of sustainable air fuel (SAF), coupled with zero emission aircraft for short distances
- Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) regulates the SAF standards



Recommendation: Grant Application; Carbon Accounting



Update the ANU process for grant applications.

ANU processes for applying and supporting grants :

- How is this grant going to affect the carbon emission budget?
- How much travel will be required?

This will allow ANU to manage the carbon budget and also assist with the data capture.

Recommendation: Host the Conferences



The calculation on the usage of carbon budget is complicated. From our understanding, it is the traveler that takes the carbon cost for the flight

Is this an ethical path? Not really, but does it increase international relationships and opportunities? yes.

We can change policies in terms of slowing down travel. Visitors need to stay there for three months.

Pro's	Con's
<ul style="list-style-type: none">- ANU staff do not need to travel- We are not spending Carbon budget- Tourism- Greater number of ANU faculty and students with international community	<ul style="list-style-type: none">- Carbon budget are still being used- We are passing the buck- Different staff with different skill-sets required.

How We Book Travel at ANU Today

General Travel information

Purpose of Travel

Travel Budget

Approver

The image displays four overlapping screenshots of the ANU Travel Approval system interface, illustrating the process of booking travel. The screenshots are arranged in a cascading manner, showing different sections of the form.

- Top Screenshot: General Travel Information**
 - Header: Australian National University, Home, Travel Approval, Logged in as Benjamin Fox (u782247)
 - Section: General Travel Information
 - Form fields: Name (Benjamin Fox), University ID (u782247), Travel Date From (12/12/2023), Travel Date To (12/12/2023)
 - Form ID: 10588222
- Second Screenshot: Purpose of Travel**
 - Section: Purpose of Travel
 - Form fields: Check any appropriate travel purpose(s) (0)
 - Conference
 - Meeting
 - Outside Studies and Performance Development Programs
 - Research
 - Fieldwork
 - Student Recruitment & Marketing Activities
 - Training
 - Visiting Lecturer
 - Other

- Third Screenshot: Travel Budget**
- Section: Travel Budget
- Form fields: Funding currency (AUD), Funding source selected by the ANU (Research Grants), ANU Funded Travel Expenses (Expense Type ID, Amount AUD)
- Bottom Screenshot: General Ledger Codes**
- Section: General Ledger Codes
- Form fields: Add and remove budget codes using the + and - buttons, Department ID (e.g. 24110), Project ID (if required e.g. 01), Amount AUD (\$0.00)
- Table: General Ledger Codes

Code	Fund	Department ID	Project ID
24110001	E	24110	01
24110002	E	24110	02

Other Expenses GL Code(s)			
Add and remove budget codes using the + and - buttons			
	Department ID (e.g. 24110)	Project ID (if required e.g. 01)	Amount AUD
+ 1	24110	01	\$0.00

Totals			
Travel Budget Code	AJCS500		
Travel Party Funding	AJCS55		
Private Funding	AJCS1		
ANU Funded Expenses (AJCS500)			
General Ledger Total	AJCS500 (Must equal ANU Funded expenses)		
Unallocated Expenses	AJCS5		

Recommendation: Make the Budget Bucket Smaller



- Restrict the ability to travel based off budget.
- Reduce the budget for travel, or pay a “ANU Tax” that goes to the below zero program
- These funds can then be used to bring on staff to focus on the issue in more depth.
- This may also lead to an independent validation of travel from an external party of each of the colleges.

Recommendation: Multi Criteria Decision Analysis.



The policy to travel is very loose at the moment. (Refer to previous slides on the policy process)

- Do we have money? Yes
- Does my coordinator approve? Yes
- Book flight and leave.

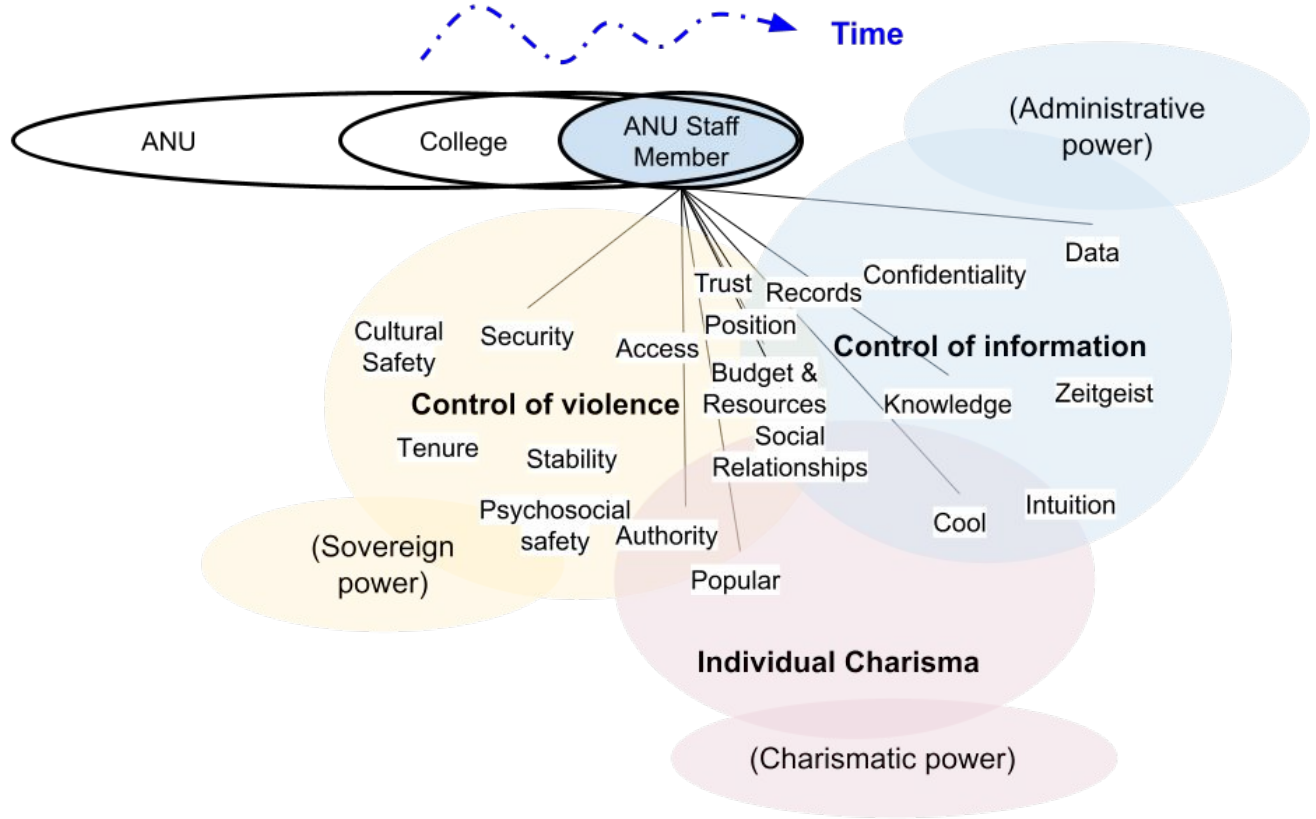
We need to ask the following questions,

- What does the ANU benefit from this travel?
- Does this align with ANU strategic plan?
- What does the responsible school benefit?

If this is just for the staff member to create an opportunity from themselves, then the travel needs to be evaluated.

Three basic forms of academic power*.

Academic development cannot rely on Zoom and email 100%



Schismogenesis**
Creation of division

**Bateson G (1935) '199. Culture Contact and Schismogenesis', *Man*, 35:178, doi:10.2307/2789408.

*Graeber D and Wengrow D (2021) p. 507 *The dawn of everything: a new history of humanity*, Allen Lane, London.

The perfect ride

OECD designs transport around scale, so crew time and engine thermodynamics are treated as fixed costs.

So we build faster 'reliabler' and bulkier; planes ships, trains, trucks, cars

Boeing Dreamliner: "The airplane's unparalleled fuel **efficiency** and range flexibility enables carriers to profitably open new routes as well as optimize fleet and network performance. And for their passengers, an experience like none other in the air, with **more comfort** and **less fatigue** " (Boeing, 1995, emphasis mine).

A deficit model. Costs = fuel, crew time, passenger's discomfort and fatigue.

Time-lossy travel; a driver of the great acceleration.

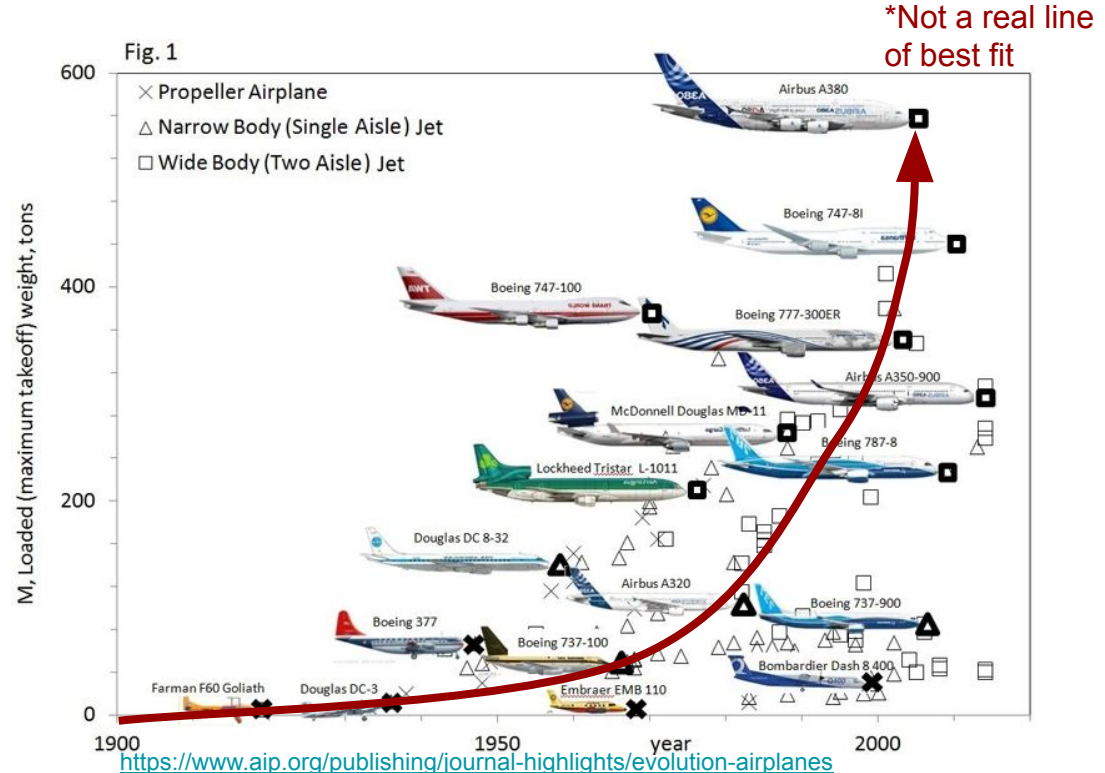
Optimise Overhead Costs

Engine Thermodynamics
Crew Time
Fuel (avoid future costs)

Minimise Passenger's Costs

Unproductive
Discomfort
Fatigue

Result => Faster, fuel hungrier & tolerable UX



Trains demonstrate an optimistic paradigm change

In Australia, we are so accustomed to time-lossy travel that we conflate and confuse luxury with productivity focus, cultural development and and style.

We need to adapt how we think of travel.



Images: <https://www.architecturaldigest.com/story/inside-a-wes-anderson-designed-luxury-train>
<https://www.delicious.com.au/travel/international/gallery/all-aboard-inside-the-worlds-most-beautiful-trains/avb2rb69>

Trains demonstrate an optimistic paradigm change



[Sound Tracks festival](#), Victoria 2023 a jazz band plays in the train's cocktail bar, people rave 13 cars away. This timeful moving event connects people.

Pic: Nick McKinlay
<https://www.theguardian.com/culture/2023/oct/09/all-aboard-the-new-music-festival-heading-to-regional-victoria-via-steam-train>

Trains demonstrate an optimistic paradigm change

- (Crew / Passenger) ⇒ Zero.
- Electric and reliable.
- Overhead costs per passenger are diluted & the public value generated on a train may exceed the public costs. More trains = more value.
- Trains suit; automation, urban travel and some intercity travel.
- But; high CapEx costs, heavy infrastructure, limited grade capacity, vulnerability to extreme weather.
- Trains demonstrate timeful travel.

Timeful travel

Think of a happy place for you.

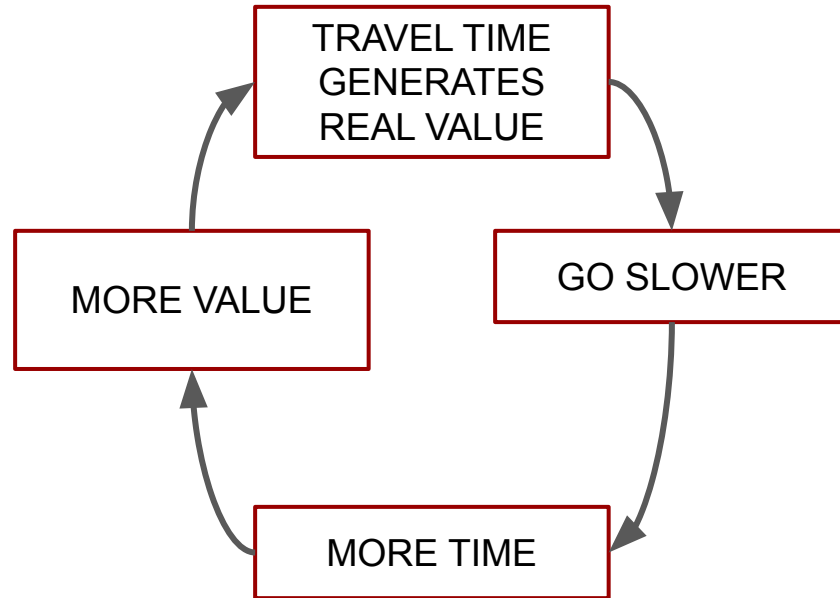
Imagine travelling was as productive, immersive, flexible and enjoyable. You want to stay longer.

Time then makes individual value and generates public value.

Feedback makes transport slower, reduced fuel consumption, increases public value.

This is timeful travel.

Optimise for value during travel.

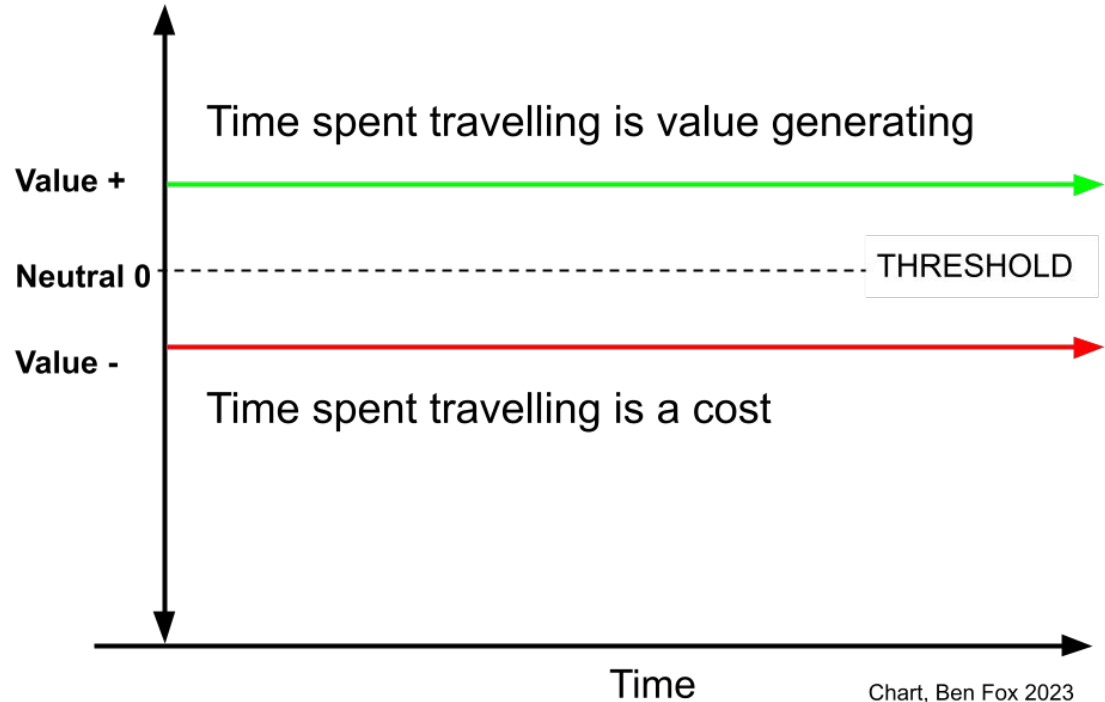


Ben Fox 2023

Timeful Travel

Customisable
Authentic
Connecting
Creative &
Productive

Net value generated vs time spent travelling



Chart, Ben Fox 2023

Recommendation: Invest R&D in timeful travel



- **Customisable**, personal preferences, transformative and immersive learning experiences.
- **Authentic**, highly flexible routes, styles, build meaningful connections with country as traversed. A rich source of academic value, fostering a deeper understanding of worlds, perspectives and geography.
- **Connects** people safely, reliably in curated experiences, by unique insights, fosters collaborations, enriching relationships and knowledge acquisition.
- **Creative and productive spaces**, equipped with productive tools intellectual engagement, an academic platform. Travellers enhance their skills, praxis and research.

Better data & Reporting. Allocate the C budget. New thinking is required.

Emissions reduction; a costlier path
of higher resistance

Decarbonising Academic
Development

...

Record and Analyse GHG Emissions

Model future scenarios



Defer 

Grant Application Overhaul 

Host the Conferences 

Make the Budget Bucket Smaller

Multi Criteria Decision Analysis

Invest in timeful travel R&D 



THANK YOU

Dr Kim Blackmore



Dr Paul Wong

Brenda Martin



Dr Ash Lenton

Tim Johnson



Dr Chris Mesiku

Juliet Meyer



Emma Baldwin

Prof Mark Howden



Dr Daniel Kilov

Dr Jessamy Perriam

End of presentation

Resources

Australian Government Transport Department of Infrastructure (2022) Aviation emissions, Department of Infrastructure, Transport, Regional Development, Communications and the Arts. Available at:

<https://www.infrastructure.gov.au/infrastructure-transport-vehicles/aviation/aviation-safety/aviation-emissions> (Accessed: 28 August 2023).

Barrett, J. and Visontay, E. (2023) 'Why Australians are paying 50% more for air fares than pre-pandemic even as jet fuel costs drop', *The Guardian*, 30 May. Available at:

<https://www.theguardian.com/australia-news/2023/may/30/why-australians-are-paying-50-more-for-air-fares-than-pre-pandemic-even-a-s-jet-fuel-costs-drop> (Accessed: 10 October 2023).

Bateson G (1935) '199. Culture Contact and Schismogenesis', *Man*, 35:178, doi:[10.2307/2789408](https://doi.org/10.2307/2789408).

— (1999) *Naven: a survey of the problems suggested by a composite picture of the culture of a New Guinea tribe drawn from three points of view*, 2. ed., [Nachdr.], Stanford Univ. Press, Stanford, Calif.

CSIRO (2023) Sustainable Aviation Fuel Roadmap. Canberra: CSIRO.

Dolšak N and Prakash A (2022) 'Different approaches to reducing aviation emissions: reviewing the structure-agency debate in climate policy', *Climate Action*, 1(1):2, doi:[10.1007/s44168-022-00001-w](https://doi.org/10.1007/s44168-022-00001-w).

Graeber D and Wengrow D (2021) *The dawn of everything: a new history of humanity*, Allen Lane, London.

Harvey D (2005) *A brief history of neoliberalism*, Oxford University Press, Oxford ; New York.

Resources

Higham, J. and Font, X. (2020) 'Decarbonising academia: confronting our climate hypocrisy', *Journal of Sustainable Tourism*, 28(1), pp. 1–9. Available at: <https://doi.org/10.1080/09669582.2019.1695132>.

International Air Transport Association (2021) Net-Zero Carbon Emissions by 2050. Available at: <https://www.iata.org/en/pressroom/pressroom-archive/2021-releases/2021-10-04-03/> (Accessed: 28 August 2023).

Portner H, Roberts D and Poloczanska K (2022) IPCC, 2022: Summary for Policymakers, Cambridge University Press, Cambridge, https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_SummaryForPolicymakers.pdf, accessed 4 August 2022.

Qantas (n.d.) Our planet. Available at: <https://www.qantas.com/au/en/qantas-group/acting-responsibly/our-planet.html> (Accessed: 28 August 2023).

— (n.d.) Sustainable Aviation Fuel. Available at: <https://www.qantas.com/au/en/qantas-group/acting-responsibly/our-planet/sustainable-aviation-fuel.html> (Accessed: 5 September 2023).

Shymko Y and Frémeaux S (2022) 'Escaping the Fantasy Land of Freedom in Organizations: The Contribution of Hannah Arendt', *Journal of Business Ethics*, 176(2):213–226, doi:[10.1007/s10551-020-04707-x](https://doi.org/10.1007/s10551-020-04707-x).

The Australian National University (2021) AN OVERVIEW OF ANU GREENHOUSE GAS (GHG) EMISSIONS.

Resources

— (n.d.) ANU Below Zero Initiative survey: Baseline attitudinal data for the ANU staff and student community. Available at: <https://www.anu.edu.au/files/guidance/ANU%20Below%20Zero%20Initiative%20survey%20results%20final.pdf> [Accessed 5 Sep. 2023].

— (n.d.) Below Zero Program Progress report: July – December 2022. Available at: <https://sustainability.anu.edu.au/files/2023-06/Below%20Zero%20Progress%20Report%20-%20July-December%202022.pdf> [Accessed 5 Sep. 2023].

— (n.d.) Travel Emissions Dashboard.

Top Universities. (2019). *Top Universities*. [online] Available at: <https://www.topuniversities.com/>.

Visontay, E. (Jul 2023) 'Airlines could ditch flights to Australia to meet future emissions promises, parliament told', *The Guardian*, 20 July. Available at: <https://www.theguardian.com/environment/2023/jul/21/airlines-could-ditch-flights-to-australia-to-meet-future-emissions-promises-parliament-told> (Accessed: 28 August 2023).

— (Mar 2023) 'Jet planes and sugar cane: Qantas and Airbus get on board biofuel factory in Queensland', *The Guardian*, 30 March. Available at: <https://www.theguardian.com/business/2023/mar/30/sugar-cane-aviation-fuel-qantas-airbus-jet-planes-biofuel-factory-queensland-australia> (Accessed: 28 August 2023).

Whitehead et al (2022) *FACTS: A Framework for an Australian Clean Transport Strategy*. Available at: <http://transportfacts.org/wp-content/uploads/2022/06/FACTS-a-Framework-for-an-Australian-Clean-Transport-Strategy-2022.pdf>.