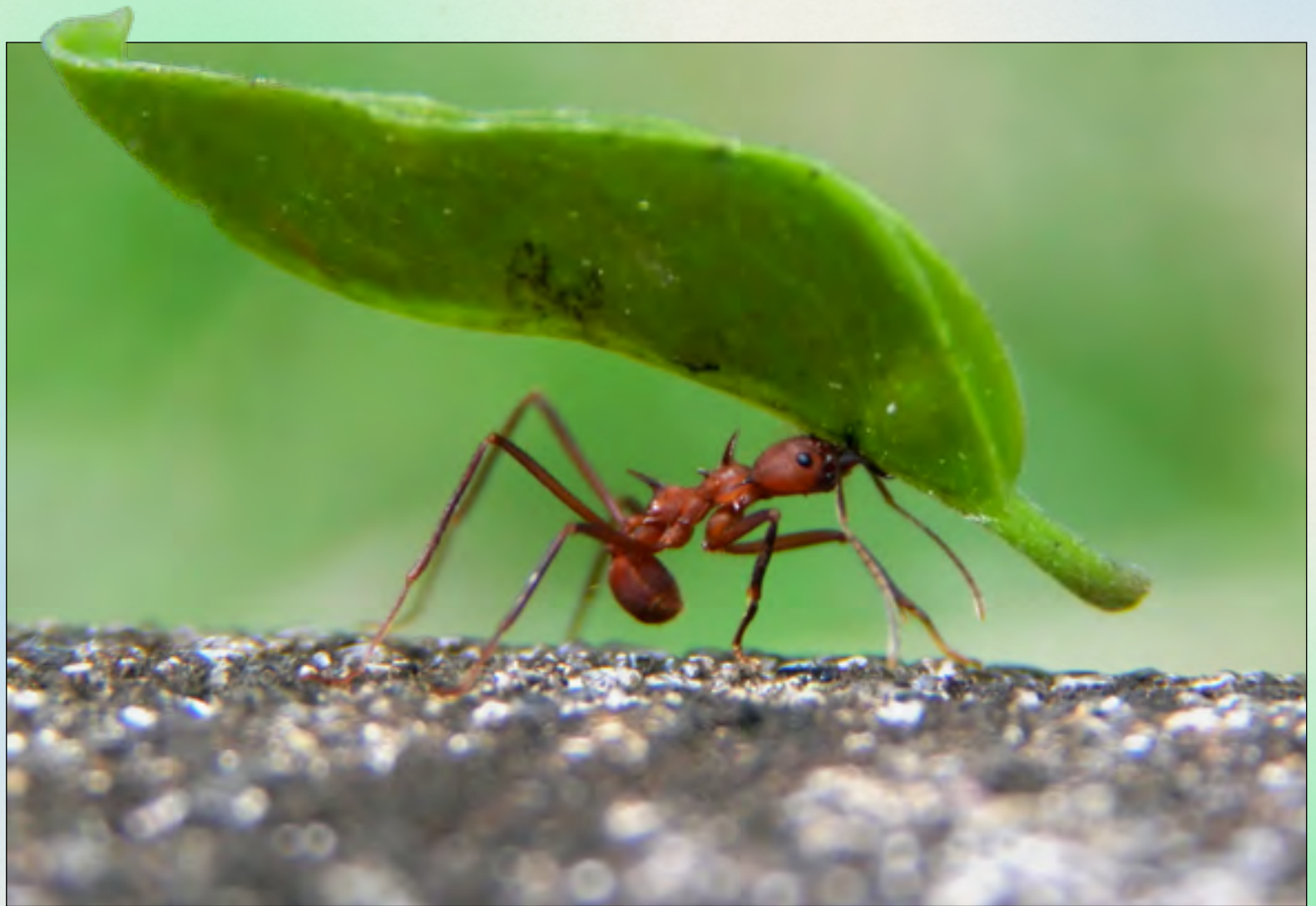


Australian
Ethical



AE

A little goes a long way:
Examining effective ways to lower your carbon footprint

Important information

This information is general in nature and provided for informational purposes only. It is not intended to be used as investment or financial advice and does not take into account your personal financial situation, objectives or needs. You should consider obtaining financial advice that is tailored to suit your personal circumstances before making an investment decision or switching your super. Please read the Financial Services Guide and the relevant Product Disclosure Statement(s) and Target Market Determination as well as other important documentation available on our website for information about our products.

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About this report

A little goes a long way: Examining effective ways to lower your carbon footprint is a research report published by Australian Ethical Investment Ltd (Australian Ethical). It is based on research undertaken by The University of Technology Sydney (UTS) Business School, which used scientific resources that quantified the carbon emissions generated as a result of the activities of the average Australian.

The research provides information about which actions taken by individuals can have the greatest impact on influencing a reduction in carbon dioxide equivalent (CO₂e) emissions. We want to start a discussion across Australia about the power that grassroots change can have, starting at an individual level.

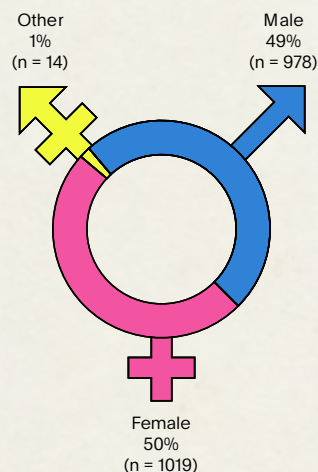
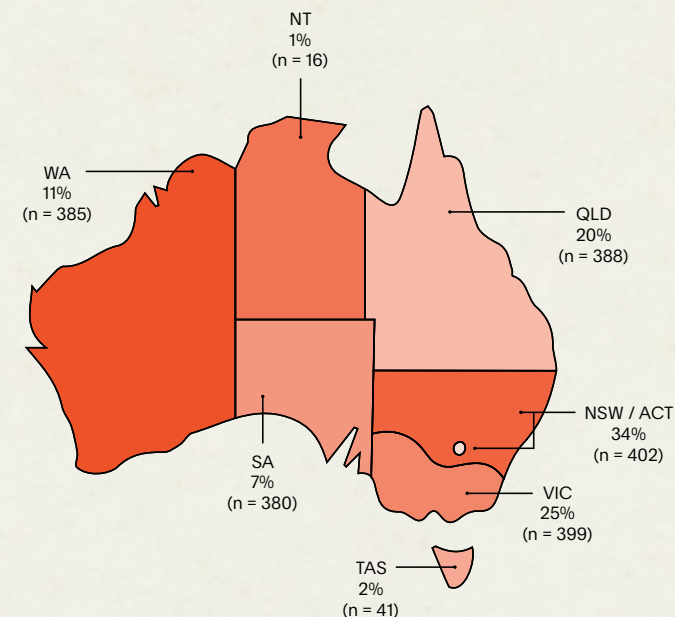
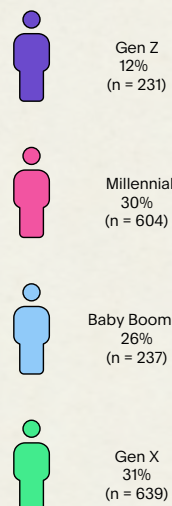
The cumulative effect of small actions really can go a long way – and help to bring about systemic change that is good for Australia and good for the planet.



Methodology

In addition to the UTS research included in this report, Lonergan Research has done a statistically rigorous deep dive into Australia's perceptions about climate change. Lonergan surveyed 2,011 Australians aged 18+ from capital city and non-capital city areas. The survey, which was in accordance with the ISO 20252 standard, was conducted online among members of a permission-based panel between 14 October and 18 October 2022. After interviewing, data was weighted to the latest population estimates sourced from the Australian Bureau of Statistics.

Sample demographics



Methodology

The framework developed by UTS consists of several activity categories, including:



FOOD / DIET



MOBILITY / TRANSPORT



HOME / RESIDENTIAL LIFE



LIFESTYLE / PERSONAL FINANCE

The framework developed by UTS consists of several activity categories, including Food/Diet, Mobility/Transport, Home/Residential Life, and Lifestyle/Personal Finance. To identify opportunities for individuals to reduce carbon emissions, UTS assembled a dataset that employed standard, easily relatable units of measurement. For example, it calculated reductions based on the number of return flights avoided, the reduction in the number of minutes of shower time per day, or the percentage of clothing dried using a line or rack rather than a tumble dryer.

To help determine the impact of investing with an ethically screened fund like those managed by Australian Ethical, UTS used the MSCI Carbon Portfolio Analytics report from Australian Ethical (report date: July 22, 2022). This report compared an evaluation of avoided carbon emissions of an ethically managed fund compared to a market benchmark of listed assets.¹ The UTS report used investment amounts of \$50,000 and comparisons with mean and median superannuation savings levels (to assess the initial impact of a change in investment) or annual super contributions (to assess the annual impact of ongoing investments). The intention was to help individuals draw a comparison between the potential carbon emission savings associated with choosing to invest with an ethical fund.

The UTS research has ranked a wide spectrum of activities that individuals can take to reduce their carbon impact. The specific actions vary in terms of their direct or indirect impact on reducing fossil fuel consumption. Some actions, such as installing solar panels, turning off electronic devices when not in use, or composting food waste, directly reduce greenhouse gas emissions while others, such as recycling plastics and glass or switching your super or investments to an ethical/responsible, low carbon fund have no or minimal direct impact, but remain worthwhile as contributors to social and systemic change when adopted at a large scale.

1. The comparison benchmark is a blended benchmark of the S&P ASX 200 Index (for Australian and New Zealand shareholdings) and MSCI World ex-Australia Index (for international fund shareholdings).

Considerations when reading the research

When commissioning this research our focus has been solely on society's contribution to climate change as a result of greenhouse gas emissions that can be influenced by lifestyle choices of an individual or household. However, we recognise that this is only one aspect of sustainability and as an ethical investment company, we routinely consider a broad range of outcomes impacting people, planet, and animals in line with our Ethical Charter.²

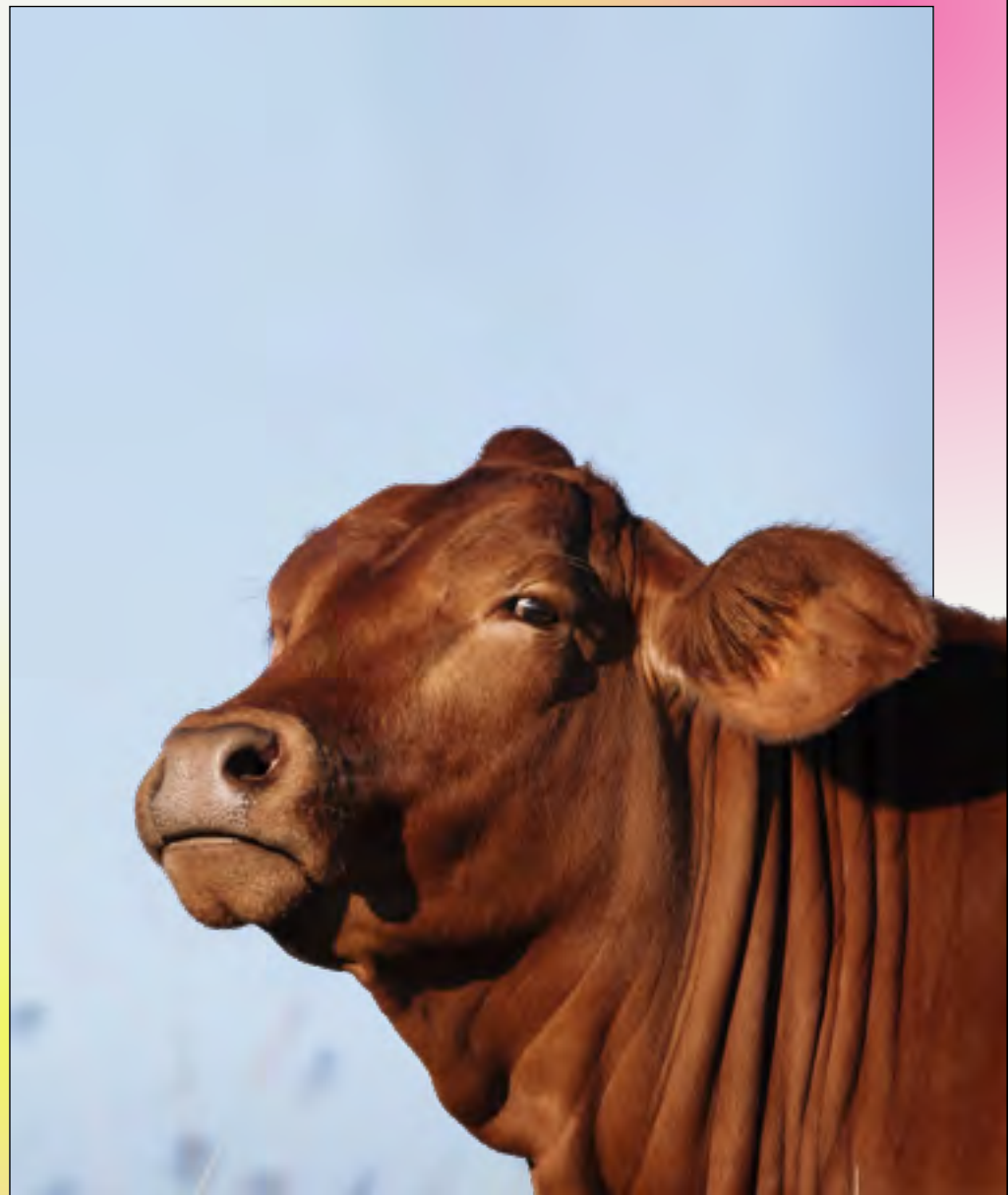
Though carbon dioxide (CO₂) at 65% is the most common greenhouse gas, it is by no means the most potent. Methane has 25 times more potential to warm the atmosphere, while nitrous oxide has 300 times.³ To standardise the warming effects of these gases the term 'carbon dioxide equivalent' or 'CO₂e' is commonly used.

We know the concept of a 'personal carbon footprint' is polarising – it was coined by an advertising agency on behalf of BP who popularised the term to help shift the focus off the fossil fuel producer and direct it towards the consumer⁴ – but it's clear that consumer actions are also needed to address global warming, and it is useful shorthand for measuring the impact of individual actions on CO₂e.

2. For more information, please visit australianethical.com.au/why-ae/ethical-charter.

3. Ecometrica. (2012, September 4). "Greenhouse gases, CO₂, CO₂e, and carbon: What do all these terms mean?" Retrieved from ecometrica.com/greenhouse-gases-co2-co2e-and-carbon-what-do-all-these-terms-mean on October 27, 2022.

4. Kaufman, M. (2012, August). "The carbon footprint sham: A 'successful, deceptive' PR campaign". Retrieved from mashable.com/feature/carbon-footprint-pr-campaign-sham on 22 December 2022.⁴



Introduction

02

Introduction

The climate is changing. Australians can already see and feel the impacts of climate change through more frequent and severe weather events, like droughts, bushfires and floods.

Tackling climate change can feel overwhelming and beyond our individual power to influence. However, as individuals if we all make small changes in our everyday lives it can really add up to make a difference.

The choice is ours. By making incremental changes on a personal level we can contribute directly to lowering carbon emissions, or to a broader, systemic movement that can really make transformative change.

We know we need to make better choices in many aspects of our lives, but is there a way we can prioritise our actions to have the most impact? What are the things we can change in our everyday lives that will make a material difference? Which actions have the most impact?

Australian Ethical has created this guide to uncover the actions we can take as individuals that have the most potential to reduce climate change. The results may surprise you.

A little really can go a long way. Take action.



Executive summary

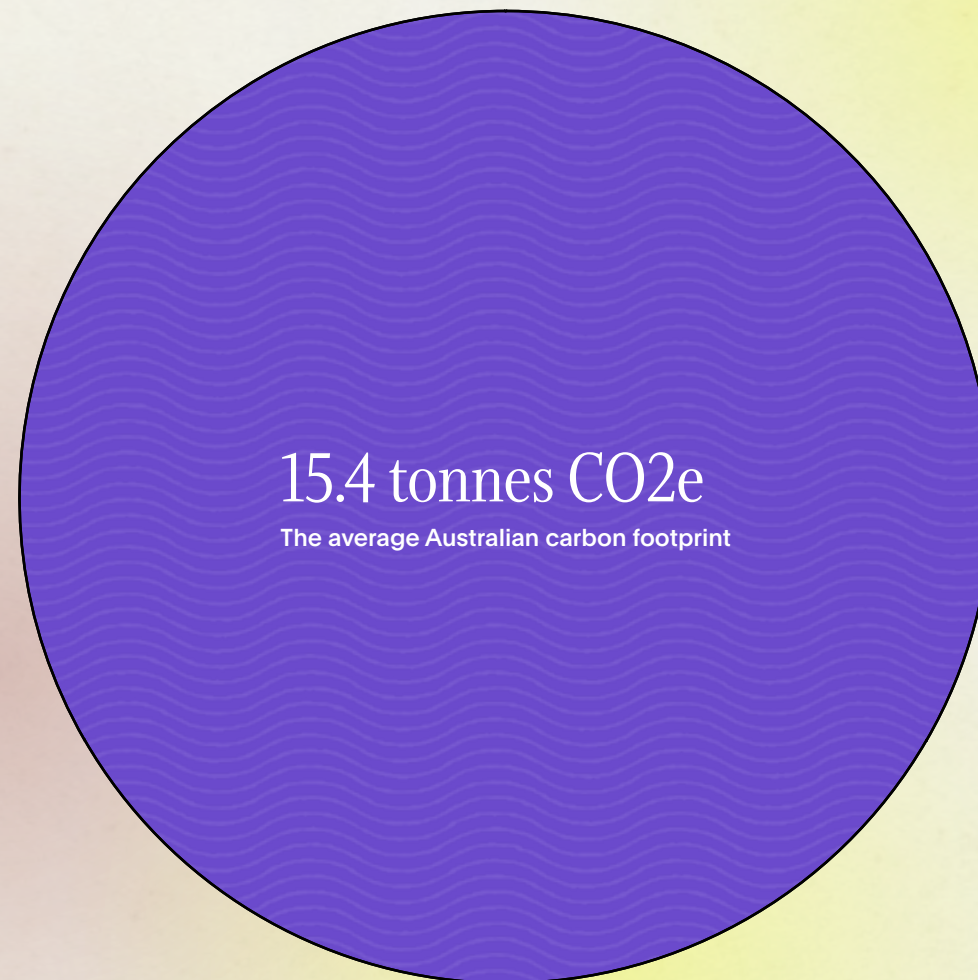
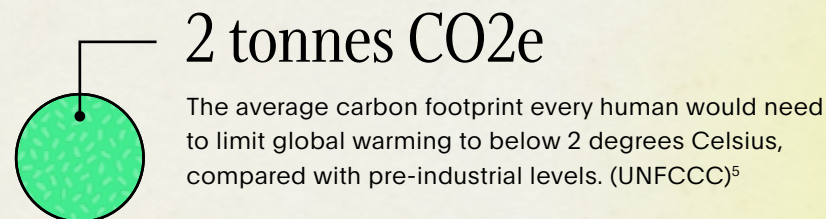
03

96% of Australians surveyed* said they are taking specific actions to reduce their carbon footprint.
But are these actions the most impactful?

Our research shows that Australians are underestimating the reduction needed.

*To understand Australia's perceptions about climate change, Lonergan Research surveyed over 2,000 Australians aged 18+ from capital city and non-capital city areas. Lonergan Research. (2022, October). Impact Unpacked: Lonergan Research for Australian Ethical.

Australians have a long way to go to reduce their individual carbon footprint if we want to limit global warming



5. The UNFCCC secretariat (UN Climate Change). "What is the Paris Agreement?". Retrieved from unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement on 10 January 2023.

We need tonnes of carbon reduction to keep global warming within 2°C

The United Nations Framework Convention on Climate Change (UNFCCC) states the goal is to "limit global warming to well below 2, and to pursue a limit of 1.5 degrees Celsius, compared to pre-industrial levels".⁶ To do this, every human would need to reduce their individual carbon footprint to 2 tonnes of CO₂e. While 2 tonnes by 2050 was the initial target, some experts now believe that slightly more than 2 tonnes is what must be achieved by 2030.⁷ This only emphasises the urgency.

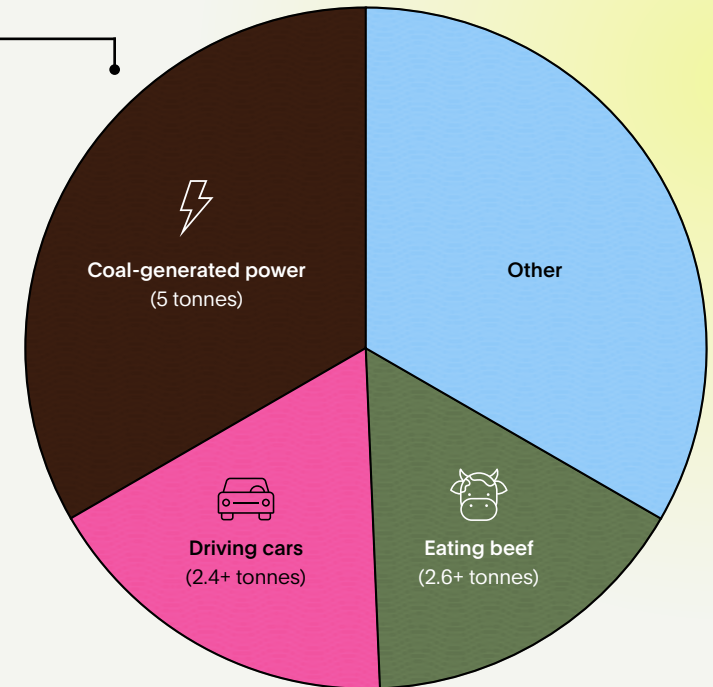
However, Australians do not recognise the level of change required, with the average Australian estimating that the individual carbon footprint needed to keep below a 2-degree warming would be 5.5 tonnes.

6. The UNFCCC secretariat (UN Climate Change). "What is the Paris Agreement?". Retrieved from unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement on 10 January 2023.
7. Oxfam International, "Carbon emissions of richest 1% set to be 30 times the 1.5°C limit in 2030", Press release from 5 November 2021. Retrieved online at oxfam.org/en/press-releases/carbon-emissions-richest-1-set-to-be-30-times-15degc-limit-2030 on 10 January 2023.
8. UTS Business School. (2022, November). Carbon Savings: Lifestyle & Investment Choices Report.

THE PRESENT

15.4 tonnes

This is the average Australian carbon footprint (CO₂e).⁸



THE GOAL

2 tonnes

This is what we need to get to – the average carbon footprint (CO₂e) every human would need to limit global warming to 2 degrees Celsius.

13.4 tonnes CO₂e reduction is required by each Australian

What do Australians believe about their impact?⁹



90%+ pay some level of attention to sustainability



1/4 of us are passionate about it



39% admit to not knowing what the required carbon footprint is to keep global warming below 2 degrees of warming



45% underestimate the reduction needed



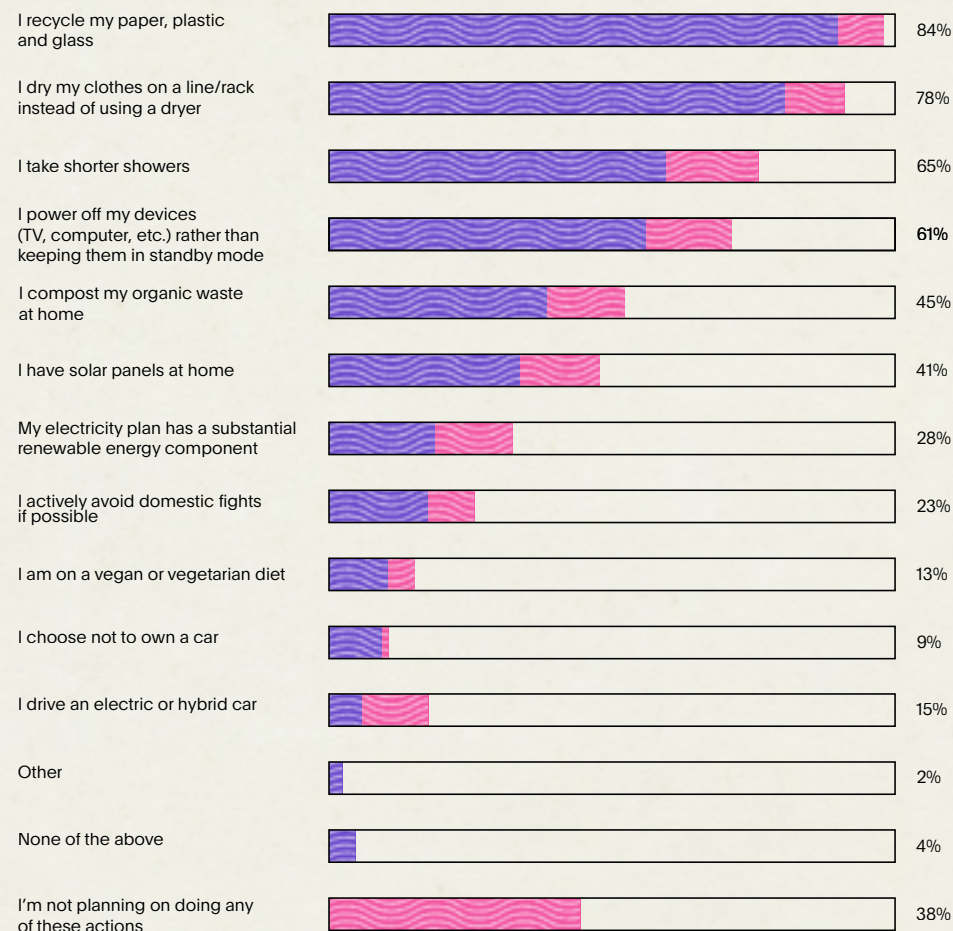
96% are taking specific actions to reduce their individual carbon footprint

9. For more information, please visit australianethical.com.au/why-ae/ethical-charter.

10. Loneragan Research. (2022, October). Almost all Australians are taking specific actions to reduce their individual carbon footprint, Impact Unpacked: Loneragan Research for Australian Ethical.

We asked Australians to rank these 11 activities.

Which of the actions below if any, are you taking to reduce your individual carbon footprint to combat climate change? Which of these actions do you plan to do in the next 12 months to reduce your individual carbon footprint?¹⁰



Currently Doing

Planning

Australians could be making more impactful choices

The top 5 things Australians surveyed believe make the most difference to reducing their carbon footprint:

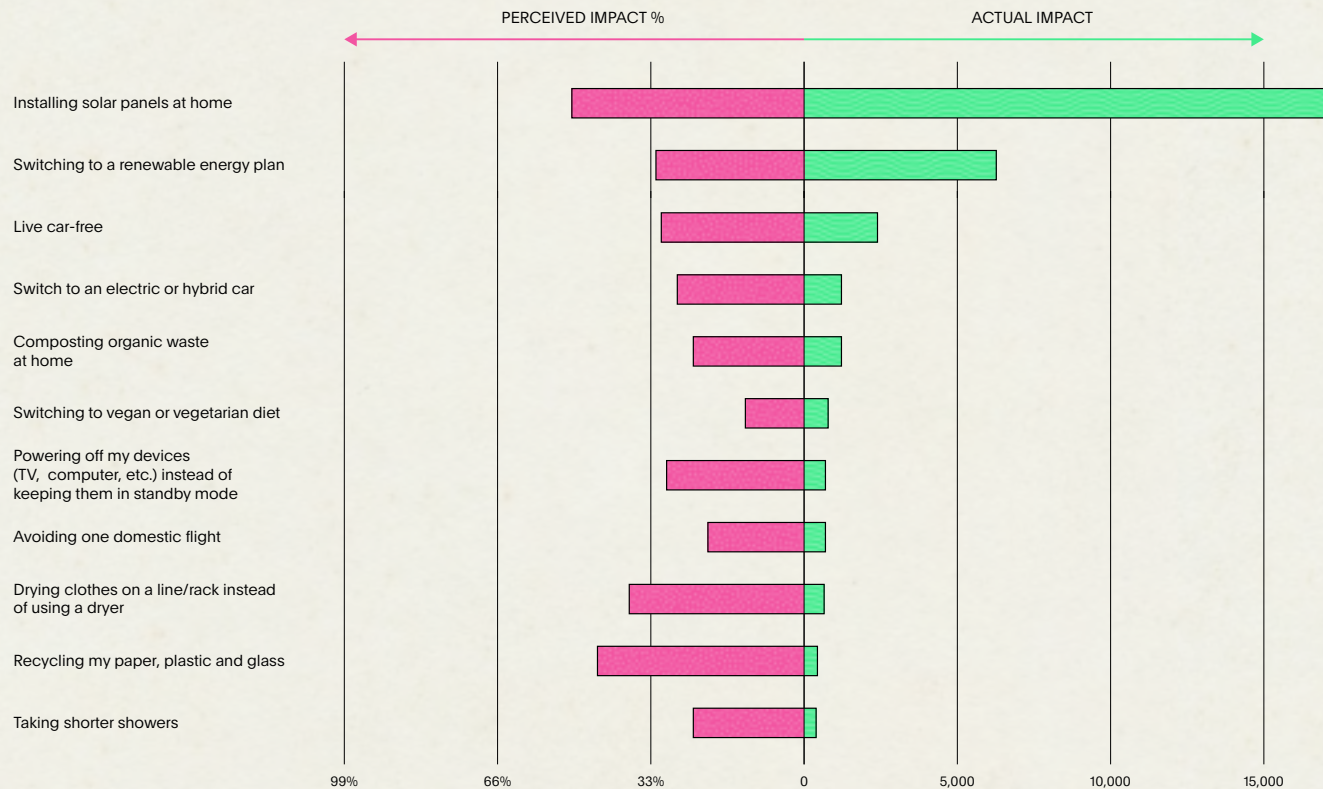
1. Installing solar panels in their homes
2. Recycling paper, plastic and glass
3. Drying clothes on a rack rather than with a dryer
4. Switching to a renewable (green) energy plan
5. Powering off devices rather than leave them in standby mode

According to UTS, only two of these choices make the top 5 list for annual savings of CO₂e: installing solar panels and switching to a renewable energy plan.

11. UTS Business School. (2022, November). Table 19. Emission Savings by Activity: Actual Rank (Calculator) vs. Perception Rank (Survey), Carbon Savings: Lifestyle & Investment Choices Report.

Perceived impact % vs Actual impact in CO₂e¹¹

This chart highlights a large gap between perceived versus actual impacts.



While all these actions are positive for Australians' carbon footprint, according to UTS only two of the perceived top 5 for annual savings of CO₂e make up the actual top 5 list.

UTS research shows that switching \$50,000 in super or investments to an ethical/responsible fund is among the important ways the average Australian can contribute to systemic change and carbon emission reduction.*

It's also the easiest way.†

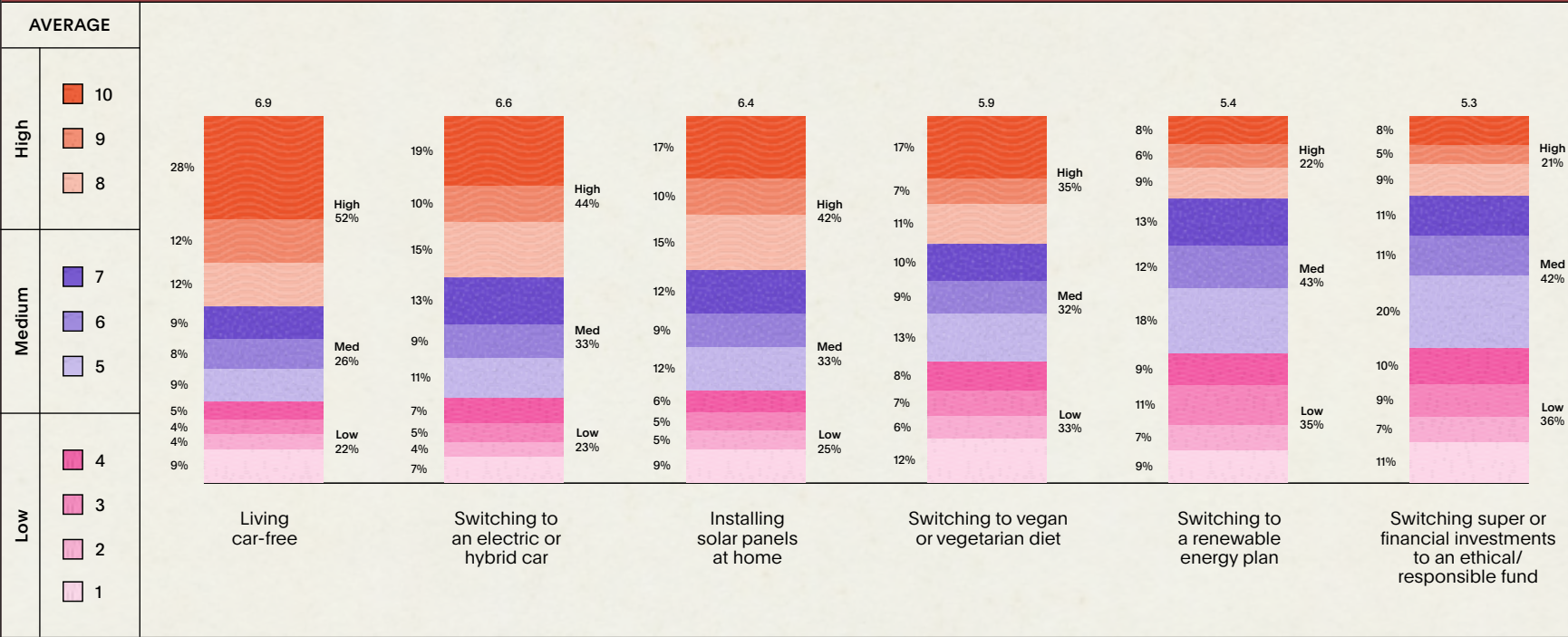
(It takes only minutes to switch your super to an ethical/responsible fund like Australian Ethical.)

* To determine the impact of investing with an ethical fund like Australian Ethical, UTS used the MSCI Portfolio Analytics report from Australian Ethical (report date: July 22, 2022). For more information, refer to Methodology on Page 7.

† Note: Before you switch, please consider not only investments and fees but also any difference in the insurance provided by the relevant fund. You should consider seeking advice and read the relevant product disclosure statement and target market determination to make an informed decision based on your own financial objectives, situation and needs.

Effort

Thinking about the effort taken to reduce your carbon footprint –
how much effort do you believe the actions to reduce your carbon footprint would take?¹³



We also asked Australians which of the actions designed to make an impact on their carbon footprint would require the most effort?

Of the carbon reduction options shown, living car-free is believed to require the most amount of effort with 52% surveyed saying it would take a high degree of effort. This is a full 10 percentage points above the rating for installing solar panels at home, which comes in third with 42% saying it would require a high degree of effort. Second place was 'switching to an electric or hybrid car' with 44% of those surveyed saying it would take a high degree of effort.

Australians feel switching their super or investments to an ethical/responsible fund requires the least effort of the six actions on the list (only 21% of those surveyed said it would require a high degree of effort). A further breakdown reveals 17% of those who had already switched said it required a high amount of effort, versus 22% of those who had not switched.

13. Lonergan Research. (2022, October). One in five Australians believe switching their super or investments to an ethical/sustainable fund takes a high degree of effort, Impact Unpacked: Lonergan Research for Australian Ethical.

Key findings



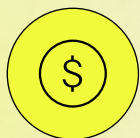
96%

of Australians are taking individual actions to combat climate change. However, the average carbon footprint for individuals in Australia is 15.4 tonnes – a long way from the 2 tonnes needed to keep under 2 degrees Celsius of warming.



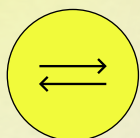
2/5

activities Australians believe will make a difference to their carbon footprint actually have the most impact.



\$50,000

of your super or investments when moved to an ethical or responsible fund with a low-carbon footprint has meaningful social impact potential.



Moving your money

Also requires amongst the least perceived effort.

Key ways individuals can contribute to reducing their carbon footprint

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KEY WAYS INDIVIDUALS CAN CONTRIBUTE TO REDUCING THEIR CARBON FOOTPRINT

The big picture

The top 3 sectors that represent a combined relative weight of 71.9% of all Australian emissions as of 2019 are Electricity and heat, Agriculture, and Transport.¹⁴

UTS chose and categorised common lifestyle activities related to these sectors with the aim of identifying activities that provide the greatest carbon savings potential.

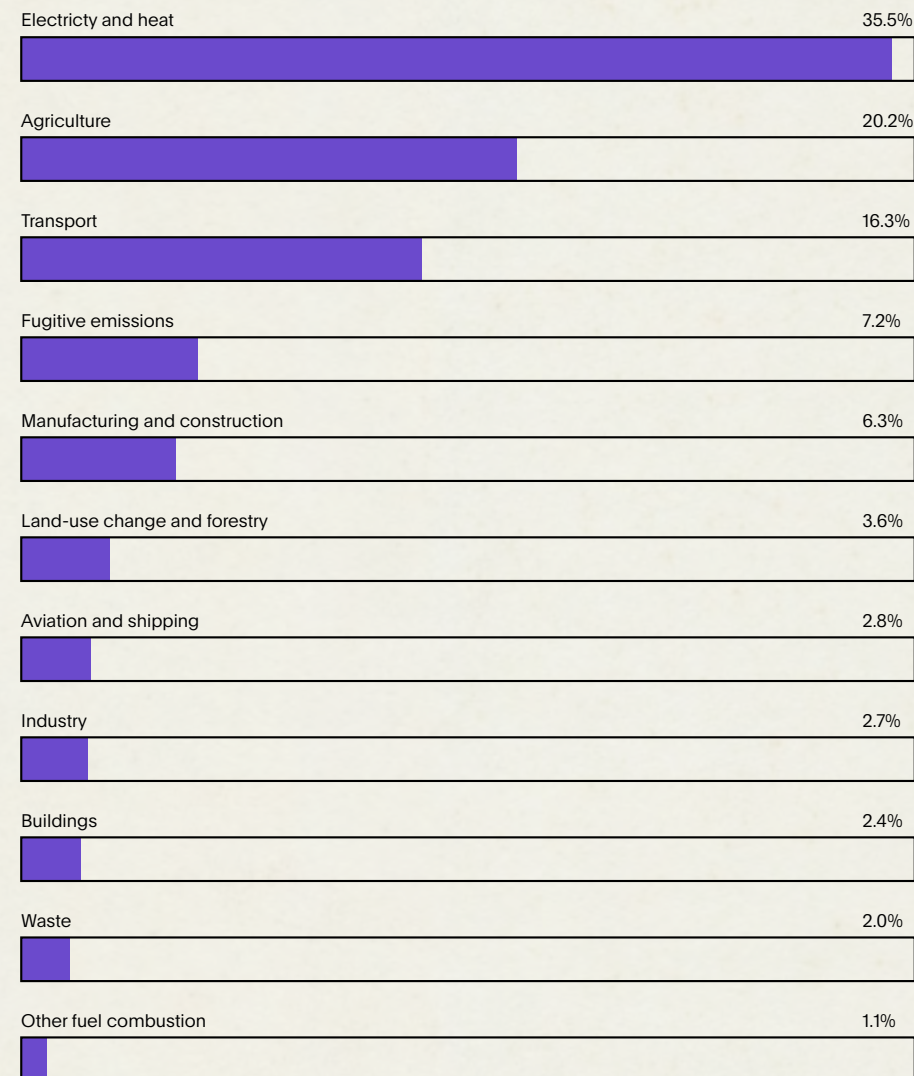
Given that fossil fuels are used predominantly in energy production in Australia, the Electricity and heat sector leads the list in CO₂ emissions followed by Agriculture and Transport.

UTS then ranked a set of activities across 4 categories (Food/Diet, Mobility/Transport, Home/Residential Life, and Lifestyle/Personal Finance) to reduce carbon footprint.

14. Climate Watch. "Historical Emissions". Retrieved from climatewatchdata.org/data-explorer/historical-emissions on 27 October 2022.

15. UTS Business School. (2022, November). Figure 3. Greenhouse Gas Emissions by Sector in Australia (2019), Carbon Savings: Lifestyle & Investment Choices Report.

Greenhouse gas emissions by sector in Australia (2019)¹⁵



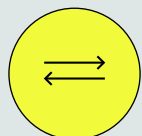
Australian Ethical	About this report	Introduction	Executive summary	Key areas	Conclusion	Appendix
Top CO2 saving activities ¹⁶						
Rank	Activity	Annual CO2 saving in kg	Rank	Activity	Annual CO2 saving in kg	
1	I plan to install solar panels at home.	17,228	21	I plan to eat 30% more vegetarian food (eat less meat and fish).	259	
2	I plan to switch to a renewable energy plan.	6,278	22	I plan to buy and move to a smaller house/apartment.	185	
3	I plan to avoid 1 international flight(s) (i.e. Sydney to London or LA, return).	4,215	23	I plan to shift from PET-bottled natural mineral water to tap water.	164	
4	I plan to give up my car.	2,400	24	I plan to stop buying plastic and canned beverages.	158	
5	I plan to avoid 3 domestic flights.	2,118	25	I plan to improve my windows (e.g. double glazing).	142	
6	I plan to switch to an electric or hybrid car.	1,250	26	I plan to reduce my consumption of sweets and alcohol.	106	
7	I plan to recycle 100% of my organic waste at home.	1,250	27	I plan to consume less alcohol, tea, coffee, chocolate (foods with low nutritional value).	87	
8	I plan to install roof insulation at home.	850	28	I plan to buy 30% fewer cosmetic products.	70	
9	I plan to walk or cycle to work instead of driving my car.	818	29	I plan to buy 30% less furniture and reduce my renovations by 50%.	65	
10	I do not have plans to add a pet to my home.	800	30	I plan to buy 30% fewer clothes.	62	
11	I plan to switch to a plant-based (vegan) diet.	800	31	I plan to buy products with less or greener packaging.	55	
12	I plan to power off my devices (TV, computer, etc) rather than keeping them in standby mode.	729	32	I plan to upgrade all of my home appliances to 5-star rating.	54	
13	I plan to reduce or cut red meat consumption from my diet by 80%.	640	33	I plan to buy 30% more ecological cosmetics.	37	
14	I plan to reduce over-purchasing and avoidable food waste.	493	34	I plan to wash 50% of loads using cold water only.	33	
15	I plan to recycle 100% of my paper, plastic and glass.	453	35	I plan to buy 30% more ecological clothing (eco and organic labelled).	31	
16	I plan to work more from home.	450	36	I plan to extend the life of clothing and textiles through repairs.	22	
17	I will take shorter showers by taking off 5 minutes from my daily routine.	388	37	I plan to buy 30% more eco-friendly furniture.	11	
18	I plan to reduce red meat intake by 50%.	384	38	I plan to use renewable building materials (e.g. wood, straw bale, hemp, clay).	10	
19	I plan to dry 50% of my clothes on a line/rack instead of using a dryer.	328	39	I plan to reduce my plastic waste by 30%.	6	
20	I plan to use products until the end of their lifecycle (lifetime optimisation).	320				
16. UTS Business School (2022, November). Activity 40, Data and Interactive Calculator Tool: SNAPSHOT - Activity 40.						
A LITTLE GOES A LONG WAY						22

KEY WAYS INDIVIDUALS CAN CONTRIBUTE TO REDUCING THEIR CARBON FOOTPRINT

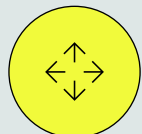
Investments



The Lonergan research¹⁷ shows that just **2 out of 5 (41%)** Australians consider themselves an investor, despite almost 90% having an investment through their superannuation fund.



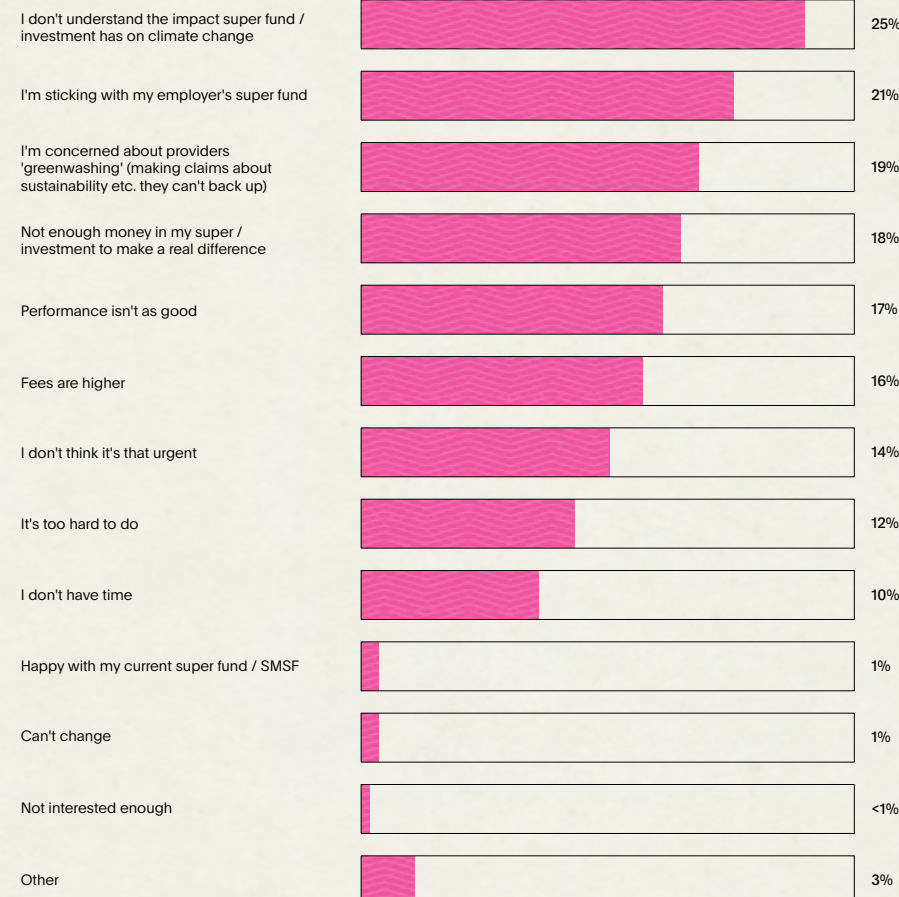
UTS found Australians' ability to choose lower carbon investments by switching to an ethical or responsible fund was 'a sleeping giant' in terms of potential carbon impact and the size of the prize explains why. **Australians have more than \$3.3 trillion** in super investments alone with this projected to grow to \$10.5 trillion by 2040.¹⁸



Among the **93% of Australians** surveyed who have not switched their super or financial investments to an ethical/sustainable fund, **a quarter (25%)** have held back from switching because they don't understand the impact super funds/ financial investments have on climate change.

17. Lonergan Research. (2022, October). Impact Unpacked: Lonergan Research for Australian Ethical.
18. Association of Superannuation Funds of Australia (ASFA). (2022, September 30) "Super Statistics" as at 30 September 2022. Retrieved from superannuation.asn.au/resources/superannuation-statistics on 27 October 2022.
19. Lonergan Research (2022, October). A quarter of super fund holders say not understanding the impact super funds and investments has on climate change holds them back from switching. Impact Unpacked: Lonergan Research for Australian Ethical.

What has held you back from switching your super or financial investments to an ethical/sustainable fund?¹⁹



One in five haven't switched because they're sticking with their employer's super fund (21%), or because they are concerned about providers 'greenwashing' (making claims about sustainability etc. they can't back up) (19%). High value investors with a superannuation value of over \$500k are much more likely than the average to cite concerns about providers 'greenwashing' (\$500-\$999k 34%, \$1m+ 47%; cf. average 19%).

About low-carbon investing

Australians ranked switching their super as having relatively less impact on their carbon footprint than nearly every action listed, placing it at 11th out of 12. The UTS research ranks switching your super to an ethical fund as making a meaningful potential contribution.

Australian Ethical tracks and publishes the carbon footprint of the companies in its investment portfolio. The carbon intensity of our listed shares investments is 77% lower than the benchmark²⁰, representing **56 tonnes less** CO₂e per \$1 million invested. Sure, not everyone has a million dollars to invest, but the typical (median) Australian super balance is around \$50,000.²¹

20. Carbon intensity of share investments measures companies' carbon emissions relative to the companies' revenue. Carbon emissions of share investments measures companies' carbon emissions relative to the amount invested. Compared to a blended benchmark of S&P ASX 200 Index (for Australian and NZ shareholdings) and MSCI World ex Australia Index (for international shareholdings). Comparisons based on shareholdings at 30 June 2022 and analysis tools provided by external sources which cover 88% of the listed companies we hold shares in by value. For more information, see the Australian Ethical Investment 2022 Sustainability Report: australianethical.com.au/globalassets/pdf-files/sustainability-reports/2022/AE-SustainabilityReport-2022_Full-Web.pdf.

21. Association of Superannuation Funds of Australia (ASFA). (2022, September 30). "Super Statistics" as at 30 September 2022. Retrieved from superannuation.asn.au/ on 27 October 2022.

22. UTS Business School. (2022, November). Table 19. Emission Savings by Activity: Actual Rank (Calculator) vs. Perception Rank (Survey), Carbon Savings: Lifestyle & Investment Choices Report.



Understanding low-carbon investing

Directly comparing the climate impact of different choices is difficult because they have the potential to impact real world carbon emissions in different ways. The mechanism for ethical and responsible investment to influence emissions reduction is clearly different to general consumption choices. Many of our investments are existing assets (such as shares in companies traded on the stock market) and switching your super or investments to an ethical fund does not directly affect your real-world carbon output for these assets because the companies typically continue to operate as usual in the short term and the carbon isn't removed from the atmosphere.

Potentially powerful indirect effect

Switching super or investments to a low-carbon option can have an important indirect effect:

- It makes it harder and more expensive for those companies that are not aligned with the Paris agreement to access capital or insurance.
- Responsible investors act as stewards, raising issues and continually using their voting rights to advocate for better corporate behaviours.
- It acts as a powerful signalling mechanism that is further amplified by the collective actions of others.

We also contribute some of our investment capital as fresh capital to listed and unlisted companies which is used by those companies for new projects. For example, we invest in innovative early-stage companies developing carbon reduction solutions – such as a microbial technology capturing carbon in agricultural soils.

We also give 10% of our profits to the Australian Ethical Foundation which is committed to finding the most effective ways to combat climate change and has granted \$500k in Visionary Grants in the last few years for embryonic innovative ideas, many of which involve carbon sequestration.

Key takeout:

Consider switching your super and investments to an ethically and sustainably managed fund.

Note: Before you switch, please consider not only investments and fees but also any difference in the insurance provided by the relevant fund. You should consider seeking advice and read the relevant product disclosure statement and target market determination to make an informed decision based on your own financial objectives, situation and needs.

KEY WAYS INDIVIDUALS CAN CONTRIBUTE TO REDUCING THEIR CARBON FOOTPRINT

Energy

In 2021 more than 70% of our electricity came from fossil fuels, with the burning of coal delivering more than half of all electricity used by Australians.²³

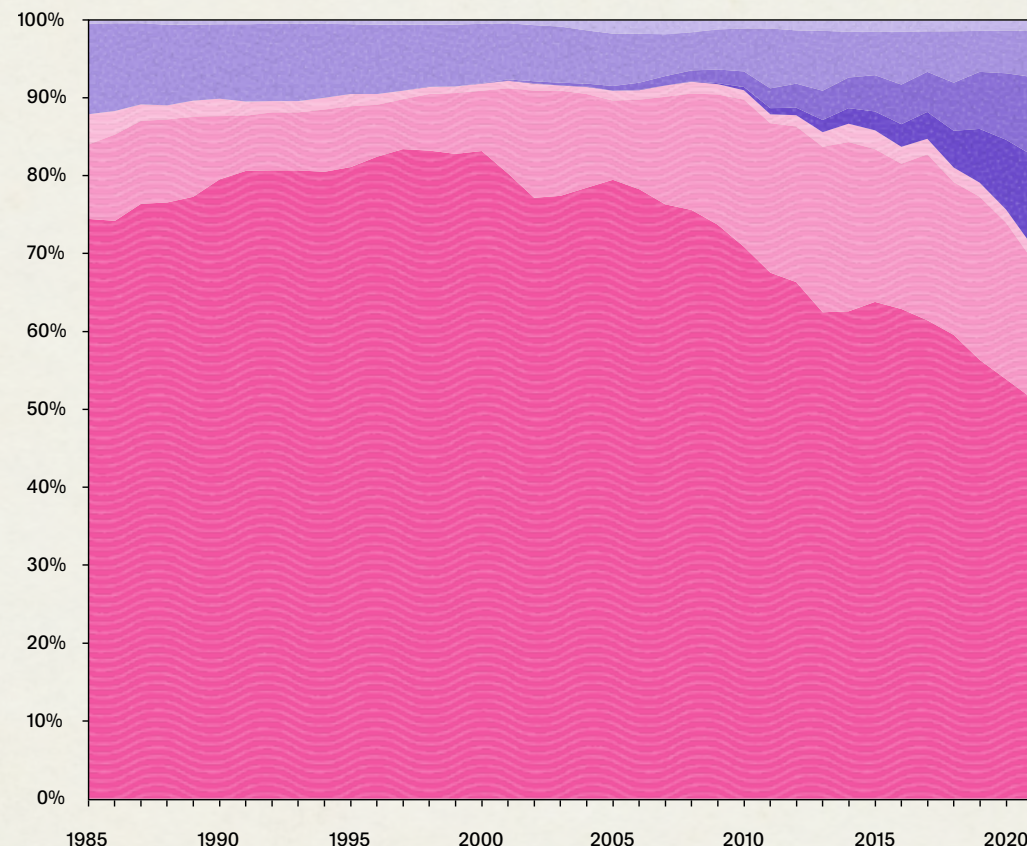
The better news is that our reliance on coal for electricity generation is declining. In 2021 it was 51.45%, down from a peak of 83% in 1999-2000.²⁴ Renewables have taken up much of this difference, but at nearly 18% natural gas remains a significant part of the energy mix.

23. Department of Climate Change. (2022, September). "Energy, the Environment and Water (2022)", Australian Energy Statistics, Table O. Retrieved from energy.gov.au/data/australian-electricity-generation-fuel-mix on 27 October 2022.

24. UTS Business School. (2022, November). Carbon Savings: Lifestyle & Investment Choices Report.

25. UTS Business School. (2022, November). Figure 4. Electricity Production by Source in Australia (1985-2019), Carbon Savings: Lifestyle & Investment Choices Report.

Electricity production by source in Australia (1985-2019)²⁵



Coal



Gas



Oil



Solar



Wind



Hydro



Other
renewables

Top 10 household actions for CO2e savings²⁶

The largest impact that a household can make to contribute to reducing its carbon footprint is to switch to a renewable source of energy. Installing solar panels at home can save up to **17,228kg** of CO2e per year, which has the biggest environmental impact by some margin. But even switching to a renewable energy plan could save 6,278kg of CO2e per year.²⁷

<div>  <p>Installing solar panels at home</p> </div>	<div>  <p>Switching to a renewable energy plan</p> </div>	<div>  <p>Installing roof insulation at home</p> </div>	<div>  <p>Powering off devices (TV, computer, etc.) rather than keeping them in standby mode</p> </div>	<div>  <p>Recycling 50% of organic waste at home</p> </div>	<div>  <p>Recycling 100% of paper, plastic, and glass</p> </div>	<div>  <p>Taking shorter showers by taking off 5 minutes from daily routine</p> </div>	<div>  <p>Drying 50% of clothes on a line/ rack instead of using a dryer</p> </div>	<div>  <p>Move to a smaller house/apartment</p> </div>	<div>  <p>Improve window insualtion (e.g. double glazing)</p> </div>
17,228kg per year	6,278kg per year	850kg per year	729kg per year	625kg per year	453kg per year	387.8kg per year	327.9kg per year	185kg per year	141.7kg per year

26. UTS Business School. (2022, November). Table 17. Greenhouse Gas Emissions Savings From Home Activities, Carbon Savings: Lifestyle & Investment Choices Report.

27. UTS Business School. (2022, November). Carbon Savings: Lifestyle & Investment Choices Report.

KEY WAYS INDIVIDUALS CAN CONTRIBUTE TO REDUCING THEIR CARBON FOOTPRINT

Food

Everything we eat has a supply chain from ‘the paddock to the plate’ that contributes to greenhouse gas emissions. Most of these emissions are caused by land use change (e.g. deforestation), as well as by farming processes including applying fertilizers and the digestion and respiration of farmed animals. When combined, land use change and farming emissions generate over 80% of the total greenhouse gas (GHG) footprint for most foods.²⁸

The graphs on the following pages show that with the notable exceptions of dark chocolate and coffee when compared on a kilo-by-kilo basis, plant-based foods have a significantly smaller carbon footprint than animal-based foods. However, unlike meat products, the majority of the carbon impacts for plant-based foods come from post-farm activities.

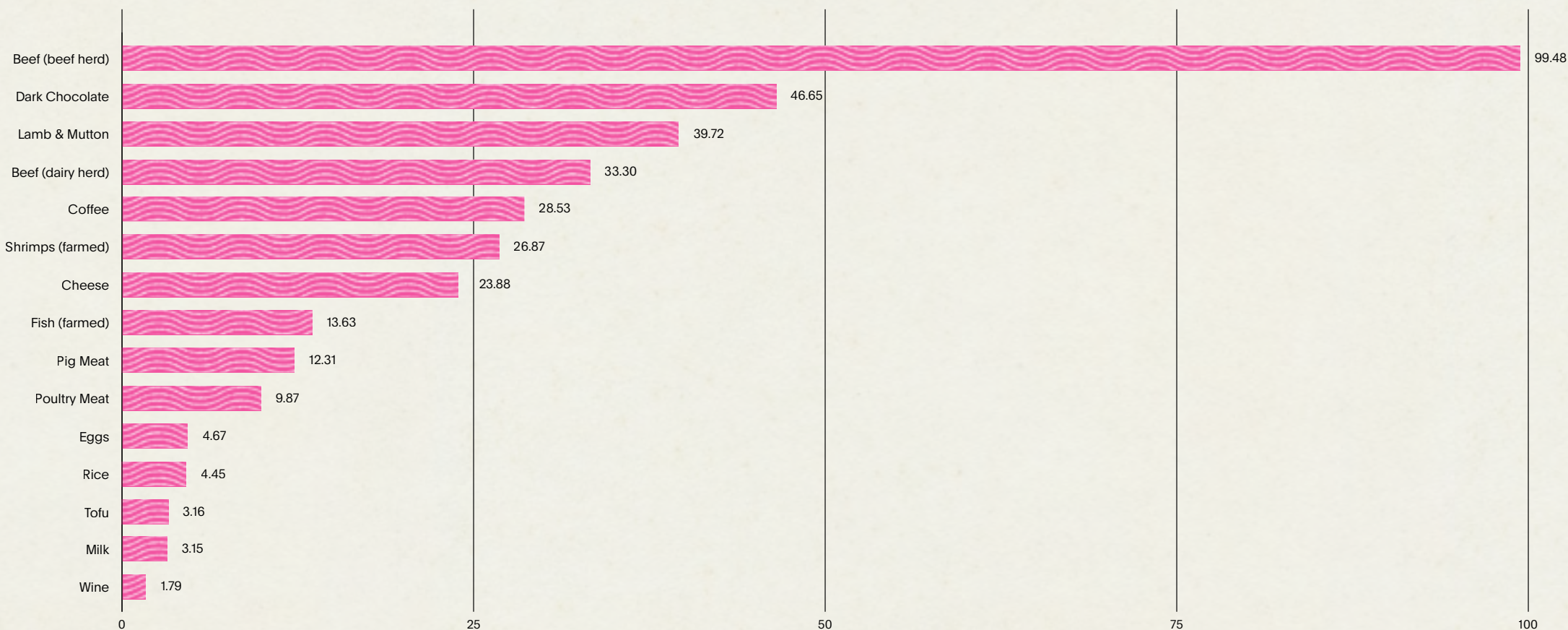
Once animal-based food leaves the farm, all subsequent processes in the supply chain (processing, transport, retail and packaging) add up to a small proportion of the overall emissions. On the other hand, fruits and vegetables have small on-farm carbon impacts, but their transportation emissions contribute more than 20% of the total.

28. Williams, K, Hunter, B, Schmidt, B, Woodward, E and Cresswell, I. (2021, July). “The State of the Environment report: Land”. Retrieved from soe.dcceew.gov.au/land/introduction on 12 August 2022.



Environmental footprints of different foods²⁹

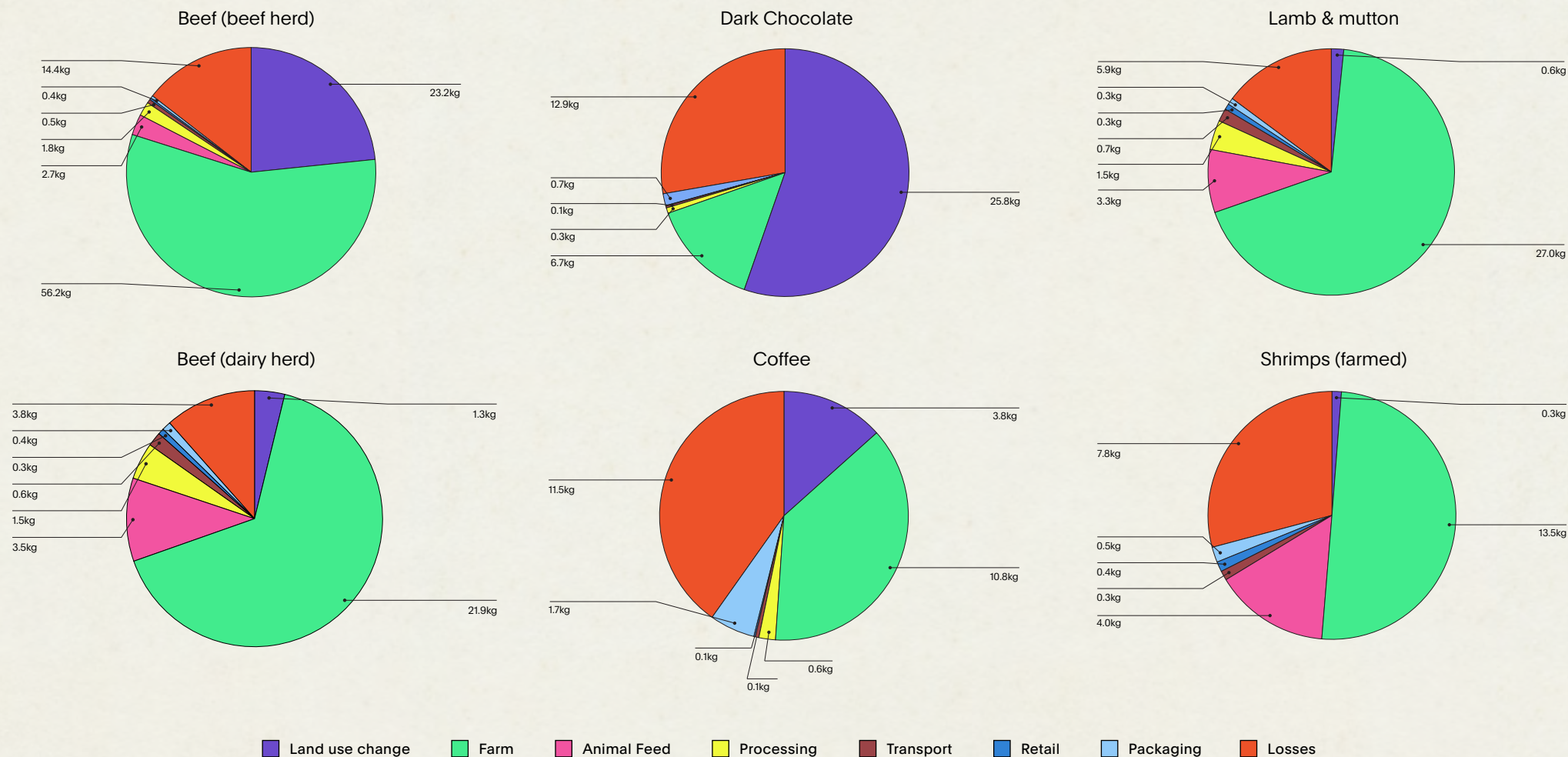
Greenhouse gas emissions per kilogram of food product



29. UTS Business School. (2022, November). Figure 9. Environmental Footprints of Different Foods with a Breakdown across the Supply Chain, Carbon Savings: Lifestyle & Investment Choices Report.

Breakdown of environmental footprints across the supply chain²⁹

Greenhouse gas emissions per kilogram of food product



29. UTS Business School. (2022, November). Figure 9. Environmental Footprints of Different Foods with a Breakdown across the Supply Chain, Carbon Savings: Lifestyle & Investment Choices Report.

The truth about beef

The carbon footprint of beef production is significantly higher than other types of meat, with 99.48 kilograms of greenhouse gas (GHG) emissions produced per kilogram of beef. This is more than double the GHG emissions produced by lamb or dairy cattle. Australians are the highest meat consumers in the world on a per capita basis, with an average annual meat consumption of 140 kilograms per person, more than double the global average of 62.7 kilograms. Beef makes up a significant proportion of this meat consumption, with Australians averaging 26.1 kilograms of beef per year, more than 3 times the global average and second only to Argentina's annual beef consumption of 48.1 kilograms per person. For the source for this, see Appendix.

So, on average, the beef each person in Australia eats per year produces 2.6 tonnes of CO₂e. Apart from the significant animal welfare implications, beef requires 20 times more land and emits 20 times more greenhouse gas emissions per gram of edible protein than common plant proteins, such as beans.³⁰

What's the takeaway from this? It's worth remembering that there are alternative proteins to beef, and that consuming any other meat source is better for the environment. There is also an increasing range of plant-based meat alternatives available for people who want to reduce their intake.

30. Ranganathan, J and Waite, R. (2016, April). "Sustainable Diets: What You Need to Know in 12 Charts". Retrieved from wri.org/insights/sustainable-diets-what-you-need-know-12-charts on 27 October 2022.

31. UTS Business School. (2022, November). Figure 10. Per Capita Consumption of Different Meat Types (by country), Carbon Savings: Lifestyle & Investment Choices Report. Food and Agriculture Organization of the United Nations, online data source: www.fao.org/faostat/en/#data. Note: Data refers to meat 'available for consumption'. Actual consumption may be lower after correction for food wastage.

Per capita consumption of different meat types (by country)



A dark secret

Beef cattle is a known carbon issue, but the fact that dark chocolate comes in second may be more surprising. Dark chocolate (rather than milk) has a higher proportion of cocoa, and in parts of West Africa, particularly the Ivory Coast, farming has caused massive deforestation. There is also a significant transport footprint in moving the cocoa grown in this narrow tropical strip to the rest of the chocolate-hungry world.³²

As demand for coffee has increased, tropical forests are also being cleared for plantations of Robusta beans, a high-density monocrop, which doesn't rely on being planted next to highly carbon-sequestering trees for shade, and fertilisers are then used to top up the depleted soil. The roasting, transporting and brewing of coffee also contributes to its significant carbon footprint.³³

Many Australians love coffee and chocolate so it's important that we make better choices by looking out for brands that have earned the Fairtrade³⁴ or Rainforest Alliance³⁵ certification. Both organisations work with cocoa and coffee farmers to help them improve the sustainability of their farming practices. Fairtrade for example, prohibits deforestation, while supporting farmers to diversify into other crops or non-farm income sources to help them cope better with extreme temperatures, drought, unseasonal rains and other challenges that will only increase with climate change.

32. World Wildlife Magazine. (2017, March). "Bittersweet: chocolate's impact on the environment". Retrieved from worldwildlife.org/magazine/issues/spring-2017/articles/bittersweet-chocolate-s-impact-on-the-environment on 27 October 2022.

33. Perkins, C. (2022, July). "Wonder about the impact of your daily cup of coffee on the planet? Here's the bitter truth". Retrieved from ideas.ted.com/truth-about-coffee-impact-on-environment-planet on 27 October 2022.

34. For more information, please visit fairtrade.net.

35. Kamiya, G. (2020, December 11). "The carbon footprint of streaming video: fact-checking the headlines", International Energy Agency. Retrieved from [iea.org/commentaries/the-carbon-footprint-of-streaming-video-fact-checking-the-headlines](https://www.iea.org/commentaries/the-carbon-footprint-of-streaming-video-fact-checking-the-headlines) on 27 October 2022.



The milk in your latte




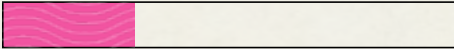

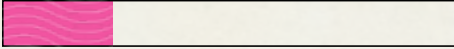

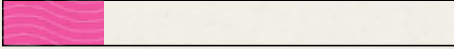

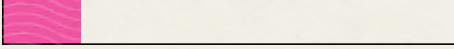
Dairy Australia estimates that each Australian consumes an average of around 321 litres of dairy milk per year, which is higher than in the EU and the US.³⁶ Producing one litre of dairy milk produces 3.15 kg of CO₂e. This means Australians generate an average of **one tonne of CO₂e each year per person**, just from our consumption of dairy milk.

Though plant-based milks are not perfect from an environmental standpoint, their respective carbon footprints per litre of production are considerably smaller. Rice milk is the worst of the plant options, but still has a footprint 35% that of dairy, while almond milk has the smallest carbon footprint.

36. Dairy Australia. (2021, October). "Strategic Plan 2020-2025: Situation Analysis". Retrieved from dairyaustralia.com.au/strategic-plan-2020-25/situation-analysis#.Y7ZdjOxByhx on 27 October 2022.

37. Poore, J., & Nemecek, T. (2018), "Reducing food's environmental impacts through producers and consumers", Science, 360(6392), 987-992.

Greenhouse gas emissions per kilogram of food product (milk)³⁷

Type of milk	CO ₂ e emissions of 1 litre of milk (in kg CO ₂ e)
 Dairy milk	 3.15kg
 Rice milk	 1.18kg
 Soy milk	 0.98kg
 Oat milk	 0.90kg
 Almond milk	 0.70kg

The estimates in this table prepared by UTS are based on a meta-analysis of food system impact studies across the supply chain including land use change, on-farm production, processing, transport, and packaging.

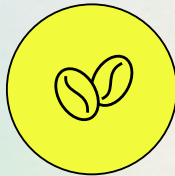
Key takeouts:



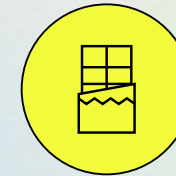
Switch to a plant-based diet /
eat less meat – especially beef



Switch to plant-based milk



Look for Fairtrade or Rainforest
Alliance certified coffee and chocolate



Eat less dark chocolate

KEY WAYS INDIVIDUALS CAN CONTRIBUTE TO REDUCING THEIR CARBON FOOTPRINT

Transport

Global transport emissions totalled 8 billion tonnes of CO₂ in 2018 (pre-COVID). That's a tonne for every human on Earth. Of this, the largest contributors by far were passengers travelling on roads (45.1%) and road freight (29.4%). Aviation came in a distant third, accounting for 11% of global emissions, with passenger transport (81%) far outweighing freight.³⁸

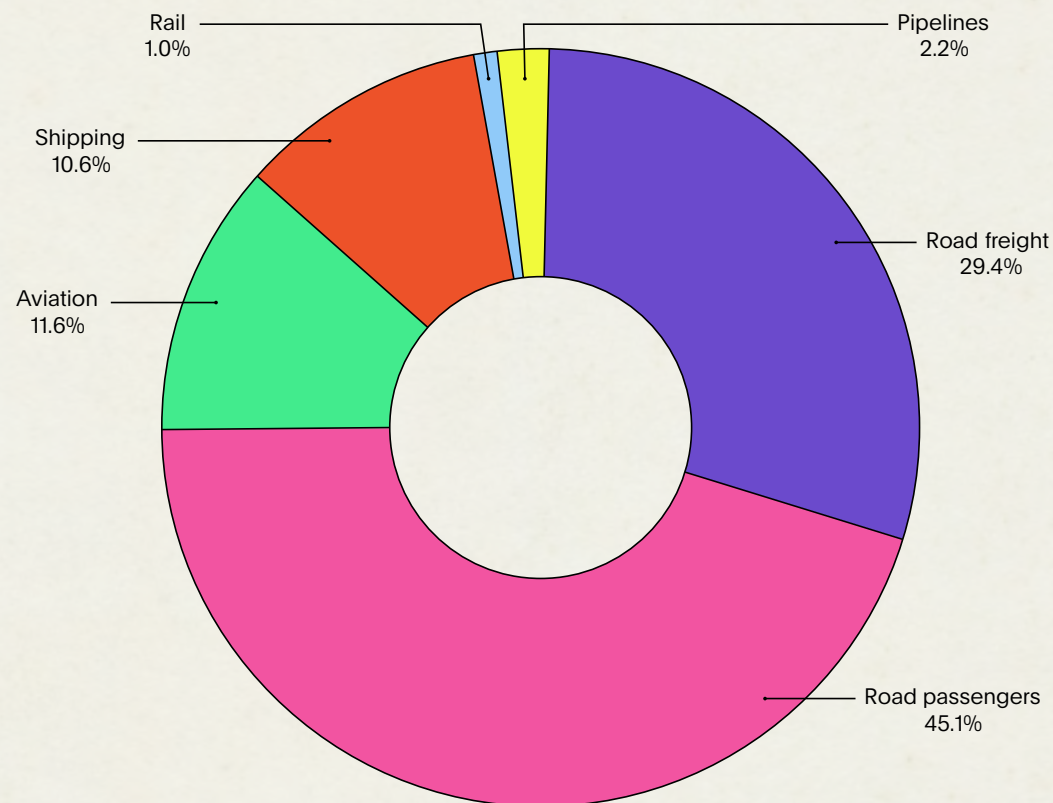
Australians are big road users. Sixty-eight per cent of us drive to work. Another 5.1% travel as passengers, and 1.8% commute via motorbikes, trucks or taxis.³⁹

38. Australian Bureau of Statistics. (2017, October 23). "More than two in three drive to work, Census reveals". Retrieved from abs.gov.au/ausstats/abs@nsf/mediareleasesbyreleasedate/7DD5DC715B608612CA2581BF001F8404 on October 27, 2022.

39. Our World In Data. (2020, October 6). "Cars, planes, trains: where do CO₂ emissions from transport come from?" Retrieved from ourworldindata.org/co2-emissions-from-transport on October 27, 2022.

40. UTS Business School. (2022, December). "Global CO₂ emissions from transport", Data and Interactive Calculator Tool: CASE Transport.

Global transport emissions in 2018 (pre-COVID)⁴⁰

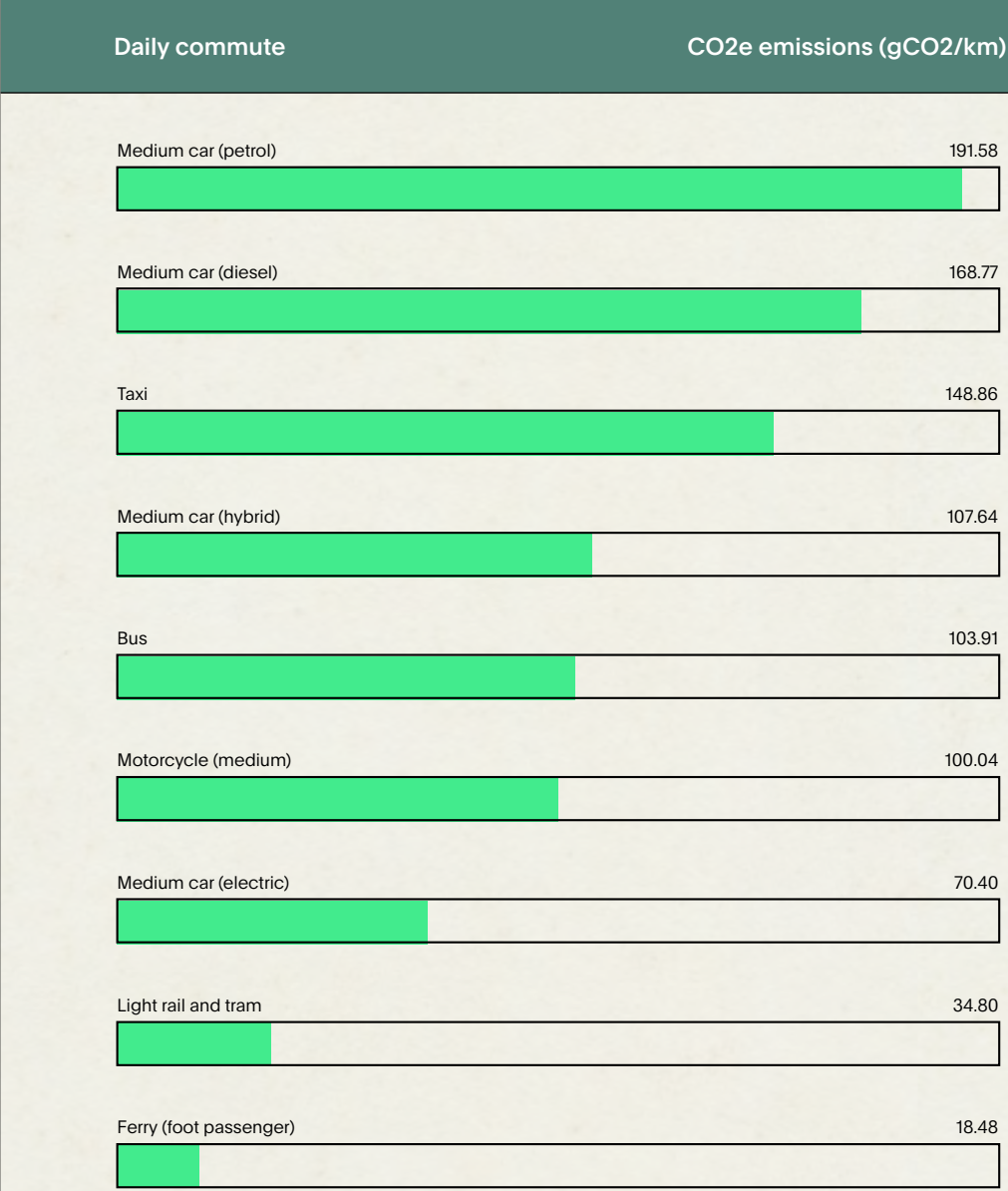


Commuting impact

Driving a petrol/diesel vehicle unsurprisingly has significantly higher emissions per kilometre than an electric or hybrid vehicle. The best commuting choices are walking, cycling or public transport via ferry, light rail and tram.

41. UTS Business School. (2022, November). Table 9. Emissions (gCO2/km) by Travel Type (Daily Commute), Carbon Savings: Lifestyle & Investment Choices Report.

Emissions by travel type⁴¹



Key takeouts:



Switch to an electric or hybrid car – or give it up altogether



Walk or cycle to work instead of driving



Work from home more often



Avoid flights

KEY WAYS INDIVIDUALS CAN CONTRIBUTE TO REDUCING THEIR CARBON FOOTPRINT

Digital life

Increasingly, we live our lives online. Most people would never consider that even this has a carbon impact. However, the vast digital ecosystem of the internet: the millions of emails sent, the photos taken, the web searches processed and cached, and back-ups to 'the cloud' all contribute to our individual footprint. The 'cloud' is a massive network of data centres that draw down vast amounts of energy to keep servers running and more importantly, to keep them cool.



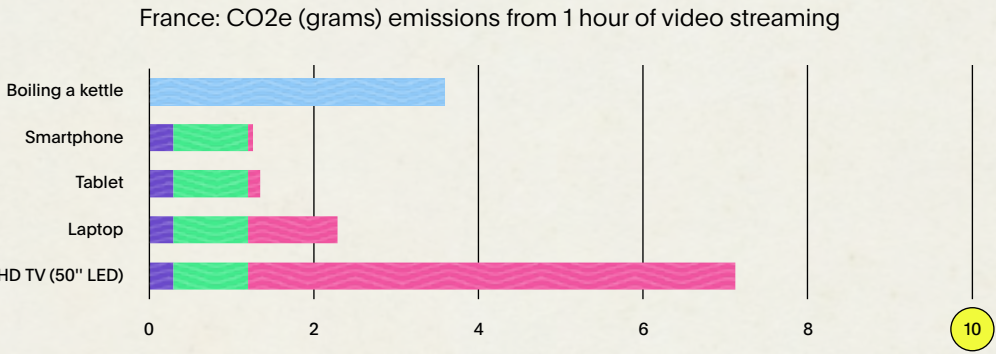
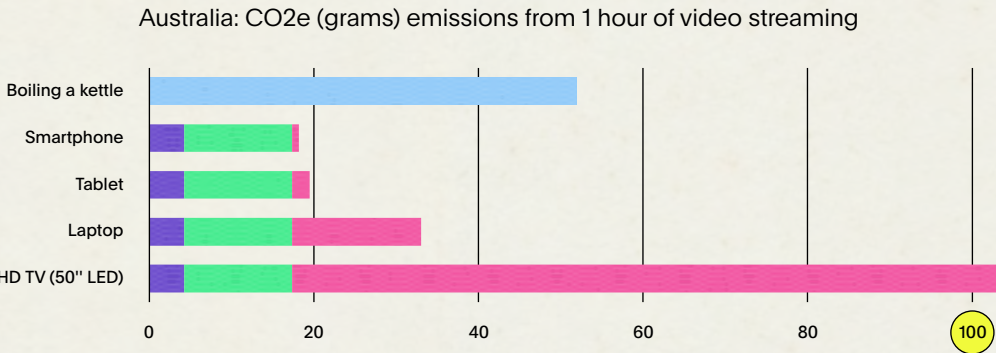
The impact of streaming

Over 75% of Australian households subscribe to at least one streaming service. However, due to Australia’s reliance on fossil fuels for energy production, the CO2e footprint of streaming an hour of video in Australia is around 10 times higher than in countries like France, where about 90% of electricity is generated from low-carbon sources. The type of device used for streaming also plays a significant role in emissions. For example, in the graph on the right, streaming one hour of HD video on a 50-inch LED TV generates 13 times more emissions than streaming the same on a smartphone.

42. UTS Business School. (2022, November). Figure 11. CO2e Emissions from Streaming One Hour of HD Quality Video on Different Devices in Countries with Considerably Different Energy Sources (Fossil Fuels vs Renewables), Carbon Savings: Lifestyle & Investment Choices Report.
Kamiya, G. (2020, December 11). “The carbon footprint of streaming video: fact-checking the headlines”, International Energy Agency. Retrieved from [iea.org/commentaries/the-carbon-footprint-of-streaming-video-fact-checking-the-headlines](https://www.iea.org/commentaries/the-carbon-footprint-of-streaming-video-fact-checking-the-headlines) on 27 October 2022. CO2e estimates from boiling a kettle are added for comparison.

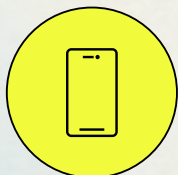
CO2e emissions from streaming one hour of HD videos

The stark comparison between Australia and France here is due to the considerably different energy sources (fossil fuels vs renewables).⁴²



■ Data centre ■ Data transmission ■ Device ■ Comparison

Key takeouts:



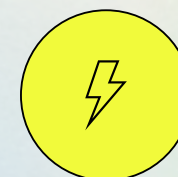
Stream on
smaller devices
where possible



Consider how many times you've
backed up the same thing in the
cloud and streamline



Do a spring clean of your photos
and documents saved in the cloud
and delete files you don't need



Lobby your local Member of
Parliament for more renewable
energy in Australia

Conclusion

05

Conclusion

Many Australians, having seen firsthand the impacts of climate change-related extreme weather events, want to know what they can do to stop it. It feels urgent because it is urgent.

We hope to provide people with clear information that enables them to make choices about things they can consider if they want to act – no matter how big or small.

When considering the perceived effort, the research shows that investing your money responsibly and ethically can be among the most achievable steps individuals can do to act against climate change.

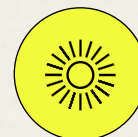
This small action – if taken by enough people – sends a signal to the market. If enough people do it, it may encourage the market to change and stop backing projects and companies that do harm to people, animals and the planet.

Based on our research, Australians who have switched their super to an ethical/responsible fund are far more likely to believe they have control in influencing climate change (91%) with a fifth (19%) believing they have a lot of control.⁴³

As an individual, you can act. We know that small changes made by enough individuals can have a systemic impact. Regardless of the choices you make, or don't – we hope that this research has provided facts and insights that contribute positively to the discourse around climate change.

43. Lonergan Research. (2022, October). Impact Unpacked: Lonergan Research for Australian Ethical.

Achievable actions with meaningful potential
to reduce your carbon footprint:



Installing solar panels at home

Impact: High



Switching to a renewable energy plan

Impact: High



Switching \$50,000 of your super or investments to a low carbon fund

Appendix

06

How we calculated

Detailed account of CO2 estimates

The information provided in the report is based on estimates of the carbon footprint of various everyday actions, such as travel, food, and energy consumption. It is important to note that these estimates may vary between different sources due to differences in the methods and assumptions used to calculate them. To provide a more reliable estimate, a median or average of estimates from multiple sources was used. However, it is important to recognize that any carbon footprint estimate is subject to limitations and uncertainties and should be used with caution. The estimates provided in this report should not be taken as an absolute guide and should not be relied upon for making decisions. In addition to considering the environmental impact of our actions, it is also important to consider other factors such as cost, convenience, personal preferences, and unintended health consequences to make informed decisions that align with our values and goals.

Disclaimer

The carbon data, estimates, and multiplicity of sources of CO2 carbon footprint numbers presented in this report are provided for informational purposes only. These estimates may be incomplete, out of date, or contain errors, and should be used with caution for comparison only. Emissions are measured in carbon dioxide equivalents (CO2e), based on 100-year global warming potential factors for non-CO2 gases. Negative CO2e values represent carbon dioxide savings through plant absorption. The data and analysis tools used in this report have been sourced from the public domain, and the authors and publishers of these sources do not guarantee the accuracy or completeness of their data and do not hold liability for errors or omissions in their data or for its use. Carbon footprint estimates for diet and food products, as well as products in general, should also be used with caution as they may not consider the full lifecycle of a product or the environmental impact of disposal, and may have unintended health consequences. The estimates provided in this report should not be taken as an absolute guide and should not be relied upon for making decisions. In addition to considering the environmental impact of our actions, it is also important to consider other factors such as cost, convenience, and personal preferences in order to make informed decisions that align with our values and goals.

How we calculated

Switching to ethical and sustainable investments from a benchmark:

The carbon footprint comparison is for the listed shares which Australian Ethical invests in and an applicable mainstream sharemarket benchmark, based on those companies for which we have the relevant carbon data.

The comparison benchmark is a blend of the S&P ASX 200 Index for Australian and New Zealand shareholdings, and the MSCI World ex-Australia Index for international shareholdings. Individual superannuation funds and options vary and will typically include investments other than listed shares such as cash, fixed income, property and other shares, which will have different carbon footprint characteristics.

The carbon footprint (tns CO₂e/A\$M invested) of an investment is calculated as the investor's share of annual carbon emissions of the companies invested in (including their direct and some indirect emissions), divided by the value of the investor's investment. This is based on shareholdings at on 30 June 2022. Carbon footprint information will change with changes to investments, changes to the carbon performance of companies and changes to the companies for which we have carbon data. Carbon characteristics of an investment may or may not be relevant to your investment decisions. Your investment decisions should take into account the financial, risk, fee and other characteristics of potential investments.

We have used carbon data and analysis tools provided by MSCI ESG Research LLC accessed 22 July 2022. MSCI ESG Research is not responsible for the way we have used their data and tools. The information and comparison are based on our investment in listed shares in those companies which have been analysed by MSCI ESG Research for their carbon footprint. More information on MSCI carbon footprinting methodology and metrics are available here: [msci.com/documents/10199/2043ba37-c8e1-4773-8672-fae43e9e3fd0](https://www.msci.com/documents/10199/2043ba37-c8e1-4773-8672-fae43e9e3fd0)

MSCI ESG Research is not responsible for the impact information or the way we have used their data and tools. MSCI ESG Research (1) retains copyright in all its data; (2) does not warrant or guarantee the originality, accuracy and/or completeness of their data; (3) makes no express or implied warranties of any kind, and disclaims all warranties of merchantability and fitness for a particular purpose; (4) has no liability for any errors or omissions in connection with their data or for our reporting and use of their data; and (5) without limiting any of the foregoing, has no liability for any direct, indirect, special, punitive, consequential or any other damages (including lost profits) even if notified of the possibility of such damages.

Investment carbon footprint metrics need to be used with caution. Company carbon data often includes estimates or is incomplete and may be out of date or include errors. Companies make different decisions about what they do and don't include when measuring and reporting their operational footprints. There are also different portfolio measurement methodologies, and different carbon metrics which can be used to assess carbon footprint, each with different strengths and weaknesses.

Some of the carbon data we use is provided in US\$ terms. We report carbon information in A\$ terms using an average exchange rate as published by the Australian Taxation Office for the 2022 Financial year.

How we calculated

It is common to see news articles and information posts discussing the carbon footprint of everyday actions such as travel, food, and energy consumption. These articles often provide estimates of the carbon dioxide (CO₂) emissions associated with these actions, but it is important to note that these estimates can vary widely between different sources. One reason for this variation is that different units of measurement may be used, making it difficult to directly compare the estimates. However, even when the estimates are converted to a common unit of measurement, they can still differ significantly. One way to account for this variation is to take a median or average of the estimates from different sources. This can help to provide a more balanced and reliable estimate, although it is still important to consider the limitations and uncertainties associated with any carbon footprint estimate. On the other hand, meta-analysis and the averaging may be too distanced from locale-specific CO₂e figures.

- **Meta-analysis and estimation averaging:** The majority of carbon footprint estimates for diet and food products are obtained from Poore, J., & Nemecek, T. (2018).⁴⁴ The authors note the following about the scope of the studies included in this meta-analysis: "We derived data from a comprehensive meta-analysis, identifying 1530 studies for potential inclusion, which were supplemented with additional data received from 139 authors. Studies were assessed against 11 criteria designed to standardize methodology, resulting in 570 suitable studies with a median reference year of 2010. The data set covers ~38,700 commercially viable farms in 119 countries and 40 products representing ~90% of global protein and calorie consumption".

- **Locale-specific example:** While the CO₂e footprint of individual meat products is still based on the meta-analysis, an estimate of carbon footprint savings from reducing red meat intake is based on the average Australian consuming 19.7kg of beef, 22kg of pork and 8kg of lamb in 2019. The calculation of CO₂e footprint savings assumes a fixed relative reduction in consumption of these meats and an equivalent increase in consumption of chicken instead. The calculation is performed on the data from a study conducted by University of Sydney (2021).⁴⁵

While carbon footprint estimates for diet and food products can be a useful tool for understanding the environmental impact of different food choices, they should be used with caution and not taken as an absolute guide. It is important to consider both the environmental and health impacts of food choices to make informed and balanced decisions.

Carbon footprint estimates for diet and food products are a measure of the greenhouse gas emissions associated with the production, transportation, and distribution of these products. These estimates can be useful for understanding the environmental impact of different food choices, but it is important to use caution when interpreting them and to not rely on them as an absolute guide. One reason to use caution when interpreting carbon footprint estimates for diet and food products is that they can vary significantly depending on the specific methods and assumptions used to calculate them. For example, different studies may use different data sources and assumptions about things like transportation distances, production methods, and land use, which can lead to widely different estimates of a product's carbon footprint. Another reason to use caution is that focusing solely on carbon footprint when making food choices could have unintended health consequences. For example, choosing foods with a lower carbon footprint may lead to a diet that is high in processed or nutrient-poor foods, which can have negative impacts on health. On the other hand, choosing foods that are higher in nutrients and whole foods, which may have a higher carbon footprint, can have positive impacts on health.

44. Poore, J., & Nemecek, T. (2018), "Reducing food's environmental impacts through producers and consumers", Science, 360(6392), 987-992.

45. Whitton, C., Bogueva, D., Marinova, D. and Phillips, C.J.C., 2021. Are We Approaching Peak Meat Consumption? Analysis of Meat Consumption from 2000 to 2019 in 35 Countries and Its Relationship to Gross Domestic Product. Animals, [online] 11(12), p.3466. Retrieved from doi.org/10.3390/ani11123466 on 16 January 2022.

How we calculated

Carbon Footprint of different transport options:

The carbon footprint of travel can vary significantly depending on the mode of transportation used. For example, flying long distances typically has a much higher carbon footprint than taking a train or driving a car. However, even within the same mode of transportation, estimates of the carbon footprint can vary. For example, to approximate the carbon footprint of one international flight, we assumed the flight originates from Sydney, Australia and consider the most frequent destinations – LAX and LHR. Specifically, the estimate of 4,215kg of CO₂e per return international flight per passenger is based on the average emissions for economy return flights SYD-LAX (3,390kg) and SYD-LHR (5,040kg).⁴⁶ Similarly, the estimate of 706kg of CO₂e per return flight is used in this calculation and is based on the weighted average emissions for return flights SYD-MEL (800kg) 4 times a year, SYD-HBA (290kg) once a year, SYD-PER (920kg) once a year, SYD-BNE (630kg) 3 times a year, and SYD-DRW (890kg) once a year.⁴⁷ These estimates account for the increased warming effects of aviation emissions at altitude using the radiative forcing index (RFI) of 1.89 to adjust CO₂ emissions estimates for air travel, which accounts for the warming effect of other greenhouse gases that are emitted along with CO₂ from aircraft engines. The RFI is based on the global warming potential (GWP) of these gases relative to CO₂ and is used to more accurately reflect the total warming impact of air travel.

Carbon Footprint of our Digital Life:

The carbon footprint of energy consumption can depend on the type of energy being used and the efficiency of the equipment or appliances consuming it. By way of example, the Video Streaming case study demonstrated the CO₂e costs of using different devices with variable equipment efficiency and two countries with markedly different average energy production compositions.

46. Individual flight estimates are sourced from [icao.int/environmental-protection/Carbonoffset/Pages/default.aspx](https://www.icao.int/environmental-protection/Carbonoffset/Pages/default.aspx).

47. Individual flight estimates are sourced from carbonfootprint.com/calculator.aspx.

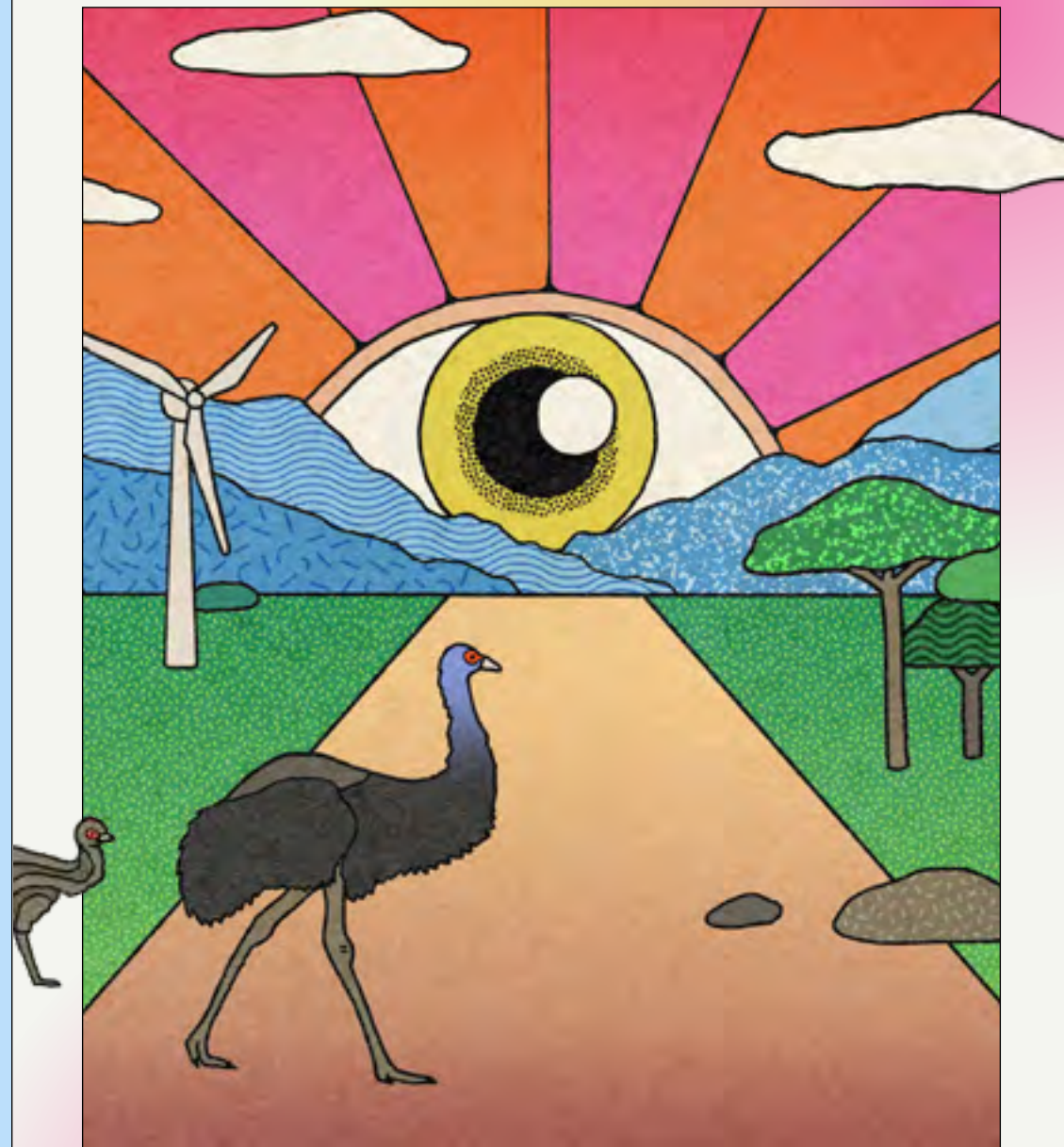
Australian Ethical

We are Australian Ethical, Australia's leading ethical investment manager.

Since 1986, we have been investing for a better world, by making investments in line with an Ethical Charter, designed to help create positive impact for people, planet and animals, and in doing so, allowing our investors to align their investments with their values whilst benefitting from long-term, risk-adjusted returns.

Funds are ethically screened according to frameworks that underpin the Charter, aligning investment outcomes with the global Sustainable Development Goals.

For more information, please visit australianethical.com.au.



Lonergan Research

Lonergan Research is an independent strategic research consultancy, founded in 2009, that combines a wide range of disciplines and approaches to solve business challenges. Lonergan Research is methodically neutral, offering the best tools to meet specific research needs, believing that the value of research lies in insights not data. Its work encompasses qualitative, quantitative, big data/data science, fieldwork and mystery shopping.

The logo for Lonergan Research, featuring the word "LONERGAN" in a bold, sans-serif font. The letters "L", "O", "N", "E", "R", "G", and "A" are in a light grey color, while "N" is in a dark grey color. A small red dot is positioned to the right of the final "N".

UTS Business School

The Finance Department of the UTS Business School undertakes innovative teaching across a variety of undergraduate and postgraduate courses as well as a vibrant research environment that attracts top academic talent - as demonstrated in the most recent ERA ranking (Excellence in Research for Australia).⁴⁶

For more information, please visit uts.edu.au/about/uts-business-school/finance/what-we-do/teaching-and-learning.



46. Australian Research Council (2019). State of Australian University Research 2018–19: ERA National Report. Australian Research Council, Canberra. For more information, visit arc.gov.au/excellence-research-australia.