



Australian  
National  
University

# Climate, Energy & Disaster Solutions Highlights 2023

Advancing solutions to  
climate change, the energy  
transition and disasters



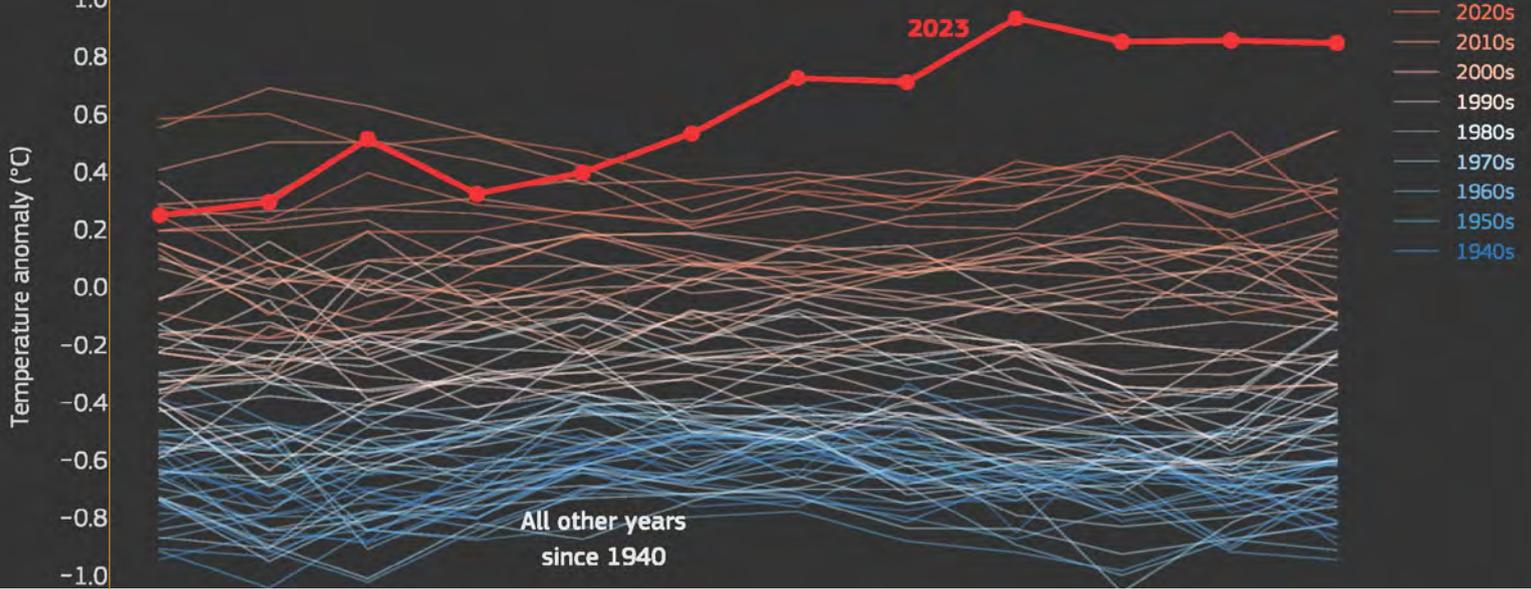


Image: Copernicus Climate Change Service

Global average temperatures hit 1.48 degrees Celsius above the pre-industrial reference for the first time in 2023, taking us perilously close to 1.5 degrees of warming. The impacts were felt globally. Unprecedented wildfires in Canada released more than 1.5 billion tonnes of carbon, triggering a health crisis in New York City. These fires may mark a shift in fire patterns in these forest areas, threatening their value as an important carbon sink. Heatwaves claimed tens of thousands of lives across Europe and Asia. Deaths in developing countries likely went under-reported, as many labourers in India continued to work in the extreme heat. Floods affected almost every continent, with thousands dying in Libya after a storm unleashed as much as 400mm of rain in a day in some cities. The annual Arctic sea ice minimum was the sixth lowest on record while Antarctic sea ice reached its lowest maximum ever. And the list goes on and on.

Against this backdrop, communities worldwide have been putting their noses to the grindstone. In December, the COP28 agreement was the first to explicitly call for a transition away from fossil fuels. In September, renewable energy production on the East Coast of Australia supplied nearly 100% of the market for half an hour, demonstrating its rapidly growing capacity. In March, the United Nations Intergovernmental Panel on Climate Change (IPCC) concluded its Sixth Cycle with its comprehensive Synthesis Report. While the authors noted that warming has already reached 1.1 degrees Celsius and emissions continue to increase, they have also laid out a pathway to achieving the 1.5 degree target by making deep and rapid cuts. The window of opportunity is closing, but emission-reduction policies are already having an impact. However, the climate adaptation gap continues to grow. All the solutions we need are available and gaining popularity, such as renewable energy, improved urban infrastructure, better forest management and avoided food wastage. Importantly, the report emphasises that every increment of warming avoided means lives and money saved, environments maintained and disasters avoided.

### The message is clear –it can be done and it must be done.

Now in its third year, The Australian National University (ANU) Institute for Climate, Energy & Disaster Solutions (ICEDS) remains focused on advancing innovative solutions to climate change, the energy transition and disaster risk reduction. The University's unique transdisciplinary approach to tackling these complex and interwoven issues is strengthened through collaboration across our growing member base.

We are proud to share with you just a small selection of the world-leading work being undertaken by ANU researchers and staff. On behalf of the Institute, we would like to thank you for your support in 2023 and encourage your continued engagement with the University on this vital work.

Professor Mark Howden,  
Director and Head of Climate

Professor Frank Jotzo,  
Head of Energy

Associate Professor Roslyn Prinsley,  
Head of Disaster Solutions

ANU Institute for Climate, Energy and Disaster Solutions (ICEDS)

# ICEDS community

Strengthening capacity and capability in climate, energy and disaster research, teaching, outreach and engagement

  
Over  
**600**  
members

  
**7**  
out of 7  
ANU colleges

  
**26**  
out of 27 ANU  
schools

## Research Clusters

Throughout 2023, engagement within and between ICEDS' 26 research clusters continued to build communities of practice on climate, energy and disaster solutions across the University.

Our growing membership of ANU researchers from various disciplines provides unique opportunities for collaboration and capacity building to generate solutions-driven initiatives. Members have been engaged in extensive research, teaching, public policy engagement and outreach activities throughout the year.

## Members' event with Senator David Pocock

In August, ICEDS members joined Senator David Pocock in-conversation with Professor Mark Howden and Dr Arnagretta Hunter to discuss how we can future-proof climate and energy policies for generations to come and the role universities play in shaping policy agendas. Members continued discussions with their ANU colleagues and Senator Pocock over a networking lunch.



Professor Mark Howden and Senator David Pocock.  
Photo: Jerry Cashman / ANU

## ANU New Research Showcase

In March, ICEDS hosted a showcase of early-stage innovative research projects that are building capabilities for addressing the challenges of climate change, energy transition, and disasters. The event featured nine snapshot presentations from researchers sharing early findings and impact pathways of novel technical, scientific and social approaches to climate change, energy and disasters.



L-R Dr Emily Macleod, Dr Jessie Moritz, and Dr Alireza Rahbari presenting at the ANU New Research Showcase.

## ICEDS Member Profile

# Dr Naomi Hay

## Designing Community Resilience

When the 2022 floods hit Naomi's home community in the Northern Rivers, she was unable to contact her parents, who are in their 80s. The phones, internet and roads were all cut off and the police and state emergency services were overwhelmed.

Eventually it was a community Facebook page that allowed Naomi and her sisters to find someone in the area who happened to have internet and a boat and could go and check on their parents' welfare. Naomi notes that "this experience was really telling of the strength of community connections and links, rather than relying only on governments and institutions that are often overwhelmed in times of crisis."

Coming from such a flood-prone region, disasters have long been of interest to Dr Naomi Hay, who is now a lecturer and convenor of the Design Honours program with the ANU School of Art and Design. She initially studied the built environment, and worked as an interior designer however, after many years in this field, she "realised everything that was wrong with the building industry," prompting a complete change of direction in her research.

Naomi went on to do a PhD on the role of design in strengthening communities of resilience for sustainable futures, contrasting the experience of diverse regional communities in Queensland. She found that community connectedness, where community members, local government, and institutions regularly spoke to and worked with each other, was the most significant predictor of community resilience.

Naomi thinks that the art and design space has some unique talents to bring to interdisciplinary research on disasters.

**"One thing that is important is the ability to communicate with people, and artists and designers are good at doing this in a way that is more accessible to a broader audience."**

"Design researchers are generally practised in systems thinking, where we need to understand relationality within and between systems to address complex, 'wicked' problems like disasters."

[Read more](#)



Coming from such a flood-prone region, disasters have long been of interest to Dr Naomi Hay. Photo: Jerry Cashman / ANU

# Research highlights

## Why bringing back the arvo nap could help us adapt to extreme heat

Too much air conditioning may be harming our health, according to a study led by ANU researchers.

The study found that despite spending substantially more time in air-conditioned spaces over the past 40 years, people in Australia's Northern Territory (NT) have paradoxically become more vulnerable to heat-related deaths.

However, Aboriginal communities in the NT are no more vulnerable to heat despite high burdens of chronic illness, extreme socioeconomic and housing inequity and far less access to air-conditioned spaces. The reason for this apparent discrepancy appears to be cultural, according to the authors.

“Our research shows that the social and cultural practices developed by First Nations people over generations, such as reducing physical exertion in hotter parts of the day, are powerful mechanisms for protecting human health,” said Dr Simon Quilty, lead author and PhD candidate at the ANU National Centre for Epidemiology and Population Health.

“An afternoon nap can help your body acclimatise, protects you from the hottest part of the day, costs nothing and has no carbon footprint.

This is a story of how Aboriginal culture and knowledge of environment has enabled extraordinary resilience to extreme weather.”

[Read more](#)

Cultural heat avoidant practices as simple as staying out of the hot afternoon sun or the siesta, may provide powerful protection against heat extremes caused by climate change. Photo: Henrique Felix/Unsplash



The ANU researchers surveyed 931 property investors to understand barriers and preferred policy options. Photo: Andre Nery/stock.adobe.com



## A place in the sun: removing solar barriers for renters

According to ANU researchers, rental properties – and their tenants – have been largely excluded from the household energy transition.

“Rental properties are considerably less likely to have rooftop solar,” said Dr Lee White, a Fellow with the ANU Zero Carbon Energy in the Asia Pacific Grand Challenge program.

“The focus has been on reducing the upfront costs. While this is important, our study uncovered another equally significant barrier – property investors don’t believe renters will be willing to pay higher rent for solar.”

The researchers surveyed 931 property investors to understand barriers and preferred policy options.

The study’s authors believe the budget commitments outlined in 2023 by the federal government are a step in the right direction.

“This concern that investing in solar won’t yield sufficient returns runs contrary to previous studies showing Australian tenants are willing to pay for more liveable homes and solar,” Dr White said.

[Read more](#)



## ANU researchers working with communities to prevent flooding with nature-based solutions

As Australia experiences more extreme flooding events, many communities are thinking about how to reduce the impacts of these floods without disrupting the ecology of their regions.

Nature-based Solutions (NbS) to flooding are approaches that aim to protect, sustainably manage and restore ecosystems to meet critical societal needs today while building positive long-term environmental and economic outcomes.

An interdisciplinary team at ICEDS is working to develop National Guidelines for NbS for flood mitigation, funded by the National Emergency Management Agency (NEMA). A key aspect of this project is working in partnership with local communities to develop viable solutions.

Associate Professor Roslyn Prinsley, who is Head of Disaster Solutions at ICEDS and leads the project, stresses that “knowledge generated in partnership with the community and local government is more likely to be useful, more relevant to their needs and more suitable for take-up.”

The researchers are working with communities in flood-prone catchments around Australia to explore case studies of possible NbS interventions. Regular engagements throughout 2023 have included working with local councils, exchanging knowledge with community experts through Expert Panel discussions, hearing from interested community members through workshops and speaking to the broader community at local events.

Research team members Bill McAllister and Karen Jackson helped community members build their own flood catchment designs at the Ipswich Sustainable Living Festival. Photo: ANU

[Read more](#)

## ANU solar pioneer wins Queen Elizabeth Prize for Engineering

An internationally-renowned ANU expert in solar energy who helped transform the efficiency of solar cell technology has been honoured with the world's most prestigious engineering prize.

Professor Andrew Blakers from the ANU College of Engineering, Computing and Cybernetics, his former PhD supervisor Professor Martin Green from UNSW Sydney, Dr Aihua Wang and Dr Jianhua Zhao have been awarded the 2023 Queen Elizabeth Prize for Engineering (QEPrize) for development of Passivated Emitter and Rear Cell (PERC) solar photovoltaic technology.

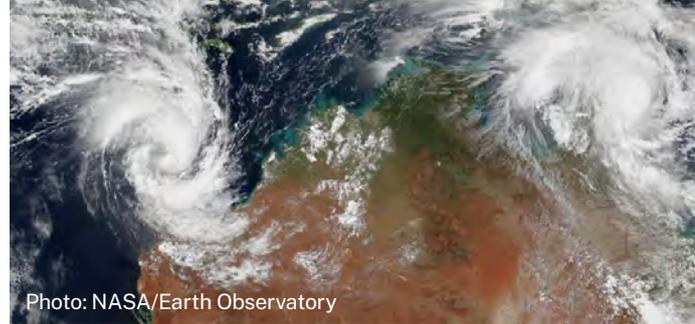
Through their work on PERC technology, and with the input of many others worldwide, the 2023 awardees have significantly reduced the costs of solar panels, with the cost of solar power generation falling by more than 80 per cent in the last decade - making solar the cheapest source of electricity in most countries.

Professor Blakers hopes to use his newfound platform as a QEPrize recipient to highlight the importance of accelerated solar adoption to address the threat of global warming.

"Solar energy is enormously abundant nearly everywhere. Silicon solar cells allow clean and affordable electrification of energy-poor rural areas across Asia, Africa and the Americas. This energy source creates large opportunities for billions of people to improve their economic, educational and social positions without the destruction caused by fossil fuels," he said.

[Read more](#)

Professor Andrew Blakers says that "as a PhD student and postdoctoral researcher working on high efficiency silicon solar cells in the 1980s, it was a fantasy to imagine that our work could have a global impact." Photo: Jamie Kidston/ANU



## Can and should we intervene with cyclones?

Cyclones don't take note of national borders, and therefore the logistics and politics of potential cyclone intervention are incredibly complex. If not well managed, these technologies would be vulnerable to exploitation for political or economic purposes. Governance of both the research and deployment of these technologies must be considered carefully.

As a child growing up in Cairns, Jack Miller remembers being evacuated from his home and confronting the destructive impacts of Cyclone Yasi in 2011. These experiences increased Jack's interest in cyclones, yet he still did not think much about how they form. But in his first year studying at the ANU, Jack was given an opportunity to do just that as an ICEDS Research Assistant exploring the feasibility of various cyclone interventions.

While the concept of intervening to potentially weaken or even stop cyclones initially seemed to Jack like "a bit of a wacky idea straight out of the 1960s space race", some digging demonstrated that it might not be as impossible as it appeared.

Jack conducted a technical review of possible cyclone interventions including cloud seeding, sea surface temperature modification, high altitude particle injection and aerosol injection. Jack's review was supplemented by governance and risk analysis and cyclone modelling by other researchers. This interdisciplinary approach allowed the team to consider not just the potential feasibility of various interventions, but also the ecological, governance and social implications in a paper for the Journal of Climate Risk Management.

[Read more](#)

## “We all need to eat”: building climate-resilient systems in the Pacific

A systems approach to building food resilience provides critical insights for policy makers, researchers and practitioners facing food security impacts of a changing climate.

We all need to eat, so finding the means to continue feeding our populations is paramount. In island countries and territories of the Pacific this is even more pronounced, as communities already face existential threats from climate change and other creeping food insecurity issues.

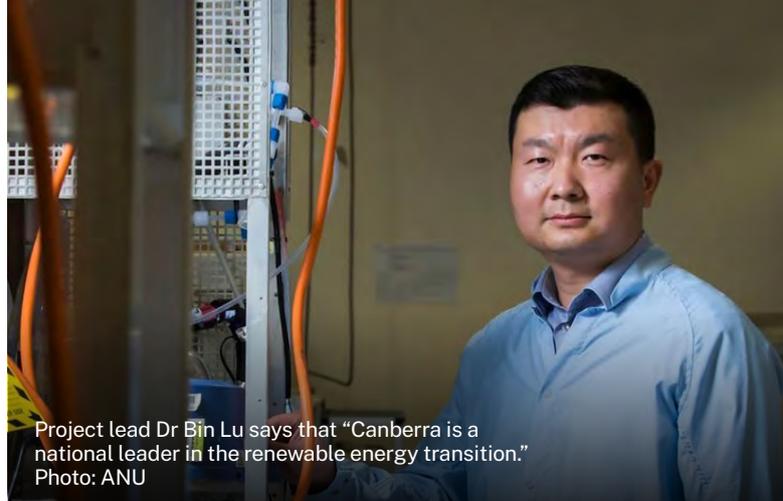
Food is often treated in a siloed manner or focused primarily on ensuring supplies are maintained or increased. But we need to consider all the stages between farm and plate to respond to the myriad of channels through which climate change can have impacts and on which food systems can impact on climate change.

ANU researchers set out with this systems perspective, inventorying what was known about climate change impacts on the whole of food systems in Pacific Island Countries and Territories (PICTs).

The paper, published in February, reviews over 100 studies from the last decade, serving as a first step to diagnose risks and identify adaptation priorities. While we understand enough to start adapting these systems in response to the challenges of climate change, there are still many knowledge gaps that limit the effectiveness and scalability of adaptation activities.

As decision-makers and leaders take on board the projections and adaptation recommendations from the IPCC, our review emphasised that multi-sector and systems-oriented adaptation strategies would be a desirable, and perhaps necessary, path forward.

[Read more](#)



Project lead Dr Bin Lu says that “Canberra is a national leader in the renewable energy transition.”  
Photo: ANU

## ANU experts to power path to all-electric ACT

A map to guide the Australian Capital Territory (ACT)’s transition to an all-electric economy will be developed by ANU experts.

It will show how cities like Canberra can achieve net zero emissions in a reliable and affordable way.

According to project lead, Dr Bin Lu, the study will provide a template for the rest of the country.

“Our target — net zero by 2045 — is five years ahead of the national target, so there’s a real opportunity for the rest of the states and territories to learn from the ACT’s experience.”

Dr Lu and his team will develop detailed modelling for the electrification of ACT suburbs.

This means looking at everything from electric cars, heating and cooking, to electrifying industry.

“We will also need energy storage to support this transition,” Dr Lu said.

“We’ll be working on data that shows how distributed energy storage resources — things like electric car batteries, neighbourhood batteries and hot water storage — can play a big role.”

The research will provide valuable insights into the challenges and opportunities in transitioning to net zero emissions by 2045.

[Read more](#)



The 2023 Seed Funding round included a new Ideation grant category which awarded up to \$10,000 to support earlier stages of research and development. Photo: Romolo Tavani/Adobe Stock

## Building interdisciplinary research into climate, energy and disasters

ICEDS has continued to support exciting interdisciplinary research into a diverse range of climate change, energy transition and disaster risk challenges through the Seed Funding Grant. Now in its second year, the 2023 round committed over \$160,000 to support ten ANU projects to conduct novel, additional research across the fields of energy, disaster-risk reduction and climate.

Climate change and its impacts are worsening, increasing the frequency of disasters, and stressing the urgency for rapid decarbonisation and climate adaptation. The ICEDS Seed Funding Grant is designed to foster the interdisciplinary research required to respond to these complex challenges.

Emily Macleod, a Chief Investigator for a project that aims to develop guidelines for a national child disaster workforce strategy, said that an interdisciplinary approach to the project was critical. “Bringing together researchers from the Centre for Mental Health Research (National Centre for Epidemiology and Population Health), the Crawford School of Public Policy, the Fenner School of Environment and Society, and the Research School of Medicine and Psychology enables us to develop guidelines that are robust and policy ready,” she said.

For Rini Astuti, the new Ideation category which supports earlier stages of research and development, provides a unique opportunity for her project to explore creative ways to engage with the public and policymakers. Rini is the Chief Investigator on a project that will look at centering socio-environmental justice issues in critical minerals and energy transition research and policies.

“If we want our research to have an impact, it is important to engage with the public. However, research funding is often limited to only cover the cost of conducting the research or can be inflexible. The introduction of a new category that can be customized to our research or project needs, such as this Ideation category, is exactly what we need,” said Rini.

[Read more](#)

## McMichael Award supports researchers tackling impacts of climate change on health

Dr Amy Dawel from the School of Medicine and Psychology and Dr Annabel Dulhunty from Crawford School of Public Policy have been jointly awarded the McMichael Award – a research and leadership initiative that aims to address the health challenges arising from climate change.

Dawel will generate new knowledge about child mental health in the aftermath of catastrophic environmental events by exploring the critical role of caregivers' couple-level coping. The study will capitalize on a unique dataset of over 100 couples that was collected in 2022.

"We are now facing a time where extreme weather events are going to become more and more common, whether that's a bushfire, flood, or extreme temperatures. These are placing increased stress on people, which has knock-on effects for their local communities. We need to be using this information to build resilience and resources that help minimise impacts on family's mental and physical health," says Dawel.

The McMichael Award will enable Dulhunty to delve more deeply into the connections between climate change and women's health and wellbeing, particularly their vulnerability to violence and their overall health outcomes in these climate affected communities.

"There is a clear link between climate change and violence against women, we have less scholarship on the diverse policy responses and the different ways climate adaptation plans and strategies can respond to the needs of women and the most vulnerable in disasters," says Dulhunty.

Both projects continue research that was funded by the inaugural ICEDS Seed Funding Grant.

This prestigious award is named in honour of the late Professor Tony McMichael AO. McMichael was a former Director of the National Centre for Epidemiology and Population Health (NCEPH), joint winner of the Nobel Peace Prize, and world authority on the impact of the environment on human health.

"Climate change is now upon us. The next few decades will be critical," says Associate Professor Judith Healy, wife of the late McMichael and generous financial contributor to the award endowment.

"Our world needs a next generation of researchers to tackle and collaborate on the huge threats that face us, but also promising opportunities to promote better population health."

*ICEDS proudly supports the McMichael Award program, providing funding towards a second award for the 2023 program.*

[Read more](#)



Dr Amy Dawel (Left) and Dr Annabel Dulhunty (Right), 2023 McMichael Award Recipients. Photo: Calo Huang

# Education highlights

## Innovating access to local produce

Coming from the small coastal NSW town of Culburra Beach, Kayleigh Sleath has been passionate about entrepreneurship from an early age. “I love being able to build things that I could actually see being used in the real world,” she tells us.

Now an ANU Bachelor of Engineering Research and Development student, Kayleigh’s interest in food systems was sparked by an episode of the podcast, *How to Save a Planet*, finding it fascinating that “...we could have things set up in a way where the food that we are farming is also doing good for the planet. Not just for us.”

Like many young people, Kayleigh is worried about the impacts of climate change. She is particularly concerned about how our long and centralised food supply chains may be impacted by the system shocks that will come more regularly with worsening climate change. For example, the empty supermarket shelves in WA towns like Kununurra during the February 2022 floods, or the more widespread shortages experienced during the COVID-19 pandemic.



ANU student Kayleigh Sleath believes that accessing fresh food at farmers’ market prices is “...really valuable.” Photo: Jerry Cashman

These experiences have made Kayleigh passionate about supporting more local and distributed food production. This passion fuelled her Engineering Special Topic project which designed a Click & Collect program for

Farmers’ Markets. Kayleigh developed an app called Ohna that allows people to look through the produce available at the Capital Region Farmers’ Market in Canberra and pre-order their groceries.

ICEDS Deputy Head of Climate Dr Steven Crimp is advising Kayleigh’s project and considers that “improving the proportion of locally-sourced produce in our weekly shop can reduce the overall embedded Greenhouse Gas Emissions in the foods we consume,” and notes that this is an important action that individuals and families can take to reduce their greenhouse gas footprint.

[Read more](#)



Master of Energy Change student Jirui Tie believes the degree is an opportunity for “... anyone who wants to have a change of direction in their life.” Photo: ANU/ Alex Gotts

## Find your ‘why’ with the Master of Energy Change

Jirui Tie initially studied Economics and was on track to do further study in Strategic Management. But when she was asked why she wanted to study this in her application interviews, she had no answer. “I found that I could not answer those questions. I was missing why I was there.”

While searching for something that felt more meaningful to her, Jirui found an article on the United Nations website about how community-scale renewable energy in remote rural areas was helping women gain access to electricity transforming their lives as a result. Reading this changed Jirui’s life too, as she finished the article “...at that exact second, I suddenly felt like that is what I want to do.”

When Jirui came across the ANU Master of Energy Change, which is designed to bring together people from different disciplines across engineering, economics, law, and policy to address the need for an energy revolution, she knew it was perfect for her. She has developed a passion for solar photovoltaics through her degree that she hopes to take forward into a PhD. “Due to my background in economics I never expected to join a research project about photovoltaics and engineering. It is already so over my expectations, and I am excited!”

Jirui wants to use her studies to support other women. “...With solar and a battery, you can support a village. That is the best tool for me to make my connection to women in other areas.”

[Read more](#)

## Leah's Path to Climate Policy

Leah Rheinberger's lifelong passion for nature conservation led her on a transformative path to the ANU Master of Climate Change program, where she discovered a profound connection between science, policy and the urgent call for climate action.

Leah's passion for conservation was ignited during her childhood, growing up in the stunning landscapes of Western Australia. As she ventured into undergraduate studies in Environmental Science, her journey was one that would take her through various roles in environmental science and management, both in the public and private sectors.

However, as the climate crisis became an increasingly urgent topic of discussion, especially with her two children, Leah's motivation grew. Headlines across the country of coral bleaching of the Great Barrier Reef and the devastating Black Summer bushfires were real-world reminders of the planet's perilous state.

**"I felt the Master of Climate Change offered a multi-disciplinary approach to climate policy, led by international experts in their respective fields. The program also offered a diverse range of units and focused on developing writing and analytical skills,"** Leah said.

Throughout her academic journey, Leah discovered a keen interest in the scientific aspects of climate change and its environmental impacts. She was equally fascinated by the exploration of climate mitigation and adaptation policy solutions and valued the insights into decarbonisation pathways, adaptation strategies and climate finance provided by Professor Frank Jotzo.

Following her recent graduation, Leah sees the need to address global challenges with locally-relevant policy solutions, as her Masters focused on analysis of national climate and environmental policies using local case studies.

**"I believe alignment between all levels of government, including international agreements, is critical to effective climate policies. Further, I believe good public policy should employ relevant participatory processes to enable inclusion of diverse perspectives and knowledge",** she stresses.

[Read more](#)



**"The [Master of Climate Change] program offered a diverse range of units and focused on developing writing and analytical skills,"** said student Leah Rheinberger.  
Photo: Supplied

# Professional Short Courses



19

professional short courses delivered in 2023



635

total participants



4.55

rating out of 5 by participants

## Growing demand for ANU Expertise

In 2023, ICEDS near doubled its previous year's offering of domestic professional short courses reflecting the growing demand in Australia for expertise on the policy, practice and research of climate, energy and disaster solutions. Across the year, ANU researchers and staff delivered 19 professional short courses to 635 participants. This included the first Disaster Solutions Essentials course, which provided 14 professionals with an understanding of the trajectory of disasters, how Australia and the world are responding, and the need to go beyond incremental thinking to find transformative solutions for disaster risk reduction.

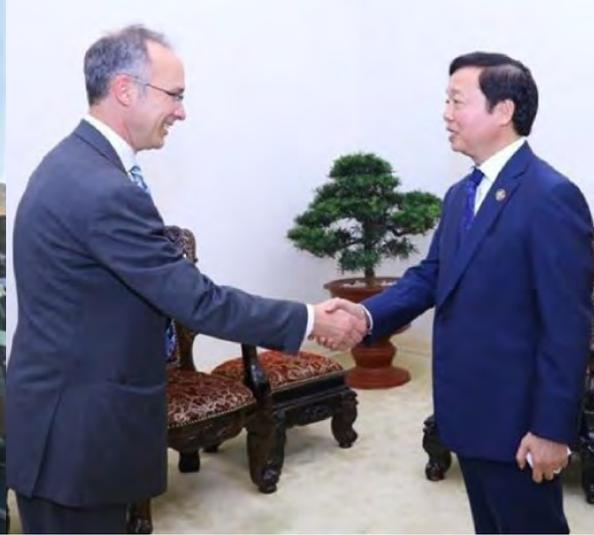
Essentials participants included professionals from national and sub-national government departments, non-government organisations, community groups, private companies, regulatory agencies and academia.

Associate Professor Mark Croweller AFSM addressing the Disaster Solutions short course in August 2023. Photo: ANU





Vietnamese Members of Parliament pictured alongside ANU researchers  
Photo: Dr Do Nam Thang



Deputy Prime Minister of Vietnam, Mr. Tran Hong Ha meeting Professor Frank Jotzo. At the meeting, Ha spoke highly of “Australia’s outstanding achievements in realising the international commitments on climate change adaptation and energy transition which are partly attributed to Australian scholars, including Jotzo.” Photo: VNA

## Educating professionals and decision-makers across the globe

The Institute also delivered a series of international short courses, funded by the Australian Government Department of Foreign Affairs and Trade (DFAT). The courses focused on climate change adaptation and mitigation, the energy transition, and the integration of renewable energy into the grid. A total of seven courses were delivered across South and Southeast Asia, Africa, the Indian Ocean (adjacent states) and Latin America. They were often delivered in blended modes (online and/or in-person) and multiple languages, supported by simultaneous live translations and translated course materials, to meet the changing demands of cross-cultural executive education.

In July and August, ICEDS delivered a Masterclass for a delegation of Members from the Vietnam National Assembly to share Australia’s knowledge, experience and strategic insights in climate change and energy transition.

The Masterclass began in Quang Ninh, (Vietnam), with a Pre-Course Seminar which introduced the topic of the energy transition, and featured a site visit to GE Hai Phong factory, welcome remarks from the Australian Embassy to Vietnam and the Vietnam National Assembly’s Science, Technology and Environment Committee, and high-level overview presentations from ICEDS Head of Energy Professor Frank Jotzo and ANU Research Fellow Dr Thang Do on ‘energy transition’.

Across 12 days in July and August, a delegation of Vietnamese Members of the National Assembly were hosted in Australia and immersed in the topic of climate change and energy transition through presentations and discussions with ANU academics, industry experts and policymakers as well as site visits to Snowy Hydro facilities, Asia Pacific Renewable Energy Training Centre (APRETC) facilities and the Hazelwood Mine.

Diplomatic meetings were also held in Canberra at Australian Parliament House with Australia’s Assistant Minister for Trade and members of the House Standing Committee on Climate Change, Energy, the Environment and Water. The delegation also met with Australia’s Ambassador for Climate Change, and the Deputy Secretary of the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW).

# ANU Below Zero

## Climate action in practice

In May 2021, ANU launched the Below Zero Program to support the University in reaching its climate goals to reduce its greenhouse gas (GHG) emissions from its operations as close to zero as possible, as quickly as possible. Below Zero aims to be a carbon sink by supporting projects and partnerships that remove GHGs from our atmosphere. It also seeks to share the journey with internal and external communities to accelerate the rate of transformational change that's needed to combat climate change.

In 2023, ANU reinforced its commitment to sustainability by launching the latest Environmental Management Plan that embeds broad sustainable action across its campuses. ANU also established a new central Sustainability Division to serve as the hub for coordinating and guiding sustainability efforts, facilitating greater alignment of research and teaching with its operational portfolio.



Heat pumps, in addition to being carbon neutral, run at 250-300% of the energy efficiency of natural gas boilers, reducing their running costs as well as the energy required to maintain thermal comfort for building users. Photo: ANU

Some brief highlights from 2023 include:

### Energy

- The heating infrastructure of four buildings on the Acton Campus has transitioned from gas boilers to electric heat pumps, contributing to an estimated 253 tCO<sub>2</sub>e. per annum reduction and providing useful learnings for electrifying the rest of the campus.

### Travel

- ANU Senior Management Group approved a reduction target of 50% from emissions associated with University travel from the 2019 baseline by 2025.
- A cross-disciplinary Travel Lab Group was established to run alongside the Travel Change Management Plan as a complementary part of an implementation and a knowledge-to-action research program.

### Digital engagement

- Development and launch of a new environmental sustainability website to communicate sustainability efforts and achievements and improve the program's visibility and accessibility online.
- A new online resource for staff and students called the ANU Green Network was launched to bring together people, resources and ideas that promote a more sustainable campus.

These programs of work will continue to grow in 2024 and include the following key priorities:

### Reporting

- Disclosing and managing climate risk and contributing to developing an Environmental Sustainability reporting framework.
- Improving our carbon inventory and reporting mechanisms.

### Carbon removal

- Continue progressing with the development of a carbon removal plan and developing relationships and projects to reach our carbon removal goals

### Research and teaching

- Continuing progress in linking Below Zero with research and teaching via establishing research groups or labs, internships, supporting ANU courses and engaging with the new Teaching and Learning strategy.



Photo: ANU/Jerry Cashman

## ANU student cuts her teeth in corporate governance with the Below Zero Program

“Ask as many questions as possible” is the advice that Nikki Wade would give to anyone doing an internship.

The undergraduate student is in her fourth year of a double-degree in law and economics and recently finished an internship with the ANU Below Zero Program.,

Nikki had already done some volunteer work analysing modern slavery statements with the organisation Walk Free. This was her stepping stone to her project at Below Zero, investigating the viability of the carbon credits as part of the University’s organisational climate action program.

This was not without challenges-diving deep into the obscure world of procurement policies and processes, while contending with the volatility of the carbon market.

“I think the carbon credit market in general is quite uncertain and the effectiveness of carbon credits is definitely subject to scrutiny. This added to the challenge of understanding how carbon credits could be involved in the University’s procurement plans in the future” she says.

The support and one-on-one time with her supervisor made a big difference and helped her build transferrable skills.

“I feel like with this experience, my ability to collaborate and write has even impacted in a positive way my work in government.”

Nikki is working for the Treasury while she finishes her studies and thinks about next steps.

[Read more](#)

# Events



24

seminars, panels,  
roundtable discussions  
and workshops



3,099

audience  
members



4.5

average rating out  
of 5 by audience  
members



88%

of those surveyed  
will talk to others  
about the event

ICEDS ran an extensive events program in 2023, engaging audiences with a wide variety of topics across in-person, online and hybrid formats.



Her Royal Highness Crown Princess Victoria of Sweden delivered a special address to open the ICEDS panel event. Photo: ANU

## Electrification in Sweden and Australia

On 14 February, ICEDS hosted a special panel event on the occasion of Her Royal Highness Crown Princess Victoria of Sweden's visit to the ANU Acton campus. During the panel moderated by ICEDS Director Professor Mark Howden, Australian and Swedish experts shared their views on best practices to fully leverage electrification on the path to net-zero. The panel included Johan Forssell, Sweden's Minister for International Development Cooperation and Foreign Trade, Matthew Ryan, Assistant Secretary Transport branch at Australia's Department of Climate Change, Energy, the Environment and Water, Associate Professor Marnie Shaw, Research Leader for the ANU Battery Storage and Grid Integration Program and Martin Merrick, President of Volvo Group Australia.

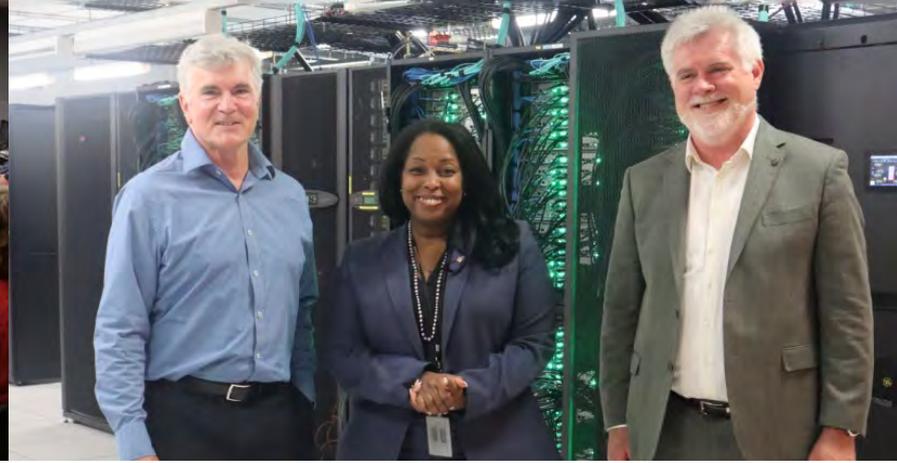
In her opening remarks, HRH Crown Princess Victoria noted "we are at a junction that requires us to find solutions for transforming the way we produce and consume energy."

Following the panel discussion, guests viewed a demonstration of a heavy electric truck. The panel discussed at length how Australian road regulations were preventing the import of many new electric trucks and how to overcome these barriers. Recently, these regulations were changed, opening up imports and providing new, low GHG options for the transport industry.

[Read more](#)



Professor Mark Howden takes questions from the audience in Wagga Wagga. Photo: Charles Sturt University



L-R Professor Mark Howden, Acting Assistant Secretary Jennifer Littlejohn, and Professor Sean Smith pictured at the National Computational Infrastructure supercomputer. Photo: Jerry Cashman

## Riverina Climate Update

The Riverina Climate Update 2023 held on 22 June at Charles Sturt in Wagga Wagga marked the first regional instalment of the flagship ICEDS climate event.

The idea to bring the event to the region originated from Kildare Catholic College geography teacher Sharon Forwood, who wrote to ICEDS enquiring about a climate short course for their students.

“The connection with ICEDS has been empowering for staff and students at Kildare,” Sharon said. “It has helped us to shift the conversation about climate change from the gloom and doom on social media to a conversation about hope and opportunity,” she said.

ICEDS joined forces with Kildare Catholic College, Wagga Wagga City Council and Charles Sturt University to host the event which investigated current community responses to climate change and discussed how to accelerate collective learning and responses to the issue.

[Watch the event recording](#)

## Roundtable: Opportunities for multilateral collaboration on climate change

In October, ICEDS partnered with the National Computational Infrastructure (NCI) supercomputer to host Jennifer Littlejohn, Acting Assistant Secretary of the U.S. Department of State, Bureau of Oceans and International Environmental and Scientific Affairs.

ICEDS brought together six U.S. diplomats, and ten leading academics from ANU and the University of Wollongong for a roundtable discussion covering current and future opportunities for multilateral collaborations between the United States, Australia and the Pacific Island nations, including ocean governance, cyclone mitigation, geology, and climate change.

## The IPCC Synthesis Report: Key findings from this 7-year cycle

In March 2023, the United Nations Intergovernmental Panel on Climate Change (IPCC) released its Synthesis Report, the final product from its sixth assessment cycle.

The report integrates all IPCC reports from that cycle to provide a comprehensive understanding of climate change drivers, impacts, and adaptation and mitigation responses.

This event provided an opportunity to hear directly from Australians involved in preparing and approving this report about its key findings, and the urgent action required to address the challenges and opportunities of climate change.

Supported by the Australian Government Department of Climate Change, Energy, the Environment and Water, this event was co-hosted by ICEDS and Melbourne Climate Futures.

[Watch the event recording](#)



Ewelina Przybyszewski, ICEDS Program Manager opens the panel event. Photo: ICEDS

# Public policy engagement and outreach

## ANU contributions to national policy debate

Throughout 2023, ICEDS staff and members have written and coordinated several submissions on key government inquiries. These include a submission to the *Climate Change Amendment (Duty of Care and Intergenerational Climate Equity Bill 2023)*, incorporating contributions from experts in epidemiology, primary and special education, law, climate adaptation and youth climate anxiety across the University.

A submission was also made on *Australia's draft National Science and Research Priorities*, offering advice to ensure Australia's research and innovation system meets national capability needs, including advocating for a greater emphasis on social and ecological dimensions of climate adaptation, especially disaster preparedness and socio-ecological resilience.

[Read more ICEDS policy submissions in 2023](#)

## ANU Professor to lead Australia's Carbon Leakage Review

Australia's Minister for Climate Change and Energy, The Hon Chris Bowen MP, announced in September 2023 that Professor Frank Jotzo had been appointed to lead the Australian Government's Carbon Leakage Review.

The review will assess carbon leakage risks for Australian industrial activities and examine a range of policy options to address them. It will include assessing the feasibility of a Carbon Border Adjustment Mechanism (CBAM) which would seek to protect Australian producers from being undercut by competitors from countries with weaker emissions restrictions and encourage other countries to implement their own climate policies.

"During the policy development of the Safeguard Mechanism it became clear that there is a genuine need to better understand the issues and options available to Australia" Frank Jotzo said.

"This is a very complex policy issue. The review will investigate deeply, consult extensively and make recommendations on the basis of thorough analysis," said Frank.

[Read more](#)

## Opportunities for Australia's new Net Zero Authority

Australia's newly announced national Net Zero Authority offers an opportunity for constructive engagement with coal communities in planning for a decarbonised future according to Associate Professor Rebecca Colvin from the ANU Crawford School of Public Policy.

The new agency, established in July 2023, marks a significant development for Australia, reflecting a shift in the climate policy debate of the world's second largest exporter of thermal coal. "We're seeing the beginning of quite profound changes to the landscape, especially in regional Australia," said Rebecca.

"This is an opportunity to take a coordinated approach and particularly to help those regional communities and the workers navigate what is going to be an uncertain time of change," she said in an interview with ICEDS.

[Watch](#)



Associate Professor Rebecca Colvin.  
Photo: Adriana Paulovcinova



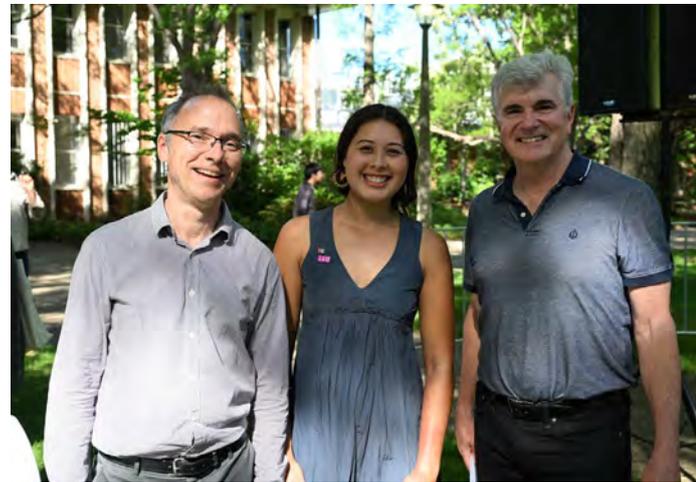
Key findings from the latest IPCC Synthesis Report were discussed with Pacific Island stakeholders at an event co-hosted with the Pacific Climate Change Centre at SPREP. Photo: ICEDS

## Communicating IPCC key findings with Australian and Pacific audiences

In 2023, ICEDS led a collaboration across the University, including the ANU Communications and Engagement team and the Pacific Security College, to generate significant engagement with both Australian and Pacific Islander audiences on the IPCC Sixth Assessment (AR6) Synthesis Report, released in March.

Key messages of this landmark report were conveyed in accessible and relevant formats to a range of people, through TV and radio interviews, vodcasts, factsheets, government briefings, opinion editorials, short form videos, events and public presentations. Products tailored to national and regional audiences successfully communicated climate change information to empowered decision makers and raised the profile of ANU as a go-to source for commentary on the IPCC specifically and on climate change and the energy transition more generally.

“These are factsheets developed with our partners at ANU and I’d like to encourage you all to use them. Use them when you give your minister briefings, use them to discuss in-country matters that are impacted by climate change and to influence national positions. We have used these factsheets to inform our people who go into climate change negotiations, we use these factsheets in the development of points given to our leaders and our ministers.” – Director of Climate Change & Resilience, Secretariat of the Pacific Regional Environment Program.



L-R Professor Frank Jotzo, Mahealani Delaney and Professor Mark Howden celebrate receiving the Vice Chancellor’s Award for Influential Impact and Engagement. Photo: ANU.

As lead IPCC contributors, Professors Mark Howden and Frank Jotzo transformed interest in the report into impact for ANU at local, national, and international levels reaching over 15 million people, including over 1 million Pacific Island stakeholders.

The outreach project, led by Mahealani Delaney was awarded the Vice Chancellor’s Award for Influential Impact and Engagement in recognition of the significant engagement generated with both Australian and Pacific Islander audiences on the IPCC report.

[Read more](#)



Professor Mark Howden pictured with fellow delegates from Australia and the Southwest Pacific region at the 59th session of the IPCC. Photo: IISD/ENB | Anastasia Rodopoulou

## ICEDS Executive engagement

**ICEDS Director and Head of Climate Change, Professor Mark Howden** has given over 209 presentations to policy, industry, academic and general audiences throughout 2023, both as Director of ICEDS and in his capacity as a Vice-Chair of the IPCC Working Group II.

In 2023, Professor Howden was re-elected to serve as a Vice-Chair of the Intergovernmental Panel on Climate Change (IPCC) for its seventh reporting cycle. Professor Howden was also recognised by the Investor Group on Climate Change (IGCC) receiving the Chair's Award for an Individual Advancing the Cause of Climate Investment.

He has provided high-level input and briefings for politicians, political organisations and government departments, embassies, scientists, industry, and community groups. This includes various state and federal Ministers and representatives; the Department of Foreign Affairs and Trade; the Department of Climate Change, Energy, the Environment and Water; the Climate Change Authority; several High Commissioners and the diplomatic community, to name a few.

Professor Howden has been engaged in considerable media activity in 2023. This includes interviews with *ABC News*, *SBS*, *CNN*, *The New York Times* and the *BBC* amongst others. Throughout the year, he was featured in over 825 media items, reaching an audience of up to 13 million people, globally. This included extensive coverage following the release of the final IPCC report for the Sixth Reporting Cycle in March, in relation to El Niño weather patterns and record-breaking temperatures, and during the United Nations COP28 climate summit in December.

Professor Frank Jotzo pictured consulting with fellow IPCC Synthesis Report authors before responding to comments from the floor. Photo: IISD/ENB | Anastasia Rodopoulou

**ICEDS Head of Energy, Professor Frank Jotzo**, led and contributed to research including on net-zero emissions strategies and Australia's opportunities for renewable energy exports. Professor Jotzo was appointed to lead Australia's Carbon Leakage Review and has served on several advisory and steering committees, including the Jobs and Skills Australia (JSA): Clean Energy Workforce Capacity Study and the Carbon Valuation Group. He continued his work for the IPCC as a member of the core writing team of the IPCC Synthesis Report.

Professor Jotzo spoke at a number of significant public events and conferences, including as a keynote speaker at the Investor Group on Climate Change's annual summit, the Australasian Emissions Reductions Summit, the Clean Energy Council summit and several side-events at the COP28 UN Climate Change Conference. He provided many briefing sessions to governments and various organisations in Australia and internationally, including on the IPCC synthesis report and on ANU research on decarbonisation strategies and climate policy instruments.

Professor Jotzo engaged extensively in public outreach through the media over the year, on topics such as emissions targets, domestic and international climate policy, the *Inflation Reduction Act*, carbon pricing and tariffs, and COP28. In 2023, Professor Frank Jotzo was appointed a Contributing Editor of *Carbon Brief* and concluded his tenure as the joint editor-in-chief of the journal *Climate Policy*. In addition to extensive interviews, including an episode of the *100 Climate Conversations* podcast, Professor Jotzo authored many op-eds and commentaries which were published among others by the *Australian Financial Review*, *The Interpreter* and *The Guardian*.

Professor Jotzo teaches on climate change policy and economics in Masters courses at ANU Crawford School and regularly contributes to ICEDS executive short courses on energy issues, both to international and Australian audiences.



**ICEDS Head of Disaster Solutions, Associate Professor Roslyn Prinsley**, has focused on leading and supporting robust research initiatives building on ANU expertise in Disaster Risk Reduction with a focus on transformative solutions.

In 2023 Associate Professor Prinsley convened the first Disaster Solutions Essentials professional short course, the ANU Disaster Solutions Update and presented at several events including the Northern Rivers Living Lab.,

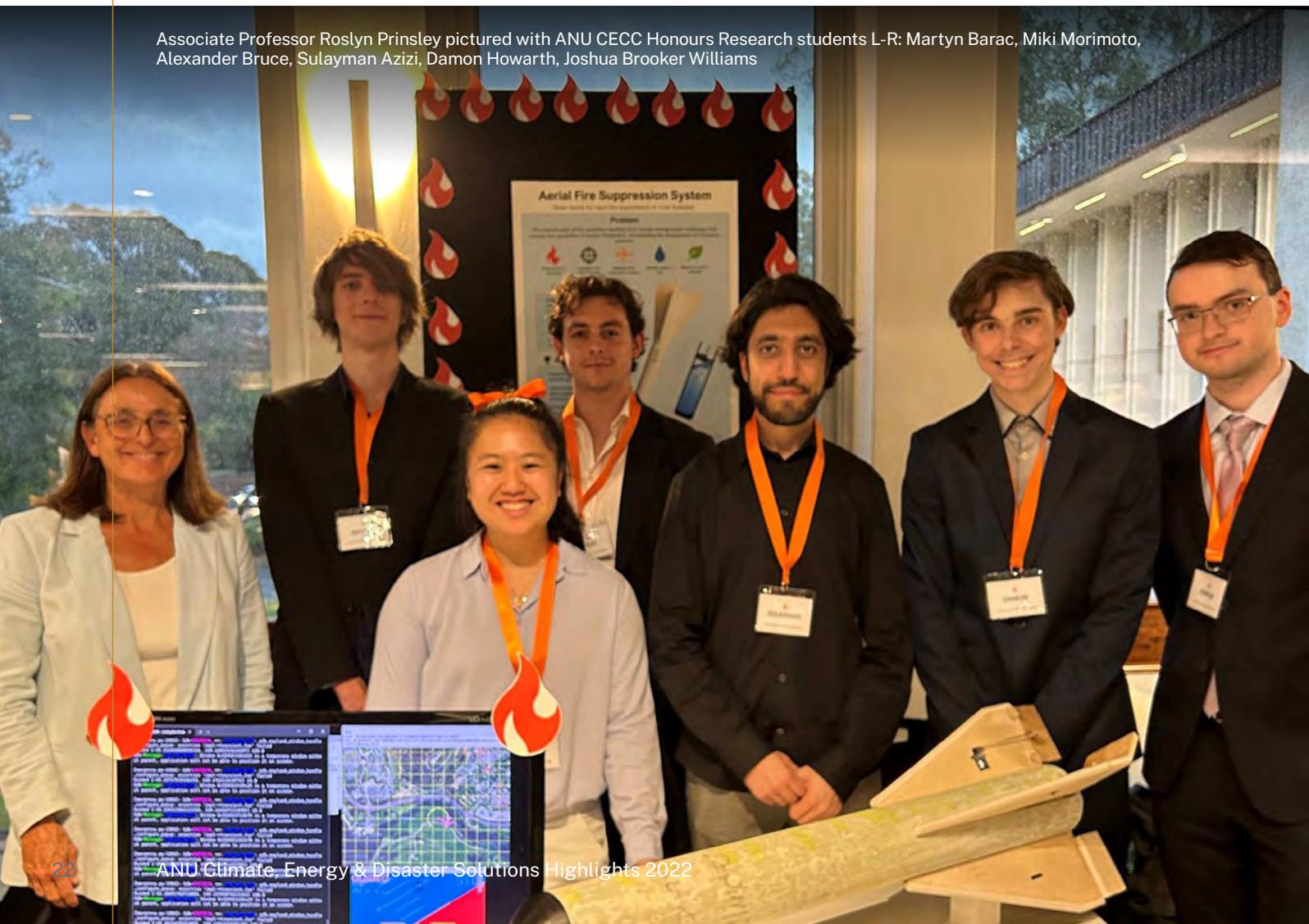
Associate Professor Prinsley has delivered briefings to the of Department of Prime Minister and Cabinet, the National Emergency Management Agency, Natural Hazards Research Australia, Floodplain Management Australia, the Korean Government, multiple representatives from the insurance industry including Suncorp and SwissRe, and the Lismore community.

Associate Professor Prinsley engaged in media activity in 2023, including interviews with *ABC News*, *ABC Saturday Extra*, *Channel News Asia*, *Canberra Times*, *News.com.au*, and authored articles in *The Conversation*, *The Strategist*, *Cosmos Magazine*, *The Mandarin* and *UNDRR PreventionWeb* amongst others. She has

delivered multiple presentations in her capacity as the lead for the *Partnering with communities in regional Australia to increase resilience to floods* project, including the Flood Community of Practice, Ipswich, Noosa and Moree local councils. The multi-stakeholder and interdisciplinary project, which supports regional Australian communities to mitigate future flood risk, will have as one of its main outputs the development of the first Australian Guidelines to incorporate Nature-based Solutions for flood mitigation.

Associate Professor Prinsley has continued mentoring students involved in research projects aimed to generate transformative solutions to disasters, including a cohort of Honours research students from the College of Engineering, Computing and Cybernetics, developing a rapid aerial fire suppression technology.

Associate Professor Roslyn Prinsley pictured with ANU CECC Honours Research students L-R: Martyn Barac, Miki Morimoto, Alexander Bruce, Sulayman Azizi, Damon Howarth, Joshua Brooker Williams



# In the Media



**25.3k**  
mentions



**434**  
million  
audience reach



Photo: Shutterstock

## **Net zero by 2050? Too late. Australia must aim for 2025**

[Read more](#)

21 September, The Conversation

Authored by Professor Mark Howden, Professor Frank Jotzo, Professor Ken Baldwin, Professor Kylie Catchpole, Kylie Walker, and Professor Lachlan Blackhall



Photo: Joel Masson – stock.adobe.com

## **Defending Australia from disasters**

[Read more](#)

2 June, The Strategist

Authored by Associate Professor Roslyn Prinsley



Photo: COP28 / Christopher Pike

## **CoP28 agreement is progress – but there is still plenty of wriggle room for any country, including Australia**

[Read more](#)

14 December, The Guardian

Authored by Professor Frank Jotzo



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## **There's a Way to Quit Coal Without Wrecking Jobs and Communities**

[Read more](#)

8 December, Bloomberg

Featuring Dr Thang Do



Photo: Original Power

## **The Group helping Aussies in the outback access cheap power**

[Watch](#)

14 December, The Project

Featuring Dr Simon Quilty



Photo: Shutterstock

## **Pacific Islands are holding the front line of climate change, but this is a global fight**

[Read more](#)

27 March, ANU Reporter

Authored by Professor Mark Howden, Mahealani Delaney and 'Ofa Ma'asi-Kaisamy

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