Atmospheric
Carbon Removal
Summit 2023

Building Australia's
carbon removal industry.

September 27, 2023
UNIVERSITY OF TECHNOLOGY SYDNEY

summit23.climaterecoveryinstitute.com.au

Join us at the atmospheric carbon removal summit, hosted by the Climate Recovery Institute (CRI), as we bring together key players from industry, government, NGOs, and finance to kick-start the development of an Australian carbon removal industry.

Climate
Recovery Institute

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Logistics

Location and directions

University of Technology Sydney
(Business School)
**14-28 Ultimo Road
(enter via the Goods Line entrance on the top floor)**
Haymarket NSW 2007

Hotel information

We are pleased to provide details for the following nearby hotels .

Novotel Sydney Central
169-179 Thomas Street Haymarket
Book here

Old Clare Hotel
1 Kensington Street Chippendale
$260-$380/night (preferential rate)
Email to book
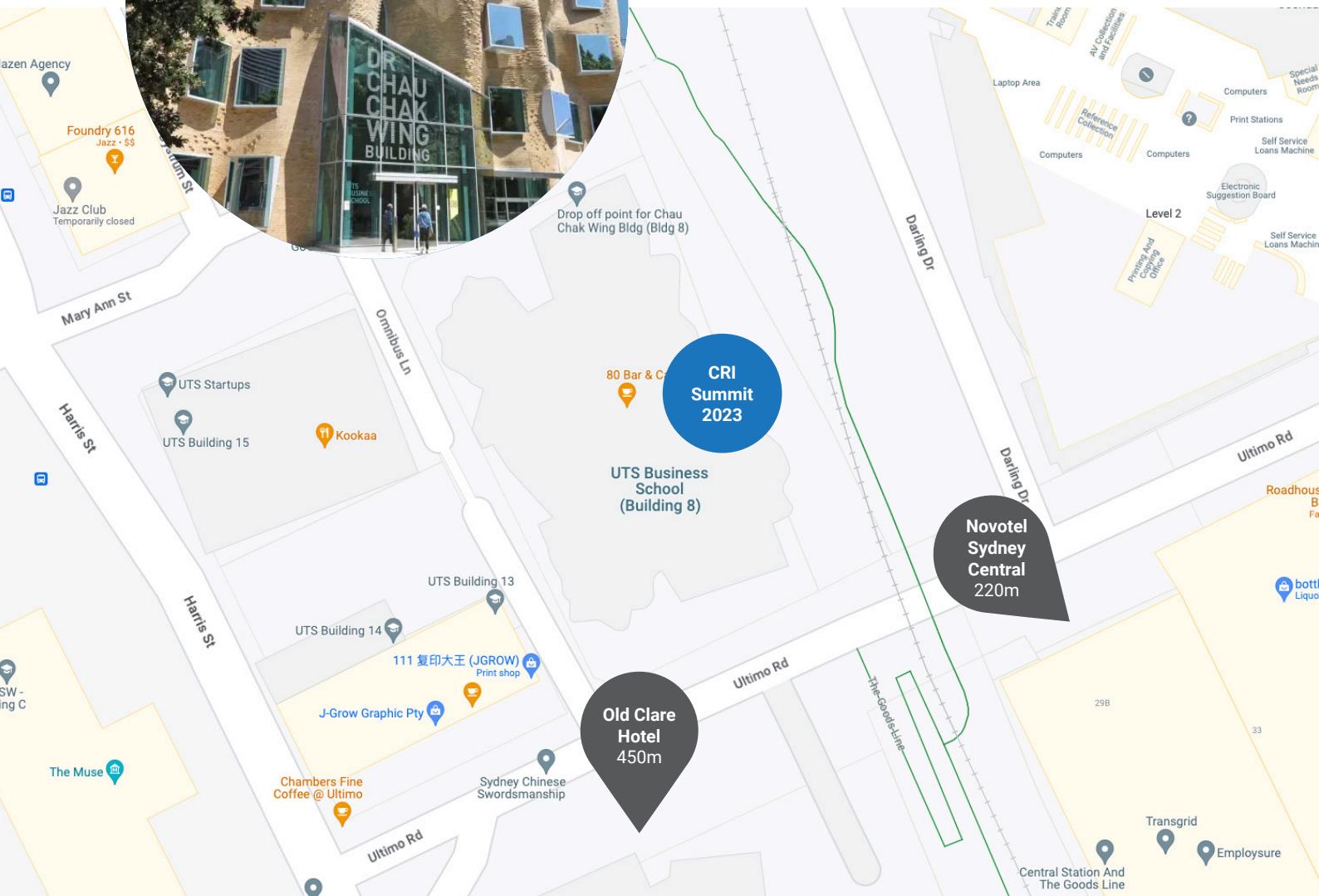
Acknowledgement of Country

The Climate Recovery Institute acknowledges the Traditional Custodians of Country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past, present and emerging, and extend that respect to all Aboriginal and Torres Strait Islander peoples today.

Why it matters.

1.5 degrees is no longer possible without removing 5-15 billion tonnes of historical CO_2 from the atmosphere annually from the 2030s

IPCC carbon budgets not only require near total decarbonisation of global industrial, agricultural and energy systems, but also the removal of tens of gigatonnes of historical emissions from the atmosphere from the 2030s to reverse catastrophic levels of warming that will otherwise be locked in.

1.5 degrees is no longer possible without removing 5-15 billion tonnes of historical CO_2 from the atmosphere annually from the 2030s - in addition to rapidly decarbonising global industrial, agricultural and energy systems. This is the equivalent of a global market of over US$5 trillion and 10-30% of current emissions annually. Australia has significant potential to harness existing resources and capabilities to deploy new atmospheric carbon removal solutions including land management, renewable energy, mining and infrastructure.

We know from work we've been doing for Australian governments, that getting this right is about much more than just the need for accelerated technology RD&D. We need appropriate frameworks to deliver durable removals in addition to - not instead of - emissions reductions; as well as ecological protections, effective governance, just transition frameworks, First Nation people's needs, scalable investment incentives, supply chain integration and collaboration mechanisms.

The event is bringing together leading international carbon removal start-ups and scientists with leaders from policy, industry, finance, and NGOs to help develop a roadmap for the future of atmospheric carbon removal in Australia.

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Event program

ATMOSPHERIC CARBON REMOVAL SUMMIT 2023

September 27, 2023

When Wednesday 27 September, 2023
9:00am to 4:30pm
Networking drinks to 6:30pm

Where University of Technology Sydney Business School
14-28 Ultimo Rd, Haymarket NSW 2007
(enter via the Goods Line entrance)

08:30 **Registration and coffee**

09:00 **Welcome to Country**
Aunty Yvonne Weldon

09:15 **Conference welcome**
Professor Christian Turney – *Pro Vice-Chancellor Research*
University of Technology Sydney

09:25 **The importance of atmospheric carbon removal in mitigating climate change**
Roger D. Aines, Ph.D – *Senior Advisor for Carbon Dioxide Removal, Office of the Under Secretary for Energy and Innovation*
US Department of Energy

09:50 **Atmospheric carbon removal and Australia's net zero policy goals**
Dr Will Howard – *Lead Scientist*
Climate Change Authority

10:15 **The opportunity and conditions for a successful industry in Australia**
Henry Adams – *Director*
Alana Hollestelle – *Associate Director*
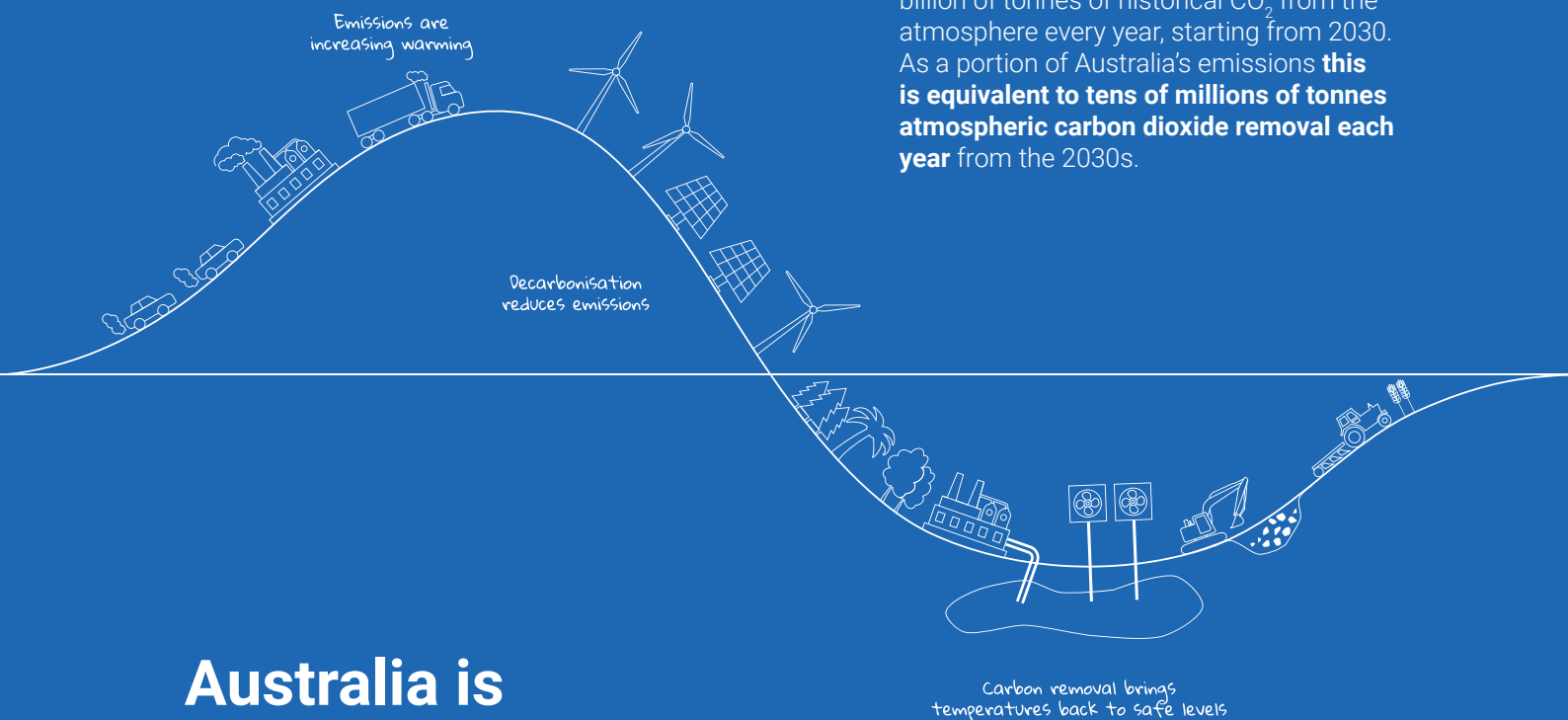**Common Capital**

10:40 **Morning tea**

Time	STREAM 1 – Measurable and durable CO_2 removal and storage	STREAM 2 – Economics, Governance and Community
11:00	**Integrating agriculture and landscape regeneration for scalable and durable carbon removal** Professor Justin Borevitz – *Research School of Biology* **Australian National University**	**Designing for scalability – Industry perspectives on US tax credits and Regional Direct Air Capture Hubs** Alexa Dennett – *Head of Marketing and Communications* **Heirloom Carbon**
11:20	**Harnessing geology to accelerate permanent CO_2 storage through mineral carbonation** Greg Dipple, Ph. D – *Head of Science and Co-founder* **Arca**	**Delivering megaton scale CO_2 mineralisation through Australia's mining capabilities** Samantha Langley – *Principal Business Planning Climate Change, GHG Emissions Reduction and Sustainability* **BHP Nickel West**
11:40	**Next generation direct air capture solutions** Professor Deanna D'Alessandro – *ARC Future Fellow, School of Chemistry* **University of Sydney** Scientific Advisor - **Southern Green Gas**	**Navigating regulatory approvals and building social license for first-of-a-kind critical infrastructure** Victoria Mendes Da Costa – *Permitting Director* **CarbonNet Project**
12:00	**Navigating the potential and challenges of ocean solutions** Professor Philip Boyd – *ARC Laureate Fellow, Institute for Marine and Antarctic Studies* **University of Tasmania** Professor Michael Elwood – *Research School of Earth Sciences* **Australian National University**	**Social licence and sustainable funding models for scaled carbon removals** Monica Richter – *Senior Manager, Low Carbon Futures* **WWF**
12:20	**How do we accelerate RD&D to match the speed and scale of removals required** Dr Andrew Lenton – *Director, Permanent Carbon Locking Future Science Platform (CarbonLock)* **CSIRO**	**The path forward: lessons from 15 years of clean tech development** Sophia Hamblin Wang – *Chief Operating Officer* **MCi Carbon**
12:40	**Lunch**	
01:40	**The UTS Green Genie – harnessing algae for direct air carbon capture** Professor Peter Ralph – *Executive Director of the Climate Change Cluster* **University of Technology Sydney**	
01:50	**Panel discussion: Getting it right for people, communities, and ecosystems** Professor Jan McDonald – *Faculty of Law* - **University of Tasmania** Monica Richter – *Senior Manager, Low Carbon Futures* - **WWF** Victoria Mendes Da Costa – *Permitting Director* - **CarbonNet Project** Roger D. Aines, Ph.D – *Senior Advisor for Carbon Dioxide Removal* - **US Department of Energy**	
02:45	**Afternoon tea**	
03:40	**Panel discussion: Roadmap to scale** Sophia Hamblin Wang – *Chief Operating Officer* - **MCi Carbon** Greg Dipple, Ph.D – *Head of Science and Co-founder* - **Arca** Jaime Painter – *Chief of Staff* - **Loam Bio**	
04:20	**Conference close** Professor Christian Turney – *Pro Vice-Chancellor Research* **University of Technology Sydney**	
04:30	**Networking drinks**	
06:30	**End**	

Key topics.

The urgency of carbon removal

The IPCC's Sixth Assessment Report warns that the world is on track to exceed the Paris Agreement's climate targets. To avoid catastrophic warming, **it's no longer enough to achieve deep cuts in emissions by decarbonising existing industry**. Carbon budgets now also require us to remove 5-15 billion of tonnes of historical CO_2 from the atmosphere every year, starting from 2030. As a portion of Australia's emissions **this is equivalent to tens of millions of tonnes atmospheric carbon dioxide removal each year** from the 2030s.

Emissions are increasing warming

Decarbonisation reduces emissions

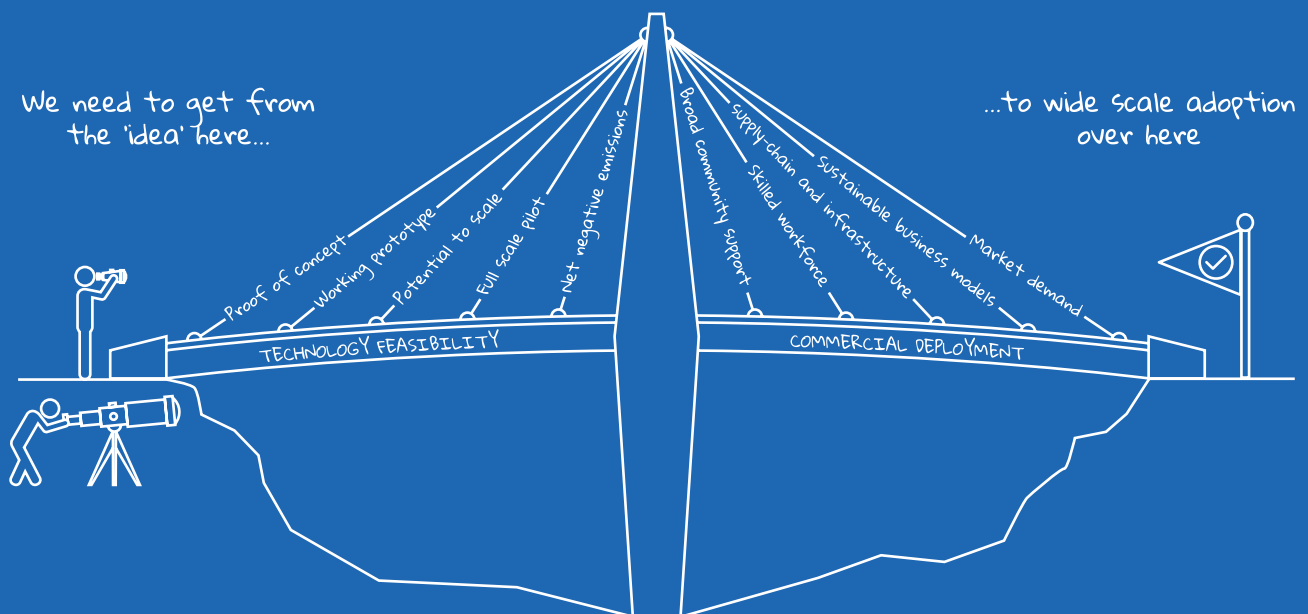Carbon removal brings temperatures back to safe levels

Australia is poised to lead

Australia's unique physical capabilities and existing industries provide **strong foundation and comparative advantage for development** of a competitive CDR industry. These include strengths in renewable energy, minerals, primary industries, research, building materials, advanced manufacturing, project engineering, and finance.

Addressing the Immaturity of carbon removal technology

There is rapid progress developing new and promising early-stage CDR technologies across land and marine, biological and mineralisation methods. But current projects are far from the gigatonne scale required. **We don't have the luxury of decades** that traditional innovation diffusion usually takes and need a concerted approach to achieve technology and commercial maturity in the timeframes required.

We need to get from the 'idea' here...

...to wide scale adoption over here

Proof of concept
Working prototype
Potential to scale
Full scale pilot
Net negative emissions
Broad community support
Skilled workforce
Supply-chain and infrastructure
Sustainable business models
Market demand

TECHNOLOGY FEASIBILITY

COMMERCIAL DEPLOYMENT

The importance of early collaboration for a just transition

Collaborating with diverse stakeholders, including First Nations people, is crucial to ensuring an equitable environmental transition. **By being an early mover, Australia can create new net-zero emissions industries and jobs** that will endure throughout the transition.

Speeding up
the pace

While work has begun on advancing CDR technologies, **it's not happening fast enough.** We know from Australia's successes and setbacks in renewables that scaled and competitive deployment **involves communities, supply chains, finance and policy – not just technology.**

We need to build on these lessons to jumpstart collaboration and innovation to develop a thriving atmospheric carbon removal industry in Australia.

Regular
innovation
pathway

Foresight-led
integrated research
and stage-gate
assessment
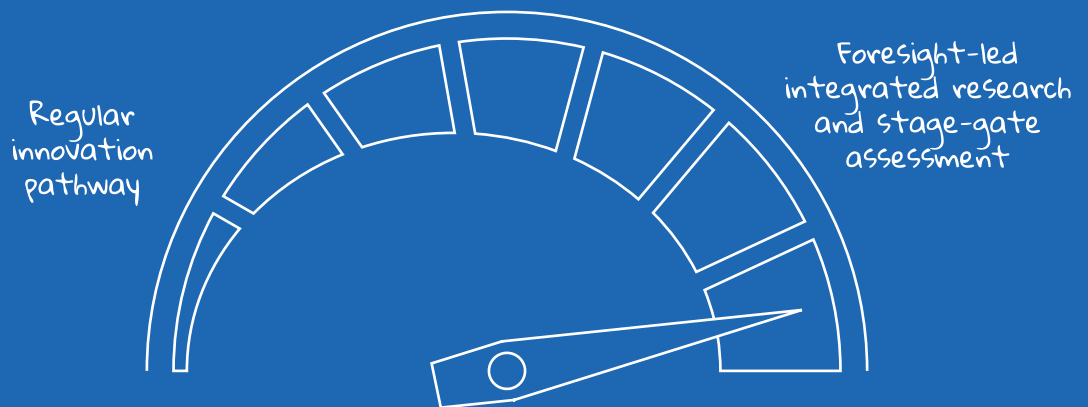
Achieving 1.5° means removing billions of tonnes of carbon dioxide from the atmosphere.

Meet the speakers.

Experts and leaders from technology, industry, policy, NGOs, and community groups. Helping develop a roadmap for the future of atmospheric carbon removal in Australia.

Roger D. Aines, Ph.D	US Department of Energy
Greg Dipple, Ph.D	Arca
Dr Will Howard	Climate Change Authority
Samantha Langley	BHP Nickel West
Monica Richter	WWF
Jaime Painter	Loam Bio
Alexa Dennett	Heirloom Carbon
Sophia Hamblin Wang	MCi Carbon
Dr Andrew Lenton	CSIRO
Professor Chris Turney	University of Technology Sydney
Henry Adams & Alana Hollestelle	Common Capital
Victoria Mendes Da Costa	CarbonNet Project
Professor Philip Boyd	University of Tasmania
Professor Deanna D'Alessandro	University of Sydney
Professor Jan McDonald	University of Tasmania
Professor Justin Borevitz	Australian National University
Professor Michael Elwood	Australian National University
Professor Peter Ralph	University of Technology Sydney

Roger D. Aines

SENIOR ADVISOR FOR CARBON DIOXIDE REMOVAL

US Department of Energy

Roger is an internationally renowned leader on atmospheric carbon dioxide removal.

In his current role as Senior Advisor for Carbon Dioxide Removal at the US DOE, he oversees the Carbon Negative Initiative and provides technical advice and guidance to the Under Secretary for Energy and Innovation.

He is on secondment from his position as Energy Program Chief Scientist at Lawrence Livermore National Labs, where he developed and led the Carbon Initiative, one of the world's largest primary research teams working on a broad cross-section of carbon dioxide removal technologies.

Greg Dipple

HEAD OF SCIENCE AND CO-FOUNDER

Arca

Greg is a global leader and pioneer in atmospheric carbon dioxide removal. He has led seminal research into accelerating the natural weathering and carbon mineralisation of ultramafic rock and mine tailings since 2005.

He is the Head of Science and Co-founder of Arca. Arca's proprietary technologies combine CO_2 from the atmosphere with waste from metal mines, converting atmospheric CO_2 into rocks and storing it for millennia.

He is also Professor of Geological Sciences at the University of British Columbia.

DR

Will Howard

LEAD SCIENTIST

Australian Government Climate Change Authority

Will is the Lead Scientist at the Climate Change Authority (CCA), the statutory body that provides independent advice to the Australian Government on climate change.

Will leads the CCA's work program across climate science and adaptation, climate policy, and negative emissions through atmospheric carbon dioxide removal.

He has advised the Australian Government on climate and science issues since 2014, working previously as Lead Climate Scientist for the Department of Agriculture, Water and the Environment, and Head of Science for the Office of the Chief Scientist.

He is also a Visiting Fellow at ANU, researching marine climate change.

Samantha Langley

PRINCIPAL BUSINESS PLANNING CLIMATE CHANGE, GHG EMISSIONS REDUCTION AND SUSTAINABILITY

BHP Nickel West

Sam leads BHP Nickel West's asset decarbonisation and net zero transition. She is the 2023 winner of the WA Women in Resources innovation award for a project she initiated and leads. The project explores scaling carbon dioxide removal by carbonation of mine waste, with a team of engineers, geochemists and policy and climate change experts from across BHP and international partners.

She has 20 years of carbon and environmental management experience in the mining industry, including at BHP's Carbon desk and Kalgoorlie Nickel Smelter, and the KCGM and Paddington gold mines in Kalgoorlie.

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Monica Richter

SENIOR MANAGER, LOW CARBON FUTURES

WWF

Monica leads WWF Australia's low carbon futures program, working across business, government and the NGO sector pursuing zero carbon and circular economy solutions.

She is also project director at both the Business Renewables Centre, and the Materials & Embodied Carbon Leaders' Alliance (MECLA).

She is an economist and social ecologist with over 20 years' experience in climate-focussed corporate engagement, business development, policy and advocacy.

Prior to WWF, she held program, campaigning and policy roles at the ACF, Green Peace and the Australian Department of Foreign Affairs and Trade.

Sophia Hamblin Wang

CHIEF OPERATING OFFICER

MCi Carbon

Sophia is a carbon technologist and circular economy expert. As the COO of a globally leading climate tech company, Sophia is at the forefront of carbon innovation.

Since 2006, MCi have been on a journey to permanently lock CO_2 into industrial materials for commercial use.

Sophia brings on the ground lessons on what it takes to build a successful early mover climate tech company, including pioneering technology, partnering with industry, creating markets and business models, advocating for an effective policy setting, and building a first-of-a-kind operation.

Alexa Dennett

HEAD OF MARKETING AND COMMUNICATIONS

Heirloom Carbon

Alexa is a senior executive at Heirloom Carbon, a leading second generation direct air capture company. Heirloom has recently been a major recipient of the multi-billion dollar direct air capture grant funding from the US DOE.

Alexa has over 13 years' experience in Silicon Valley scaling high growth global technology companies including at Google X, Wing, and Dropbox.

She has also worked as a Solicitor for King & Wood Mallesons and a Management Consultant at Pacific Strategy Partners in Sydney.

Jaime Painter

CHIEF OF STAFF

Loam Bio

Jaime leads the strategy for Loam Bio, one of Australia's biggest climate tech start-ups. Loam harnesses unique microbes that convert organic matter into stable soil carbon to provide durable CO_2 storage and improve agricultural outputs.

Originally trained as a humanitarian engineer, her roles prior to Loam include strategy and business development for the Perennial Foods Group working in Ethiopia on scaling regenerative agriculture, and management consulting with McKinsey in Australia.

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DR
Andrew Lenton

DIRECTOR, PERMANENT CARBON LOCKING FUTURE
SCIENCE PLATFORM (CARBONLOCK)

CSIRO

Andrew leads the CarbonLock FSP for CSIRO, a major primary research program focussed on developing innovative ways to remove and store carbon dioxide on permanent timescales.

He also leads Australia's engagement in Mission Innovation - Carbon Dioxide Removal, was a co-author on the 5th and 6th IPCC Assessment Reports and led the Climate Change Authority's recent report on Australia's sequestration potential.

He has more than 20 years of experience in global carbon cycles, climate and earth system modelling and exploring solutions beyond mitigation to address climate change.

PROFESSOR
Chris Turney

PRO VICE-CHANCELLOR RESEARCH

University of Technology Sydney

Chris Turney is Pro-Vice Chancellor of Research at the University of Sydney. He conducts transdisciplinary research into the carbon cycle, focussing on reducing uncertainties over climate impacts and climate-carbon feedback.

Chris is also a founding Director and Scientific Advisor with CarbonScape, the first company to create technology for sustainable, high-quality biographite made from renewable materials.

Chris is also a talented science communicator. His new podcast, "Unfking the Future" is taking listeners on a journey to understand common-sense climate solutions.

Henry Adams

DIRECTOR

Common Capital

Henry is the Co-founder and Director of Common Capital, a policy and strategy consultancy specialising in catalytic funding mechanisms for the net zero transition.

He has 18 years' experience in the design, implementation and reform of market-based environment protection and climate mitigation policies.

This includes leading a series of flagship carbon dioxide removal policy and economics projects for state and commonwealth agencies.

He a co-founding Director of the Climate Recovery Institute.

He has previously worked in climate policy for the NSW Government, as a Ministerial Advisor and as a Management Consultant at IBM.

Alana Hollestelle

ASSOCIATE DIRECTOR

Common Capital

Alana leads Common Capital's deep decarbonisation policy and strategy research on issues including atmospheric carbon dioxide removal and agrifood.

She is also a co-founding Director of the Climate Recovery Institute.

Alana was the lead author and project manager of a flagship carbon dioxide removal opportunity study for the NSW Government. It combined detailed qualitative and technoeconomic research and analysis on the sequestration potential, pathways, barriers and policy priorities for building a geographically specific carbon dioxide removal industry at a 1.5 degree-aligned scale.

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Victoria Mendes Da Costa

PERMITTING DIRECTOR

CarbonNet

Victoria is senior executive at the CarbonNet, a flagship Victorian Government-led project to establish a commercial scale geological carbon storage hub in Gippsland.

She is responsible for helping navigate a complex set of emerging, state, national and international regulatory frameworks and ensuring the Australian first-of-a-kind geo-sequestration project delivers strong environmental and community outcomes.

She has over 25 years' public and private experience in providing strategic policy, issue management and regulatory advice.

PROFESSOR

Philip Boyd

ARC LAUREATE FELLOW AND PROFESSOR AT THE INSTITUTE FOR MARINE AND ANTARCTIC STUDIES

University of Tasmania

Philip is an internationally renowned expert on ocean-based carbon dioxide removal and reliable sequestration. He is the Co-chair of UN Cross Agency GESAMP (joint Group of Experts on the Scientific Aspects of Marine Environmental Protection) Ocean Interventions for Climate Change Mitigation working group.

Philip conducts transdisciplinary research across ocean biogeochemistry, phytoplankton processes, open ocean ecosystems, marine approaches to climate intervention and the development of research governance.

Philip is a founding member of the CRI Advisory Network.

PROFESSOR

Deanna D'Alessandro

ARC FUTURE FELLOW, SCHOOL OF CHEMISTRY

University of Sydney

Deanna is a highly awarded Professor of chemical and biomolecular engineering, and Scientific Advisor to the Australian direct air capture start-up, Southern Green Gas.

She has decades of experience in capturing and storing carbon dioxide and leads a climate-focussed advanced material lab developing cutting edge materials (known as metal organic frameworks (MOFs)) to capture carbon at a molecular scale.

She has previously held an ARC future fellowship at Sydney University and research fellowship at UC Berkley.

PROFESSOR

Jan McDonald

FACULTY OF LAW

University of Tasmania

Jan is a Professor in the Faculty of Law at the University of Tasmania. She is a governance expert conducting research into the legal and policy dimensions of climate change responses, including carbon dioxide removal.

Jan is also a Lead Councillor with the Biodiversity Council and serves on the Board of the Tasmanian Land Conservancy.

Jan is a founding member of the CRI Advisory Network.

Climate Recovery Institute

PROFESSOR
Justin Borevitz
COLLEGE OF SCIENCE

Australian National University

Justin is a Professor at the Australian National University in the Research School of Biology where he leads the Borevitz Group on plant genomics for climate adaption.

He is an expert in land-use impacts of carbon dioxide removal technologies and methods to support climate resilience and carbon drawdown in agroecological landscapes.

He is on the board for Soils for Life and a scientific advisor to a number of regenerative agriculture and climate resilience-focussed start-ups and not-for-profits.

Justin is a founding member of the CRI Advisory Network.

PROFESSOR
Michael Elwood
RESEARCH SCHOOL OF EARTH SCIENCES

Australian National University

Michael is a Professor at the Australian National University Research School of Earth Sciences. His deep understanding of marine chemistry, geochemistry and carbonate chemistry is informing his research in using the ocean for long-term chemical sequestration, using a range of pilot studies.

Michael is a founding member of the CRI Advisory Network.

PROFESSOR
Peter Ralph
EXECUTIVE DIRECTOR OF THE CLIMATE CHANGE CLUSTER

University of Technology Sydney

Peter is the Executive Director of the Climate Change Cluster (C3), an institute that through science and discovery is delivering new insights into the environmental response to climate change and transforming these into innovative solutions to mitigate or prevent further ecosystem damage.

He has extensive experience with industry-based algal carbon capture and manufacture technology, working across the following sectors; food and beverage, energy, wastewater, bioplastics, pharmaceuticals, and platform chemicals and mining (remediation and bioextraction).

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We have a unique opportunity to co-design this new industry with communities

Thank you to our sponsors and supporters.

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TASMANIA

About the Climate Recovery Institute.

We are focussed on accelerating the research, demonstration, development, and deployment of gigatonnes scale carbon removal solutions.

The Climate Recovery Institute is a not-for-profit focused on mitigating climate change through advancing the scalable and just deployment of activities that remove carbon dioxide from the atmosphere. The Institute brings together multi-disciplinary experts and voices across policy, industry, science, engineering, social science, NGOs and civil society from across Australia and internationally.

We accelerate the research, development, demonstration, and deployment of gigatonnes scale carbon removal solutions. We take a foresight led approach to consider the interdependent technical, commercial, social, supply chain and regulatory pathways to driving costs down and accelerating rapid deployment at scale.

We run major programs, provide advisory and host events through the year.