



### Our vision and mission

The 2015 Paris Agreement sought to unite countries in the fight against climate change by devising strategies to keep the global temperature rise to a maximum of 1.5 °C. While a significant focus is on emissions reductions, the Intergovernmental Panel on Climate Change (IPCC) says this will not be enough to avoid dangerous levels of global warming.

Alongside adaption and mitigation, the world must actively remove historical emissions of carbon dioxide (CO<sub>2</sub>) already in the atmosphere through Carbon Dioxide Removal (CDR). Our vision is to provide a role model of best practice for an environmentally, socially and ethically responsible transition to Net Zero Australia using a portfolio of approaches for CDR.

### Our research

Our research involves the development of more efficient processes for CDR, as well as the creation of an economic, social and political ecosystem in Australia that supports a portfolio of solutions for CDR to reach our Net Zero goals.

CO<sub>2</sub> removal can be achieved in two ways. The first is by enhancing carbon storage in natural ecosystems, such as planting forests or storing carbon in soil or oceans. The second is by using technologies such as Direct Air Capture (DAC) that separate CO<sub>2</sub> from ambient air, then store it. The latter also provides a sustainable source of CO<sub>2</sub> for use.

To achieve these aims, our research involves integrated technology solutions that include developing social license to operate, social acceptance and environmental justice.

Key challenges we are addressing include:

- improving materials and reducing costs for DAC;
- understanding and developing methods for long duration carbon removals;
- reducing barriers to implementation of a portfolio of carbon removals approaches;
- policy and legislative gaps.

### Our approach

The University of Sydney brings together experts across the sciences, engineering, policy, business and law to address the key research questions and accelerate commercialisation, particularly in DAC and soil carbon sequestration.

## Meet our research experts

We have a highly interdisciplinary research team and leverage outstanding capabilities and infrastructure.

- **Professor Deanna D'Alessandro:** School of Chemistry. Metal-Organic Frameworks (MOFs) for DAC
- **Professors Alex McBratney and Budi Minasny:** Sydney Institute of Agriculture. Soil carbon sequestration and monitoring
- **Professors Tim Langrish, Andrew Harris, PJ Cullen and Antonio Tricoli, A/Professor John Kavanagh, Drs Fengwang Li, Gustavo Fimbres-Weihs and Li Wei:** School of Chemical & Biomolecular Engineering. Continuous flow scale-up of materials for commercial applications, techno-economic assessment, carbon dioxide conversion
- **A/Professor Amanda Tattersall and Katie Moore:** Sydney Policy Lab. Social acceptance
- **Professor Chris Wright, Dr Tanya Fiedler, Dr Danny Gozman and A/Professor Tom van Laer:** University of Sydney Business School. Social acceptance, communications, carbon markets
- **Professor David Scholsberg:** Sydney Environment Institute. Environmental Justice
- **Professor Susan Park and Dr Gareth Bryant:** Arts & Social Sciences. Global governance, political economy
- **Dr Erin Kelly and Professor Maree Teeson:** Matilda Centre. Climate anxiety

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## Contact us

For further information or to discuss in greater detail, please contact:

### Net Zero Initiative

XXXXX@sydney.edu.au

## How your business will benefit

By partnering with us, your business will be able to:

- collaborate with leading academic and industry experts from the University of Sydney to address the challenges faced by your business;
- help shape the next generation of postgraduate students with skills relevant for your business needs;
- host one of our talented PhD students, who will be placed in your business for up to one year; and
- benefit (pending eligibility) for the Australian Government's R&D Tax Incentive Scheme.

## Past projects

- Developing novel MOFs for DAC including their scale-up for commercialisation. Industry led partnership with Southern Green Gas developing the first solar powered DAC project. Partners include Corporate Carbon and AspiraDAC. Project supported by Musk Foundation XPRIZE in Carbon Removals (Student Prize) and Frontier (pre-market purchasers including Meta (Facebook), Google, Stripe).



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