Transform CO_2
Transform the future

2025

Annual Report

GETCO2

ARC Centre of Excellence
for Green Electrochemical
Transformation of Carbon Dioxide

GETCO2
Transform CO_2
Transform the future

Acknowledgement of Country

The ARC Centre of Excellence for Green Electrochemical Transformation of Carbon Dioxide acknowledges the Traditional Owners and their custodianship of the lands on which the Centre operates, including Nodes in Meeanjin (Brisbane), Gadigal Country (Sydney), Naarm (Melbourne) and Tarntanya (Adelaide).

We pay our respects to their Ancestors and their descendants, who continue cultural and spiritual connections to Country. We recognise their valuable contributions to Australian and global society.

Contents

OUR CENTRE

Australian Research Council Centre of Excellence for
Green Electrochemical Transformation of Carbon Dioxide

Converting CO_2 into valuable chemicals and fuels.

Catalysing a green manufacturing and export revolution.

Paving the smartest and cleanest path to net zero.

Centre overview

Australian Research Council Centre of Excellence for Green Electrochemical Transformation of Carbon Dioxide (GETCO2, The Centre)

GETCO2 is a $45M, 7 year collaboration led by The University of Queensland, bringing together national research, industry, government and university partners to address the challenge of decarbonisation.

Established in 2023, the Centre focuses on converting CO_2 into valuable products such as fuels and chemicals, driving excellence in research, training and technology translation.

GETCO2 aims to deliver long term economic, social, and environmental benefits by supporting Australia's net zero goals, developing innovative technologies and materials, and training the next generation of scientists and engineers.

GETCO2 aims to strengthen the nation's energy and manufacturing industries for a more resilient future.

Our Values

GETCO2 is committed to the following core values, which guide our work and culture:

- **Curiosity:** We value curiosity and foster an environment where people feel safe to ask questions.
- **Learning:** We prioritise continuous growth and the sharing of insights to drive innovation and sustainable impact.
- **Inclusion, Diversity, Equity and Accessibility (IDEA):** We embrace and promote IDEA in all its forms and strive for equitable opportunities and treatment for all members.
- **Collaboration:** We foster a cooperative environment, encouraging teamwork, knowledge sharing and mutual support.
- **Kindness:** We treat all members with respect, empathy, and compassion.
- **Integrity:** We act ethically, honestly and responsibly in all our activities and interactions.
- **Transparency:** We operate with openness and clarity in decision-making and communication.

Our Vision

Our vision is to position Australia as a global leader in carbon dioxide transformation and generate long-term economic, social and environmental benefits nationally and internationally.

Transform CO_2

Transform the future

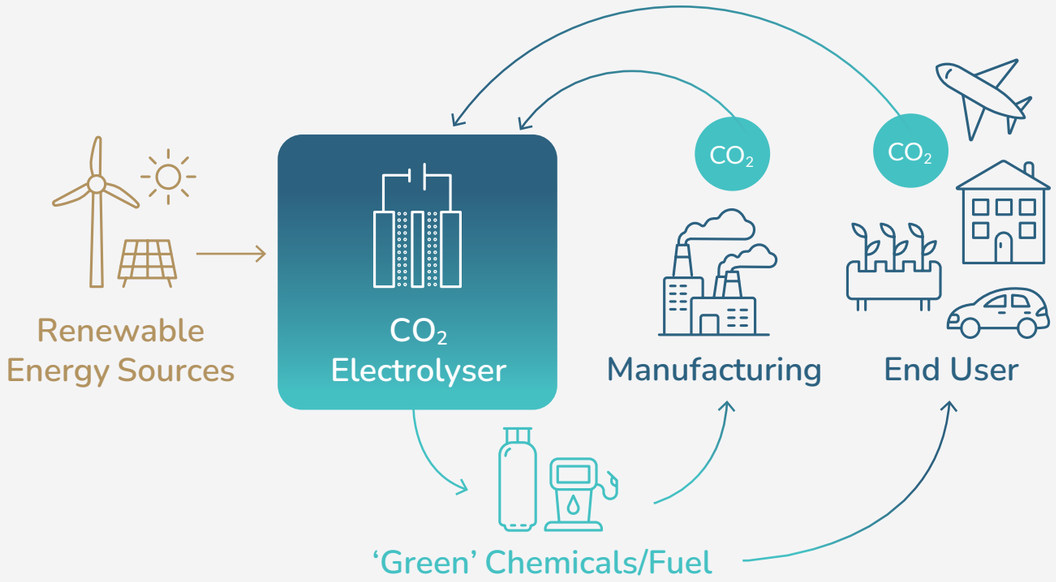
Objectives 2023-2030

1 Advancing fundamental knowledge of carbon dioxide (CO_2) conversion in electrochemical systems to selectively manufacture diverse value-added products.

2 Developing innovative electrolysers and key components (catalysts, membranes and electrodes) for highly efficient, scalable and durable electrochemical CO_2 conversion.

3 Demonstrating CO_2 conversion to value-added commodity and fine chemicals to enable industry-ready CO_2 utilisation technologies supporting the emergent Australian circular carbon economy industry.

4 Training the next generation of highly skilled scientists and engineers, equipped with unique expertise in catalysis, functional materials and advancing manufacturing for CO_2 utilisation across Australian research communities and industries.



Outcomes

The Centre outcomes will ripple across scientific disciplines, industry sectors and policy development.

1 Creating new knowledge on the kinetics and mechanism of CO_2 electrocatalysis, and the complex dynamics of the transport of gas, liquids and ions in electrolysers.

2 Developing novel concepts and designs for electrolysers and new technologies for electrocatalytic CO_2 reduction including electrodes, membranes and catalysts, new analytical methods for characterising working electrocatalysts and new computational tools to model electrolysers.

3 Expanding research capacity in materials science, chemical engineering and sustainable energy technologies through training of next generation researchers.

4 Linkages and translation of research through extensive collaborations with established international research leaders, and strategic partnerships with industry, government and end-users of the technologies developed.

5 Contributing to the National Science and Research Priorities, addressing the challenges of advanced manufacturing and energy.

Our partners

Collaboration is central to GETCO2's pathway to impact, from the fundamental discovery level to uptake and application of technologies.

Collaboration is central to GETCO2's pathway to impact, from the fundamental discovery level to the uptake and application of technologies.

GETCO2 comprises seven Australian universities, five international universities, and seven industry/ government organisations supporting our research program and strategic portfolios.

GETCO2 also connects more widely with 45 associate investigators from 25 different organisations (including nine overseas) who offer broader expertise to the core research program.

Our industry partner organisations span much of the value chain of a carbon circular economy, including

- large multinational sustainable technology firms
- national research institutes
- government agencies
- clean-tech and advanced materials start-ups and SMEs
- material suppliers and
- respected consultants to the energy and water industries

The strong backing from government and industry indicates GETCO2's strength in alignment with cross sector targets for net zero emissions by 2050, and aspirations for a circular economy that supports sustainable development and resource recovery.

Partnerships – globally and locally with universities, industry and government

2nd year

First Power-to-X Hackathon

40% increase in research output

95% publications in top quartile of global journals

Director's Report

The year 2025 marked a pivotal turning point for the ARC Centre of Excellence for Green Electrochemical Transformation of Carbon Dioxide (GETCO2). As we entered our second year, we have moved beyond foundational setup into a phase of high-velocity impact.

Our growth in 2025 has been nothing short of remarkable: we nearly doubled our engagement and outreach efforts, increased our research output by 40%, and saw a 40% surge in participation at our annual conference. These aren't just statistics; they represent the growing influence of our Centre in the global race for sustainable energy solutions.

To sustain this momentum, we have evolved our leadership structure. We appointed Prof Tom Rufford (UQ) as our inaugural Deputy Director Research, a move designed to cultivate future leaders while streamlining our strategic operations alongside Prof Rachel Caruso. Strengthening our leadership team, Tom is working closely with the Centre Directorate to oversee strategy and operations. Importantly, Prof Rufford and Prof Rachel Caruso are co-leading the GETCO2 Research Program Committee.

At our nodes, we saw a passing of the torch. While we bade a fond farewell to CI Prof Zaiping Guo as she moved to the City University of Hong Kong, we are thrilled she remains an Associate Investigator. Prof Christian Doonan has stepped in as the Adelaide University Node Director, and we welcome CI A/Prof Jianfeng Mao, whose expertise in sustainable materials will be vital to our next phase of energy storage research.

Our researchers continue to define the "gold standard" in electrochemical transformation:

- World-Class Recognition: Three of our Chief Investigators were named Clarivate Highly Cited Researchers 2025, placing them in the top 0.1% of scientists globally.
- Elite Quality: Over 95% of our publications appeared in the top quartile of global journals.
- The Next Generation: I am particularly proud of our EMCRs, Dr Kaige Sun and Dr Xiaoli Zhang, who were named among the Stanford/Elsevier Top 2% Scientists. This recognition validates our commitment to a mentoring environment where the scientists of tomorrow can thrive today.

One of the year's most inspiring moments was the Power-to-X Hackathon. Seeing our PhD students and postdoctoral researchers collaborate across nodes, pitching innovative concepts to senior industry leaders, demonstrated the "real-world" grounding of our Centre. It was impressive to witness how teams collaborated across nodes developing their concepts! In particular, I thank our Advisory Committee members and industry mentors for generously sharing their insights and experience with our EMCRs.

It was fantastic to see our Node Spotlight series gain momentum in 2025, with face-to-face gatherings of researchers and professional staff in Brisbane (UQ), Sydney (USyd/UNSW) and Melbourne (RMIT/Monash). At these events, we enjoy welcoming and sharing our research with Associate and Partner Investigators as well as Advisory Committee members, and I thank them for their support. The value of face-to-face engagement cannot be underestimated for sparking ideas and building authentic collaborations.

On this note, I was also pleased to join the ARC Centres of Excellence Summit in July, held at RMIT, and attended by Directors, Chief Operating Officers and professional staff from Centres from around the nation. The Summit is an important way for us to learn from our peers and strive for better practices across Centres.

At our 2025 annual conference I was pleased to share for the first time the Centre Charter, a short, formal document that defines the identity, purpose and operating principles of GETCO2. Now available on our website, the Centre Charter was developed based on the results of three, progressive centre-wide surveys, reflecting the views of centre members, and establishes a shared framework to support collaboration, decision-making and accountability across the Centre and its stakeholders. The core values identified by our members are curiosity, learning, IDEA, collaboration, kindness, integrity and transparency. GETCO2 commits to embedding these principles into our practices, governance and long-term strategy.

Following the retirement of Prof Robin Batterham, whom we thank for his years of dedicated service, we welcome Dr Anita Hill and Prof Sandra Kentish as the Chair and Deputy Chair of our newly unified Advisory Committee. With their guidance and our established baseline of excellence, we remain focused on our core mission: advancing fundamental knowledge, developing the next generation of electrolysers and training the skilled workforce that will forge a net-zero future.

Reflecting on coming into our third year of operation, mid-term of the 7-year lifespan of the Centre, I feel that together we have established a solid baseline. We will continue to focus on using the strength of our combined knowledge and resources to achieve our Centre mission.

Prof Xiwang Zhang FTSE
Centre Director

Governance

Advisory Committee Chairs

Robin Batterham
Strategic Advisory Committee

Anita Hill
Research Advisory Committee

Directorate

Xiwang Zhang
Director

Rachel Caruso
Deputy Director

Tom Rufford
Deputy Director

Eloise Larsen
Chief Operations Officer

Node Directors

Chen
USyd

Whittaker
UQ

Zhao
UNSW

Lee
Griffith

Doonan
UoA

Zhang
Monash

Caruso
RMIT

Centre Management Committee (CMC)

Node Directors,
Directorate,
RPC Chair,
Portfolio Leaders

Portfolios

Caruso
Inclusion, Diversity, Equity & Access

Martin
Engagement & Partnerships

Bernhardt
Capacity Building

Research Program Committee (RPC)

Caruso
RPC Chair

Tom Rufford
RPC Co-Chair

Chen

Hou

Knibbe

Research Themes

Li

Zhang

Zhao

Flagship Programs

EMCR Committee

Centre Management Committee

The Centre Management Committee (CMC) is at the heart of GETCO2's governance and management structure, with inputs from two advisory committees – Strategic Advisory Committee (SAC) and Research Advisory Committee (RAC) – and the Centre Research Program Committee (RPC).

Research Program Committee

The Research Program Committee (RPC) is responsible for monitoring research progress and outputs/outcomes across Research Themes, Flagship Programs and Strategic Projects. The RPC seeks advice from the RAC to identify new research opportunities and oversees initiatives to promote research integration across the Centre including multidisciplinary and cross-nodal collaboration.

Strategic Advisory Committee

The Strategic Advisory Committee (SAC) advises the Centre Director, Deputy Directors and CMC on strategies for wider linkages at a national and international scale, future visions on policy levers, industry trends and inter/national landscape. The SAC will review Centre performance and advise on the Centre's strategic plan, identify risks and opportunities.

Research Advisory Committee

The Research Advisory Committee (RAC) provides advice to the Centre Director, Deputy Directors and Research Program Committee (RPC) on the research aims, scientific planning and outputs, and international benchmarking of Centre outputs.

Early/Mid-Career Researcher Committee

A newly established Early/Mid-Career Researcher Committee (EMCRC) informs and leads Centre initiatives, mentored by senior members. Representatives from the EMCRC sit on each of the Centre committees.

The three **Portfolios** reflect strategic areas of focus thatwill underpin the Centre's culture, nurturing future research leaders, supporting partnerships, research translation and wider outreach. To ensure continuity in these Portfolios the members will rotate on a biennial basis.

Our People

Research Advisory Committee

Dr Anita Hill FAA FRACI FSTE (Chair)

Prof David Sinton
FAAAS FASME FCAE FCSME
FEIC FRSC

Prof Benny Freeman FAIChE

Prof Sandra Kentish FSTE

Emeritus Prof Jurg Keller FTSE DFIWA

Strategic Advisory Committee

Prof Robin Batterham AO FREng
FAA FTSE (Chair)

Adjunct Prof John McGagh AM
FTSE FIChemE

Prof Sir Anthony K. Cheetham FRS

Dr Sarah Ryan FAIE FTSE MAICD

Honorary Prof Vicki Chen FTSE

Dr Julia Woertink

Prof Paul Greenfield AO FTSE

Our People

Early- and Mid Career Researcher Committee

Dr Basiram Brahma Narzary
(Chair)

Dr Sandani Amanda Ekanayake
(Co-chair)

Dr Yuting Zhuo
(Secretary)

Dr Jinshuo Zou
(Treasurer)

Hirusha Hansamali Jayarathne
Rajapaksha Mudiyanselage
(Events Coordinator)

Dr Chen (Patrick) Jia
(Vocal/Committee Liaison)

Dr Hsiwen (Wayne) Wu
(Vocal/Committee Liaison)

Dr Shuang Song
(Vocal/Committee Liaison)

Dr Ray (Wei) Bi
(Vocal/Committee Liaison)

Our People

Chief Investigators

Prof Debra Bernhardt
The University of Queensland

A/Prof Jingwei Hou
The University of Queensland

Prof Darren Martin
The University of Queensland

Prof Karen Wilson
Griffith University

Prof Rachel Caruso
RMIT University

A/Prof Ruth Knibbe
The University of Queensland

Prof Tom Rufford
The University of Queensland

A/Prof Jie Zhang
Monash University

Prof Yuan Chen
The University of Sydney

Prof Adam Lee
Griffith University

Prof Yansong Shen
University of New South Wales

Prof Xiwang Zhang
The University of Queensland

Prof Christian Doonan
Adelaide University

Dr Fengwang Li
The University of Sydney

A/Prof Simon Smart
The University of Queensland

Prof Chuan Zhao
University of New South Wales

Prof Zaiping Guo
Adelaide University

A/Prof Jianfeng Mao
Adelaide University

Prof Andrew Whittaker
The University of Queensland

Prof John Zhu
The University of Queensland

Our People

Professional Staff

Dr Eloise Larsen
Chief Operations Officer
The University of Queensland

Dr Ifra Marriam
Senior Research Projects Officer
The University of Queensland

Anna Knudsen
Communications Advisor
The University of Queensland

Kaori Sugita
Senior Project Officer
The University of Queensland

Dr Deniz Ertekin
Senior Research Projects Officer
The University of Queensland

Tammika Hutton
Node Administrator
Adelaide University

Elyanna Fong
Executive and
Administrative Assistant
The University of Queensland

Partner Investigators

Prof Aimy Bazylak
University of Toronto

A/Prof Brian Seger
Technical University of Denmark

Dr Celesta Fong
CSIRO

Prof Dongxia Liu
University of Delaware

Dr Elena Corbos
Johnson Matthey

Prof Feng Jiao
Washington University in St. Louis

Adj Prof James (Jim) Snow
Oakley Greenwood

Prof John Varcoe
Surrey University

Dr Matthew David
GrapheneX

Dr Michael Groszmann
Grains Research & Development Corporation

Prof Saleem Ali
University of Delaware

Ms Sylvia Tulloch
Zeotech Limited

Associate Investigators

Prof Adrian Sheppard
Australian National University

Prof Aijun Du
Queensland University of Technology

Prof Alexis Bell
Berkeley University of California

Dr Aoni Xu
The University of Sydney

Prof Ashok Kumar Nanjundan
University of Southern Queensland

Dr Bernt Johannessen
Australian Nuclear Science and Technology Organisation

Dr Cameron Bentley
Monash University

Dr Changkui Fu
The University of Queensland

Prof Charl FJ Faul
University of Bristol

Prof David Winkler
La Trobe University

Prof Edward Sargent
University of Toronto

Dr Gloria Milena Monsalve Bravo
The University of Queensland

Prof Graeme Henkelman
The University of Texas at Austin

Prof Hamid Arandiyan
RMIT University

Dr Hangjuan Ren
Monash University

A/Prof Hao Li
Tohoku University

Dr Helena Wang
The University of Melbourne

Dr Hesamoddin Rabiee
University of Bern

Dr Hima Haridevan
The University of Queensland

Prof Hongxia Wang
Queensland University of Technology

Dr Hui Peng
The University of Queensland

A/Prof Jeffrey Harmer
The University of Queensland

A/Prof Lei Ge
University of Southern Queensland

Dr Lei Shi
Jilin University

Prof Liu Ye
The University of Queensland

Prof Marianthi Lerapetritou
University of Delaware

Dr Martina Lessio
University of New South Wales

Dr Mengran (Aaron) Li
The University of Melbourne

Dr Mike Tebyetekerwa
The University of Queensland

Dr Minkyung (Kaye) Kang
The University of Sydney

A/Prof Muxina Konarova
The University of Queensland

Dr Neil Robinson
The University of Western Australia

Prof Qin Li
Griffith University

Dr Ravichandar Babarao
RMIT University

A/Prof Rosalie Hocking
Swinburne University of Technology

Prof Suresh Bhatia
The University of Queensland

Dr Sailin Liu
Adelaide University

Dr Tao Li
Adelaide University

Dr Timothy Duignan
The University of Queensland

Dr Tomohiro Yasukawa
Monash University

Dr Travis Mitchell
The University of Queensland

Dr Tu Le
RMIT University

Dr Xiangkang Zeng
The University of Queensland

Dr Yong Zhao
The University of Newcastle

A/Prof Yulin Zhong
Griffith University

Prof Zaiping Guo
City University of Hong Kong

Prof Ziqi Sun
Queensland University of Technology

Our People
Postdoctoral Researchers

Postdoctoral Researchers

Dr Aimin Li
Monash University

Dr Basiram Brahma Narzary
The University of Queensland

Dr Chen (Patrick) Jia
University of New South Wales

Dr Chengli Rong
The University of Sydney

Dr Conger Li
The University of Queensland

Dr Divyani Gupta
Adelaide University

Dr Fangzhou Liu
The University of Sydney

Dr Francis McCallum
The University of Queensland

Dr Guoliang Chen
The University of Queensland

Dr Guoyin Yu
University of New South Wales

Dr Haoming Yu
Monash University

Dr Haoxin Mai
RMIT University

Dr Hsiwen (Wayne) Wu
Monash University

Dr Jindi Yang
The University of Queensland

Dr Jinshuo Zou
Adelaide University

Dr Jiyuan Liu
The University of Sydney

Dr Joshua Powell
The University of Queensland

Dr Kaige Sun
The University of Queensland

Dr Kate Flint
Adelaide University

Dr Luke Wylie
The University of Queensland

Dr Ming Yong
The University of Queensland

Dr Mohamed Ibrahim
The University of Queensland

Dr Qingbing Xia
The University of Queensland

Dr Ray (Wei) Bi
The University of Queensland

Dr Ruizhi Wu
University of New South Wales

Dr Sandani Amanda Ekanayake
RMIT University

Dr Shuang Song
University of New South Wales

Dr Steffen Jeschke
Griffith University

Dr Venkata Durga Bapayya Chowdary Dasireddy
Griffith University

Dr Wengang Huang
The University of Queensland

Dr XiaoLi Zhang
RMIT University

Dr Yu Yang
The University of Sydney

Dr Yuting Zhuo
University of New South Wales

Dr Zhong Zheng
The University of Queensland

Dr Zhuyuan Wang
The University of Queensland

Dr Zixi Xie
The University of Queensland

Our People
Students

Research Assistants

Kalyssa Sidoti
The University of Queensland

Jiayun Zhang
The University of Queensland

Master Students

Grace Huang
The University of Sydney

I Gde Banny Sanjaya
The University of Queensland

Mohammad Farkhan Hekmatyar Dwinanda
The University of Queensland

Tian Wang
The University of Queensland

Honours Students

Jack Buchanan
The University of Queensland

Xin Chen
The University of Sydney

EMCRs contributing to GETCO2 research projects

PhD Students

Abdelmoniem Abughazala
Monash University

Abdullah Alanazi
The University of Queensland

Aiping Zheng
RMIT University

Anoja Kawsihan
Adelaide University

Ayesha Siddique
The University of Queensland

Beibei Ma
The University of Queensland

Chunlu Ding
Monash University

Dayu Zhu
Monash University

Fatema Khatun
The University of Queensland

Gongbo Liu
Monash University

Hafiza Sana
Monash University

Hanan Mohamed Mohsin
University of New South Wales

Hao Wang
The University of Queensland

Haochen Lu
University of New South Wales

Hirusha Hansamali Jayarathne Rajapaksha Mudiyanselage
The University of Queensland

Hizkia Manuel Vieri Gultom
The University of Queensland

Hongxia Zhang
The University of Queensland

Huaxuan Han
Adelaide University

Jayden Bryant
The University of Queensland

Jie Yang
The University of Queensland

Jinqi Xiong
The University of Sydney

Kaijie Xu
The University of Queensland

Lei Liu
Monash University

Liuru Fang
Monash University

Maleeha Jamal
The University of Queensland

Malin Wachtler
RMIT University

Mengjie Liu
Monash University

Mengmeng Jin
Adelaide University

Mengmeng Yang
University of New South Wales

Naimatul Khoiroh
The University of Queensland

Ni Made Sri Suliartini
The University of Queensland

Nicholas Paraskevas
The University of Queensland

Niken Taufiqurrahmi Listyorini
The University of Queensland

Piyathi Muthukumarana
RMIT University

Prince Kumar Patel
The University of Queensland

Qiyang Zhang
University of New South Wales

Rachel Mugumo
The University of Queensland

Rizal Evans
The University of Queensland

Ronny Javier Pibaque Sanchez
The University of Queensland

Ruirui Liu
University of New South Wales

Sachin Kumar
The University of Queensland

Tanika Duivenvoorden
The University of Queensland

Thi Kieu Oanh Le
Griffith University

Tommy Hatzimanolis
The University of Queensland

Wenming Zhao
The University of Queensland

Xiangyi Zha
The University of Queensland

Yaodong Zhang
The University of Queensland

Yifan Hu
University of New South Wales

Ying Liu
Adelaide University

Yuen-Leong (Calvin) Chow
Monash University

Yurou Li
Adelaide University

Zhichuan Ma
The University of Queensland

Zhun Shi
University of New South Wales

Activity Report

Dr Eloise Larsen
Chief Operations Officer

In 2025, we reviewed and updated the Centre governance, streamlining our structure with the growth and expansion of Centre capacity and activities – unifying our advisory committees, integrating the Deputy Director Research role, and forming an EMCR committee. We also established a new collaborative travel grant scheme and held our first round of annual GETCO2 awards – all exciting developments in the evolution of the Centre.

In terms of performance, we are exceeding the vast majority of our KPI targets and driving real impact. We know that collaboration is the biggest challenge facing any organisation with diverse stakeholders and disciplines, and we will continue to build on our frameworks and strategies to bring Centre members together. It is fantastic to see we are exceeding our targets for female research personnel and percentage female PhD recruits – creating an environment for women to succeed in STEM career paths in a field which has very low gender diversity. Our financial statement shows that Centre expenditure almost doubled in this year compared to 2024, highlighting the surge in activities with our research teams now in place.

In the operations team we fondly farewelled Aimee Sisley and welcomed Elyanna Fong. With a background in IT and Executive support, Elyanna is an ideal fit for the operations team. Along with the Deputy Director Research, we created the new role of Senior Research Projects Officer to support our research program, which has flourished with our rapidly expanding research teams. Dr Ifra Marriam brings to the team a PhD in materials science and battery research, combined with experience in HDR student support. Dr Deniz Ertekin temporarily joined the team while Ifra was on parental leave. With a PhD in neuroscience and great experience in science communication and engagement, Deniz joined us at the busiest time of the year - a week or so before our conference. We thank Deniz for her industrious contributions to the Centre over a short period.

Communications Community of Practice at the ARC COE Summit in July at Swinburne University, Melbourne.

Professional staff meeting at the ARC Centres of Excellence Summit in July at RMIT, Melbourne.

Finance Community of Practice at ARC COE Summit in July at The University of Melbourne.

FLEET COO Dr Tich-Lam Nguyen facilitates a panel discussion about ARC Centre Of Excellence succession planning with Directors, Prof Peter Taylor (ACEMS), Prof Emma Ryan-Weber (ASTRO 3D) and Prof Brant Gibson (CNBP).

In 2025, the annual ARC Centre of Excellence Summit was organised by Chief Operation Officers located in Melbourne. The Director and COOs meeting at the Summit opened with an inspiring address by Prof Ute Roessner, ARC Chief Executive Officer, who described centres as “powerful engines of innovation”. For me, it was fantastic wrapping up the day with the COOs, swapping best practice insights and strategy. At the professional staff day, comprising operations teams from Centres across the nation, we were energised by inspiring stories of collaboration across Centres and examples of past joint initiatives – the kind of momentum we’re eager to amplify in 2026 and beyond. We feel fortunate to be part of a generous and welcoming community, with a culture of continuous learning and sharing, united by the common goal of excellence in practice!

Developed over the course of 2024-2025, it was amazing to bring the Centre Charter to fruition — a milestone shaped by the voices of our community, capturing who we are and how we choose to work together. Our members identified the values that define us: curiosity, learning, IDEA, collaboration, kindness, integrity and transparency. With this Charter, GETCO2 commits to weaving these principles into our culture, our governance and our long-term direction.

Our advisory committee members described the culture at our 2025 National Conference as alive with “buzz” and “energy”. We strive for all of our events to be purposeful, challenging and fun, sparking a positive Centre culture which naturally radiates outward. We are thrilled that our strategic collaborations over the course of 2025 have led to the commitment to hold an international conference in 2026! In 2023, we held our first international conference (International Symposium on Green Transformation of Carbon Dioxide ISGTCO2) to launch the Centre onto the global landscape. Seeing how GETCO2 has supercharged its research and partnerships will be amazing as we gather our collaborators from across Australia and around the world for the 2026 International CO_2 Alliance Conference.

GETCO2

2025

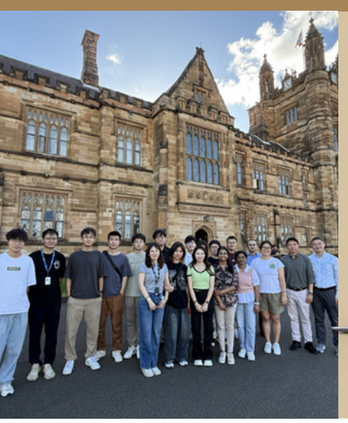
Timeline of activities

Q1

February
CI Workshop & Node Spotlight, Brisbane

February
RCAST visit Japan

March
Node Spotlight Sydney



March
First EMCR Committee Meeting

Q2

April
Online Computation Workshop

May
inSTEM Melbourne

May
Node Spotlight Melbourne

June
Ngee Ann Polytechnic visit, Brisbane

Q3

July
Winter School Brisbane

August
Science Alive! Adelaide

September
Node Spotlight Brisbane

September
CAETS Technical tour, Brisbane

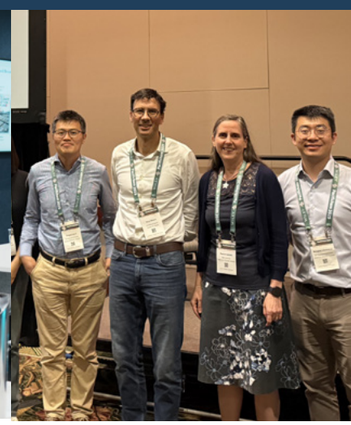
Q4

November
National Conference Sydney

November
Hackathon Pitching Sydney

December
IMSTEC Training Workshop, Brisbane

December
Pacifichem Hawaii



Highlights

Building Global Partnerships

In 2025, GETCO2 advanced its global collaboration efforts through a strengthened partnership with the University of Tokyo's Research Center for Advanced Science and Technology (RCAST).

The collaboration, launched in 2024, brings together complementary expertise from Australia and Japan aiming to accelerate innovation in electrochemical systems, CO_2 conversion, hydrogen energy and emerging bioprocessing technologies.

From left: Prof John Zhu, Prof Tom Rufford, Dr Ifra Marriam, Dr Hui Ying Hoh, Prof Xiwang Zhang, Prof Tatsuoki Kono, Prof Masakazu Sugiyama, Dr Mike Tebyetekerwa, Prof Debra Bernhardt, Dr Eloise Larsen, Prof Darren Martin, Caroline Stott, A/Prof Simon Smart. Online from left: Assistant Prof Masahiro Fukuda, Project A/Prof Hiromu Kumagai and Sumiyo Okawa

Prof Sugiyama, Professor Satoshi Ohara and Prof Kono inspect the GETCO2 laboratories with CI Prof Darren Martin and AI Dr Hima Haridevan

Dinner with the Consul-General of Japan and representatives from Trade and Investment Queensland, Sumitomo Australia Pty Ltd., Idemitsu Australia Pty Ltd., Sumisho Coal Australia Holdings Pty Ltd, Queensland Japan Chamber of Commerce & Industry, Queensland Treasury, UQ Biosustainability Hub, UQ Global Partnerships and UQ Strategic Partnerships - Government and Industry. Ikebana flowers kindly arranged by Elyanna Fong and Vernisher Wooh (Sogetsu Ikebana Queensland).

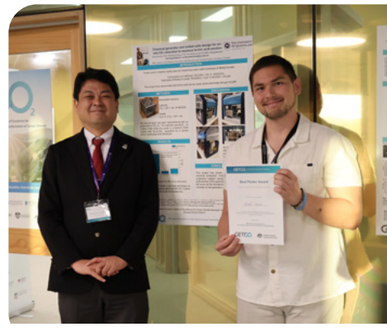
Two major engagements in 2025 shaped this growing partnership:

February 2025: A GETCO2 delegation travelled to RCAST in Tokyo to deepen technical exchanges on catalyst and electrolyser performance, system design, and biotechnology integration into industrial processes.

Industry and government collaborators - including Trade and Investment Queensland, Sumitomo Corporation, Idemitsu Kosan Co.,Ltd, and New Energy and Industrial Technology Development Organization (NEDO) joined the conversations to explore collaborative approaches to regional decarbonisation and resilient international supply chains.

August 2025: RCAST researchers returned to GETCO2 to meet with a broader group of UQ leaders and explore wider collaborations between The University of Tokyo and The University of Queensland. RCAST Director Prof Masakazu Sugiyama held technical meetings with UQ researchers and engaged with GETCO2 EMCRs during a research poster session. The visit identified new opportunities for cooperative projects, EMCR exchanges and joint training.

This growing partnership has led to a joint application to the Australia–Japan Innovation Fund (AJIF) for 2025–26.



PhD student Rizal Evans, winner of the Best Poster Award at GETCO2's poster session, kindly judged and awarded by Prof Sugiyama.

GETCO2 centre members visiting RCAST in February 2025.

Highlights

Dr Eloise Larsen
Chief Operations Officer

National Conference

The 2025 GETCO2 National Conference brought together 110+ Centre members and affiliates at Sydney's historic Q Station. Over three days, participants shared research progress, engaged in professional development, contributed to strategic and operational planning and review, and networked at an engaging poster session featuring 50+ EMCR research projects. We also celebrated excellence through our Centre Awards, recognising the achievements of our members in engagement, collaboration, diversity, research breakthroughs, and innovation.

98%
of participants rated the overall conference as "Excellent"

112
participants

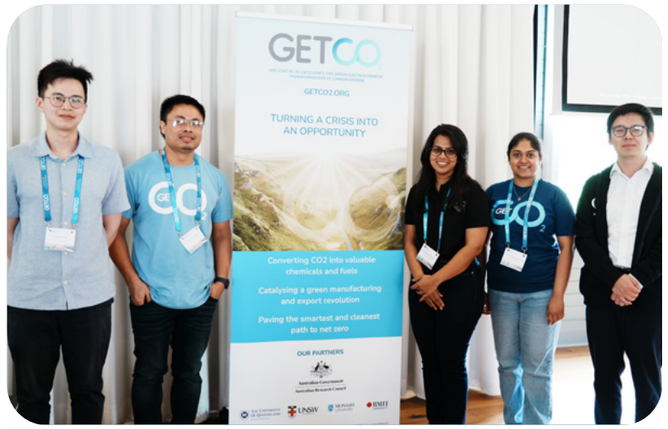
40
presentations and workshops

54
research posters

With a community representing more than 20 nationalities, we held a multicultural panel discussion exploring the opportunities and challenges of cross-cultural collaboration.

The cultural diversity of our people was also beautifully represented at our gala dinner.

Our national conference program included ongoing research program review and activity planning for 2026.



Our EMCR Committee gave an overview of the capacity building and leadership activities the committee has led, and encouraged the EMCR cohort to get involved. They also organised a fun team-building exercise constructing kites!

"All things/activities were well-organized and arranged."
"All the casual conversations are always valuable!"
"Smooth program, professional transition between sessions, well organised."

Highlights

Hackathon 2025

An ambitious initiative run by the Centre's Engagement & Partnerships Portfolio, the Hackathon was designed to accelerate innovation in CO_2 electrolysis and Power-to-X technologies.

The Hackathon brought together five multidisciplinary teams from seven universities, comprising EMCRs, PhD candidates, and Associate Investigators from our partner universities and other universities across Australia.

The teams were tasked with identifying high-impact innovations in materials and supply chains to enable sustainable gigawatt-scale deployment of CO_2 electrolysers, while considering techno-economic analysis, life cycle assessment and policy frameworks.

Designed as more than just a competition, the Hackathon focused on creating a collaborative learning experience for the team members. Over 12 weeks, they engaged in interactive online workshops covering entrepreneurship, human-centred design, business modelling and techno-economic analysis. These sessions featured insights from industry leaders and innovation experts, including speakers from UniQuest, Main Sequence and Lewi Software, who shared practical strategies for translating research into real-world solutions.

5
teams from 7 universities

100%
rating of 'very good' or 'excellent'

69%
reported growth and new skills

20+
EMCRs collaborated across disciplines

The Hackathon teams were generously mentored by highly experienced industry leaders, including Dr Sahil Garg and Dr Sui Boon Liaw from Woodside Energy, Leigh Staines (Industry Professor for the Resources Technology and Critical Minerals Trailblazer Program), KS Chan (Chief Commercialisation Officer CO_2CRC), and Leeanne Bond (Professional company director, chairperson and board member).

The mentors kindly volunteered their invaluable expertise, guiding the teams through technical challenges to shape commercially viable concepts.

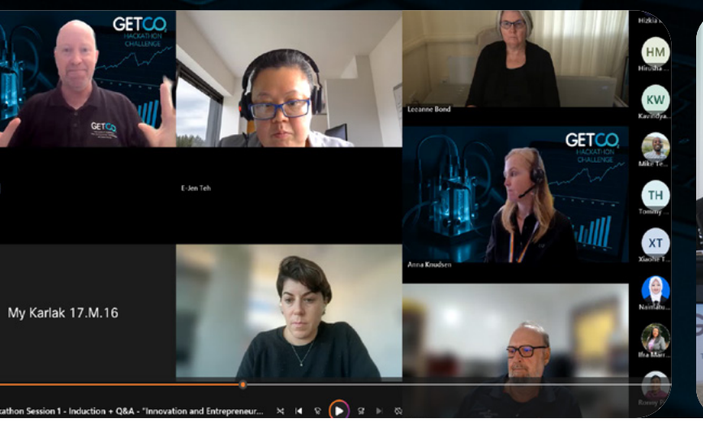
We were thrilled that Oakley Greenwood Pty Ltd, Woodside Energy and Main Sequence, generously sponsored the Hackathon, maintaining strong industry focus and engagement.

The Hackathon finale took place at the GETCO2 National Conference in Sydney, where teams refined their pitches and presented to an esteemed judging panel. The CO_2nverters claimed first place with an innovative electrolyser concept enabling farmers to produce formic acid affordably and safely, while Team CelluStack earned runner-up for their modular, recyclable design.

These solutions exemplify the creativity, collaboration, and commitment that define GETCO2's mission to drive a sustainable future through CO_2 transformation.

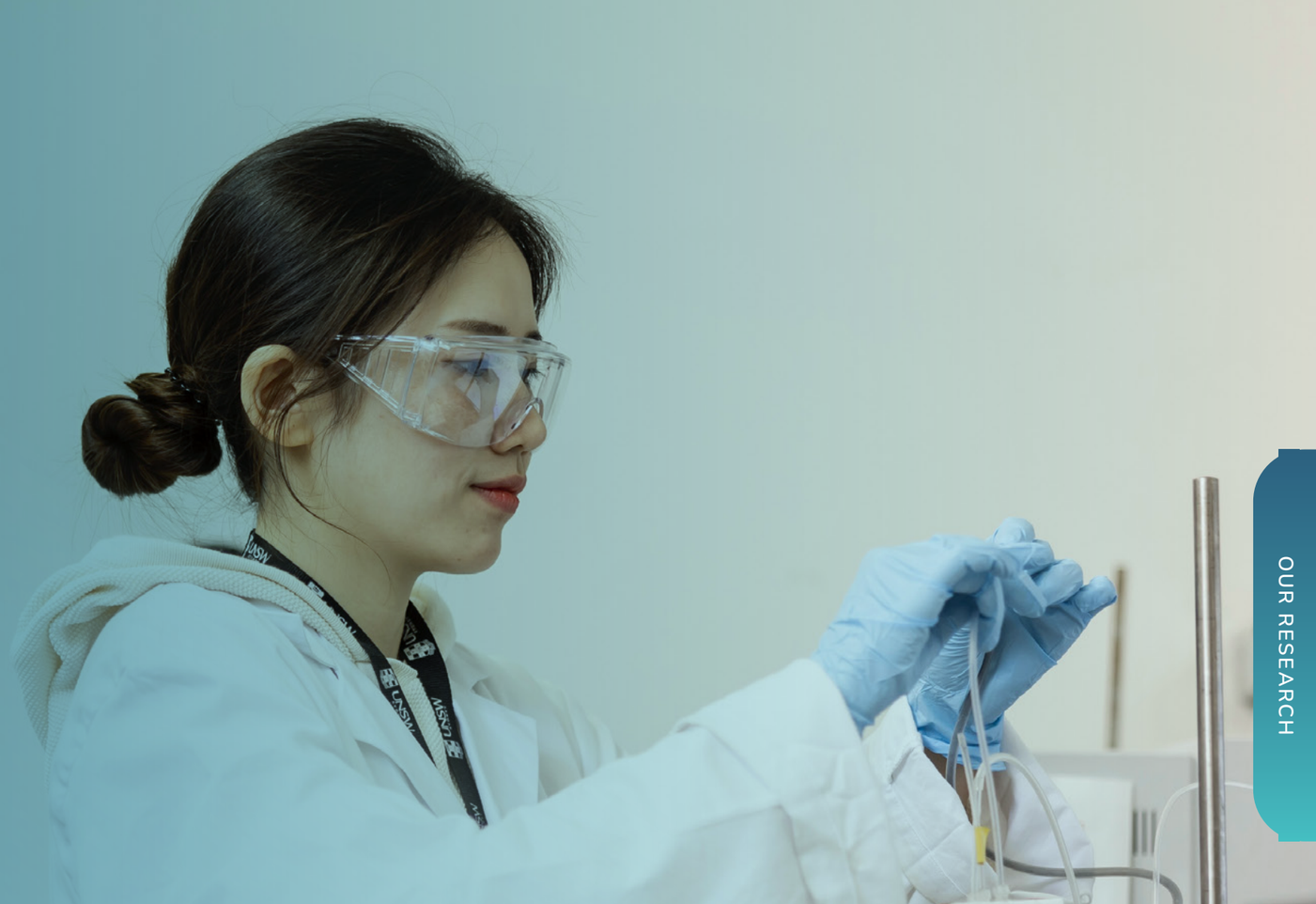
The winning prize was a 2-hour workshop delivered by Main Sequence with tailored entrepreneurship coaching, to help the winners with ideas for the next steps for their innovation.

Big thanks to our Hackathon Judges, image below from left: Em Prof Jurg Keller, Adj Prof Jim Snow, Dr Gloria M.M. Bravo and Dr Anita Hill



Converting CO_2 into valuable chemicals and fuels.
Catalysing a green manufacturing and export revolution.
Paving the smartest and cleanest path to net zero.

OUR RESEARCH



In our second year of operation, the growth of our EMCR cohort pushed our research activity into a higher gear. Two of our EMCRs were named in the Stanford/Elsevier Top 2% Scientists 2025. Our global reach is expanding with our work cited in 19 different subject categories by authors in 76 countries. Eight of our publications to date are Highly Cited, with 5 of them Hot Papers in the top 0.1% of their subject area.

Deputy Directors' Report

Prof Rachel Caruso
RMIT

Prof Tom Rufford
The University of Queensland

Team capacity grew through the recruitment of new postdoctoral and PhD researchers

There was a real buzz and energy when we assembled in November for GETCO2's 2025 National Conference, with a cohort approaching the target capacity of the Centre. In fact, with additional scholarships, fellowships and new project funding we are on track to exceed the target numbers of researchers working on GETCO2 projects.

In 2025, the number of early- and mid-career researchers (EMCRs) contributing to GETCO2 research grew to 88. The EMCR team includes 35 postdoctoral researchers – an increase of 60% on 2024 – comprising 24 positions partly or fully funded by the Centre and 11 researchers supported through other funding, including one ARC Early Career Industry Fellow and one ARC Discovery Early Career Researcher Award Fellow.

Dr Anita Hill and Em Prof Jurg Keller give feedback to the Hackathon teams at the National Conference

56
EMCR-led research projects

23
publications co-authored by CIs and AIs

88
EMCRs

Increasing by 33% since 2024, the 53 PhD students working on Centre projects included 23 students funded by GETCO2 stipends or top-ups, with at least 15 students funded by University Research Training Program or Strategic scholarships, and six students awarded international scholarships, demonstrating the high quality of our cohort. We also continued to support the career pipeline from undergraduate project students to postgraduate students, with 9 Masters/Honours students working with GETCO2.

Research Project Reviews

In our second year of operation, we initiated a formal research project review (RPR) across the Centre to evaluate progress toward the Centre's objectives and identify additional opportunities for collaboration within and beyond the Centre. In the reviews, we were excited to see new EMCR-led projects initiated within the GETCO2 Research Program that explore emerging scientific questions and build collaborations across teams and nodes. During the RPR, our Research Theme and Flagship leaders reviewed progress on 56 projects across the Centre and mapped our research staff and students' work against the Centre's objectives. We were pleased to see significant progress in several critical areas, and our Chief Investigators discussed opportunities to build on these achievements in 2026. Many thanks to the CIs and EMCRs for their contribution to the RPR to ensure effective oversight of the Centre research program.

Strategic funds

In 2025, we progressed the strategic projects that were awarded in 2024, and awarded one new strategic fund project, **Manufacturing and commissioning demonstration prototypes.** These demonstration prototypes designed and built at UQ in 2025 have been a great success for sharing our Centre's research vision with a wide range of audiences from industry, government, school students and the public who have visited UQ laboratories, UQ Open Day and Science Alive! in Adelaide. See Research Feature: CO_2-to-formic-acid electrolyser on page 54.

Enhancing GETCO2 reach and capabilities with new Associate Investigators

We welcomed six new researchers to the GETCO2 community as Associate Investigators (AIs):

- Prof Charl FJ Faul (University of Bristol)
- Dr Helena Wang (The University of Melbourne)
- Dr Tomohiro Yasukawa (Monash University)
- Dr Hesamoddin Rabiee (University of Bern)
- Dr Hangjuan Ren (Monash University)
- Dr Yong Zhao (University of Newcastle)

We are now engaged with AIs from 15 Australian institutions and 9 international institutions, and value the wide range of expertise and contributions these collaborators bring to GETCO2's research endeavours. The strength and productivity of the AI contributions is evidenced by 23 publications coauthored by CIs and AIs in 2025. We were extremely pleased that 13 of our Australian-based AIs joined the 2025 National Conference at Q Station, and we thank those who did an excellent job of rigorously reviewing and judging our exciting EMCR poster session!

Research Advisory Committee updates

We were again grateful to have strong support from our Research Advisory Committee (RAC) this year. We met in person with Prof Robin Batterham, Prof Sandra Kentish and Dr Anita Hill during our Node spotlight in Melbourne, where they participated in a robust Q&A and generously reviewed our EMCR poster presentations.

It was also wonderful to have RAC involvement in our inaugural Hackathon, where Dr Anita Hill and Em Prof Jurg Keller not only shared their experiences in research translation and impact with the EMCRs, but also volunteered to carefully judge the pitching competition. We also appreciate Prof Benny Freeman's incredibly useful and strategic insights from his experiences as Director for the Center for Materials for Water and Energy Systems (MWET) during our National Conference.

In April 2025, Centre Director Prof Xiwang Zhang and CI Dr Fengwang Li visited RAC member Prof David Sinton, Director of CANSTOREnergy at the University of Toronto, Canada to explore strategic alignments with GETCO2.

Finally, we look forward to working together with Dr Anita Hill and Prof Sandra Kentish, from our previous Research Advisory Committee, in their new roles as GETCO2 Advisory Committee Co-Chairs. Their vast experience and enthusiastic contributions will continue to be incredibly valuable to Centre research and strategy.

GETCO2 Director Prof Xiwang Zhang and CI Dr Fengwang Li visiting AI Prof Edward Sargent's group at Northwestern University

Research Framework

Our four Research Themes focus on advancing fundamental knowledge and technology associated with electrolyser components.

The innovations generated from the Research Themes will support the development of next-generation CO_2 electrolysers that can produce and co-produce commercially attractive products via our Flagship Programs.

Our three Flagship Programs aim to develop processes for the conversion of CO_2 to high-value, commercially relevant target products, applying the innovations generated from our four Research Themes.

Flagship Program 1

Multicarbon compounds (e.g., ethylene, ethanol)

Flagship Program 2

Organonitrogen compounds (e.g., urea, methylamine)

Flagship Program 3

Value-added co-products (e.g., formic acid, lactic acid)

Integrated Research Program

Themes: Advancing fundamental knowledge and technology

Flagships: Applying innovations to chemical and fuel production

Research Theme 1

Electrode & Electrolyser


Theme leaders:
Prof Tom Rufford and Prof Yansong Shen

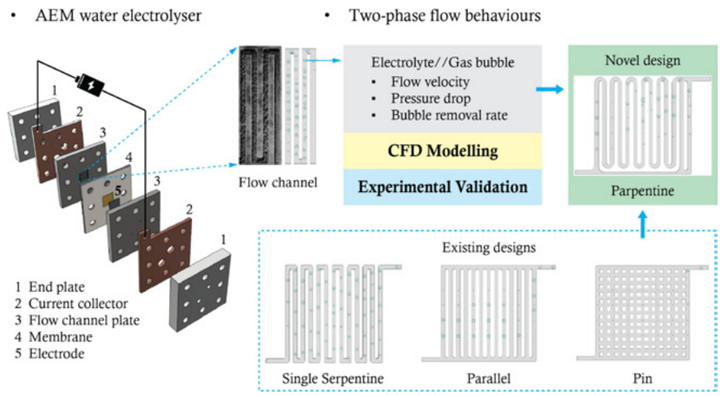
Overview

RT1 Electrode & Electrolyser focuses on creating new electrode structures and fabrication methods for integrated electrolysers. This work is driven by a detailed understanding of gas, liquid and solid interfaces, as well as mass and charge transport and reaction kinetics. Insights into the structure and stability of electrical double layers and gas bubbles will guide the design of electrocatalysts, electrodes and full electrolyser systems. This fundamental knowledge will also be relevant to fields such as colloid and interface science, and the outcomes are expected to benefit areas including fuel cells, photo(electro)catalysis for water splitting and microfluidics.

Key aims and activities for 2026

RT1 will encourage wider use of the electrolyser performance testing facility at UQ and the numerical virtual electrolyser at UNSW, particularly for access by EMCRs across GETCO2. In 2025, we validated these platforms so there is now opportunity for wider collaboration. The experimental bench-top facility was introduced to Centre members at the 2025 EMCR Winter School held at UQ. We plan to hold an online workshop about the virtual platform in early 2026.

Led by RT1, UQ CIs will host a one-day workshop at UQ on 4 September 2026 as a satellite meeting in conjunction with the *77th Annual Meeting of the International Society of Electrochemistry* in Sydney. The interactive workshop will share the latest GETCO2 findings on *Best practices for CO_2 and water electrolyser testing*, showcasing the experimental performance testing facility.



A novel flow channel design optimising two-phase flow behaviours.

Model by Dr Yuting Zhuo, UNSW

Research highlights for 2025

Through a collaborative effort, RT1 established an advanced CO_2 electrolyser performance testing facility at UQ in 2025. This electrolyser testing facility provides the physical infrastructure and test protocols for researchers to assess their catalyst, electrodes or membrane materials under standardised conditions. A workshop was held in conjunction with the GETCO2 Winter School to train GETCO2 EMCRs on use of the facility. In parallel to the development of the laboratory testing facility at UQ, a virtual testing model was developed at UNSW.

EMCR Dr Yuting Zhuo and CI Yansong Shen at UNSW developed and validated a virtual prototype of a full-scale electrolyser simulating industrial scale conditions. This prototype serves as a platform to test new catalysts, electrodes, membranes, cell components and cell design in a numerical simulation. Other Centre members and collaborators can access the virtual prototype to model performance data to explore the effectiveness and potential benefits of new materials or designs.

Other highlights led from RT1, include the portable CO_2-to-formic-acid electrolyser (see Research Feature page 54) and the collaborative perspective article in Chemical Science where GETCO2 authors analyse the impacts and risks of existing global supply chains for critical materials needed for Power-to-X technologies (see Research Feature page 57).

Projects

RT1A: Managing gas and liquid transport in electrolysers

RT1B: Novel electrodes and electrolyser designs and fabrication methods

RT1C: Protocols for electrolyser testing, design, and scale-up

RT1D: Design of Cu-based cathodes and electrolysers

RT1E: Electrochemical process design and technology adoption

Research Theme 2

Catalyst


Theme leaders:
Prof Yuan Chen and A/Prof Jie Zhang

Overview

RT2 Catalyst focuses on delivering mechanistic and kinetic models for describing electrochemical CO_2 conversion and fundamental insights into electrocatalyst structure-performance relationships. We will develop standardised testing protocols for CO_2 conversion and an associated database of reliable performance benchmarks. These integrated tools will provide new knowledge and capabilities for realistically assessing electrocatalyst performance, and solutions for enhancing performance at the system level. Working with RT1 Electrode & Electrolyser and RT3 Membranes, optimised cathode and anode electrocatalysts will be assessed at the system level using full-cell electrolysers and membranes for various Flagship projects. This will benefit the wider electrochemistry and catalysis research communities and underpin the discovery and patenting of new electrocatalyst formulations and ionic liquids for CO_2 conversion to high-value products.

Key aims and activities for 2026

RT2 will use an automated testing array of 10-20 electrochemical reactors to validate and compare catalysts from various research groups invited to submit samples for testing and collaboration. New instrumentation and protocols for rapid electrocatalyst synthesis, and spectroscopic and microscopic tools for screening physicochemical properties of electrocatalyst libraries will be developed.

Various types of single atom catalysts will be synthesised, e.g. single atom alloys, and liquid and vapour phase synthesis routes will be compared. The aim is to both stabilise active catalytic sites and to balance highly stable materials with appropriate reactivity.

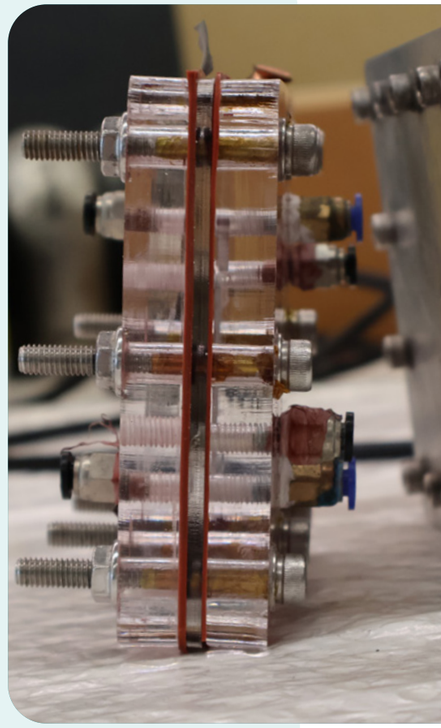
With the key aim of developing more efficient electrocatalysts for desired CO_2 reduction products, RT2 will focus on understanding the role of incorporating nitrogen (N-doping) into semiconductor material copper(II) oxide (CuO) for improving methanal production. The role of rare earth doping on catalyst performance will be explored through doping cerium (Ce) to bismuth (Bi) catalysts. We will also create new graphitic carbon substrates to support electrocatalysts and improve catalytic activity.

Research highlights for 2025

RT2 established advanced data reproducibility standards for research on electrochemical CO_2 conversion, including structured data-processing methods, consistent reporting practices, and strategies that connect performance evaluation with mechanistic studies. These findings were published in the top-tier journal Joule, in a paper titled *Enhancing data reproducibility and relevance for performance-mechanism studies in CO_2 electrocatalysis*, co-authored by EMCR Yu Yang, EMCR Dr Jiyuan Liu, AI Dr Aoni Xu, CI Prof Fengwang Li, and international collaborator Yaohui Shi.

RT2 work showed that the local coordination environment of single atom catalysts is a powerful way to control reaction pathways. For instance, fluorine doping reshaped isolated copper sites and enabled efficient CO_2 reduction to multi-carbon products. Likewise, molecule doped Cu–Au alloy sites greatly improved carbon monoxide (CO) electroreduction to multi-carbon products. The team also demonstrated that hierarchical porosity is crucial for achieving industrial level performance. A single atom iron catalyst with ordered pores delivered much better mass transfer for CO_2 reduction.

CI Prof Yuan Chen's team and international collaborator Prof Fuming Chen have coupled electrochemical CO_2 reduction with desalination using a carbon-based catalyst. The CO_2 reduction generates high current densities, which drives rapid ion transfer across desalination membranes. With one of the highest salt removal rates ever reported, this process can yield drinkable water from seawater. The work was published as a Very Important Paper (VIP) in Angewandte Chemie International Edition. VIPs are exceptionally high-quality publications, representing the top 5% of articles, based on recommendations from at least two referees, who identify the work as outstanding or highly important to the field.



Projects

RT2A: A standardised, high-throughput electrocatalyst discovery platform

RT2B: Mechanistic insight and quantitative structure-reactivity relationship

RT2C: Engineering catalyst surfaces to improve selectivity and stability

Research Theme 3

Membranes

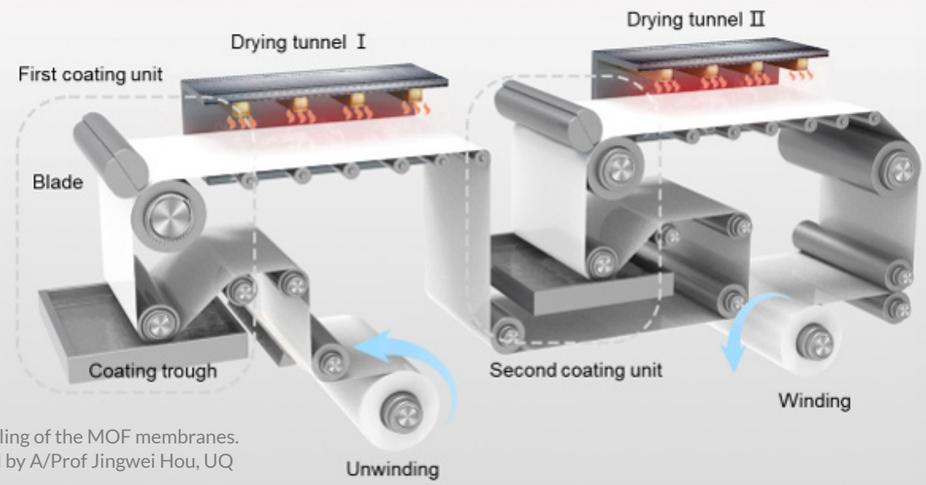

Theme leaders:
A/Prof Jingwei Hou and Prof Andrew Whittaker

Overview

In CO_2 electrolysers, membranes separate the cathode and anode chambers allowing selective exchange of molecules between them. RT3 Membranes aims to develop high-performance membranes to achieve selective separation of ions and molecules crucial to CO_2 electrolyser operation by establishing design and fabrication principles and operating protocols. New characterisation and modelling tools will support the development of novel membranes with precise molecular separation abilities that will have far-reaching industrial impacts in pharmaceutical, energy, environmental, petrochemical and clinical applications.

Key aims and activities for 2026

RT3 researchers plan to investigate high-performance hybrid separation materials by exploring interdisciplinary membrane research. Particular focus will be placed on the development and understanding of emerging materials such as metal–organic frameworks (MOFs), polymers with intrinsic microporosity (PIMs), and two-dimensional (2D) separation membranes. The research will aim to enhance separation efficiency while addressing key challenges related to material stability, thereby improving the practical application of advanced membrane technologies.



Upscaling of the MOF membranes.
Model by A/Prof Jingwei Hou, UQ

Research highlights for 2025

In 2025, RT3 combined strong fundamental research with active efforts towards translation and real-world applications. While continuing to advance the science of porous materials and separation membranes, the team has placed increasing emphasis on scaling up technologies and industry-relevant outcomes. RT3 is exploring shared synergies between membranes for CO_2 capture and CO_2 transformation technologies through connections with leading international industry players.

RT3 also strengthened its interdisciplinary and international research collaborations in 2025, with CIs engaging with researchers at Tianjin University, Tsinghua University and Nanjing University. Prof Charl Faul of University of Bristol was endorsed as a GETCO2 Associate Investigator. Prof Faul contributes expertise in engineering porous polymers for separation and catalysis, and his involvement in the Centre enhances strategic links with leading European institutions.

Within RT3, several CIs are co-supervising students, thereby supporting knowledge sharing and improved student training. In November 2025, RT3 held a membrane/separations workshop comprising research presentations and a poster session. The workshop was organised by EMCR Dr Jindi Yang and CI A/Prof Jingwei Hou. Chaired and facilitated by EMCRs, the workshop enabled 11 EMCRs from across UQ to network, share their research and learn from each other.

RT3 led the organisation of post-conference workshop *Membrane Innovations for Decarbonisation and Resource Recovery* at UQ in conjunction with the 12th International Membrane Science and Technology Conference (IMSTEC), December 2025. Chaired by Centre Director CI Prof Xiwang Zhang, with EMCRs Dr Rijia Lin and Dr Zhuyuan Wang, the workshop attracted 24 participants from 11 institutions, 4 of which were international, with contributions from GETCO2 Advisory Committee members Prof Sandra Kentish and Honorary Prof Vicki Chen.

Projects

RT3A: Advanced membranes for gas separation – enabling CO_2 capture from flue gas and direct air capture

RT3B: Robust ion-exchange membrane for CO_2 electrolyser

RT3C: Zeolite-based membranes for CO_2 direct air capture: a multi-scale approach

Research Theme 4

Characterisation & Computation

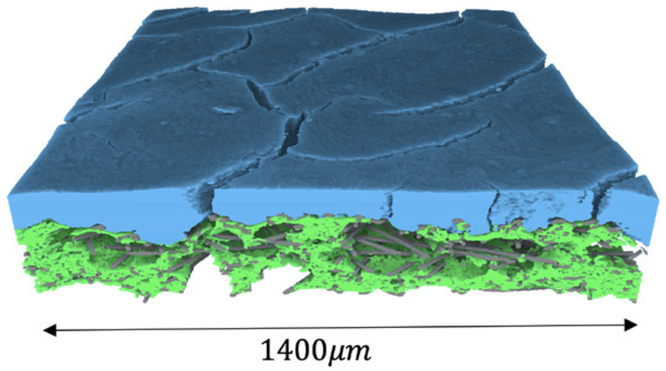

Theme leaders:
A/Prof Ruth Knibbe and Prof Debra Bernhardt

Overview

RT4 Characterisation and Computation is structured around three interconnected components: spectroscopy, imaging, and modelling to improve mechanistic understanding. We are developing advanced methods to capture dynamic processes, to provide time- and space-resolved insights into complex chemical and physical transformations. Our imaging work focuses on creating integrated three-dimensional models that range from the nanometre to the millimetre scales, helping us to understand the structure of electrolyser materials as they age with use. New approaches in modelling are being developed to understand catalytic reactions, and transport of gases and ions through membranes.

Key aims and activities for 2026

We will strengthen collaborations with GETCO2 AIs, A/Prof Rosalie Hocking from Swinburne University of Technology and Dr Bernt Johannessen at ANSTO, exploring multimodal operando approaches, combining spectroscopy with advanced imaging. In parallel, we will continue to develop methods for 3D imaging for multiscale analysis and modelling. To better understand reaction/diffusion processes we are combining quantum calculations with molecular simulations. The use of ionic liquids as an electrolyte for CO_2 electrolysis is also being analysed. Much of this theoretical work requires close collaboration with research groups working with laboratory experiments to validate assumptions and predictions.



Left image:

Gas diffusion layer and microporous layer provided by SGL Carbon. Nick Paraskevas segmented the sample using a 2.5D convolutional neural network (Sensor3D), with imaging assistance from Dr Levi Beeching using the ANU HeliScan MicroCT at a resolution of 1.1 μm. Grey represents the carbon fibres, blue represents the microporous layer and green represents a carbonised resin binder.

Research highlights for 2025

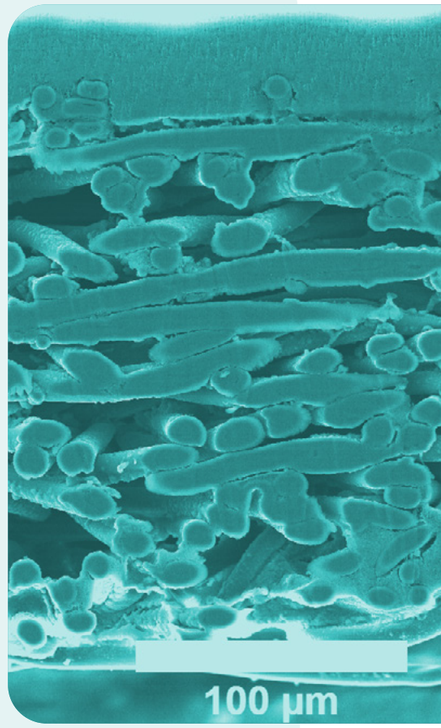
Work by AI Dr Aoni Xu at USyd and EMCR Dr Luke Wylie at UQ is an exemplar of RT4 collaboration across Nodes and expertise (see Collaborative Travel Grants page 70). Together they described how CO_2 self-consumption using silver-based electrolytes influences the Tafel slope, which describes catalytic performance and reaction mechanisms.

Below, UQ PhD student Nick Paraskevas explains how he has been developing advanced 3D models to understand how the electrolyser gas diffusion layer works:

We use X ray scans to look inside gas diffusion layers (GDLs), which are components of electrolysers. This project is part of a bigger effort to figure out how large a sample needs to be so we can accurately study how gases and liquids move through it. We also want to predict how liquid spreads through the materials when it floods.

One big challenge is that GDLs are almost all made of carbon. The fibres, binder and microporous layer all have nearly the same density, so in X-ray images they look almost identical. This makes it hard to tell the different components apart using normal image processing methods. A convolutional neural network (CNN, a type of AI) can do better because it can detect small differences in shape and texture.

While CNN has been used for this before, the model looked at each image slice separately. That caused small jumps or 'flickering' between slices. This not only looks messy but also causes problems when we try to simulate how liquid and air move through the material, because the boundaries need to be smooth. To fix this, we used a '2.5D' method that includes neighbouring slices during training of the model. This makes the layers line up smoothly and removes the need for extra cleanup afterward.



Projects

RT4A: Cell designs for operando spectroscopy and microscopy

RT4B: Advanced imaging

RT4C: Kinetics and mechanisms across length scales

Image above:

Cross-section of a gas diffusion electrode used in CO_2 reduction. The gas diffusion layer (bottom) consists of long carbon fibres, while the microporous layer (top), is denser and comprises carbon nanoparticles and a binder.

Flagship Program 1

Multicarbon compounds via carbon-carbon bond formation


Program leaders:
Dr Fengwang Li and Prof John Zhu

Overview

Flagship Program 1 (FP1) tackles one of the grand challenges in carbon utilisation: converting CO_2 into valuable multicarbon compounds such as ethylene, ethanol and propanol. By forming new carbon-carbon bonds using renewable electricity, we can create sustainable chemical feedstocks that reduce our reliance on fossil fuels and mitigate greenhouse gas emissions.

Over the past two years, FP1 has integrated innovations across all our research themes, from designing new copper-based catalysts and advanced membranes to developing robust electrolyser designs. This holistic approach ensures that we are not just making discoveries at the atomic level, but actively translating them into efficient, scalable devices capable of operating under practical industrial conditions.

Key aims and activities for 2026

In 2026, FP1 will shift toward translating our laboratory-scale breakthroughs into practical, larger scale systems. We will integrate our patented membranes, engineered catalysts and optimised gas-diffusion electrodes into bigger membrane electrode assembly (MEA) electrolysers. Importantly, we will test these multi-layer stack designs under industrially relevant conditions to evaluate mass transport, thermal management and long-term durability.

We will also leverage our new computational tools—including Large Language Model (LLM)-assisted workflows and molecular dynamics simulations—to rapidly screen new catalyst and electrolyte compositions. By pairing these predictive data-driven models with advanced real-time characterisation, we aim to define universal design rules that further boost energy efficiency and improve multicarbon product selectivity.

Research highlights for 2025

In 2025, we created advanced copper based catalyst designs—using ligand control and engineered interfaces—that drive carbon-carbon coupling efficiently and boost ethylene selectivity at industrially relevant current densities. We also began charting the previously unknown reaction pathways needed to make higher value, high-energy-density C3 products such as n-propanol.

Our team had a breakthrough in our membrane technology, developing a nanochannel-confined polymerisation (NCP) platform to fabricate ultra-dense, highly conductive ion-exchange membranes. This innovation greatly improves electrolyser stability, prevents product crossover, and delivers a significant boost in membrane mechanical strength.

Our team developed new real-time diagnostic tools to keep these systems running efficiently over long periods. Using methods such as the distribution of relaxation times (DRT), we identified complex degradation processes in the device, including salt precipitation and cathode flooding. This shifts our work from simply observing failures to deliberately designing and engineering more durable electrolysers.

Finally, we improved integrated systems that couple CO_2 capture with electrochemical conversion. By tuning the micro-environment at the catalyst interface and developing new superhydrophobic and biomass-derived materials, we are enabling the direct use of dilute CO_2 streams, such as industrial flue gas, without costly purification steps.

Projects

FP1A: Ethylene electrosynthesis from CO_2/CO

FP1B: Integrated CO_2 capture and electrochemical conversion from flue gas

Flagship Program 2

Organonitrogen compounds via carbon-nitrogen bond formation

Program leader
A/Prof Jie Zhang

Overview

FP2 focuses on developing sustainable electrochemical methods to convert captured CO_2 and a nitrogen source into valuable organonitrogen compounds by forming carbon–nitrogen (C-N) bonds using renewable electricity. These compounds are vital precursors for many industrial products, including fertilisers, pharmaceuticals, polymers and specialty chemicals. In 2025, the program's scope broadened to include other types of carbon bonds — such as C-S compounds — which are often more complex and higher value than C-N compounds.

The flagship integrates advances in catalyst design, electrode and electrolyser engineering, membrane development and advanced characterisation and computation to improve reaction selectivity, energy efficiency, and scalability. By combining CO_2 reduction with S- or N-containing reactants, the program seeks to replace conventional fossil-derived production pathways with low-carbon alternatives.

Key aims and activities for 2026

Our 2026 research will expand on electrocatalytic C-X bond formation, including C-N, C-P, and C-Se coupling reactions, to selectively synthesise heteroatom-containing molecules from CO_2. Insights gained from the C-S studies, particularly in controlling reaction selectivity and interfacial chemistry, will be applied to new C-X coupling reactions.

Key activities will include expanding the scope of substrates, including nitrate and sulfite, investigating the roles of cations and interfacial electric fields, and integrating mechanistic experiments with theoretical modelling. C-S coupling reactions will be further optimised to produce structurally diverse organosulfur compounds.

Through these activities we aim to establish a sustainable electrochemical platform for C-X bond formation and converting CO_2 into high-value heteroatom-rich molecules.

Research highlights for 2025

In 2025, FP2 focused on developing sustainable electrocatalytic conversion of CO_2 into products via carbon-heteroatom (C-X) coupling, including C-N and C-S bond formation. While there is much existing research on producing simple C1 and multi-carbon products, there is little research on the selective construction of heteroatom-containing molecules. To address this challenge, we demonstrated a highly selective pathway that couples CO_2 with sulfite to form hydroxymethanesulfonate (HMS), a valuable compound often used to synthesise chemicals for industrial applications. In contrast to previously reported systems, which typically generate complex mixtures of sulfur-containing products, our system produced HMS as the sole C-S product with a high Faradaic efficiency.

Importantly, the reaction selectivity was found to be strongly influenced by electrolyte composition and cation effects, providing new insights into how the electrochemical microenvironment governs heteroatom coupling reactions. This work demonstrates a practical and scalable approach for synthesising value-added organosulfur compounds for sustainable chemical manufacturing, with potential for broader industrial and environmental impact.

Projects

FP2A: Urea/Amide/Amines from CO_2/CO and inorganic nitrate/NO_2

Flagship Program 3

Value-added co-products via anodic oxidation of organic compounds


Program leaders:
Prof Chuan Zhao and Prof Christian Doonan

Overview

FP3 is fundamentally reshaping the economics of CO_2 conversion. Conventional electrolysers waste massive amounts of energy producing oxygen (O_2) at the anode. We aim to incorporate oxidation of organic compounds such as glycerol and methanol at the anode, to create valuable commercial chemicals while simultaneously lowering electricity consumption. By coupling these reactions at the anode with CO_2 reduction at the cathode, our aim is to transform waste into wealth on both sides of the electrolyser.

Robust and high-performance anodic oxidations are being developed by precisely controlling the environment surrounding individual active atoms and optimising the electronic structure of materials. These design principles significantly boost reaction efficiency, bringing our concept closer to a scalable reality for a sustainable chemicals industry.

Key aims and activities for 2026

Looking ahead, our focus shifts from catalyst discovery to deep mechanistic understanding and system integration. We plan to use spectroscopic techniques to observe at atomic resolution exactly how organic molecules behave on the catalyst surface in real-time and how catalytic interfaces evolve. Unlocking these in-depth mechanisms is essential for designing the next generation of high-performance electrocatalysts.

We will also aim for industrial relevance by scaling up reactor designs on our best-performing anodic catalysts. We aim to transition from basic laboratory cells to Membrane Electrode Assembly (MEA) stacks capable of operating high currents. A central goal is to successfully couple these optimised anodic reactions with cathodic CO_2 reduction, demonstrating a fully integrated prototype that produces valuable chemicals at both electrodes with long-term stability.

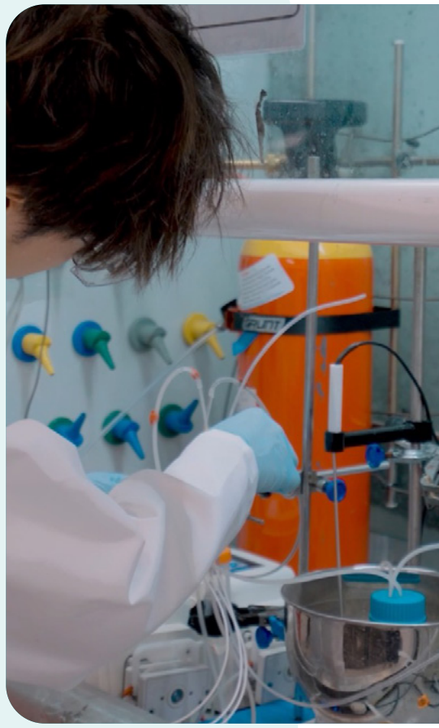
Research highlights for 2025

In 2025, our team delivered three major breakthroughs in transforming organic molecules into useful products. Firstly, we converted glycerol, a cheap and abundant byproduct of the biodiesel industry, into formate, a highly valued chemical with many industrial applications due to its low toxicity and high biodegradability. Our new nickel-copper alloy catalyst demonstrated exceptional activity, stability and efficiency, converting glycerol into formate at potentials far lower than conventional oxygen evolution reaction, which directly translates to energy savings.

We achieved similar success with anodic methanol (CH_3OH) oxidation to produce formic acid. By incorporating phosphorus into nickel-cobalt hydroxides, we engineered a catalyst that overcomes the energy barrier of the reaction. Converting methanol with over 90% Faradaic efficiency, these results prove that valuable feedstock chemicals can be produced using significantly less electricity.

Expanding our scope to less reactive substrates, we also made substantial progress in methane (CH_4) oxidation. While methane conversion typically requires extreme heat and pressure, we developed a method which operates under mild conditions. Using hydrogen peroxide (H_2O_2) produced by O_2 reduction in tandem catalytic systems, we bypassed the need for harsh environments and activated chemically inert methane. This finding provides valuable insights into integrating electrosynthesis with thermocatalysis.

We also explored how advanced operando spectroscopy could support our laboratory experiments to explain complex oxidation mechanisms. It allows us to precisely predict reaction pathways and regulate intermediate reactions, a critical step for validating the economic viability and industrial potential of our systems.



Projects

FP3: Development of alternative anodic oxidation reactions for coupling with CO_2 electroreduction

Research Feature

CO_2-to-formic-acid electrolyser

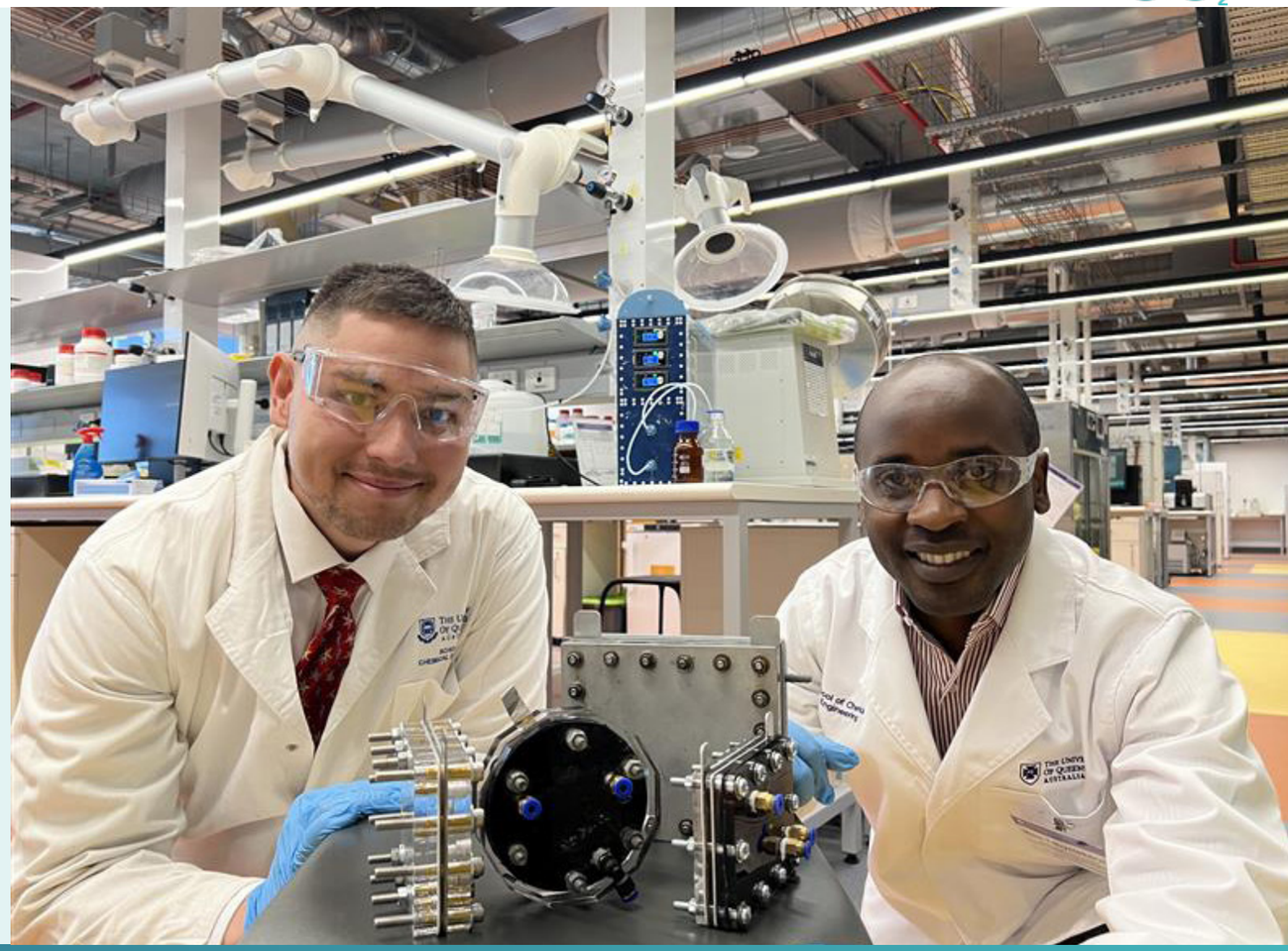
GETCO2 developed Australia's first portable on-site generator producing formic acid directly from CO_2, water and electricity.

PhD student Rizal Evans and AI Dr Mike Tebyetekerwa led the design and construction of GETCO2's first demonstration technology - a portable CO_2-to-formic-acid electrolyser. Formic acid is an important antimicrobial agent and chemical acidifier used in agriculture for animal feed preservation and improved animal health. It is a viable, environmentally friendly alternative to using antibiotics in livestock feed.

The challenges of using formic acid in practice are that farms do not have the necessary onsite infrastructure to adequately store concentrated formic acid, and chemical transport costs from a centralised supplier are expensive. In contrast, the formic acid-producing electrolyser enables the farmer to generate the chemical onsite, on demand, without need for large storage facilities or the risk of chemical degradation with storage over time.

The formic acid prototype electrolyser is the largest of its kind and is an excellent demonstration tool to engage with industry, the general public and school students.

Rizal has engaged with a range of communities on behalf GETCO2 including numerous school groups, the QLD Deputy Premier and Science Alive in Adelaide, to name a few. The design team of CO_2nverters with EMCRs Princekumar Patel, Xiaohe Tian, Jia Li, Dr Kaige Sun, Rizal Evans and Ronny Pibaque successfully pitched this innovation to be outright winners at the GETCO2 Hackathon (see page 32).



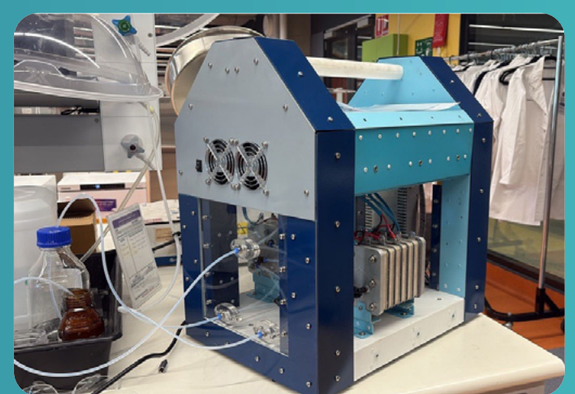
Rizal demonstrating the electrolyser to Queensland Deputy Premier, the Hon Jarrod Bleijie MP

The CO_2nverters, from left:

Ronny Pibaque, Xiaohe Tan, Kaige Sun, Dr Boon Liaw (mentor), Rizal Evans, Jia Li and Princekumar Patel

Formic acid-producing electrolyser at a glance:

- Generator output - 2.4 L formic acid per day
- Formic acid concentration range - 1.5-25 wt%
- Energy consumption - 25.9 kWh per kg formic acid produced
- Modular & scalable design and construction
- No chemical feedstocks required, only water, CO_2 and electricity



Research Feature

CO_2 electrolyser testing facility

The Centre implemented a strategic project, led from Research Theme 1, to establish an advanced CO_2 electrolyser performance testing facility at UQ.

A collaborative effort, the facility was built by CI Prof Tom Rufford, AI Dr Mike Tebyetekerwa, EMCRs Dr Ray Bi and Dr Aloka Sahu, PhD students Hizkia Vieri and Rizal Evans at UQ, with advice from CI A/Prof Fengwang Li at USyd, CI Prof Jie Zhang at Monash and AI Dr Mengran Li at The University of Melbourne.

Understanding the key components of electrolysers — catalysts, electrodes and membranes - is core to the GETCO2 research program. However, to evaluate the new materials and methods developed, we need to integrate the components and test them in operating electrolyser cells.

This project established an advanced testing facility, providing a platform for participants to test their catalyst, electrodes or membrane materials under standardised conditions. This testing facility provides the physical infrastructure and standardised test protocols for researchers to make the best possible assessment of electrolyser performance. During the project, we optimised the configuration of a membrane electrode assembly (MEA) CO_2 electrolyser, and collected benchmark performance data using common catalysts and membranes. The benchmark data enables researchers using this facility to compare the performance of their novel materials with that of established, published materials.

This project built new capability and capacity for GETCO2 in electrolyser testing, and provides an excellent platform for collaboration among GETCO2 researchers and beyond. A workshop with 24 EMCR participants from five universities was held in July 2025 to train EMCRs to operate the testing facility. UQ-based GETCO2 EMCRs Dr Zhuyuan Wang and Dr Ray Bi led the laboratory training. The testing facility also provides an important opportunity for partnerships with industries that seek testing for CO_2 or water electrolysers.

EMCR workshop in electrolyser testing

Snapshot of CO_2 electrolyser testing facility:

- Infrastructure and capability: Advanced test facility to support GETCO2 researchers to evaluate catalysts, electrodes, membranes and electrolyser designs.
- Researcher skills and capacity: Platform to train EMCRs in best practice electrolyser design and testing.
- Shared knowledge and best practices: Demonstration of best practice approach to CO_2 electrolyser performance testing evidenced in test data and publications.
- Benchmark performance data: Commissioning and initial test program will deliver a database of performance results for commercial CO_2 electrolysers and materials.

Research Feature

Article in Chemical Science

As the world scales up Power-to-X technologies to achieve net zero carbon emissions, how can we ensure the supply chain for critical materials and rare earth metals remains sustainable and ethical?

Material needs for power-to-X systems for CO_2 utilization require a life cycle approach was a perspective article in Chemical Science, authored by a collaborative team of one GETCO2 EMCR, four CIs, two PIs and one AI collectively from four institutions and two countries.

Since publication in March 2025 as part of the 2025 Chemical Science Perspective & Review Collection, the article has already been cited by several authors in a wide range of journals from ACS Energy Letters to Water Environment Research to Carbon Footprints.

In this highly collaborative article, GETCO2 PhD student Aloka Kumar Sahu, CI Prof Thomas Rufford, PI Prof Saleem H. Ali, CI Assoc Prof Ruth Knibbe, CI Assoc Prof Simon Smart, PI Prof Feng Jiao, AI Prof Alexis T Bell and GETCO2 Director Prof Xiwang Zhang analyse the impacts and risks of existing global supply chains for these critical materials needed for Power-to-X technologies.

The team advocate that life cycle thinking, including the use of tools like Environmental Life Cycle Assessment (LCA) and Social Life Cycle Assessment (SLCA), is crucial for the informed, just, and ethical development of disruptive technologies and systems such as Power-to-X technologies.

The article grew from a conversation between GETCO2 CI Prof Thomas Rufford and international Partner Investigator Prof Saleem H. Ali at GETCO2's inaugural conference, the International Symposium on Green Transformation of Carbon Dioxide (ISGTCO2) in November 2023.

"This Perspective article is just the first piece of our work in studying costs and impacts of CO_2 utilisation with more detailed case studies and analysis to be conducted by incoming PhD students in the next few years of GETCO2. Major research initiatives like ARC Centres of Excellence provide the opportunity and resources to support the interdisciplinary work that we advocate in this Perspective article."

Prof Tom Rufford

"It was a great brainstorming experience for me to put ideas and information into words, shaping the thoughts rooted by Thomas Rufford and Saleem H. Ali to visualize the development and challenges in the Power-to-X industry for CO_2 utilization from completely different perspectives".

Dr Aloka Kumar Sahu

Citation: Chem. Sci., 2025,16, 5819-5835,
https://doi.org/10.1039/D4SC07752K

Research Impact

68
Publications

559
Citations in 2025

19.7 average citations per paper (2024 & 2025)

8
Highly cited papers (top 1%)
(2024 & 2025)

Highly Cited Researcher


Prof Xiwang Zhang


A/Prof Jianfeng Mao


Prof Chuan Zhao

Of the world's population of scientists and social scientists, Clarivate Highly Cited Researchers are 1 in 1,000.

Highly Cited Researchers demonstrate significant and broad influence in their field(s) of research. Each researcher selected has authored multiple Highly Cited Papers which rank in the top 1% by citations for their field(s) and publication year in the Web of Science Core Collection over the past eleven years.

Stanford/Elsevier Top 2% Scientists


Dr Kaige Sun


Dr Xiaoli Zhang

Journal quality

95.5% of publications in the top 25% journals

To date GETCO2 papers have been published in 45 Q1 journals.

Research Impact

Highly Cited Papers

To date, GETCO2 had 8 Clarivate Highly Cited Papers (top 1%) in the fields of:

Materials Science (6)

Environment/Ecology (1)

Chemistry (1)

Of these 8 highly cited papers, 5 are also Hot Papers (top 0.1%).

Highly Cited Papers are articles and reviews ranked in the top 1% within the subject area for a given year. They are recognised as indicators of scientific excellence and outstanding performance.

Hot Papers are articles and reviews published in the past two years that rank in the top 0.1% of their subject area, based on citation activity. They highlight emerging scientific impact by showing which recent papers are gaining significant attention from the global research community.

Sustainable Development Goals

74 of GETCO2 publications from 2024 and 2025 contribute to 10 United Nations Sustainable Development Goals (SDGs), mostly:

7: Affordable and Clean Energy (41 publications)

9: Industry, Innovation and infrastructure (15 publications)

13: Climate Action (47 publications)

Sources: Scopus, SciVal Elsevier, Web of Science, Clarivate Analytics, Altmetric Explorer, Digital Science March 2026.

International Reach

71% of GETCO2 2025 publications include international collaboration.

To date, 76 countries have cited GETCO2 work.

To date, GETCO2 work has been cited by authors from more than 160 institutions.

Top 3 collaborating countries

GETCO2's Top 3 collaborating countries are:

China

United States

Japan

Cross-disciplinary Reach

GETCO2 work has been cited in 19 different subject categories ranging from main subject areas of Chemistry and Materials Science to Computer Science and Agricultural and Biological Sciences.

Patents

To date, two publications have been cited by patents, representing two unique patent families.

Sources: Scopus, SciVal Elsevier, Web of Science, Clarivate Analytics, Altmetric Explorer, Digital Science March 2026.

Media and Communication Impact

In 2025, GETCO2 strengthened its external profile through a coordinated and strategic approach to media and communications. With the Centre's website fully established, communications efforts focused on expanding digital engagement and growing audiences across multiple platforms.

Website

GETCO2's website recorded growth in global visibility with international reach in 2025 climbing well above 2024 levels, noting particularly strong engagement with China and the United States. After the landing page (7,712 views), the most frequently visited sections were the Our People-page (4,001 views) and the events-page related to the 2025 National Conference (1,731 views), reflecting high interest in the Centre's expertise and flagship events.

Newsletters

GETCO2 delivered five newsletters in 2025, reaching both external subscribers and Centre members. These newsletters exceeded expectations and achieved an average open rate of 66 %. This engagement rate is more than double the typical 20–30 % benchmark considered healthy for the science and technology sector, as reported by email marketing platform Vision6.

This highlights the Centre's effective communication strategy and strong connection with our community throughout the year.

Social media

LinkedIn remained the Centre's primary platform for external communications and professional engagement. Consistent posting and targeted content resulted in strong audience growth, with 880 new followers during 2025, culminating in 2,680 followers. The Centre also established a YouTube channel, publishing two videos showcasing outcomes from the Hackathon and laboratory equipment demonstrations. These platforms provide an important foundation for increasing the visibility and accessibility of GETCO2's research and engagement activities into 2026.

Media attention

In 2025, GETCO2 publications were mentioned 39 times in national and international news outlets, such as Mirage News, Tohoku University, and Phys.org (Altmetric Explorer, Mar 2026). This shows that GETCO2's work is resonating internationally and beyond academia, capturing public attention through lively media coverage.

28,842
website views

Website users by country:

Australia	3.1K
China	2.8K
United States	1.5K
Germany	289
India	208

214
newsletter subscriptions

66%
opening rate

2,680
followers

Converting CO_2 into valuable chemicals and fuels.
Catalysing a green manufacturing and export revolution.
Paving the smartest and cleanest path to net zero.

OUR COMMUNITY

Inclusion, Diversity, Equity and Access (IDEA)

Chairs: Prof Rachel Caruso and Prof Xiwang Zhang

GETCO2 is committed to Inclusion, Diversity, Equity and Access (IDEA) principles because we believe excellence is achieved through differences in thought, approach and delivery. We will establish a culture where people feel valued and respected with all voices being heard and opinions considered.

GETCO2 at inSTEM

We were proud to support and participate in the 2025 inSTEM Conference - a space dedicated to building more inclusive and equitable environments in science, technology, engineering and mathematics. Three of our centre members contributed to the organising committee and our delegation comprised a mix of students, professional staff, CIs and an AI from three of our partner universities; UQ, RMIT University, and UNSW. We were thrilled that GETCO2 Deputy Director, Prof Rachel Caruso delivered the opening address for the conference.

"Working across biotechnology, chemical engineering and advanced materials, I participated in inSTEM to connect with a community committed to equity and inclusion in STEM. With experience in research and teaching, I've seen how diversity strengthens science. inSTEM gave me space to reflect on my journey - from overcoming language barriers to contributing to cutting-edge labs - and how it can help build a more inclusive research culture".

GETCO2 PhD student Ronny Pibaque Sanchez.

The conference aimed to support and facilitate delegates to:

- Strengthen leadership and allyship by learning from experts and colleagues about how to create more inclusive teams.
- Build lasting connections with a diverse group of individuals across STEM disciplines.
- Gain new insights and strategies to support your career or the careers of those around you.

Presentations, panel discussions and workshops ranged from supporting CALD individuals (Culturally and Linguistically Diverse), gender diversity and neurodiversity in STEM workplaces, to mental health, self-compassion, mentoring and using LinkedIn to build your profile.

The sessions fostered important conversations around belonging, representation and how we can each play a role in shaping inclusive research cultures. We left inSTEM full of new ideas, deeper connections and a strong commitment to embed these values in our work at GETCO2.

"I participated in inSTEM as I am keen to promote diversity and inclusion in GETCO2 and in my research group. The inSTEM program covered such a wide variety of topics that are highly relevant to research leaders. In addition to sessions on networking, social media, mental health and wellbeing, career development and instigating change, we heard from neurodivergent, gender diverse, culturally and linguistically diverse individuals and panels.

These inspiring speakers gave insights that were helpful to me in building a stronger understanding of diversity. I would highly recommend this conference to anyone wanting to support marginalised groups and foster inclusivity"

Prof Rachel Caruso, GETCO2 Deputy Director

Image: Prof Rachel Caruso, Dr Eloise Larsen, A/Prof Ravichandar Babarao, Kaori Sugita, Anna Knudsen and Ronny Pibaque Sanchez.
Photo credit: Matt Lucas.

Inclusion, Diversity, Equity and Access (IDEA)

continued

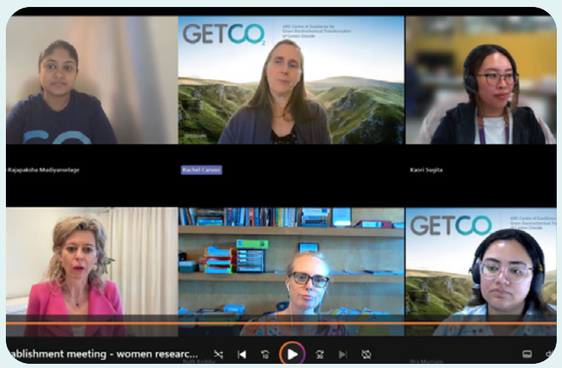
Inclusion, diversity, equity and access are the foundations of GETCO2 culture.

All Talent, All In: Building the Leadership Pipeline for Women in GETCO2

At GETCO2, we believe that great science needs diverse thought, perspective, and lived experience to solve complex problems. However, women remain significantly underrepresented in senior research and leadership roles in STEM across Australia. Data shows a steep drop-off occurs in the period between early-career and senior leadership roles. Over 2025, quantitative and qualitative research was conducted with the Centre's EMCRs and CIs to better understand the experiences, needs and aspirations of women in GETCO2. Two online surveys with six questions were deployed with 68% of women EMCRs participating, and 94% of CIs, providing a strong baseline of leadership and women's voices. In addition, three listening circles with 20 women, both EMCRs and CIs, were held to discuss key topics arising from the surveys.

The surveys and discussion will help shape the All Talent, All In program that supports the growth, visibility and leadership of EMCRs in the Centre, particularly women.

We are committed to ensuring that the GETCO2 leadership pipeline reflects the full talent of our community. We look forward to implementing the All Talent, All In program in 2026.



Top image: Prof Rachel Caruso presenting an update about IDEA Portfolio activities at the National Conference in Sydney.

Left image:

The All Talent, All In coordinating committe meeting online, facilitated by coaching consultant Jen Ramsey. From top left: PhD student Hirusha Hansamali Jayarathne Rajapaksha Mudiyanselage, Prof Rachel Caruso, Senior Project Officer Kaori Sugita, Jen Ramsey, A/Prof Ruth Knibbe and Senior Research Project Officer Dr Ifra Marriam.

Right image:

Advisory Committee members Prof Paul Greenfield and Hon Prof Vicki Chen help to celebrate cultural diversity.

IDEA Portfolio plan for 2026

- Leadership and Career Planning workshop at EMCR Winter School, as part of All Talent, All In program
- Panel discussion on work-life integration and wellbeing at the next whole of centre event, featuring a diverse range of leaders at various career stages
- Increasing visibility of diverse voices and leaders in the centre through video-recorded interviews and profiles accessible on GETCO2 website

Multicultural celebration

At our National Conference, we used the backdrop of Q Station to celebrate the multiculturalism of our Centre. For Indigenous peoples, Q Station is Car-rang gel / Garangal – saltwater country. As a quarantine station for 150 years, Q Station was a gateway for immigrants arriving in Australia, marking the beginnings of a new life and contributing to the country's multicultural foundations. We held a fascinating discussion panel facilitated by CI Prof Yuan Chen with CD Prof Xiwang Zhang, Senior Project Officer Kaori Sugita, AI Dr Huangjuan Ren and PhD student Ronny Pibaque, about the challenges faced when settling into life and work in Australia, after arriving from another country. At the gala dinner, our community from 26 nations were encouraged to dress in an expression of their own culture, resulting in a beautiful and colourful turnout of traditional dress.

GETCO2 Gala Dinner, at the 2025 National Conference

Capacity Building

Chairs: Prof Debra Bernhardt and Prof Simon Smart

The Capacity Building Portfolio (CBP) aims to develop Centre participants' research, industry and professional skills to generate leading researchers, engineers, operators and managers who design, implement and troubleshoot transformative electrochemical technologies. Overseen by the CBP, the GETCO2 Mentoring and Professional Development Program supports the development of Early/Mid-Career Researchers (EMCRs) across the Centre.

Capacity Building Portfolio plan for 2026

- GETCO2/Australian Synchrotron Online Workshop, March 30th
- EMCR Winter School to be held in Melbourne
- Continuation of GETCO2 Seminar Series

EMCR Winter School

The Portfolio delivered a highly successful GETCO2 Winter School, held at The University of Queensland in July 2025. The three-day program brought together 47 participants from six universities for an intensive, hands-on learning experience focused on CO_2 electrochemical transformation. Activities included laboratory tours, training in experimental design and uncertainty analysis, data visualisation, and scientific communication. A poster and three minute presentation session highlighted emerging research ideas, while in-person networking strengthened connections across the Centre's partner universities. Read more about the Winter School on page 71.

Mentoring

Career development was further strengthened through participation in the ARC Centres of Excellence Mentorloop program. With 15 Centres involved, the program is coordinated by GETCO2 operations team member Kaori Sugita. Participants have the opportunity to engage as mentors and/or mentees, connecting with other Centres in the mentoring community while building confidence, career clarity, and professional networks. From GETCO2, 17 members signed up, including 5 mentors, 9 mentees and 3 'either'. We hope to boost the program in 2026 with more participants exploring the benefits of mentoring in terms of personal and leadership development.

EMCR Researcher Travel Grant

We launched the EMCR Researcher Travel Grant (read more on page 70), which supports short term exchanges among university nodes and partner organisations. These exchanges enable EMCRs to acquire new skills, expand collaborations, and experience different research environments.

Collectively, these initiatives demonstrate the Capacity Building Portfolio's strong commitment to developing people's personal leadership and professional skills/capabilities, strengthening networks, and building a supportive, inclusive research culture that underpins GETCO2's long term success

Summer Student Program

Over the summer, GETCO2 researchers at the UQ Node hosted 6 student interns who spent the semester break gaining hands on experience in a research environment.

Through a combination of laboratory experiments, molecular dynamics simulations and guided mentoring, the interns developed practical technical skills, improved their approach to scientific problem solving and gained insight into the research behind emerging carbon conversion technologies. However, the learning was not limited to the students – our postdoctoral researchers also gained valuable leadership experience in supervising and mentoring the interns.

We trust that this positive experience inspires undergraduate students to explore pathways in the science of CO_2 conversion.

EMCR peer-to-peer training - UQ & RMIT

Dr Amanda Ekanayake and Aiping Zheng from RMIT combined their travel to UQ for the GETCO2 Winter School with intensive electrolyser research training with Dr Ray Bi. By all accounts, Amanda, Aiping and Ray worked long hours to make the most of their visit, with Ray sharing his expert knowledge of the workings of the new electrolyser testing facility established at UQ, supported by GETCO2 strategic funds. As a result, Amanda and Aiping tested catalyst designs at UQ, establishing inter-nodal collaboration. Ray has since moved to Canada to take up a role as an electrolyser scientist with Anodyne Chemistries – well done and we hope to collaborate further!

Yifan Hu, Ruirui Liu, Chen (Patrick) Jia and Haochen Lu at the GETCO2 Winter School

Capacity Building continued

Capacity Building Through Research Collaborations

EMCR Collaborative Travel Grants

In 2025, GETCO2 initiated the EMCR Collaborative Travel Grant scheme to build collaborations across GETCO2 participant organisations, and to enable EMCR mobility while engaging in research activities that directly contribute to the Centre's mission of CO_2 transformation.

Postdoctoral researcher Dr Luke Wylie in CI Prof Debra Bernhardt's team at UQ received a travel grant to visit AI Dr Aoni Xu at the University of Sydney. Over the past year, Luke and Aoni have been working together to understand how CO_2 interacts with the solid electrode surface. This knowledge is important for improving the efficiency of converting CO_2 into valuable products. They developed a computational method that separates the intrinsic kinetics for CO_2 Reduction Reaction (CO_2RR), providing a strong foundation for studying CO_2RR mechanisms.

Complementary Expertise Driving Innovation

Luke and Aoni each bring distinct but complementary expertise to the collaboration. Aoni is an expert on continuum modelling to understand reactivity and transport, whilst Luke employs molecular dynamics to model physical properties.

Luke explained how the collaboration began:

"When I started at UQ my supervisor Debra Bernhardt introduced me to Aoni. They needed someone to turn project ideas into practical calculations and this was a good starting point to work on for my postdoc.

We take a combined approach to mixing methods to understand unique systems. Given my previous experience in ionic liquids and Aoni's expertise in electrode interactions, combined we offer a novel take on CO_2 diffusion to the electrode".

Aoni described how their different scientific approaches combine to create a deeper understanding:

"Our fields are different but closely connected: Luke and Debra focus on molecular dynamics, while I focus on electrochemical theories and Density Functional Theory, DFT, which is a computer modelling method that helps us understand how atoms and electrons behave in materials and chemical reactions.

Together, these approaches link molecular-scale transport to catalytic kinetics and helped us build a more complete understanding of CO_2RR behaviour.

We developed a method to distinguish the true reaction behaviour of CO_2 reduction from other effects caused by changes in the local chemical environment near the surface. This makes it easier to correctly analyse reaction rates and understand how the reaction proceeds."

Fostering Future Collaborations

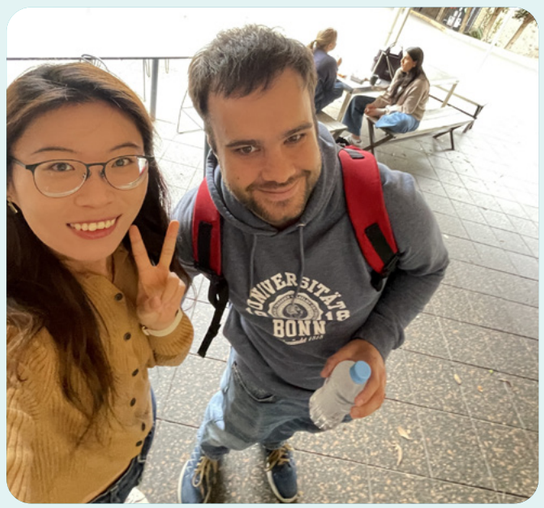
Both researchers agree that GETCO2 plays an important role in enabling meaningful and productive cross-disciplinary collaborations. Aoni noted:

"The Centre can support more collaborations like this by connecting researchers across disciplines and creating opportunities for early-stage discussion, shared projects, and idea exchange".

Luke added:

"Providing opportunities to meet collaborators in similar fields but with unique skillsets enables building and expansion on existing capacity and capability."

The collaboration between Luke and Aoni demonstrates the powerful outcomes that arise when researchers with diverse skill sets work together toward shared scientific goals. Through the support of the GETCO2 EMCR Collaborative Travel Grant, their partnership continues to advance understanding of CO_2 reduction while strengthening research capability across the Centre.



EMCR Winter School

The GETCO2 EMCR Winter School 2025, held from 22 to 24 July at The University of Queensland, was designed to strengthen technical capability and foster collaboration among early- and mid-career researchers across the centre. The program brought together around 47 participants from GETCO2 university nodes for three days of training and networking.

Organised by the Capacity Building Portfolio and led by CIs Profs Tom Rufford, Debra Bernhardt, and Jingwei Hou, the Winter School delivered high-quality, hands-on sessions combining laboratory training, practical workshops, and group exercises to build both technical skills and interdisciplinary connections.

The program began with engaging laboratory demonstrations followed by training workshops on scientific skills such as error analysis, uncertainty propagation, and experimental design. The final day focused on data visualisation and scientific communication, helping participants sharpen their presentation and research storytelling skills. A key highlight was the poster and 3-minute presentation session, which showcased innovative ideas from our EMCR researchers.

Beyond technical training, the Winter School provided a valuable platform for GETCO2 EMCRs to meet in-person, build new connections and exchange ideas across disciplines and institutions.

The post-event feedback from the program was overwhelmingly positive, with more than half of respondents reporting that the Winter School "exceeded expectations". We look forward to planning another engaging and impactful program for the next Winter School in Melbourne in 2026.

EMCR Committee

2025 Activities

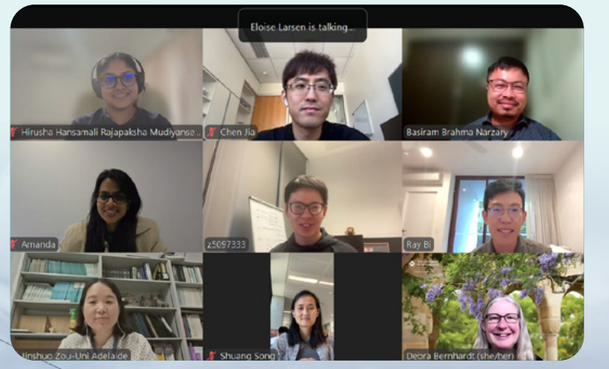
The EMCR Committee was convened through an expression-of-interest process, with representatives comprising eight postdoctoral researchers and one PhD student from five GETCO2 partner universities (see members on page 17).

With guidance from the CBP, the EMCRs developed their own Terms of Reference, with the aim of supporting and facilitating mentoring, capacity building and networking for EMCRs across the Centre. Each committee member is associated with a respective GETCO2 committee, to represent EMCR interests at governance meetings.

A huge achievement of the EMCR Committee was to launch the GETCO2 Seminar Series – a one-hour, fortnightly online session with two speakers – which has proven highly successful with solid attendance and interactions from Centre members.

The Committee also organised an EMCR-focused session at the Annual Conference, where they discussed their experiences and benefits of contributing to service roles and encouraged other EMCRs to be involved in future. The Committee also organised a networking session at the conference where teamwork was put to the test in designing and constructing a kite!

We warmly thank the inaugural EMCR Committee members for bravely paving the way for EMCRs to contribute their voice to Centre strategy and activities.



Seminar Series

The EMCR Committee was busy throughout the first half of 2025 organising the GETCO2 Seminar Series, held online every fortnight, featuring a great lineup of speakers.

The Centre's Research Program Committee encourages each GETCO2 EMCR to present in the seminar series at least once per year. The series enables EMCRs to practice their communication skills in a supportive environment and helps to connect each other's research through peer-to-peer interaction. We were fortunate to have AIs present (thanks to Dr Haoxin Mai) and attend the seminars to offer advice and expert insights, and to deepen their connections with GETCO2.

These seminars are a valuable opportunity to share research, connect with colleagues across the Centre, and build confidence in presenting. We thank the EMCR Committee for the successful establishment of the GETCO2 seminar series!

2025 Seminar series snapshot:

- 12 online sessions
- 20 speakers
- Speakers from 10 different organisations
- 1 industry speaker
- 2 international guests
- 3 Associate Investigators
- Average number of attendees - 35
- Maximum attendees- 58

Left images:

The EMCR Committee, Dr Hsiwen (Wayne) Wu, Dr Basiram Brahma Narzary, Dr Amanda Ekanayake, Hirusha Hansamali Jayarathne Rajapaksha Mudiyanselage and Dr Yuting Zhuo at the GETCO2 National Conference in Sydney

EMCR Online Meeting

Kite test flying at the National Conference

Right images:

Seminar with Dr Emma Whittlesea from Stralis

Seminar presenters awarded at the National Conference.

Engagement and Partnerships

Chairs: Prof Darren Martin and Prof Christian Doonan

Working closely with industry and government partners, the Engagement and Partnerships Portfolio (EPP) will engage and establish new partners, create research connections and share the Centre's discoveries and new knowledge. The EPP oversees the GETCO2 Research Translation and Intellectual Property Plan.

Engagement and Partnerships Portfolio plan for 2026

- Develop a structured approach to benchmarking and innovation identification across the Centre, feeding into the translational roadmap.
- Plan an industry partnerships workshop to:
  - Strengthen support for translation and commercialisation, to enable promising innovations to move more efficiently toward impact.
  - Build and maintain strong strategic partnerships, especially in emerging Australian sectors.

Public Outreach and Education

GETCO2 sustained a visible external profile throughout the year, engaging secondary and undergraduate students, and the general public through science, education and community outreach activities. Combined, these activities increase public understanding of STEM career pathways and highlight the role of CO_2 transformation in a low-carbon future.

In March, GETCO2 partnered with the World Science Festival Brisbane, hosting four laboratory tours over two days as part of the 'Labs Unlocked' program. Members of the public experienced in-person, our cutting-edge facilities and learned how researchers turn CO_2 into electricity, fuels and valuable materials.

In June, we hosted 30 students from Ngee Ann Polytechnic (Singapore) to visit GETCO2 laboratories and the ARC Training Centre for Bioplastics and Biocomposites (CBB). The visit showcased CO_2 conversion technologies, advanced electrolysers and research into biodegradable plastics from renewable resources, supporting international engagement and STEM pathway awareness.

During National Science Week in July, UQ PhD student Hirusha Hansamali Jayarathne Rajapaksha Mudiyanselage presented, "From plants to products – A better way to tackle CO_2", in Queen Street Mall in Brisbane. The talk was part of Soapbox Science, promoting women and non-binary scientists and their research, using public spaces as arenas for public learning and scientific debate.

In August, GETCO2 co-organised an interactive STEM display with the ARC Centre of Excellence for Carbon Science and Innovation at the annual Science Alive! exhibition in Adelaide. Under the banner 'Transforming Carbon from Waste to Wonder', the display showcased catalysis and CO_2 conversion through hands-on demonstrations, including a portable CO_2 electrolyser and practical chemistry experiments. The exhibition attracted around 20,000 visitors.

The Glennie School in Toowoomba visited us in November, with a group of 25 year 10 students participating in a laboratory tour and an electrolyser demonstration.

In December, through UQ's Young ChangeMakers Program GETCO2's PhD student, Tanika Duivenvoorden facilitated the 'Super Computing for Super Chemistry' workshop for 28 high school students. The workshop focused on building critical thinking, leadership and communication skills through hands-on computational chemistry activities.

Top right image: Rizal Evans and CI Prof Christian Doonan at Science Alive! Adelaide

Right image: Hirusha Hansamali Jayarathne Rajapaksha Mudiyanselage at Soapbox Science

Bottom left images: Labs Unlocked visitors and Tanika Duivenvoorden presenting for Young ChangeMakers students

Bottom right image: Dr Ming Yong , Sophie Muheiti and Junyang Zhang demonstrating membranes for electrolysers

Engagement and Partnerships continued

Industry, government and research partner engagement

In September, GETCO2 hosted a technical tour in Brisbane for international engineers attending the International Council of Academies of Engineering and Technological Sciences (CAETS) 2025 Conference. Delegates visited laboratories at UQ's School of Chemical Engineering showcasing research contributing to low carbon and circular economy solutions.

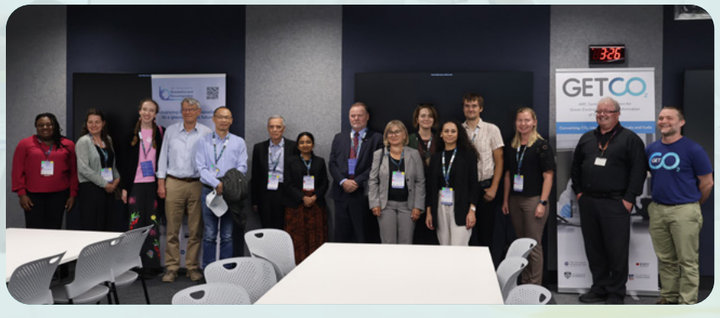
Throughout the year, UQ Node hosted several international research delegations, including visitors from the Technical University of Munich (Germany), Korea Biochar Research Center (KBRC) and Donghua University (China). Our strategic focus on bilateral collaboration with Japan was reflected in multiple engagements such as a joint seminar with Tokyo Metropolitan University (TMU), meetings with Japanese representatives from Trade & Investment Queensland (TIQ), and our ongoing collaboration with the Research Center for Advanced Science and Technology (RCAST, The University of Tokyo).

GETCO2's collaboration with government and policy stakeholders included an invitation from the Queensland Decarbonisation Hub for CIs A/Prof Simon Smart and Prof Debra Bernhardt to participate in a panel discussion at the Quantum Meets Decarbonisation Workshop, alongside leaders from CSIRO, Quantum Australia and the Queensland Quantum Decarbonisation Alliance. In addition, the Centre showcased its formic acid electrolyser to the QLD Deputy Premier and Minister for State Development, Infrastructure and Planning, and Minister for Industrial Relations, Jarrod Bleijie MP.

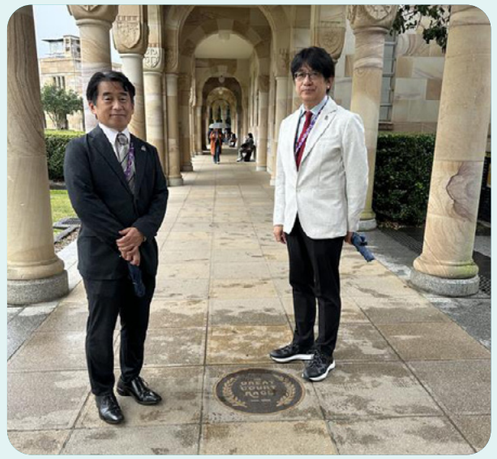
CI A/Prof Smart attended by invitation an online workshop on Carbon Capture & Utilisation organised by the Carbon Management Technologies Policy Section of DCCEEW, to better understand opportunities, barriers and practical considerations from industry and technical perspectives. Following release of the Government's Net Zero Plan, DCCEEW is exploring policies to support development, scale-up and deployment of carbon management technologies in Australia.

UQ CIs hosted Senior Manufacturing Technologist, James Kwame from Lloyd's Register Technical Directorate in the UK, to learn about challenges that the maritime industry faces with decarbonisation, and to showcase GETCO2 capabilities and facilities. Our discussions ranged from innovations such as onboard carbon capture (OCC), feasibility of CO_2 shipping and electrochemical conversion of CO_2 to methanol, a promising new marine fuel.

In December 2025, CI Dr Fengwang Li in conjunction with Advisory Committee member Prof David Sinton (UToronto) and Assistant Prof Dawei Feng from University Wisconsin-Madison facilitated a workshop about Electrochemical CO_2 Capture and Conversion (#CES018) at Pacifichem2025 organised in Hawaii by the International Chemical Congress of Pacific Basin Societies.



GETCO2 hosted a technical tour of the UQ laboratories in conjunction with CAETS 2025 - the Conference of the International Council of Academies of Engineering and Technological Sciences, organised by ICMS Australasia



Project Prof Satoshi Ohara (left) and Prof Tatsuoki Kono (right) from RCAST, University of Tokyo visit UQ campus to discuss collaborative opportunities with GETCO2 researchers

UQ hosted Senior Manufacturing Technologist, James Kwame from Lloyd's Register Technical Directorate in the UK, to learn about the challenges that the maritime industry face on the path to decarbonisation, and showcase GETCO2 capabilities and facilities

Engagement and partnerships will translate our science and engineering into policy and application.

Left top image: Visit from Korea University, from left A/Prof Huanggen Yang, Dr Eloise Larsen (UQ), Prof Yong Sik Ok, Prof Tom Rufford (UQ) and Dr Bin Cao

Right image: GETCO2 at Pacifichem 2025 - Dr Jiyuan Liu, CI Dr Fengwang Li, Prof David Sinton, DD Prof Rachel Caruso, AI Dr Aaron Li, Dr Yu Yang

Bottom image: Visit from the post-secondary education institution Ngee Ann Polytechnic in Singapore

Partnering

IMSTEC 2025

GETCO2 sponsored the 12th International Membrane Science & Technology Conference (IMSTEC 2025) with a specialist post-conference laboratory workshop - Membrane Innovations for Decarbonisation and Resource Recovery. The Centre also supported two HDR/EMCR wards for the best presentation/poster in CO_2 electrochemistry.

CAETS Technical Tour

GETCO2 hosted a technical tour of the UQ laboratories in conjunction with CAETS 2025 - the Conference of the International Council of Academies of Engineering and Technological Services, organised by ICMS Australasia.

inSTEM

With 9 other ARC Centres of Excellence, GETCO2 coorganised the annual inSTEM conference, dedicated to advancing equitable practices for marginalised and underrepresented people in STEM. Researcher Dr Xiaoli Zhang (RMIT), COO Dr Eloise Larsen and Communications Advisor Anna Knudsen (UQ) served on the organising committee, and Deputy Director Prof Rachel Caruso delivered an inspiring opening address.

GETCO2 members Kaori Sugita, Ronnie Pibaque, Prof Rachel Caruso and Anna Knudsen networking at inSTEM with members from ARC Centre of Excellence COMBS

inSTEM conference held at RMIT, Melbourne

Top image: PhD student Wenming Zhao demonstrating laboratory equipment at the CAETS technical tour

Left image: Prof Xiwang Zhang presenting at the IMSTEC post-conference workshop

Converting CO_2 into valuable chemicals and fuels.
Catalysing a green manufacturing and export revolution.
Paving the smartest and cleanest path to net zero.

OUR PERFORMANCE

Awards and Recognition

Prof John Zhu
ARC Industry Laureate Fellowship

One of only eight ARC Industry Laureate Fellowships awarded nationally, Prof Zhu will develop next-generation technologies to make hydrogen production more efficient, durable, and commercially viable. His research focuses on proton-conductive solid oxide electrolysis cells (P-SOECs) - an exciting new pathway for producing hydrogen using renewable energy.

Prof Xiwang Zhang FTSE
ARC College of Experts

On the ARC College of Experts, GETCO2 Centre Director, Prof Zhang contributes to identifying research excellence to support knowledge advancement and national innovation. College members are international experts from the Australian research community, which includes higher education, industry and public sector research organisations. College members evaluate grant proposals and ensures that ARC-funded research delivers meaningful outcomes for Australians.

Prof Darren Martin and Dr Hima Haridevan
Award Citation for Excellence in Student Learning

These faculty-based UQ Awards recognise and reward excellence in Student Teaching and Learning.

Image: ARC LinkedIn page

Prof Yansong Shen
ATSE Fellow & recipient of the RSNSW Edgeworth David Medal

Prof Shen FTSE was appointed Fellow of The Australian Academy of Technological Sciences & Engineering (ATSE) for his pioneering high-efficiency solar panel recycling, and his groundbreaking work in low-cost green ironmaking has revolutionised steel plant operations. Prof Shen was also awarded the Royal Society of NSW Edgeworth David Medal for 2024 for developing a sustainable, full-loop system for end-of-life solar panels. The Medal recognises the most outstanding contributions to knowledge and society in Australia or its territories, with the work carried out primarily in NSW.

Dr Fengwang Li awarded Le Fèvre Medal

Awarded by the Australian Academy of Science, the Le Fèvre Medal recognises outstanding basic research in chemistry, and is a tribute to Dr Li's innovations in using renewable electricity to convert carbon dioxide into products such as ethylene.

A/Prof Jie Zhang
RH Stokes Medal, RACI

The Royal Australian Chemical Institute Electrochemistry Division awarded A/Prof Zhang the R.H. Stokes Medal (2026) for distinguished research in the field of electrochemistry carried out in Australasia.

A/Prof Jingwei Hou
ARC Mid-Career Industry Fellowship

A/Prof Hou will create a cost-effective, eco-friendly way to recycle solar panels, helping recover materials, reduce waste and support Australia's clean energy and recycling goals. The Industry Fellowship Program supports increased mobility and skill-building in research collaboration, translation and commercialisation across academic and industry settings.

Dr Jinshuo Zou
Australia-India Strategic Research Fund (AISRF) Fellowship

Dr Zou received one of the 12 AISRF Early and Mid-Career Researcher (EMCR) Fellowships, awarded by the Australian Academy of Science. Dr Zou will visit the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) to collaborate on the project, Integrated electrochemical urea synthesis system for concurrent carbon capture and conversion.

Dr Xiaoli Zhang
Recognised Among Australia's Top 250 Researchers

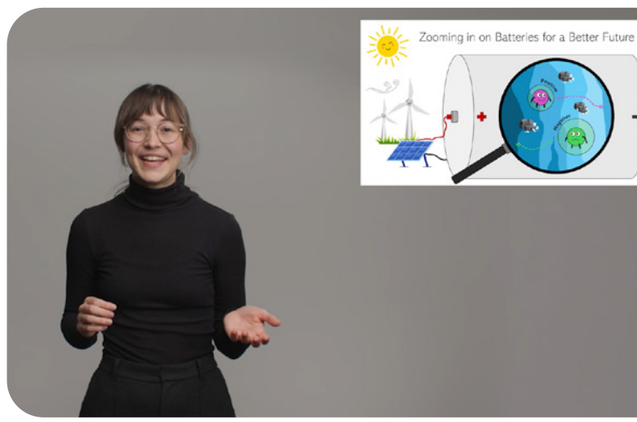
Dr Zhang was named by The Australian as one of the Top 250 Australian Researchers for the field of nanotechnology — a national honour recognising leading experts who are shaping the future of research in their respective fields. This distinction reflects Dr Zhang's outstanding contributions to scientific innovation, sustained research excellence and national leadership.

Prof Chuan Zhao
ARC Australian Laureate Fellowship

Prof Zhao will work on developing a new class of water-splitting devices to produce green hydrogen without fossil fuels. His team will build durable, efficient electrolysers using low-cost, abundant materials, designed to work with energy sources such as wind and solar. The research will advance fundamental understanding of water electrolysis, deliver industry-ready materials and enable scalable, affordable hydrogen production. Supporting Australia's transition to a net-zero economy, the project will build research capacity, deepen industry partnerships, and contribute to global decarbonisation through clean energy innovation.

Tanika Duivenvoorden
Multiple communication awards

PhD student Tanika Duivenvoorden won the Best Oral Presentation at the Australian Winter School on Computational Chemistry 2025. She also won the Inter-Institute Competition at the UQ 3-Minute Thesis (3MT) competition, as well as the Qld Branch round of the Joint Australian Chapter of ACS-RACI 3-Minute Thesis Presentation in Chemical Sciences.



Key Performance Indicators 2025

GETCO2 is committed to achieving ambitious targets over the Centre's lifetime. We firmly believe in working together to holistically build the capacity and develop the science and technology to deliver an enduring legacy. We are committed to transparency in communication of our goals and achievements within the Centre and externally.

Performance Measure	2025	Actuals
1. Number of research outputs		
Peer-reviewed journal articles	40	47
Books/Chapters/Position papers	2	21
Conference publications (Abstracts/presentations/posters)	40	42
Patents and IP disclosures	2	2
2. Quality of research outputs		
Percentage publications in top quartile of discipline specific (subject) area according to CiteScore	80%	95.5%
Highly cited publications	4	8
Prestigious awards/prizes for innovation/impact	4	27
Invited talks/keynote/plenary lectures	20	47
Percentage joint publications across Nodes and/or between CIs and PIs	60	6*
3. Number of workshops/conferences held	3	8
4. Number of training courses held	3	12
5. Number of additional researchers working on Centre research		
Postdoctoral researchers	8	12
PhD Students	8	20
Masters/Honours students	6	3
Associate Investigators	4	6
6. Number of postgraduate completions		
HDR completions	0	5
7. Number of mentoring programs offered	2	2
8. Number of presentations/briefings		
To the public	4	13
To government (parliamentarians and department/agencies at State & Federal level)	3	12
To industry/business/end users	6	29
9. Number of new organisations collaborating or involved with the Centre		
Total new industry & academic partnerships/projects	2	8
10. Number of female research personnel		
Total female research personnel	30	77
11. Centre-specific KPIs		
External fellowships/stipends awarded to CIs/PDRAs/PhD students	2	8
Other research income $,000	500	20,260
% female PhD recruits	40%	58%
Technologies at TRL4	0	0**
Technology licencing	1	0
Media outreach	20	138***

* Increases to 41% when GETCO2 postdoctoral researchers & AIs are included.

** One technology at TRL3.

*** includes 75 LinkedIn posts: 5 Newsletters; 8 Website stories.

Finances

Opening balance	10,834,924
Income	**Year 2025**
ARC income (includes indexation)	5,798,403
University contributions	1,040,377
Partner contributions	205,000
Total Income	**7,043,780**

Expenditure	Year 2025
Personnel	2,869,447
Equipment	228,734
Maintenance	428,611
Travel	269,386
Field Research	1,173
Teaching Relief	0
Other	279,500
Total Expenditure	**4,076,851**

Closing Balance	13,801,853

Transform CO_2
Transform the future

2026 Activity Plan

Q1

January

National Youth Science Forum visit, Brisbane

February

Visit from Hanyang University Korea, Brisbane

GETCO2 CI workshop, UQ Node, Brisbane

March

International Womens Day, co-hosted with ARC Centres of Excellence, Brisbane

GETCO2-ANSTO Synchrotron workshop, online

Science Meets Parliament, Canberra

Q2

April

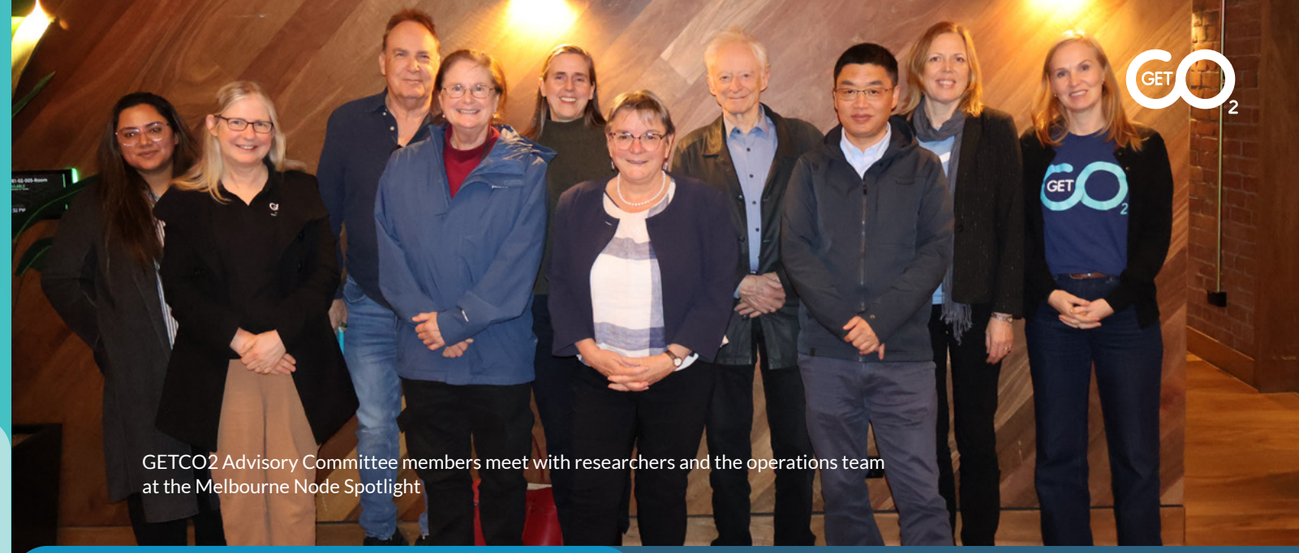
UQ Node Spotlight, Brisbane

May

UNSW/USyd Node Spotlight, Sydney

June

Australia-China Research Collaboration Week



GETCO2 Advisory Committee members meet with researchers and the operations team at the Melbourne Node Spotlight

Q3

July

GETCO2 EMCR Winter School, Melbourne

ConASTA: Australian Science Teachers Association

August

Adelaide University Node Spotlight, Adelaide

Science Alive!, Adelaide

September

International Summer School Electrochemistry, Switzerland

GETCO2 ISE 2026 Satellite Workshop, Brisbane

Q4

October

Host pre-conference visitors & partners, Brisbane

November

ALLCO$_2$ - International CO_2 Alliance Conference, Gold Coast

December

Summer scholarships

Publications

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= Highly Cited Paper = Hot Paper

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Terms and Abbreviations

AI Associate Investigator

ARC Australian Research Council

ASJC All Science Journal Classification

ATSE Australian Academy of Technological Sciences & Engineering

CD Centre Director

CI Chief Investigator

CMC Centre Management Committee

CO_2RR Carbon Dioxide Reduction Reaction

CoE Centre of Excellence

COO Chief Operations Officer

DD Centre Deputy Director

DETSI Queensland Department of the Environment, Tourism, Science and Innovation

EMCR Early/Mid Career Researcher

GRDC Grain Research and Development Corporation

IDEA Inclusion, Diversity, Equity, Access

PhD Doctor of Philosophy

PI Partner Investigator

RAC Research Advisory Committee

RACI Royal Australian Chemical Institute

RPC Research Program Committee

SAC Strategic Advisory Committee

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