

A Pathway to Zero Net Emissions from Agriculture

Strategic Plan 2025 – 2030

July 2025



Acknowledgement of Country

Zero Net Emissions Agriculture CRC acknowledges the Traditional Custodians of the lands across Australia, where we live, work and learn.

We pay deep respect to Elders past and present and extend that respect to all First Nations people who have cared for Country for tens of thousands of years.

We honour their enduring connection to Country and knowledge passed down through generations.

Zero Net Emissions Agriculture CRC is committed to genuine Indigenous inclusion and will actively build respectful relationships with First Nations people, grounded in listening, learning and trust.

These relationships will bring together scientific insight and Indigenous wisdom to foster cultural awareness and understanding, to build a more sustainable future.

Together, we will shape a lower-emissions future for Australian agriculture.

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Introduction



Dr Debra Cousins
ZNE-Ag CRC Board Chair



Richard Heath
ZNE-Ag CRC Chief Executive Officer

Zero Net Emissions Agriculture Cooperative Research Centre (ZNE-Ag CRC) was established to develop the technologies, systems, and capacity to enable Australian agriculture to transition to a lower emissions future.

Made possible by significant cash and in-kind contributions from industry, governments, small and medium enterprises (SMEs), and tertiary institutions, the CRC will invest in world-leading research, development, and extension over the 10-year life of the CRC.

Australian agriculture has a crucial role to play in reducing national and global emissions. The CRC will achieve its goals through targeted, meaningful, industry-led, outcomes-focused research.

The CRC welcomes the collaboration of partners from across industry, governments and research organisations, and we are thrilled to share our Strategic Plan and showcase our pathway to success.



Dr Debra Cousins

Our vision at ZNE-Ag CRC is Zero Net Emissions from a thriving Australian agriculture sector.

Over the life of the CRC, we will focus on developing tools and technologies to lower emissions and empower farmers and land managers to make climate-conscious decisions.

Australia's farm sector emissions fluctuate each year, based on seasonal conditions. Between 2005 and 2024, agriculture contributed between 12% and 19% of national greenhouse gas emissions¹.

Almost 80% of Australia's agricultural emissions are methane, deriving mainly from cattle and sheep industries. As such, and in order to achieve the greatest impact, the majority of the CRC's investment and research focus is directed towards addressing the methane challenge.

We have embarked on pioneering research and collaborating with industry to ensure that our work delivers practical outcomes for the farm and the planet.



Richard Heath

¹ Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2024), Australia's National Greenhouse Accounts, Canberra

Context

Australian agriculture stands at a pivotal juncture. As evidence mounts that the world must urgently address greenhouse gas emissions, the sector faces the dual challenge of maintaining productivity and profitability while meeting increasingly ambitious climate goals.

As reflected in Australia's nationally determined contribution (NDC) under the Paris Agreement and the Climate Change Act 2022, Australia is committed to **reducing greenhouse gas emissions by 43% below 2005 levels by 2030** and **achieving net zero emissions by 2050**.

In the year to September 2024, agriculture accounted for 19.2% of Australia's national greenhouse gas emissions², primarily from enteric fermentation, fertiliser use, and land management practices. Reducing these emissions is essential not only for meeting national and international commitments, but also for preserving market access, attracting investment, and maintaining the sector's social license.

However, emissions reduction is often perceived as a trade-off, pitting environmental responsibility against economic viability. For farmers and other land managers, the pressure to reduce emissions can appear at odds with the imperatives of growth, competitiveness, and asset building. This complexity is intensified by the diversity of production systems, the involvement of some producers across multiple industries, significant regional variability, and shifting policy and market contexts. As a result, a one-size-fits-all approach is neither practical nor effective.

At the same time, the transition to a low-emissions future presents significant opportunities. Global demand for sustainable food and fibre is rising. Emerging technologies, such as methane inhibitors, low emissions fertilisers, and precision agriculture, offer the potential to reduce emissions while boosting productivity. Investments in robust emissions measurement, carbon accounting, and nature-based solutions are gaining momentum, supported by growing carbon markets and sustainability-linked finance.

Indigenous peoples have long practised sustainable land management, with a deep understanding of ecosystems and climate resilience. Indigenous land knowledge offers valuable insights into balancing environmental stewardship with agricultural production. Integrating these practices into modern agriculture can play an important role in emissions reduction, helping to restore balance between the land and the people who depend on it.

Australia's agricultural industries are increasingly committed to change, and many have set their own climate targets. Achieving these targets requires a coordinated, science-led approach that integrates practical research, industry insight, and systems thinking. The complexity of the task calls for both incremental improvements and transformative innovation, supported by strong policy alignment, cross-industry approaches, and collaborative investments to pool resources.

There will not be a single technology or 'silver bullet' solution to reducing emissions from Australian agriculture. Multiple technologies incorporated into the continuing evolution of best practice systems will be needed. In this context, the testing and validation of technology stacks will be an important part of the process for giving farmers confidence that pathways towards zero net emissions are available.

Zero Net Emissions Agriculture Cooperative Research Centre (ZNE-Ag CRC) plays a critical role in addressing these challenges and opportunities. By fostering partnerships across research, industry, and government, ZNE-Ag CRC aims to deliver scalable, economically viable solutions that enable Australian agriculture to thrive in a carbon-conscious world.

² Quarterly Update of Australia's National Greenhouse Gas Inventory: September 2024, Australian Government Department of Climate Change, Energy, the Environment and Water. CC BY 4.0.

ZNE-Ag CRC Overview

ZNE-Ag CRC was established in July 2024 under the Australian Government's Cooperative Research Program to reduce emissions across Australian agriculture. It was formed through a collaborative partnership between leading research organisations, industry bodies, companies, and government agencies.

The CRC is funded by the Australian Government Department of Industry, Science and Resources and the contribution of Partners, and operates under the guidelines and requirements of a Commonwealth agreement, with specific milestones to achieve through the curation and completion of Research Projects.

ZNE-Ag CRC is committed to bridging the gap between scientific discovery and practical, on-farm application. By combining research with industry expertise, ZNE-Ag CRC will help position Australian agriculture as a key player in the global transition to a lower emissions future, making a meaningful contribution to both national and international climate goals.

Vision

Zero Net Emissions from a thriving Australian agriculture sector.

Mission

Driving innovation for a low-emissions future by advancing practical, scalable solutions that enable producers and land managers to reduce emissions, enhance productivity, and protect natural resources.

Values



Innovative – We drive research and technology to deliver practical, scalable solutions that reduce emissions in agriculture.



Inclusive – We value diverse perspectives and engage collaboratively with industries, governments, researchers, and land managers to ensure solutions are equitable, effective, and relevant.



Accountable – We act with transparency, integrity, and credibility, guided by evidence to inform our decisions and actions.



Effective – We are outcomes-focused and committed to delivering measurable results that support the transition to a low-emissions future.



Collaborative – We achieve more by working together, building strong partnerships to deliver shared successes.

Guiding principles

- **Evidence-based impact** - We are uniquely positioned to engage and bring stakeholders together, validate the technical and financial viability of emissions reduction solutions, and generate evidence that informs and shapes industry-led emissions reduction targets for Australian agriculture, aligned with 2040 and 2050 goals.
- **Targeted investment** - We prioritise timely investment in high-potential R&D that addresses industry-defined challenges and accelerates progress toward emissions reduction.
- **Practical solutions** - We focus on developing solutions that are not only effective in reducing emissions but also practical, scalable, and financially viable for Australian farmers.
- **National and global leadership** - We embrace a leadership role, both nationally and globally, to influence measurable, long-term change in agricultural emissions outcomes.
- **Enabling transition** - We are committed to creating actionable and achievable transition pathways that enable the adoption of lower-emissions practices and systems across diverse farming contexts.

ZNE-Ag CRC is funded to deliver specific outcomes aligned with national priorities and industry needs and therefore does not:

- Replicate work already being done by partners, universities, or other initiatives
- Engage in agri-political activity such as advocacy
- Operate in a political or politically biased capacity
- Set emissions reduction targets or goals for individual sectors or agriculture generally.



Our Strategic Framework

The Strategic Plan comprises three strategic themes, four research programs, and two enabling functions. Under the requirements of the Commonwealth agreement there are specific milestones to achieve within each of the research programs.

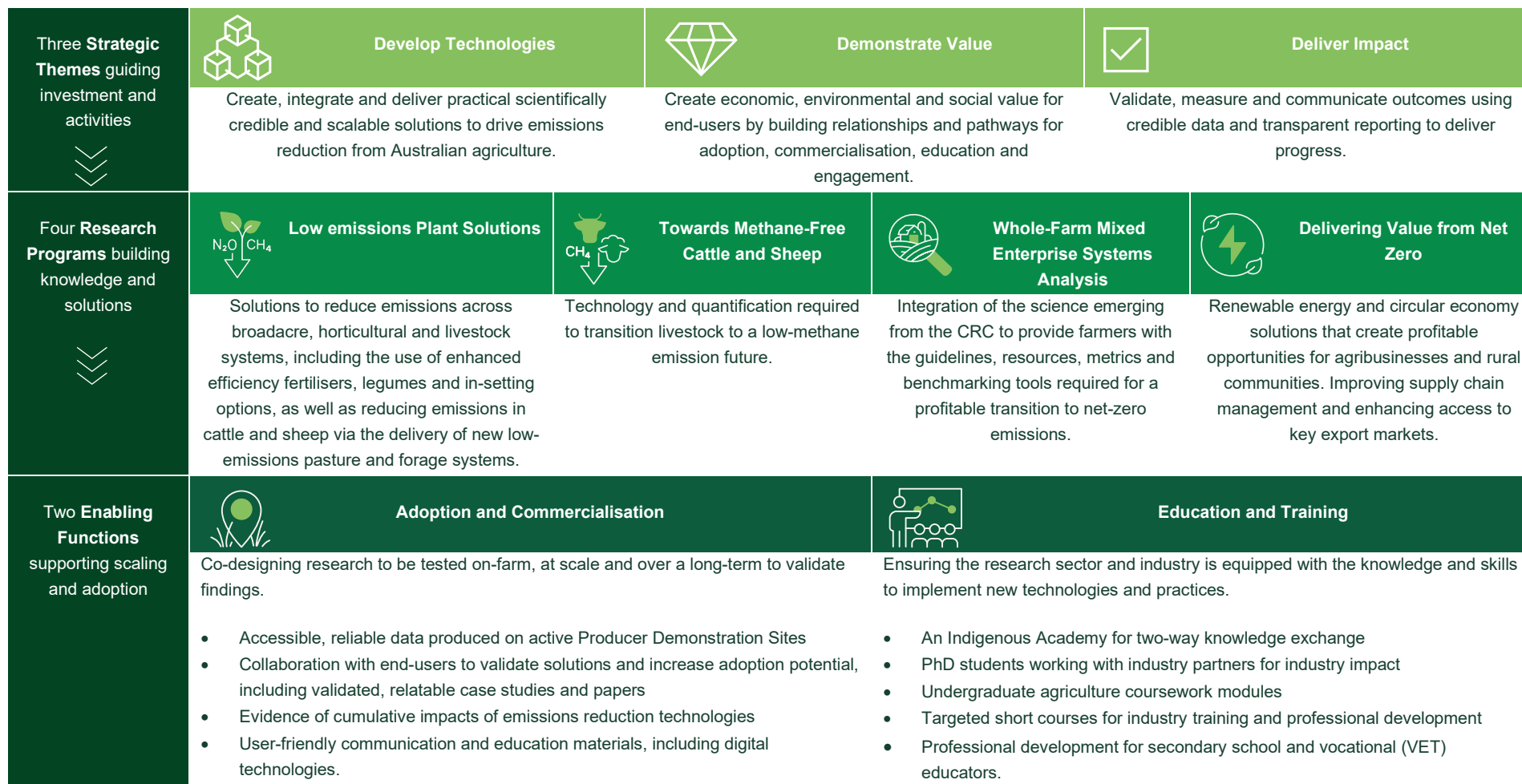
While ZNE-Ag CRC has a ten-year operational horizon, this Strategic Plan outlines the key objectives, actions, and intended outcomes for the period July 2025 to June 2030. The Plan will be subject to assessments on an annual basis to monitor progress and ensure continued relevance. A more comprehensive review will be undertaken at the three-year mark (in 2028), at which point the strategy may be realigned to reflect changing priorities, new insights, and evolving stakeholder needs.

The CRC's strategic focus and the decisions of its Board and management will also be guided by foundational documents, including a position paper on technology stacking and integration and the CRC's Extension and Adoption Strategy.

The Strategic Plan guides and informs the CRC's Annual Operating Plan (AOP) which outlines specific activities, timelines, and resource allocations for each year to ensure progress toward long-term strategic goals.



Strategic Framework



Strategic Themes

Strategic Theme 1: Develop Technologies

Objective: Create, integrate and deliver practical, scientifically credible and scalable solutions to reduce emissions from Australian agriculture.

Actions	Outputs	Outcomes
<ul style="list-style-type: none"> Invest in research and development to generate new knowledge, technologies, products and practices through co-design that have high potential to reduce emissions. Combine innovative technologies at Producer Demonstration Sites to assess and refine their effectiveness and cumulative impact and develop models that support the transition of new technologies on Australian farms. This practice is known as technology stacking 	<ul style="list-style-type: none"> Industry informed and valued research project outputs delivering across all research programs aligned with Commonwealth Grant milestones. A portfolio of emissions reduction technologies, tools, practices, tailored to different agricultural systems. A baseline of existing emissions reduction technologies, gap analysis and opportunities. 	<ul style="list-style-type: none"> Advance the science and technology required to enable a transition to low emissions agriculture. Proven emissions reduction options, optimised for various production systems, agroecological zones, commodities and risk appetites. Validated technology stacking.

Strategic Theme 2: Demonstrate Value

Objective: Validate, measure and communicate outcomes using credible data and transparent reporting to demonstrate progress.

Actions	Outputs	Outcomes
<ul style="list-style-type: none"> By 2030, support development of ambitious, evidence-informed, industry-agreed targets for 2040 and 2050, to significantly reduce greenhouse gas emissions from Australian agriculture. Develop, validate and support the implementation of standardised measurement tools for farm-level use. 	<ul style="list-style-type: none"> Evidence to inform national targets for 2040 and 2050. Industry-wide, standardised measurement tools. Credible, validated data and data platforms. Evidence of any cumulative impacts of emissions reduction technologies. Case studies, field-days, research reports and published papers. Nationwide network of active Producer Demonstration Sites. 	<ul style="list-style-type: none"> Deliver national and global leadership on the need, and the ways, to transition to a lower-emissions future. Trusted, reliable, affordable and valid measurement tools to enable farmers and land managers to track emissions.

Strategic Theme 3: Deliver Impact

Objective: Create economic, environmental and social value for end-users by building relationships and pathways for adoption, commercialisation, education and engagement.

Actions	Outputs	Outcomes
<ul style="list-style-type: none"> Engage deeply with industry, producers, policymakers and researchers to enable two-way knowledge exchange, build credibility, and ensure practical impact. Co-design research with stakeholders to align projects with sector priorities and real-world farming needs. Build meaningful, culturally aware partnerships across industry, government, and research organisations to support informed and inclusive decision-making. Ensure solutions are tailored to Australian farming systems through collaborative, cross-sector input and ongoing engagement. 	<ul style="list-style-type: none"> Products, tools and technologies for lower-emissions agriculture are accessible, affordable and available. Skilled and knowledgeable farmers, researchers and industry leaders. Guidelines for tracking emissions in digital supply chains. Standardised emissions measurement tools for industry. 	<ul style="list-style-type: none"> Harness the skills and capability of the Australian research community, industry and Indigenous Australian enterprises, to provide innovation and drive impactful, industry aligned emissions reduction research. Create commercial pathways for the integration of emissions reduction technologies.

Research Programs

Research Program	Outputs	Outcomes
Low Emissions Plant Solutions	<ul style="list-style-type: none"> Baseline data and decision support tools for optimising cover crops and tree plantings. Low-emissions legumes and best practice for legume agronomy. 2030 - 2035 <ul style="list-style-type: none"> New temperate and tropical pasture seeds. Novel low emissions fertilisers. 	Solutions to reduce emissions across broadacre, horticultural and livestock systems, including the use of enhanced efficiency fertilisers, legumes and in-setting options, as well as reducing emissions in cattle and sheep via the delivery of new low-emissions pasture and forage system.
Towards Methane-Free Cattle and Sheep	<ul style="list-style-type: none"> Novel individual animal methane measurement and proxies. Accurate Genomic Estimated Breeding Values (GEBV) for selecting low methane cattle and sheep. 2030 - 2035 <ul style="list-style-type: none"> Novel low-cost strategies to reduce lifetime rumen production of methane. Demonstration of the emissions reduction potential of technology stacking. 	Technology and quantification required to transition livestock to a low-methane emission future.
Whole-Farm Mixed Enterprise Systems Analysis	<ul style="list-style-type: none"> Baselines and emerging international benchmarks identified. Life cycle assessments incorporating synergies and trade-offs. 2030 - 2035 <ul style="list-style-type: none"> Technologies and technology stacks integrated into emissions modelling. Data integration platform and best practice guidelines for technology stacks. Demonstration case studies. 	Integration of science emerging from the CRC to provide farmers with the guidelines, resources, metrics, and benchmarking tools required for a profitable transition to net-zero emissions.
Delivering Value from Net Zero	<ul style="list-style-type: none"> Circular economy solutions. 2030 - 2035 <ul style="list-style-type: none"> Policy, governance, and behavioural insights. Renewable energy solutions integrated into farming systems. Improved supply chain tracking and traceability of emissions. 	Renewable energy and circular economy solutions that create profitable opportunities for agribusinesses and rural communities. Improving supply chain management and enhancing access to key export markets.

Enabling Function 1: Adoption and Commercialisation

Objective: Co-designing research to be tested on-farm, at scale and over a long-term to validate findings.

Actions	Outputs	Outcomes
<ul style="list-style-type: none"> Establish a nationwide network of Producer Demonstration Sites, beginning with a pilot program of nine and scaling to 25 sites nationally, to test and integrate technology and practices. Create opportunities for communication, engagement, education and knowledge sharing with industry to showcase findings and drive adoption. 	<ul style="list-style-type: none"> Accessible, reliable data and management packages produced on active Producer Demonstration Sites. Validated, relatable case studies and published journal papers. Evidence of any cumulative impacts of emissions reduction technologies. Accessible communication and education materials, including digital technologies. 	<ul style="list-style-type: none"> Emissions reduction technologies, practices and tools are tested and validated, leading to large-scale commercialisation opportunities. Economically viable, new technologies are widely understood and adopted by industry.

Enabling Function 2: Education and Training

Objective: Ensuring the research sector and industry is equipped with the knowledge and skills to implement new technologies and practices.

Actions	Outputs	Outcomes
<ul style="list-style-type: none"> Work with Indigenous Australians and Indigenous Advisory Group, to exchange and generate knowledge to develop solutions to reduce emissions from Australian agriculture. Fund PhD students to conduct research in low-emissions agriculture practices. Develop and deliver tailored training programs for industry, undergraduates and educators, including short courses. 	<ul style="list-style-type: none"> A co-designed Indigenous Academy for essential two-way learning and knowledge exchange. PhD students working with industry partners for industry impact. Co-developed undergraduate agriculture coursework modules. Co-developed targeted short courses for ongoing industry training and professional development. Accessible and reliable professional development for vocational (VET) and secondary school educators to upskill the future workforce. 	<ul style="list-style-type: none"> Enable and learn from Indigenous farmers and researchers in the transition to a lower emissions future for agriculture through two-way knowledge exchange and training. Highly skilled, industry engaged graduates equipped to support and shape emissions reduction research and innovation. Skilled and knowledgeable farmers, land managers and researchers leading the transition to low emissions practices.

Our Partners

ZNE-Ag CRC brings together partners spanning universities, industry, and government. Our network includes major agrifood enterprises, agtech innovators, grower and producer groups representing thousands of farmers, farm service and supply companies, a leading supermarket and bank, all levels of government (state, territory, and federal), and 11 Australian universities.

Tier 1 Partners	      
	   
	   
	    
Tier 2 Partners	   
	   
Tier 3 Partners	     
	  
	    
Tier 4 Partners	       
	      
	     
	    
	  

Setting Direction

ZNE-Ag CRC's research priorities were shaped by an initial consultation process involving nine partner workshops, targeted meetings and structured discussions with industry, research organisations and government representatives. This engagement highlighted sector needs, opportunities for innovation, and pathways for real impact. The four Research Programs were identified through the consultation and design process to focus ZNE-Ag CRC's efforts and address the diverse challenges and opportunities in reducing emissions across different agricultural sectors.

Alongside the Research Programs, ZNE-Ag CRC will develop and deliver a comprehensive Education and Training program to equip the research sector and industry with the knowledge and skills to develop and implement new practices effectively. This program includes a focus on Indigenous inclusion and engagement to strengthen cultural awareness and ensure two-way knowledge exchange in the transition to a lower emissions future.

The Research Programs are supported by a dedicated Commercialisation and Adoption Program that incorporates a nationwide network of Producer Demonstration Sites. These sites will provide practical examples of emissions reduction technologies in action, helping to drive adoption and scale solutions across industry.

Governance and Operations

ZNE-Ag CRC is governed by an independent Board of Directors that is responsible for strategic direction, organisational culture, funding allocations, risk management, compliance and accountability of the organisation. Progress of ZNE-Ag CRC will be closely monitored with regular reviews, financial oversight and risk assessment to maintain accountability and transparency. Currently established Board Committees are:

Finance, Audit, Security and Risk Committee (FASRC) - oversees financial integrity, audit processes, risk management, and information security to ensure effective governance and accountability.

Nominations, Remuneration and Performance Committee (NRPC) - responsible for overseeing board nominations, executive remuneration, and performance evaluation to support effective leadership and governance.

Research Investment and Commercialisation Committee (RICC) - considers investment cases put to it from the Research Advisory and Management Committee, takes guidance from the Industry Advisory Committee, and recommends project investment cases to the Board for approval.

Industry Advisory Committee (IAC) - ensures open, collaborative and constructive partnerships between research and industry and is responsible for evaluating project investment cases with respect to industry needs, commercialisation prospects and pathways, and assessing adoption potential in Australian agricultural industries.

Led by the CEO, the **Executive Management Team** delivers the day-to-day management of the organisation, ensuring that all aspects of business administration and objectives are being met. The Research Director, four Research Program Leaders, and the Education and Training Program Leader and Producer Demonstration Site Leader, provide technical expertise, oversee research projects and ensure industry relevance.

The **Research Advisory and Management Committee (RAMC)** fosters open, collaborative, and constructive partnerships between researchers and industry, playing a central role in aligning priorities and coordinating the development of robust, high-impact investment cases with ZNE-Ag CRC partners.

Risks and challenges

Delivering meaningful impact in emissions reduction requires navigating a range of interconnected challenges. A primary risk is low industry adoption of research outcomes, potentially driven by cost, complexity, policy uncertainty, or limited perceived relevance of new technologies and practices. Without strong uptake, even the most promising innovations will fail to translate into real-world benefits.

Compounding this is the difficulty in measuring and demonstrating impact. The current absence of credible, standardised tools for tracking progress in emissions reduction limits the ability to assess effectiveness and make informed adjustments over time.

Cross-sector collaboration remains critical but challenging. Misalignment of goals, timelines, or communication between research organisations, industry partners, and government stakeholders can slow momentum or derail promising initiatives. Similarly, the commercialisation and adoption pipeline is often underdeveloped. Without clear pathways to market, innovations risk stagnating within the research phase.

Innovation and legitimacy may also be undermined by the exclusion of diverse and Indigenous perspectives. Failing to meaningfully include a broad range of knowledge systems and lived experiences can limit both the quality and acceptance of research outcomes. Additionally, an insufficient skills pipeline poses a structural risk to success. A shortage of skilled professionals - particularly in areas critical to implementation - can constrain both research execution and the ability to scale solutions.

Finally, there is the risk of scope creep or strategic misalignment. Venturing into activities outside the ZNE-Ag CRC's core mandate, such as product marketing or political advocacy, may dilute impact, compromise funding compliance, and erode stakeholder trust.

Addressing these challenges is essential to ensuring that CRC investments in innovation translate into practical, measurable, and equitable outcomes across agriculture.

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