

NATIONAL STATEMENT ON
**CLIMATE CHANGE
AND AGRICULTURE**



© Commonwealth of Australia 2023

Ownership of intellectual property rights

Unless otherwise noted, copyright (and any other intellectual property rights) in this publication is owned by the Commonwealth of Australia (referred to as the Commonwealth).

Creative Commons licence

All material in this publication is licensed under a [Creative Commons Attribution 4.0 International Licence](#) except content supplied by third parties, logos and the Commonwealth Coat of Arms.



Cataloguing data

This publication (and any material sourced from it) should be attributed as: Commonwealth of Australia 2023, *National Statement on Climate Change and Agriculture*, Department of Agriculture, Fisheries and Forestry, Canberra. CC BY 4.0.

This publication is available at agriculture.gov.au/national-statement-climate-change-agriculture

Department of Agriculture, Fisheries and Forestry
GPO Box 858 Canberra ACT 2601
Telephone 1800 900 090
Web agriculture.gov.au

Disclaimer

The Australian Government acting through the Department of Agriculture, Fisheries and Forestry has exercised due care and skill in preparing and compiling the information and data in this publication. Notwithstanding, the Department of Agriculture, Fisheries and Forestry, its employees and advisers disclaim all liability, including liability for negligence and for any loss, damage, injury, expense or cost incurred by any person as a result of accessing, using or relying on any of the information or data in this publication to the maximum extent permitted by law.

Acknowledgement of Country

We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment and community. We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.

Cover: Southern Lightscapes-Australia via Getty Images.

Location: Corryong, Victoria, Australia.



AGRICULTURE MINISTERS' FOREWORD

We are proud to present the *National Statement on Climate Change and Agriculture*.

This national statement is an Australian first. It marks a commitment by all agriculture ministers to provide leadership and work together with our climate-smart agricultural sector.

Australian agriculture is one of the most diverse and varied sectors in the world. Our producers are stewards of the land, committed to healthy, productive and sustainable farming systems for future generations. We also acknowledge the ongoing role of First Nations peoples who have cared for Country through Australia's changing climate for millennia.

The Australian agricultural sector is at the forefront of climate change impacts and opportunities, and our producers work in some of the most challenging conditions on earth. Changes in temperature and rainfall, severe drought, intense flooding, fires and disease outbreaks are impacting farm production and incomes. The sector is responding: Australian producers are innovating, adapting, improving resilience and investing in the opportunities of a low-emissions future, but we must transition faster. As the climate continues to change and extreme weather events become more frequent and intense, our shared commitment to collaborate and innovate will continue to be paramount.

We all have a role to play in our climate response, including helping Australia to transition to a net zero economy.

A top priority for governments is working with industry to drive a climate change response underpinned by climate-smart practices. This is critical to the growth of a sustainable and profitable agricultural sector that aims to achieve a farmgate output valued at \$100 billion by 2030.

A climate-smart, sustainable sector will help make farming more productive and profitable, better protect our environment, increase access to international markets and strengthen our farming communities.

This national statement heralds a shared commitment by agriculture ministers to work in partnership with the sector to ensure Australia continues to lead the world in climate-smart practices by:

- *sustainably increasing agricultural productivity and driving future profitability*
- *improving adaptation and resilience to a changing climate*
- *implementing pathways that will support low-emissions agriculture.*

Signatories

Senator the Hon Murray Watt

*Minister for Agriculture, Fisheries and Forestry,
Australian Government*

The Hon Tara Moriarty MLC

Minister for Agriculture, New South Wales

The Hon Gayle Tierney MP

Minister for Agriculture, Victoria

The Hon Mark Furner MP

*Minister for Agricultural Industry Development
and Fisheries, Queensland*

The Hon Clare Scriven MLC

*Minister for Primary Industries and Regional
Development, South Australia*

The Hon Jackie Jarvis MLC

Minister for Agriculture and Food, Western Australia

The Hon Jo Palmer MLC

Minister for Primary Industries and Water, Tasmania

The Hon Rebecca Vassarotti MLA

Minister for the Environment, Australian Capital Territory

The Hon Paul Kirby MLA

*Minister for Agribusinesses and Fisheries,
Northern Territory*

OUR COMMITMENT TO WORKING TOGETHER INTO THE FUTURE

Agriculture ministers are committed to working with the sector to help Australia achieve its full potential as a world-leading, climate-smart producer and exporter of food and fibre.



We will establish strong leadership and direction nationally on climate change and agriculture by:

- enhancing consistency and alignment of policies and programs, and sharing insights and capabilities across jurisdictions to advance best practice
- working collaboratively with the sector and other stakeholders to guide future policy direction on climate change and agriculture.



We will advocate for agriculture's interests in the whole-of-economy transition to net zero by:

- seeking out opportunities presented by a low-emissions future
- targeting investment in research and development, and increasing our focus on training, education and capacity building to support uptake and adoption of innovations and technologies.



We will maintain global leadership on climate change and agriculture by:

- showcasing Australia's world-leading climate practices in food and fibre production
- pursuing fair, free and open global trade in agriculture to support global food security and emissions reduction goals
- demonstrating Australian agriculture's verifiable, trusted and strong sustainability climate credentials.



CONTENTS

Agriculture ministers' foreword	i
--	----------

Our commitment to working together into the future	iii
---	------------

Climate change and agriculture	vi
---------------------------------------	-----------

Australian agriculture today	1
------------------------------	---

Managing climate impacts on agriculture	2
---	---

Working with First Nations peoples	6
------------------------------------	---

Global leader in adaptation and resilience	7
--	---

Contributing to a net zero economy	8
------------------------------------	---

Carbon farming opportunities	14
------------------------------	----

Favourable sustainability and climate credentials for exporters	16
--	----

International leadership on climate change and agriculture	18
---	----

References	20
-------------------	-----------

CLIMATE CHANGE AND AGRICULTURE



Credit: Joshua Smith

Australian agriculture today

For generations, agriculture has played an important role in contributing to the livelihood of Australian regions and the economic prosperity of the nation.

More than 90% of the food that Australians consume is produced domestically – across 427 million hectares of agricultural land. According to the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), the gross value of agricultural production is forecast to grow to a record \$90 billion in 2022–23 (ABARES 2023b).

The sector employs more than 230,000 people, many of whom are located in rural and regional

Australia (ABARES 2022a). Agricultural employment underpins local economies and sets the foundation for safe, healthy and thriving communities. Improving climate and sustainability outcomes is a critical factor in career decision-making among younger generations (AgriFutures Australia 2022).

The Australian agricultural sector exports more than 70% of its production, forecast to be worth \$75 billion in 2022–23 (ABARES 2023b).

FIGURE 1: SNAPSHOT OF AUSTRALIAN AGRICULTURE

In 2021–22 Australia had **87,800** agricultural businesses (ABS 2023). According to ABARES (2023a), this comprises:



16,200

grain, oilseed,
and pulse farm
businesses



33,500

beef cattle, sheep,
and wool farm
businesses



4,700

dairy farm
businesses



9,800

fruit, nut, and
vegetable farms
(including wine
grape growers)



23,600

Other enterprises,
including sugar cane,
pig and poultry farmers,
nursery and turf
growers, hay and silage
farming

Note: industry classification based on main agricultural operation. Includes businesses with an estimated value of agricultural operations (EVAO) greater than \$40,000.



Managing climate impacts on agriculture

The success of the agricultural sector does not come easily. Australia has one of the most variable climates. Variability is exacerbated by climate change and can be seen in rising temperatures, reduced average rainfall, invasive pests, diseases and weeds, and increased frequency of extreme weather events such as drought, floods, fire and storms. This presents challenges for all sectors of the Australian economy, particularly where productivity and profitability are closely linked to natural resources such as agriculture.

ABARES estimates that changes in seasonal conditions from 2001 to 2020 have reduced annual average farm profits by 23% or around \$29,200 per farm.

Although farm productivity would have been higher in the absence of climate change, producers' adaptation strategies and adoption of new technologies have led to improvements in farm performance (ABARES 2021).

Over the years, producers have addressed climate impacts by investing in technology and innovation and improving land management practices.

For example, to boost performance under projected drier conditions, the sector has improved:

- water-use efficiency in irrigated cropping and pasture systems
- use of climate prediction and risk management tools
- land management practices such as conservation tillage and soil amelioration to maximise soil moisture
- farm structure, including increasing average farm size, shifting to cropping in higher rainfall areas, shifting away from cropping to livestock or adopting mixed farming in lower rainfall areas
- biosecurity practices to mitigate against animal and plant diseases that are likely to be impacted by climate change.



The case studies in this national statement illustrate how climate-smart investments by governments and industry are supporting profitable Australian farms. These case studies include initiatives that:

- target increased productivity
- improve resilience to a warming climate
- trial low-emissions technologies
- connect with First Nations communities
- highlight on-farm research and demonstration pilots, and outreach programs.

Investing in programs that drive research and adoption of climate-smart practices will be essential to Australia's farming future. This includes showcasing opportunities on how a climate-smart, sustainable industry will help make Australian farms more productive and profitable, protect our environment and increase international market access.

WA GRAIN SEASON, 2022

The total grain production in Western Australia's 2022 season was over 27 million tonnes (a gross value of more than \$11 billion). Western Australia has produced just over 50 million tonnes of grain in the last 2 years compared with about 60 million tonnes in the previous 4 years. Although the last 2 years have been wet years, this has become far less common in the WA grainbelt since 2000. The decline in rainfall is driven by changing

climatic systems, which have decreased the number and intensity of rainfall fronts during the growing season. But crop production has increased, even in the drier years, as a result of improved agronomic practices and the uptake of new technologies. For example, water-use efficiency has improved in the last decade, especially in the middle and lower rainfall areas of the WA grainbelt.

CASE STUDY 1

New South Wales: Coming up apples

The hot, catastrophic summer of 2019 to 2020 followed an extended dry period for much of New South Wales. For the state's horticultural growers, this resulted in reduced water availability across many orchards and required them to make tough decisions about water use.

Ian Pearce, a fruitgrower based near Orange, partnered with the NSW Department of Primary Industries on its Climate-smart Horticulture Pilot. The pilot aims to increase resilience to climate change by improving the understanding and adoption of digital agricultural technologies. The pilot also tested whether increased access to near real-time information improved decision-making given climate extremes and variability.

As part of the pilot, Ian made use of a range of technologies:

- soil moisture monitors to provide essential information for good irrigation management
- automatic onsite weather stations to provide local weather information, which is more relevant than regional weather sites
- photosynthetically active radiation sensors to estimate the amount of light intercepted by the canopy; this provides an indicator of canopy size, which helps producers measure tree growth and health
- temperature and humidity sensors within the canopy to help monitor disease-favouring conditions such as high humidity
- sensors in water, fuel and chemical tanks to monitor usage
- flow sensors and wireless irrigation valve controllers installed on water tanks to test whether irrigation could be successfully automated.

All the data collected is accessible through a dashboard on Ian's phone. The data from the soil moisture sensors showed that the drip irrigation on one block provided improved water efficiency compared with traditional surface sprayers in other parts of his orchard.

According to Ian, if the information had been available to him sooner, '... it would have motivated me to make the change in irrigation systems earlier, and perhaps it would have saved some of the blocks where production was sacrificed'.

The pilot is part of the Primary Industries Climate Change Research Strategy and has been funded by the NSW Government Climate Change Fund.

Learn more about the [Climate-smart Horticulture Pilot](#).



Supplied by Department of Primary Industries NSW

Pictured: Ian Pearce with his drip irrigation system at his orchard in Orange, NSW

CASE STUDY 2

Australian Capital Territory: Diversifying and protecting the farm resource base

ACT farmers John and Carol had no farming experience when they purchased a 105-hectare cattle-grazing property on the Murrumbidgee River in southern ACT 10 years ago. However, the farm is a model for what can be achieved on a small acreage.

The 2017 to 2020 drought helped reinforce the family's approach to farming. They prioritised protecting the farm's natural resources – its soils, groundcover, pastures and surface and ground water, and building resilient farm enterprises that are climate adapted. After researching best practice grazing systems, and with support from an ACT Government Rural Grants program, they designed and constructed a sophisticated reticulated stock water and flexible fencing system. This enabled them to rotationally graze their cattle and gave them greater control over pastures, weeds, groundcover and animal health.

With assistance from Greening Australia, Australian Capital Territory Natural Resource Management (ACT NRM) and Commonwealth funding, they have excluded stock and revegetated a 10-hectare box gum woodland paddock by planting tree laneways, and fencing and revegetating eroding gullies along waterways and around farm dams.

This has:

- increased shade and shelter across the farm
- improved biodiversity
- provided future refuge for cattle during heatwaves.

The family alongside ACT NRM, with guidance from NSW Department of Primary Industries, have conducted soil testing since 2015, which has been analysed by Soils for Life. The testing has shown a general trend of increased soil carbon and soil pH (ACT soils are generally acidic) due to their land management – building soils that can hold more moisture and are more resilient to drought.

The family have undertaken farm business resilience coaching, funded under the Future Drought Fund, which has enabled them to consider how they can prepare for future drought and climate change impacts on the farm. In particular, the family is evaluating new enterprises based on 'indoor' food production, as climate change reduces the ability to grow many food crops outdoors.

Learn more about [on-farm climate adaptation](#).



Supplied by Soils for Life

Working with First Nations peoples

First Nations peoples have cultural and communal responsibilities that involve caring for and protecting Country. Their knowledge is vital for tackling climate change. First Nations peoples have a significant role to play in furthering Australia's resilience to climate change – as producers and by conducting activities such as fire management, ranger programs, biosecurity surveillance and

biodiversity restoration. Australian agriculture has an opportunity to continue to partner constructively and learn from the traditional knowledge and expertise of First Nations peoples and ensure they have a leading voice in agriculture's response to climate change.

CASE STUDY 3

Western Australia: Valuing First Nations peoples and practices

The WA grainbelt is the largest agricultural area in the state and a key contributor to the Australian economy. Three Future Drought Fund regional drought resilience plans are in progress in the region.

Consultation with local Traditional Owners, the Noongar and Southern Yamatji, reinforced the need for drought resilience plans to recognise and represent the needs of First Nations communities who speak for Country. First Nations representatives shared their concerns about the damage to the natural environment, the impacts of settlement and the subsequent effects of drought and climate change.

Priority actions focused on:

- increasing the resilience of First Nations communities through on-Country restoration programs
- connecting communities on Country
- providing opportunities to share intergenerational cultural knowledge

- developing business opportunities in bush food enterprises, tourism and other culture-based economies.

Learn more about the regional drought resilience plans in the [Future Drought Fund annual report 2021–22](#).



Pictured: Carol Petterson, Menang-Ngadju Elder, in the southwest of Western Australia

Global leader in adaptation and resilience

Australian agriculture is a global leader in adaptation and resilience. However, climate modelling is predicting that future changes in climate could make conditions harder for Australian producers and this may limit the effectiveness of current adaptation efforts (ABARES 2021).

According to the Intergovernmental Panel on Climate Change, in addition to sharpening short-to medium-term adaptation efforts, governments and industry leaders will need to plan and deliver much longer-term transformative change (IPCC 2022).

It is vital to the sector's future prosperity that targeted investment in research and development operates in tandem with training, education and capacity building that support the uptake and adoption of existing innovations and technology.

According to the Centre of Excellence for Biosecurity Risk Analysis, this will be particularly important in jurisdictions like the Northern Territory and Queensland where gross state product will be disproportionately affected (CEBRA 2022). State and territory governments also have pilot programs and initiatives to facilitate extension and showcase agricultural practices.

CASE STUDY 4

Australia-wide: Future Drought Fund – climate services for agriculture

The Future Drought Fund (FDF) is an Australian Government investment in building drought resilience in our agricultural sector, landscapes and communities. Through the FDF, \$100 million is made available each year for drought resilience initiatives. Sixteen programs have been launched since July 2020. FDF programs build resilience by providing resources and enhancing practices and capabilities. This enables farmers, agri-businesses, communities and others to make informed decisions about how to manage the risks and impacts of drought in their region.

The FDF's Climate Services for Agriculture digital platform is making climate information more accessible, relevant and actionable for industry, farmers and their communities. The platform aims to build resilience by enabling users to:

- anticipate possible future climate conditions
- draw comparisons with recent conditions
- consider what changing conditions could mean for the commodities they produce
- evaluate options to prepare for future drought.

Learn more about the [Climate Services for Agriculture digital platform](#).

Contributing to a net zero economy

The Australian Government has legislated an emissions reduction target of 43% below 2005 levels by 2030, and committed to Australia reaching net zero emissions by 2050.

According to the Climateworks Centre (2021), all state and territory governments have committed to net zero emissions by 2050 or earlier, with the majority setting interim targets.

Overall, Australia’s emissions reduction targets have become more ambitious and this will require action across the whole economy. Australian agriculture will have an important role to play.

To reduce agricultural emissions, we need continued effort, novel technologies, accelerated widescale adoption of new practices, and new partnerships between government, research and industry.

The sector’s emissions remain closely linked to the level of production and are forecast to increase slightly from 2020 levels in the short term due to favourable seasonal conditions (Table 1).

TABLE 1 PROJECTED TRENDS IN AGRICULTURAL EMISSIONS, 2020 TO 2035

Year	Mega-tonnes of carbon dioxide emissions
2020	73 Mt CO ₂ -e
2023	81 Mt CO ₂ -e
2030	79 Mt CO ₂ -e
2035	78 Mt CO ₂ -e

Source: DCCEEW 2022

There are lower-emissions technologies on the horizon, reflecting significant investment from governments and industry in research and development.

FIGURE 2: AGRICULTURE EMISSIONS PROFILE

According to the National Inventory Report Volume I (DCCEEW 2023), in 2020–21 agriculture produced 16.8% of Australia’s net greenhouse gas emissions. The sector’s greenhouse gas emissions comprise approximately:

79%
methane
emissions

Mainly caused by the fermentation of plant matter in the digestive system of ruminant livestock

18%
nitrous oxide
emissions

Caused by fertiliser use and manure management

4%
carbon dioxide
emissions

Caused by urea application and lime use

At the farm level, agricultural activities can also produce and remove emissions that are accounted for in other sectors of the National Greenhouse Gas Inventory, including energy and land use, land use change and forestry.





CASE STUDY 5

South Australia: Methane-reducing feed alternatives for grazing livestock

The SA Department of Primary Industries and Regions has partnered with AgriFutures Australia on a proof-of-concept project to investigate whether legume pastures and freshwater plant and algae reduce methane production when consumed by ruminants.

The project will first select and screen different species to determine their efficacy. A comprehensive economic analysis will be conducted on the cost-benefit of methane reduction feeding and supplementation strategies. This may be validated on farm. The findings could subsequently be developed into extension and adoption opportunities for the livestock sector nationally.

CASE STUDY 6

Australia-wide: Methane Emissions Reduction in Livestock program

The Australian Government is funding the \$29 million Methane Emissions Reduction in Livestock (MERiL) program (2022 to 2026) to support research, development and deployment of methane-inhibiting livestock feeds.

This program includes:

- \$4 million to support research into the abatement potential and productivity benefits of methane-inhibiting livestock feeds
- \$23 million to support the development of technologies to deliver methane-inhibiting livestock feed supplements to grazing livestock

- \$0.7 million to develop a livestock emissions framework that provides a consistent approach for estimating emission reductions from the use of methane-inhibiting livestock feeds at the farm, industry, state and national levels
- \$1 million to Meat & Livestock Australia to integrate, analyse and evaluate outputs and data from the program, and support the development of the livestock emissions framework.

Learn more about the [MERiL program](#).

CASE STUDY 7

Victoria: Research facility aims to be world-first carbon-neutral, pasture-based dairy farm

The 230-hectare Ellinbank SmartFarm in south-eastern Victoria is Australia's leading dairy research and innovation facility, fast-tracking technology solutions in a research environment and showcasing them to the dairy sector.

The facility has an ambitious target of being the world's first carbon-neutral, pasture-based dairy farm by 2026. Actions to support this target include:

- reducing methane emissions from 450 dairy cows onsite
- testing promising methane-inhibiting feed additives, including Asparagopsis-based products, 3-nitrooxypropanol and other synthetic products, essential oils and probiotics

- enabling accelerated phenotyping in commercial herds to identify low methane-emitting cohorts of dairy cows, and subsequent development of a breeding value for low methane
- generating the farm's electricity using a range of alternative solutions, including vertical and horizontal wind turbines, pumped hydro, combined photovoltaic (solar) panels and battery systems, and the use of electric side-by-side vehicles
- making energy-efficient upgrades to the dairy shed, including upgraded glycol chiller and CO₂ heat pump systems, a heat recovery system and variable speed drives
- improving fertiliser and manure management practices, including the establishment of anaerobic biodigester technologies.

Learn more about [Ellinbank SmartFarm](#).



Supplied by Agriculture Victoria

Agriculture underpins several important outcomes, including food and fibre production, food security, thriving regional economies and opportunities for development in other countries (ABARES 2022b). All agriculture ministers remain committed to maintaining and enhancing these fundamental roles for Australian agriculture, including achieving a farmgate output valued at \$100 billion by 2030. Ministers are working with industry to make the agricultural sector sustainable and ready to take advantage of the opportunities that will come with the net zero transition.

CASE STUDY 8

Queensland: Low Emissions Agriculture Roadmap 2022–2032

This roadmap provides a framework for achieving a low-emissions agricultural sector by reducing production-based emissions and increasing carbon farming opportunities. It was co-designed with key industry partners AgForce, the Queensland Farmers' Federation and the National Farmers' Federation.

The roadmap charts a pathway for Queensland to achieve even cleaner and greener food and fibre production. It focuses on sector transition and is the result of a commitment by government to partner with industry to help:

- the agricultural sector remain viable while seeking to minimise the effects of climate change
- agribusinesses thrive while reducing greenhouse gas emissions in their operations.

The actions outlined in the roadmap are based on 5 pathways including:

- 1) Livestock emissions
- 2) Cropping and horticulture emissions
- 3) On-farm energy opportunities
- 4) Carbon farming and landscape management
- 5) Regions and supply chains.

This government–industry collaboration will help lower emissions in the production system and strengthen the sector's environmental and social credentials.

Learn more about the [Queensland Low Emissions Agriculture Roadmap 2022–2032](#).



Supplied by Department of Agriculture and Fisheries, QLD

Pictured: protected cropping systems are climate-controlled facilities that enable any plant to be produced anywhere regardless of external conditions safeguarding foods from climate change

CASE STUDY 9

Victoria: Agriculture sector emissions reduction pledge

The Agriculture sector emissions reduction pledge supports the Victorian Government's long-term vision of a climate-resilient, net zero emissions economy by 2045. Almost \$20 million is being invested in activities that support the sector to tackle its greenhouse gas emissions, while still managing climate risks and continuing to be productive and profitable in a changing climate. This includes:

- The first Victorian Agriculture and Climate Change Statement – outlining a shared vision across industry and government informed by consultation across the agricultural sector and facilitated by the Victorian Agriculture and Climate Change Council and the Victorian Government
- Research trials using lactating dairy cows in pasture-based grazing systems – testing methane-inhibiting feed additives. Experiments are showing promising results, with around 40% methane mitigation possible
- On-Farm Emissions Action Plan Pilot – empowering around 250 farm businesses over 3 years to estimate their emissions profile and identify actions to manage and reduce emissions on farm
- New spatial web tools – helping farmers make location-specific farm planning decisions based on validated data and preparing them for future climate scenarios.

Learn more about the [Victorian Agriculture sector emissions reduction pledge](#).

CASE STUDY 10

Northern Territory: Climate Change Response: Towards 2050

Towards 2050 sets the pathway for the Territory's response to climate change and transition to a low-carbon economy. It is a whole-of-government framework that recognises the Territory's unique climate context and the economic and social contributions of its agricultural sector.

The framework is built around 4 key objectives:

- 1) Net zero emissions by 2050
- 2) A resilient territory
- 3) Opportunities from a low-carbon future
- 4) Inform and involve all Territorians.

The framework identifies whole-of-economy priority initiatives and opportunities, which will play a key role in achieving these objectives and supporting the Territory's climate change response.

Initiatives and opportunities include:

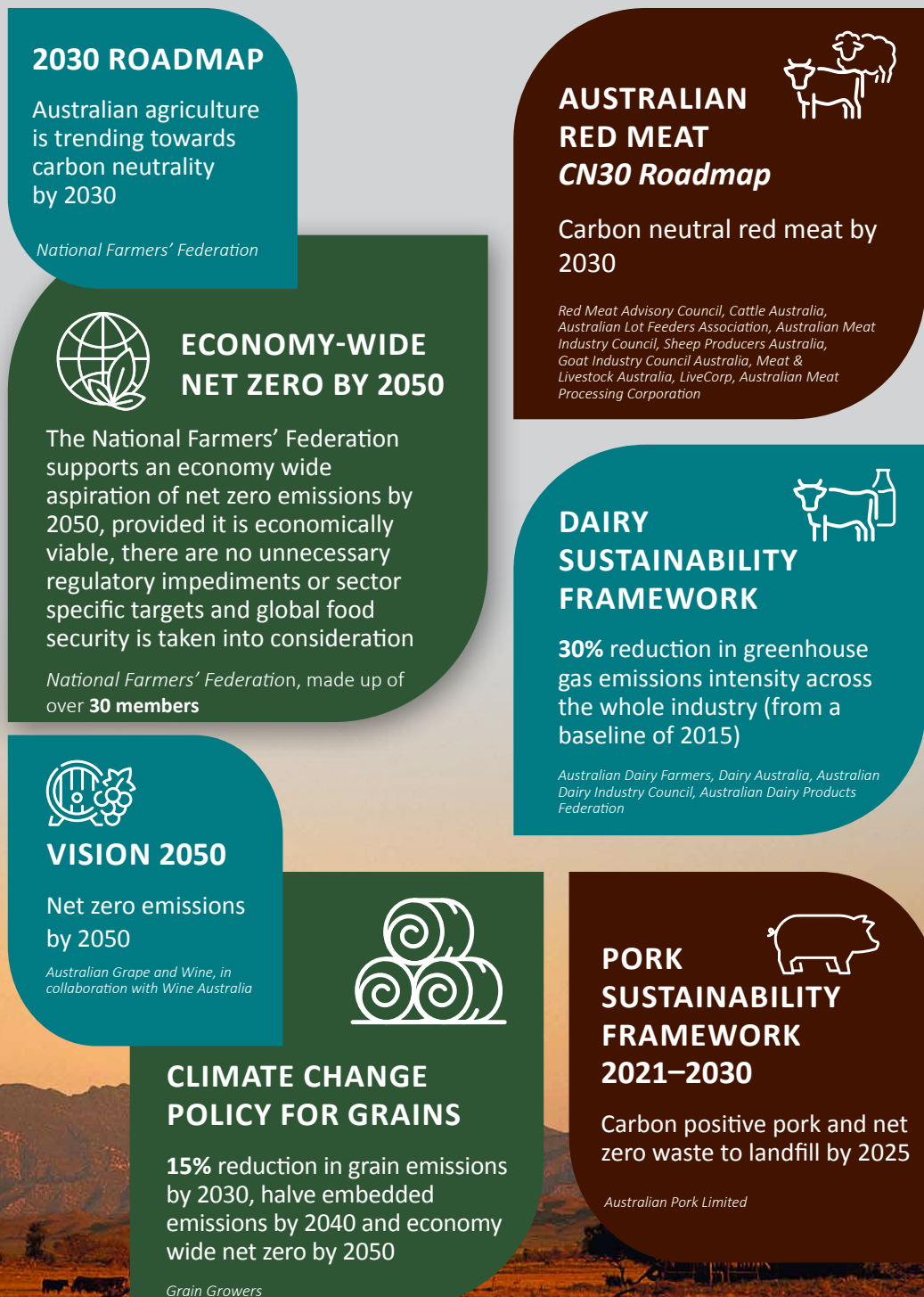
- collaboration between primary industry and researchers to reduce methane emissions from cattle and livestock
- increased landowner participation in Australia's carbon market through the development of new reduction and sequestration methodologies
- provision of professional and technical advice and extension services to help landowners manage climate change risk
- support for Aboriginal rangers to protect and care for Country through policy development, grant funding and land management programs
- delivery of savannah-burning programs that reduce carbon emissions associated with late season fires.

Learn more about the [Northern Territory Climate Change Response: Towards 2050](#).

The agricultural sector understands the importance of contributing to national goals. It is already actively planning for and investing in research, development and adoption of technologies and practices to reduce emissions. Individual farm businesses, peak industry bodies, and rural research and development corporations have also committed to ambitious emissions reduction

goals and set long-term strategies to address the challenge. We can build on existing collaboration frameworks. Enhanced coordination of research priorities, resources and capabilities will help ensure strong outcomes while avoiding duplication or fragmentation of critical research effort.

FIGURE 3: CLIMATE AND SUSTAINABILITY INITIATIVES



Carbon farming opportunities

AUSTRALIAN CARBON CREDIT UNITS IN THE AGRICULTURAL LAND SECTOR

At April 2023, the Clean Energy Regulator had issued more than 80 million Australian Carbon Credit Units (ACCUs) across all agricultural and land sector methods (CER 2023a). One ACCU represents 1 tonne of carbon dioxide equivalent (CO₂-e) greenhouse gas that is not released into the atmosphere (CER 2023b).

Participating in a growing carbon market presents an opportunity for the agricultural sector. For example, producers can be paid for storing carbon in vegetation and soils, and for avoiding emissions in line with approved

methodologies set out by the ACCU scheme. These methodologies include practices relating to waste management and feed additives for livestock. Producers also have the option to use carbon to reduce the net emissions from their businesses.

Well-managed carbon projects can also benefit regional communities by providing alternative income streams and supporting improved land management as part of a farming business. They do this by tracking salinity, improving soil health, increasing biosecurity and biodiversity and protecting agricultural land.

Producers can also allocate agricultural land to farm forestry activities. Agroforestry provides producers with scope to inset emissions and is an effective way to sequester carbon for the long term, while producing a renewable construction resource.

CASE STUDY 11

Tasmania: Farm Forestry Carbon Tool

Launched in January 2023, this initiative was created by Tasmania's Regional Forestry Hub in collaboration with Private Forests Tasmania.

It is designed as a conversation starter for farmers. In just minutes, the tool provides an indicative estimate of a farm's carbon footprint and the impact that trees may have on improving environmental outcomes, including potential tree carbon offset opportunities.

Learn more about the [Farm Forestry Carbon Tool](#).



Source: Tasmanian Partner Toolkit

Credit: Moon Cheese Studio

Supplied by: Department of Natural Resources and Environment Tasmania

The shift to a net zero economy will increase demand for land-based carbon offsets. Given the longer-term ambitions they have for their businesses, producers are now facing decisions about how best to engage with carbon and renewable energy markets. These assets themselves need protection against climate

change and biosecurity risks for them to be realised. Decisions need to be well-informed so that producers can continue to produce food and fibre and make the most of emerging opportunities without compromising their long-term ability to offset or inset their own emissions.

CASE STUDY 12

Australia-wide: Carbon Farming Outreach Program

In October 2022, the Australian Government announced \$20.3 million in funding over 4 years for a Carbon Farming Outreach Program.

The program will train trusted and independent advisers to help farmers and other land managers understand carbon markets, how they can participate, and integrate low emissions technologies and practices into their operations.

Learn more about the [Carbon Farming Outreach Program](#).





Favourable sustainability and climate credentials for exporters

Australian agriculture is an export-oriented sector. The sector's reliance on exports means that producers must constantly evolve and adapt to meet the new and emerging environmental, social and governance credential requirements of international trading partners and supply chains. Consumers are also becoming increasingly aware of environmental and climate issues and are demanding sustainably and ethically produced food and fibre with a low carbon footprint (ABARES 2020).

Global agricultural production subsidies, tariffs and quotas create inefficiencies in food and fibre production and unnecessarily raise emissions. Removing these trade-distorting measures around the world reduces overall global greenhouse gas emissions, improves global food security and lowers consumer food prices.

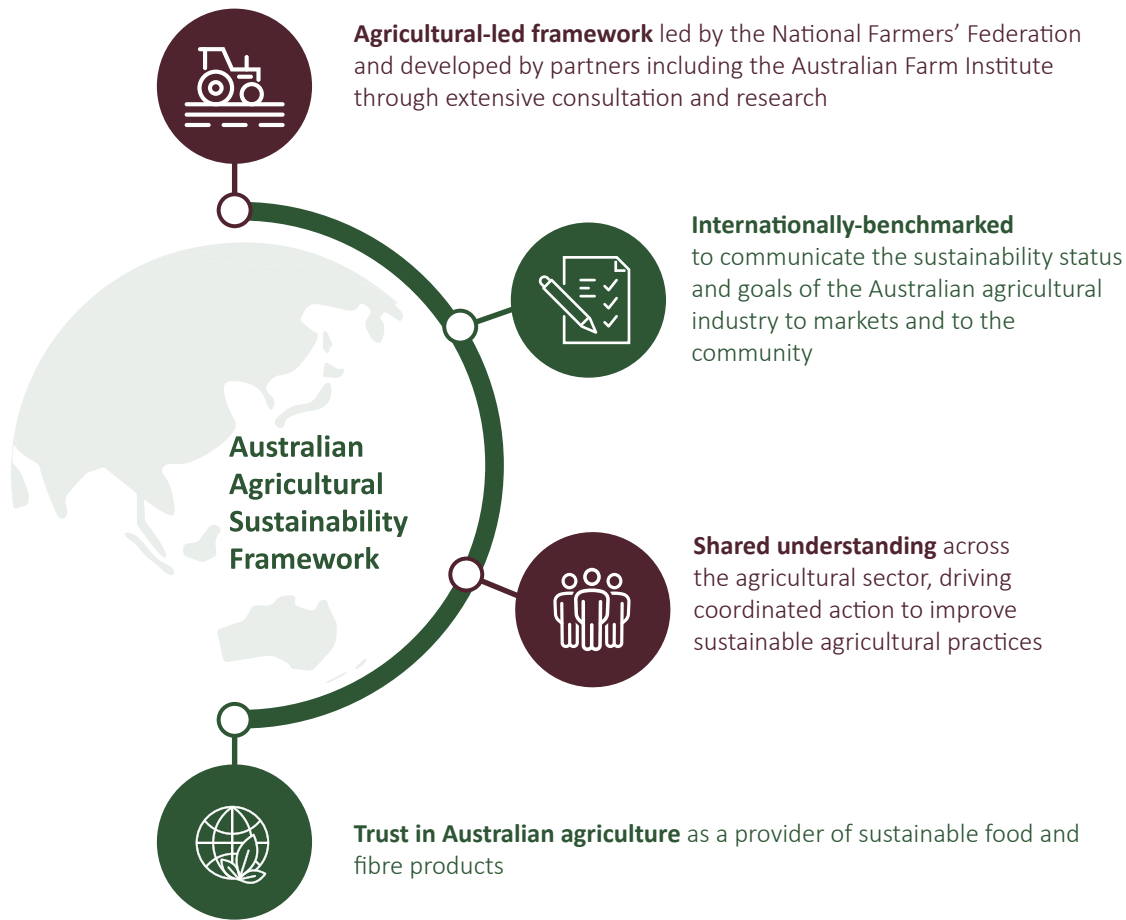
Maintaining fair, free and open trade in agriculture is imperative in addressing food security and the climate challenge over coming decades. Australia is ideally placed to be a global leader in supporting these dual outcomes: improving

global food security and climate-smart agriculture. International collaboration will be vital in developing solutions for adaptation and mitigation challenges in agriculture. Multilateral frameworks will be essential to ensure that subsidies for agricultural production do not compromise the economic, social and environmental gains from trade.

Through the industry-led Australian Agricultural Sustainability Framework, the sector can demonstrate the sustainability of its production practices. By using sustainability credentials that are fair and representative of Australia's unique climate and growing conditions, the sector will be able to increase and maintain market access for exports and verify that it meets changing consumer expectations locally and overseas.

Traceability systems then allow data and credentials to be shared along the supply chain to give assurance that our food and fibre products are sustainably produced. Learn more about [National Traceability](#).

FIGURE 4: AUSTRALIAN AGRICULTURAL SUSTAINABILITY FRAMEWORK



The Australian Agricultural Sustainability Framework is a unique piece of work based on environmental, social and governance (ESG) principles.

ENVIRONMENTAL STEWARDSHIP (E)

Greenhouse gases and air, Soil and landscapes, Biodiversity, Water, Materials, and resources



Learn more about the [Australian Agricultural Sustainability Framework](#).



Credit: Joshua Smith

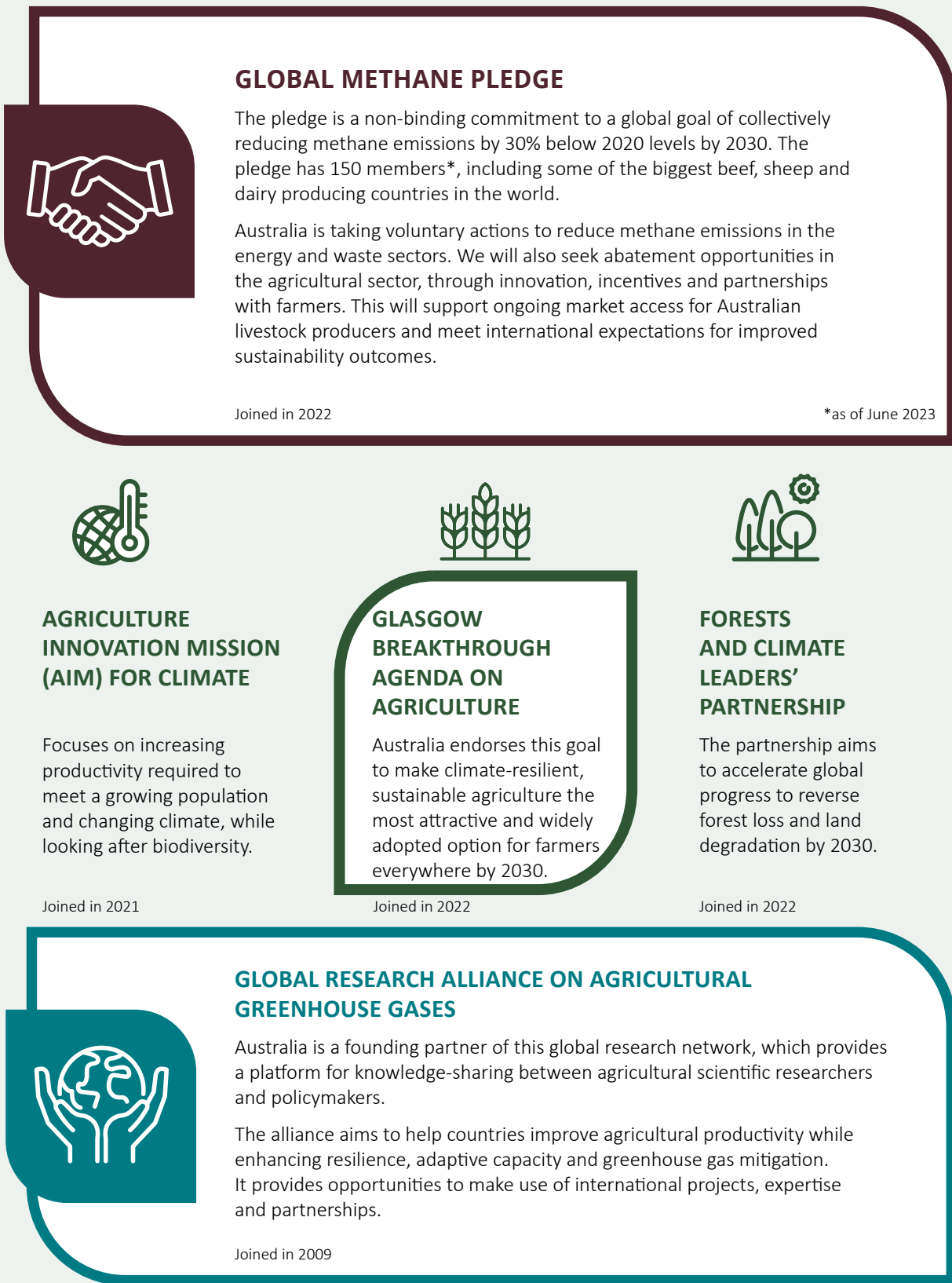
International leadership on climate change and agriculture

Australia is assuming a global leadership role as a constructive and positive climate collaborator. Government and industry are partnering with other countries to address agricultural risks and opportunities arising from climate change.

We are committed to working across borders and with our regional neighbours. We aim to empower through sharing our knowledge and experience, and by facilitating policies and systems designed for specific climates and economies. The Australian Centre for International Agriculture Research is a great example of this partnership, proactively working across Southeast Asia and the Pacific to deliver capacity-building programs to share knowledge. This increased regional leadership will help us achieve our shared goals, strengthen global efforts, ensure food security, maintain biosecurity and protect our agricultural export markets.

These shared efforts are key to maintaining the agricultural sector's competitiveness and its ability to access new export markets. We must also recognise and promote the work and leadership of Australian producers, who have established themselves as world leaders in innovative agricultural practices and climate adaptation.

FIGURE 5: INTERNATIONAL AGRICULTURAL EMISSIONS INITIATIVES



REFERENCES

ABARES 2020, [ABARES Insights: Analysis of global responses to climate change – opportunities for Australian agricultural producers](#), Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra, accessed 17 April 2023.

——2021, [Climate change impacts and adaptation on Australian farms](#), accessed 17 April 2023.

——2022a, [Labour use in Australian agriculture analysis of survey results, 2021–22](#), accessed 1 April 2023.

——2022b, [ABARES Insights: Emissions, agricultural support and food security](#), accessed 17 April 2023.

——2023a, [Australian Agricultural and Grazing Industries Survey](#), accessed 8 June 2023.

——2023b, [ABARES Insights: Snapshot of Australian Agriculture](#), accessed 23 March 2023.

ABS 2023, [Agriculture commodities, Australia](#), Australian Bureau of Statistics, Canberra, accessed 8 June 2023.

AgriFutures Australia 2022, [Community Perceptions and Worker Experiences Program](#), Wagga Wagga, accessed 9 May 2023.

CEBRA 2022, [Biosecurity risk from changes in climate, trade and pest and disease pathways](#), Centre of Excellence for Biosecurity Risk Analysis, Melbourne, accessed 6 June 2023.

CER 2023a, [Emissions Reduction Fund Register, Clean Energy Regulator](#), accessed 1 May 2023.

——2023b, [Australian carbon credit units \(ACCUs\)](#), April, accessed 1 May 2023.

Climateworks Centre 2021, [State and territory climate action: leading policies and programs in Australia](#), Melbourne, accessed 11 June 2023.

DCCEEW 2022, [Australia's emissions projections 2022](#), Department of Climate Change, Energy, the Environment and Water, Canberra, December, accessed 1 June 2023.

——2023, [National Inventory Report Volume I](#), accessed 25 May 2023.

IPCC 2022, [Synthesis report of the IPCC sixth assessment report \(AR6\)](#), Intergovernmental Panel on Climate Change, Geneva, accessed 23 March 2023.

