Australian Government

Department of Agriculture, Fisheries and Forestry

cleanenergyfuture

Filling the Research Gap under the Carbon Farming Futures program

Research Strategy (July 2012 to June 2017)

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Contents

Objectives of this research strategy

The objective of this research strategy is to guide the investments in climate change research for agriculture under *Filling the Research Gap* in order to:

- provide options for land managers to reduce emissions whilst simultaneously boosting their profitability and productivity
- increase our understanding of the likely effects of climate change on specific industries and the benefits of mitigation and adaptation responses
- develop flexible approaches to the management of land and water in agricultural systems to provide land mangers with the basis to make confident resource decisions, including financial and human resources
- develop technologies to contribute to resource efficiency and maintain industry viability given future climate change impacts on production
- contribute to the development of a nationally and internationally agreed body of knowledge on emission reductions and adaptation for agriculture.

In fulfilling its objectives, this research strategy will encourage:

- collaboration and co-ordination between research projects and across industries
- communication between researchers, land managers, industry and government agencies.

Australian climate change policy and agriculture

Climate change poses a serious risk to Australian agriculture, with scientists projecting climate-related changes such as:

- less predictable, more frequent, and more intense weather events
- longer droughts, across large areas of the country
- decreased rainfall in southern Australia
- reduced river flows in southern Australia
- increased stress to agricultural production systems as a result of higher temperatures.

In response, the Australian Government is strongly committed to reducing Australia's net greenhouse gas emissions and has placed emissions reduction at the forefront of domestic climate policy through the Securing a Clean Energy Future plan.

The Australian Government recognises that effective climate change policy must respond to both the causes of climate change (mitigation) and to its consequences (adaptation). In addition, the government values the contribution of international communication and collaboration to the preparation of an Australian response to climate change. A focus on both mitigation and adaptation is especially important to agriculture, given its significant emissions profile and its potential vulnerability to climate changes. Policy must also be flexible enough to respond to new information and maintain relevance over the long term.

This requires an investment in research that will provide technological and management options as well as information to up-skill the land sector to actively reduce emissions and respond proactively to changes in climate. Whilst the primary policy driver of this investment is a national goal to reduce greenhouse gas emissions, there is also the imperative to maintain or increase productivity, given global food security concerns. Climate change research has been and will continue to be essential in supporting the development and implementation of these climate change policy goals.

Greenhouse gas emissions and the land sector

Under the National Greenhouse Gas Inventory (Kyoto Protocol Accounting Framework), land sector emissions include two categories: a) agricultural emissions; and b) land use, land use change, and forestry (LULUCF) emissions. Land sector emissions account for 18 per cent of Australia's total greenhouse gas emissions.

Over recent years, policies such as land clearing restrictions have significantly reduced sources of LULUCF emissions. For this reason, efforts to reduce land sector emissions are now focused towards the opportunities available for agriculture to play an important role in national climate change mitigation.

Agriculture is the dominant source for both methane and nitrous oxide emissions in Australia. In 2010, agriculture accounted for 14 per cent of Australia's national greenhouse gas inventory, comprising (per cent of agricultural emissions):

- methane from enteric fermentation (65 per cent)
- nitrous oxide from agricultural soils (17 per cent)
- prescribed burning of savannas (14 per cent)
- emissions from livestock manure (4 per cent)
- rice cultivation and field burning of agricultural residues (<1 per cent).

Practices and technologies to reduce agricultural emissions are needed to ensure Australia can meet any future emission reduction targets. Action to reduce agricultural greenhouse gas emissions will not only well place the sector in a low carbon economy, but may also improve farm productivity (as greenhouse gas emissions represent losses on energy and nutrients from production systems).

There are also opportunities for agricultural production systems to store carbon in soils (i.e. through changed cropping, pasture and grazing practices) or vegetation (i.e. through reforestation or environmental plantings). However, these opportunities need to be considered along with the potential for some activities (especially soil carbon practices) to be significant sources of emissions in times of low rainfall or drought periods. Opportunities may be complementary to primary production, but could also represent a competitive use of land (forestry vs. agriculture), which needs to be carefully considered in light of food security concerns.

Climate change and the land sector

Depending on industry type and location, Australian agriculture will be affected by climate change in highly variable ways. The value and timing of the adaptive response from Australian agriculture could affect the viability and sustainability of rural communities.

Climate change may allow some industries to: expand geographically in some regions; extend the growing season; diversify; or introduce more profitable practices in the short to medium term. For example, increased atmospheric carbon dioxide concentration is expected to increase plant growth, although this may be limited in some areas by increases in temperature, changes in rainfall, and feedbacks such as nutrient cycling. Other industries may contract in some regions.

Where temperatures are likely to increase significantly, or where water availability is already limited, impacts are more likely to be detrimental. Increased temperatures will exacerbate drought and heat stress, particularly for wheat and intensive livestock industries. Reduced rainfall, and increased rainfall variability, will require changes to irrigation for intensive industries such as horticulture, cotton, sugar, dairy, livestock

and viticulture. Other possible detrimental impacts include those associated with more severe weather events, such as hail storms and tropical cyclones. Detrimental impacts may include, for example: increased crop damage and water logging; increased risk of erosion, fire and land degradation; rising water tables; and reduced water quality.

Changed climate conditions will alter the spread and impact of weeds, pests, diseases and predators. While changed conditions may reduce some productivity loss (e.g. higher temperatures and lower rainfall may reduce fungal infections), new pests and diseases may emerge, or existing ones may become more virulent and widespread.

Second-order effects of climate change may include increased demand for services, commodities and resources. For example, climate change impacts elsewhere in the world will affect world production and consequently markets for agricultural products. CSIRO suggest that detrimental impacts will become increasingly and progressively stronger during the 21st century.

Existing climate change research

The Climate Change Research Program (CCRP) was announced in July 2008 to address three priority areas: reducing agricultural emissions, improving soil management, and supporting adaptation to climate change.

The CCRP was implemented prior to the existence of the Carbon Farming Initiative (CFI) and as such was aimed at exploring the widest possible range of abatement options available for agriculture without consideration of what was likely to lead to participation in carbon markets in the short to medium term. Given the emergence of the CFI, latter years of the CCRP have increased focus on progressing practices that have the potential to lead to CFI offset methodology development.

The CCRP has therefore started to provide the scientific basis for development of CFI offset methodologies to drive land sector participation in carbon markets. For example, demonstration of methane capture and flaring from covered waste water lagoons directly supported the development of the first methodology approved under the CFI. Research on nitrous oxide emissions from fertiliser use and on feed additives in intensive livestock systems and dairies is also leading to the development of offset methodologies.

Many gains in understanding of abatement options have been made through the CCRP. Soil carbon research activities under the CCRP have collected agricultural soil samples from 3500 locations to provide data to improve estimates of changes in soil carbon levels. This has been important in improving our scientific understanding of which practices may have potential to increase soil carbon levels, and to what extent, so that ongoing research can be more focused on where the greatest potential lies. The research has also been an important basis for improving the approach taken to soil carbon measurement in the National Greenhouse Accounts.

The National Biochar Initiative of the CCRP has characterised 80 different types of biochar to develop guidelines for its use. For example, some biochars provide more agronomic benefits, while others are better for sequestering carbon. Further research under the CFI will evaluate biochar as a practical tool for landholders to mitigate emissions.

The CCRP has also developed Australia's ability to measure greenhouse gas emissions from livestock. Research has investigated a range of mitigation techniques – including genetic, feed and microbiological approaches. At this stage, progress in research has developed some feed additives to a stage which is underpinning the development

of CFI offset methodologies for the intensive livestock and dairy sectors. Further research will be required in livestock areas to enable progression towards the development of a range of offset methodologies for the CFI.

Nitrous oxide research under the CCRP has established an internationally recognised benchmark for the measurement of nitrous oxide emissions. This research has been accepted by the IPCC Emissions Factor Database review panel and will form the basis of an expert review process as part of ongoing improvement of Australia's National Greenhouse Accounts for nitrous oxide emissions. Research to date is also likely to be able to lead to very basic offset methodologies for fertiliser management. These can be enhanced and improved upon with further research.

Adaptation research under the CCRP has provided the information to support primary producers to adapt to unavoidable impacts of climate change, capitalise on potential opportunities, and continue development of sustainable and adaptable production systems. Research has focused on short to medium-term applications to counter the impacts of climate change that are already beginning to occur. For example, early results from NSW show that some practices – such as splitting nitrogen fertiliser applications and conserving soil moisture through fallow; increasing crop rotation with pasture; and retaining crop residue – should serve to offset potential yield losses resulting from future warmer and drier conditions.

Filling the Research Gap – future research activities for the land sector

Mitigation

The highly mosaic pattern of land management practice in Australia is in contrast to some other parts of the world and is the result of differing market and environmental conditions and impacts of commercial technologies. This complexity means that projects to create offsets under the CFI may need to be supported by regionally relevant research.

Mitigation research under *Filling the Research Gap* will continue to reduce the uncertainty that exists about the sources, scale and causation of greenhouse gas emissions from agriculture at the regional and farm level. This focus will identify the best opportunities for reducing emissions and allow the prioritisation of research efforts into those management practices that offer the greatest emission reductions.

Quantifying the effectiveness of management practices aimed at reducing emissions is critical to delivering practical abatement strategies that can be developed into CFI offset methodologies. Over time, these new approaches will also enhance national level estimation used to prepare the National Greenhouse Accounts.

To reduce methane emissions from ruminants, a range of strategies – such as animal breeding, biological controls, dietary supplements and feed alternatives – have been explored by the CCRP, with varying levels of abatement. For example, high and low methane emitting cattle and sheep sires have been identified; viruses to attack methane producing microbes have been investigated; and laboratory and on-farm research have shown that oil and fat supplements can reduce emissions.

Successful and permanent manipulation of the rumen microbial population will remain a major research challenge for the foreseeable future. Extensive livestock systems are not amenable to feed supplementation and strategies for reducing methane emissions in these systems are currently limited. Research is still needed to fully develop strategies into CFI offset methodologies, and to develop new and cost-

effective measurement methods. For example, investment in the development of an intra-rumen measurement device will provide the livestock industry with practices that allow emissions reduction to be quantified, leading to participation in the CFI.

Reductions of emissions from cropping and pasture are possible in certain systems or regions through the effective management of soil and water, and nitrogen inputs. Preliminary CCRP research indicates that legume rotations may provide opportunities to reduce nitrous oxide emissions in several production systems – such as sub-tropical sugar cane production and dryland cropping. *Filling the Research Gap* needs to better define the scope of these opportunities before methodology development can progress. Genetic based strategies to improve plant uptake of nitrogen and plant-based production of nitrification inhibitors may also be worthy of further investigation.

Ability to accurately and cost effectively measure and monitor soil carbon is currently limited by practical considerations. Further research into the carbon sequestration and retention capacity of soils in agricultural systems should target these considerations, and the viability of sequestering carbon in soil as an emissions management practice. The challenge of measurement and monitoring is something that has become apparent as a result of the CCRP.

Based on research undertaken to date, and identified information gaps, *Filling the Research Gap* projects researching emission reductions could target, for example:

- development of methods to manipulate methanogenic rumen activity
- development of low-cost methods for identifying low methane emitting, highly productive phenotypesfeed and nutrition in relation to emissions
- dung, urine and manure management
- novel & improved enteric methane measurement techniques
- improved understanding of management practice on soil carbon change
- improved ability to monitor soil carbon change in a cost-effective manner (including the use of remote sensing equipment)
- reducing nitrous oxide loss through chemical routes, to increase the rate of denitrification
- development of cost-effective, slow-release nitrogen fertiliser products which reduce gaseous nitrogen emissions in synergy with increased productivity and profitability
- better understanding of the links between soil carbon and nitrogen (e.g. potential increases in nitrous oxide emissions as soil carbon is increased)
- effect of management practices on soil carbon content in intensive, high input systems.

Farm systems design and analysis

Improved systems design and analysis is required to better estimate levels of abatement and carbon sequestration in response to different management practices. Research under *Filling the Research Gap* will include scenario analysis, modelling, and consideration of social, economic, and business interactions to lower the costs of implementing offset methodologies and help quantify the likely financial rewards for land managers under the CFI.

Modelling provides a key tool for the evaluation of adaptation against differing circumstances, taking into account the linkage with mitigation effects. Modelling can also illuminate future crop performance and breeding priorities, by rapidly exploring the interactions of genetics, management, and the future environment.

Research will target improved measurement and modelling techniques to address practical difficulties, costs and accuracy of emission measurement to better inform mitigation strategies. Improved modelling is critical to the development of further CFI offset methodologies. The focus of improved modelling should be on requirements to support CFI methodologies, and the integration of CFI abatement results into the National Greenhouse Accounts.

Current outputs from the CCRP have delivered new data for methane estimation, nitrous oxide emission factors; development of soil carbon modelling for the land sector in FullCAM; and improved disaggregation of emission factors for animal feeding at the regional scale. The challenge in moving forward will be to translate these improvements into positive land manager action at the farm scale.

Robust measurement activities are a primary requirement of research activities in *Filling the Research Gap*. This provides data that can feed into the development of component and systems models and algorithms needed to produce Australia's Tier 3 (modelled) National Greenhouse Accounts. These models are also needed to develop user-friendly tools for land managers that inform and align with the national inventory methods.

Future research activities could include, for example:

- integrated biosphysical, economic and social modelling to enable assessments of opportunities for land managers to participate in the CFI
- industry-specific, whole-farm systems analysis that considers production, enteric methane, nitrous oxide and soil carbon, and their dynamic interaction
- improved capability of field-scale crop and soil models to simulate the dynamic interactions between adaptation and mitigation strategies, including potential maladaptation
- disaggregation of carbon models at the national scale to better reflect farm-scale change and development
- validation of models to predict nitrous oxide from nitrification, indirect nitrous oxide from leaching, and indirect nitrous oxide from volatilisation

Adaptation

Effective adaptation requires a combination of the following:

- adequate adaptive capacity
- motivation to change and the capacity to plan for change
- well-understood technological and management options
- effective pathways to explore and adopt these
- support from social and institutional environments.

Adaptive capacity in Australian farm enterprises depends on the diversity of assets and activities, and the flexibility to substitute between assets and/or activities in response to external pressures (including climate change).

The performance of Australian agriculture in adapting to climate change, counteracting its negative effects, and grasping new opportunities will be influenced by the development and availability of effective adaptation choices and technologies, and the capacity and motivation of individuals and industries to implement the appropriate adaptations.

Successful adaptation to climate change will require flexible, risk-based approaches that deal with future uncertainty and provide strategies that are robust enough to

cope with a range of possible local climate outcomes and variations. This means land managers will need the capacity, confidence, technologies and tools to make business decisions to address climate change at the farm level.

Through an engagement approach focused on vulnerable production systems and region—such as mixed farming enterprises on the edges of climatic zones—the government can explore and promote sustainable options, reduce uncertainty, and support land managers to improve existing management strategies for dealing with climate variability. This will support the agricultural sector to build adaptive capacity and reduce vulnerability by taking action to climate change (including extreme weather events).

Within this context, research could, for example:

- focus on more systemic and transformative adaptation options rather than incremental changes
- identify plant and animal traits amenable to changes that facilitate adaptation to anticipated climate change
- identify and assess novel technologies and management options that enable win–win adaptation outcomes
- develop information to inform responses to climate change and its associated variability at the regional and individual level
- work with industry to develop suitable technological and management responses that consider biophysical, social, psychological, institutional, economic, policy and/or infrastructural barriers to adaptation
- focus on no-regrets measures by considering the interface between intensification and vulnerability in a changing climate, and between adaptation and mitigation
- provide cost-effective tools that enable land managers to adopt practices that lead to a reduction in greenhouse gas emissions
- provide robust outcomes for the reporting of the land sector for international accounting purposes.

In addition, research needs to be a supported by: efficient pathways; two-way communication; a feedback system of continual improvement; and a social and institutional environment that encourages exploration and adoption of adaptations. Research should also consider multiple adaptation benefits from research projects, such as preparing for and managing drought and water scarcity.

Connecting mitigation and adaption efforts in agriculture

The relationship between mitigation and adaptation can be interdependent—increasing mitigation can reduce the need for further future adaptation, and vice versa. At a farm practice level, the relationship between mitigation and adaptation is more complex—the relationship will be different depending on the production system and region, and the particular action in question.

Certain adaptive actions can feasibly complement mitigation strategies. Conversely, poorly considered adaptation can lead to increased emissions or reduce the availability of mitigation options. The challenge for *Filling the Research Gap* is to deliver adaptation and mitigation research for land managers and policy makers to support appropriate decision-making strategies that enhance, where possible, both adaptation and mitigation outcomes.

Within this context, research should be inclusive of projects with dual adaptation and mitigation benefits. For example, the northern beef demonstration project under the CCRP considered both adaptation and mitigation strategies concurrently.

International collaboration

Research will target member countries of the Global Research Alliance on Agricultural Greenhouse Gases which have research underway or planned to better understand, measure, and manage agricultural greenhouse gas emissions of particular relevance to Australian industries. By targeting projects to link member countries' efforts through the Alliance, faster progress towards the solutions needed for improving agricultural productivity and reducing its contribution to climate change can be achieved.

A key focus of our involvement with projects under the Global Research Alliance will be on those activities which can:

- provide additional verification to Australian domestic research
- complement Australian research by filling gaps
- increase the ability to deliver offset methodology development.

Research will prioritise interactions between soil carbon and nitrogen cycling. This research will assist Australia's efforts to lead, with France, the Alliance's Soil Carbon and Nitrogen Cycling Cross-Cutting Group.

Filling the Research Gap: Program implementation

Project Assessment

Applications for funding under *Filling the Research Gap* are assessed against pre-determined selection criteria through a competitive grants process outlined in the guidelines for each funding round. Applications are initially examined by departmental officers to pre-assess eligibility, before being provided to an Expert Advisory Panel. The role of the Expert Advisory Panel is to rank applications against the assessment criteria; identify synergies between applications; and verify the relevance of the science being proposed against the objectives of *Filling the Research Gap*. The Expert Advisory Panel provides advice to the Department of Agriculture, Fisheries and Forestry (the department).

Eligibility, conditions, and the application and selection process will be found in the *Filling the Research Gap* Grant Program Guidelines for each round (and publically accessible from the department website). As targets change with progressive investment, the *Filling the Research Gap* guidelines will re-focus priorities for each funding round.

The Expert Advisory Panel

The Expert Advisory Panel is selected on the basis that each member is a leading and active research scientist and/or industry representative. Members are required to have expertise in agricultural research and agricultural economics, with experience in climate change science research. This ensures that sufficient expertise and experience is brought together to ensure only projects that can achieve program outcomes are selected and that commercial realities are taken into account to improve the transition from applied research to demonstration of commercial applications. As well as representation from Australian science and industry, the Expert Advisory Panel includes a representative from an overseas independent

science organisation and two government officials – one each from the Department of Agriculture, Fisheries and Forestry and the Department of Climate Change and Energy Efficiency.

Filling the Research Gap Governance

The plan for management of *Filling the Research Gap* acknowledges a number challenges, and has adopted approaches to reduce risk. The department will ensure:

- management of targeted investment, through the recommendations of an independent, Expert Advisory Panel (described above)
- close coordination – throughout the life of the research program – with the Department of Climate Change and Energy Efficiency, to ensure that research outcomes are translated into methodologies
- close coordination and monitoring against other land sector activities – throughout the life of the research program – with the Land Sector Carbon and Biodiversity Board
- continuous monitoring and evaluation of project outputs against international best practice, to improve likelihood that laboratory demonstration of emissions reduction can be replicated in the field
- integrated communications targeted at a regional level, to maximise land manager up-take of technologies and improved practices
- provision of consistent, clear messages and materials, and government contact points, to support extension providers to accurately inform landholders.

In addition, to ensure credibility and effectiveness of research outcomes under *Filling the Research Gap*, it is a requirement that project results are peer-reviewed and published in scientific literature.

Attachment 1

Securing a Clean Energy Future

The Securing a Clean Energy Future Plan is a long-term plan to reshape the Australian economy, provide greater certainty to drive innovation, and help avoid the increased costs associated with delayed action on climate change. The Securing a Clean Energy Future Plan includes putting a price on carbon; promoting innovation and investment in renewable energy; improving energy efficiency; and – through the Land Sector Package – creating opportunities in the land sector to cut greenhouse gas emissions and improve productivity, sustainability and adaptability.

The Land Sector Package

Agriculture and forestry will play a key role in reducing Australia's greenhouse gas emissions, however, a carbon price will not apply to agricultural emissions, meaning there will be no requirement for land managers to pay for emissions from livestock or fertiliser use.

The land sector is predominantly supported to contribute to a clean energy future via the $1.7 billion Land Sector Package and the Carbon Farming Initiative (CFI). Over six years (from the 2011–12 financial year) the Land Sector Package will invest in measures to reduce emissions, enhance long-term productivity, protect the natural environment, and increase the land sector's adaptability to climate change. Programs under the Land Sector Package are on-going beyond 2016–17.

Opportunities for land managers to participate in the CFI will be created through the Land Sector Package Carbon Farming Futures Program. Carbon Farming Futures will invest $429 million over six years (from 2011–12) to ensure that advances in emission reduction technologies and techniques will continue the evolution of management practices in the land sector towards low emissions and improved productivity. This will complement the existing Carbon Farming Initiative.

Other elements of the Land Sector Package include:

- Biodiversity Fund ($946 million over six years, commencing 2011–12)
- Indigenous Carbon Farming Fund ($22 million over five years, commencing 1 July 2012)
- Regional Natural Resource Management Planning for Climate Change Fund ($44 million over five years, commencing 1 July 2012)
- Carbon Farming Skills ($4 million over five years, commencing 1 July 2012)
- Carbon Farming Initiative Non-Kyoto Carbon Fund ($250 million over six years, commencing 1 July 2013)

- Refundable Tax Offset ($44 million over three years, commencing 1 July 2012)
- Land Sector Carbon and Biodiversity Board.

The Carbon Farming Initiative

The Carbon Farming Initiative is an Australian Government carbon offset scheme to help land managers earn income from reducing emissions like nitrous oxide and methane through changes to agricultural and land management practices, or storing carbon in soils and vegetation.

Reduced emissions and increased carbon storage practices will enhance adaptability of the land sector to climate change, protect Australia's natural environment, and improve long-term farm productivity. Approved offset methodologies under the Carbon Farming Initiative include: manure management in piggeries; establishing environmental plantings; management of savannah fires; and capture and combustion of landfill gas. Participation in the Initiative is voluntary and is designed to maintain competitiveness of the agriculture sector.

The Carbon Farming Initiative is complemented by the Carbon Farming Futures Program.

Carbon Farming Futures

The Carbon Farming Futures program provides $429 million towards the research and demonstration of abatement practices that will allow land managers to integrate carbon farming into their normal farm business. In doing so, the program supports the land sector to assist Australia to achieve long-term emission reduction targets.

The Carbon Farming Futures program will engage widely with researchers to fund emerging technologies and innovative management practices to: reduce greenhouse gas emissions from livestock and crops; improve soil carbon; and enhance sustainable agricultural practices.

Components of the Carbon Farming Futures Program

The Australian Department of Agriculture, Fisheries and Forestry is responsible for delivering four components of the Carbon Farming Futures Program:

- Filling the Research Gap
- Action on the Ground
- Extension and Outreach
- Refundable Tax Offset (joint responsibility with the Australian Taxation Office)

The Department of Climate Change and Energy Efficiency is delivering the fifth component of CFF (Methodology Development) which will convert research from *Filling the Research Gap* into methodologies to support CFI abatement projects. DCCEE also maintains and develops Australia's national emissions inventory. Activities administered by the Australian Department of Agriculture, Fisheries and Forestry complement this work.

Filling the Research Gap

Filling the Research Gap provides $201 million over six years to fund research into new technologies and practices for land managers to reduce emissions and store soil carbon. It also includes a biennial land management practise survey to be conducted by the Australian Bureau of Statistics to underpin additionality assessments for the CFI.

Action on the Ground

Action on the Ground provides $99 million over six years to assist industry and farming groups test and apply research outcomes in real farming situations. The department will administer a competitive funding program directed towards projects which will test the relationship between different management practices and emissions levels and/or carbon stores. This will enable knowledge transfer and promote broader uptake of land sector abatement activities. Outcomes of projects will be used in extension and outreach activities.

Refundable Tax Offset

This $45 million initiative enables primary producers to apply for a 15 per cent refundable tax offset on the purchase of new conservation tillage equipment, and is designed to encourage conservation agricultural practices to reduce emissions, increase soil carbon and improve productivity.

Extension and Outreach

The Extension and Outreach component provides $64 million over six years to supply information, and support an extension network to help land managers take action on the land. The department will administer a competitive funding program to engage extension providers in regional areas to undertake activities such as information sessions, workshops, conferences, and webinars, and contribute to tie-ins at on-farm demonstrations and field days, and the social media. The program will also leverage existing extension networks and activities already underway or proposed by extension networks. This will provide capacity building activities to ensure broad access to information across the country and all extension networks.

Methodology Development

The Australian Government has committed $19.6 million to the Methodology Development component to convert research from *Filling the Research Gap* into estimation methodologies for use in the CFI. As part of this program, $7.2 million will be available as grants for methodology development projects. Outcomes will include the development of practical, low-cost estimation and reporting tools for land managers who store or reduce carbon across various landscapes and production zones.

The ‘Biosphere’ Graphic Element

The biosphere is relevant to the work we do and aligns with our mission—We work to sustain the way of life and prosperity for all Australians. We use this shape as a recognisable symbol across our collateral.

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