Dairy Australia

NRM Resources Review

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**Seeking input**

This is a working document. Input is welcome. To provide input please email Alison Kelly at

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# ConTEXT

## purpose

This report provides a preliminary overview of the natural resource management (NRM) tools, resources and policies relevant to the Australian dairy industry (as at 27th September 2016).

## background

This report was commissioned by the Profitable Dairying in a Carbon Constrained Future (PDCCF) program’s Dairy Industry Advisory Group (DIAG).

The primary strategy for the PDCCF project has been to embed carbon reduction messages into existing dairy industry programs and communication channels within the overall context that **‘good farm business management reduces greenhouse gases per litre of milk’**. The project has been increasing industry exposure to information about practices that profitably reduce/sequester greenhouse gas emissions (through regional events and one-on-one) as well as collating and updating existing industry resources and tools (on the revised [Dairy Climate Toolkit](http://www.dairyclimatetoolkit.com.au) website).

As the project has progressed the key messages and tools have been refined. The operating context has changed – i.e. with the increasing interest from international markets on carbon disclosure and domestically the interest in defining natural capital and carbon risk. Emerging trends have reinforced the need for carbon reduction to be integrated with wider NRM and productivity. Subsequently, the DIAG saw a need for understanding and mapping existing and planned NRM resources.

**This is a working document. Input is welcome.**



# International policies, programs and Australian dairy industry targets for sustainability

## Summary of international nrm initiatives

Collaboration: There is growing interest in collaborative approaches to dairy sector NRM issues globally, including addressing greenhouse gas emissions/ climate change, biodiversity and water. High-level (global) goals for addressing the dairy impacts on NRM have been committed to across a number of these topics, however, there is no one-size-fits-all approach to how to deliver the outcomes at the national and local level.

Integration of social, economic and biophysical: There is recognition of the need to integrate sustainability with social (well-being) and economic (viable business) considerations.

Drivers for sustainability differ: Global initiatives are being driven for different reasons – through industry, multi-national and NGO partnerships (e.g. [Sustainable Agriculture Initiative Platform](http://www.saiplatform.org/)), Industry/Government initiatives (e.g. [UK Roadmap](http://www.dairyuk.org/areas-of-work/environment-sustainability)), not-for-profit – private partnerships keen on environmental outcomes (e.g. Livestock Environmental Assessment and Performance Partnership), a dairy sector keen to demonstrate their environmental credentials (e.g. International Dairy Federation – Standing Committee on the Environment); corporate multi-nationals committed to sustainable sourcing of raw materials (e.g. Unilever) and financial institutions committed to supporting the Natural Capital Declaration (2012).

Duplication by necessity: There is some duplication of effort in these high-level sustainability initiatives (although this is not the intention of these groups). However, all are focused on ensuring a sustainable dairy industry into the future. It is therefore still important to engage with these initiatives and indeed ensure Australian dairy industry maintains on top of emerging trends in this area (e.g. biodiversity assessment)

## Key international initiatives

Below is a list of key international initiatives relevant to dairy and NRM:

2.2.1 [Sustainable Agriculture Initiative Platform](http://www.saiplatform.org) (SAI Platform)

2.2.2 [Global Dairy Agenda for Action](http://dairysustainabilityframework.org/the-gdaa/background/) (GDAA)

2.2.3 [Dairy Sustainability Framework](http://dairysustainabilityframework.org/) (DSF)

2.2.4 [Livestock Environmental Assessment and Performance (LEAP) Partnership](http://www.fao.org/partnerships/leap/en/)

2.2.5 [International Dairy Federation](http://fil-idf.org)

2.2.6 [UK Dairy Environmental Roadmap 2015](http://dairyroadmap.com/areas-of-work/environment-sustainability)

2.2.7 [Unilever – Sustainable Living Plan](https://www.unilever.com/sustainable-living/the-sustainable-living-plan/reducing-environmental-impact/sustainable-sourcing/)

2.2.8 [Natural Capital Protocol](http://naturalcapitalcoalition.org)

See **Appendix 1** for more detail on each of these initiatives.

## Australian Dairy Industry Sustainability Framework

Under the ‘Reducing environmental impact’ component of the Sustainability Framework there are four long-term outcomes (to 2020):

1. Improve nutrient, land and water management
2. Reduce the consumptive water intensity of dairy manufacturers by 20%
3. Reduce greenhouse gas emissions intensity by 30%
4. Reduce waste to landfill by 40%.

See **Appendix 2** for more on the Sustainability Framework.

# Resources to enable on-farm practice change in resource management

Dairying for Tomorrow is the Dairy Australia program that supports dairy farmers and the industry reduce their environmental footprint by providing resources and tools under the following common themes:

3.1 [**Climate change**](#_climate_change)

3.2 [**Water**](#_Water)

3.3 [**Effluent**](#_Effluent)

3.4 [**Biodiversity and waterways**](#_Biodiversity_and_waterways)

3.5 [**Composting**](#_Composting)

3.6 **[Soils](#_Soils)**

3.7 [**Fertiliser**](#_Fertiliser_and_off) **and off farm nutrient loss**

3.8 **[Energy](#_Energy)**

3.9[**Land management**](#_Land_management)

3.10 [**Recycling**](#_Recycling)

The following information has been collated for each of the themes:

* Description of the issue, its implications for sustainable dairy business and relevant industry target
* Summary of existing resources/tools for dairy farmers
* Existing programs delivering research and resources to address the topic
* Emerging tools/resources currently in development.

## climate change

**Description of the issue, its implications for sustainable dairy business and relevant industry target**

|  |  |  |
| --- | --- | --- |
| Environmental issue/s | Sustainable business need/s | Relevant industry indicator/targets |
| Physical impacts of climate variability, extremes and long-term change on the farm, cow and inputs  Greenhouse gas emissions exacerbating climate change | Understanding climate risk, climate change, pricing carbon and carbon farming on business (profit, production and people)  Preparedness for extremes and future climates  Profitable abatement strategies  Responding to market needs for carbon management/reporting  Having access to tools and resources to increase resilience and flexibility | **10.1 Emissions from dairy manufacturers (tonnes of CO2 equivalent per ML milk processed) – 125.8 by 2020 (Baseline: 178.7)**  **10.2 Farm emissions abatement actions (under review)** |
|  |  |  |

**Summary of existing resources/tools for dairy farmers**

| Sub-topic/issue | Existing tools/resources | Link |
| --- | --- | --- |
| Impacts of climate change | Climate change in Australian dairy regions (CSIRO 2016) | [Climate change and Australian dairy](http://dairyclimatetoolkit.com.au/climate-and-greenhouse-basics/implications-for-dairy-industry) |
| Good business management reduces greenhouse gases | 26 YouTube videos on carbon and resource use efficiency | [Dairy Climate Toolkit Videos](http://www.dairyclimatetoolkit.com.au/videos) |
| Understanding carbon risk / greenhouse gas emissions | Australian Dairy Carbon Calculator (DGAS) calculates the impact of adopting different abatement strategies on their total farm GHG emissions and GHG emissions intensity and can help them work out the strategies best suited to their farming system. | [DGAS](http://www.dairyingfortomorrow.com.au/tools-and-guidelines/dairy-greenhouse-gas-abatement-calculator/) |
| Preparing for extremes | Dairy Farm Emergency Preparedness Checklist (2011) | [Extreme weather](http://www.dairyaustralia.com.au/Environment-and-resources/Extreme-weather.aspx) |
| Managing heat stress | Cool Cows – information on how to manage heat stress in dairy herds | [Cool Cows](http://www.coolcows.com.au/) |
| Maximising pasture production | FeedBase – information on how to optimize pasture production for nutrition | [FeedBase and animal nutrition](http://www.dairyaustralia.com.au/Levy-investment/Increasing-farm-profitability-and-competitiveness/Farm-margin-improvement/Feedbase-and-animal-nutrition.aspx) |
| Understanding nitrous oxide emissions | Nitrous oxide fact sheets and  case studies | [Nitrogen Management](http://www.dairyclimatetoolkit.com.au/~/media/climatetoolkit/reports/pdccf%20-%20getting%20nitrogen%20fertiliser%20right%20-%20science%20-%202015.pdf)  [Farmer case study](http://www.dairyclimatetoolkit.com.au/~/media/climatetoolkit/reports/pdccf%20-%20getting%20nitrogen%20fertiliser%20right%20-%20farmer%20-%202015.pdf) |
| Understanding methane emissions | Methane emissions fact sheets | [Managing diet to reduce emissions](http://www.dairyclimatetoolkit.com.au/~/media/climatetoolkit/reports/pdccf%20-%20diet%20and%20pasture%20-%20science%20-%202015.pdf)  [Farmer Case study](http://www.dairyclimatetoolkit.com.au/~/media/climatetoolkit/reports/pdccf%20-%20diet%20and%20pasture%20-%20farmer%20-%202015.pdf) |
| Reducing emissions for carbon credits | Current Emissions Reduction Fund Methods – feeding dietary additives and destruction of methane from manure | [Dairy relevant ERF methodologies](http://dairyclimatetoolkit.com.au/reducing-farm-emissions/emissions-reduction-fund) |

**Existing programs delivering research and resources to address the topic:**

***Profitable Dairying in a Carbon Constrained Future (active)***

The aim of Profitable Dairying in a Carbon Constrained Future is to build farmer and service provider understanding about strategies to reduce emissions, including opportunities available through the Australian Governments Emissions Reduction Fund (ERF).

Activities being implemented include:

* Resource Use Efficiency Focus Farms
* Resource use efficiency workshops and programs including Fert$mart
* Development of resources and guidelines.

***Nitrogen Use Efficiency – More Profit from Nitrogen program (active)***

This project has four focus areas for improving the productivity and profitability of nitrogen use. These are:

* Optimizing nitrogen use efficiency through efficient irrigation practices
* Quantifying the timing and rate of nitrogen mineralisation
* Extracting value from Enhanced Efficiency Fertilisers: Developing new products and optimizing existing ones
* Turning research into outcomes: Testing and developing best practice nitrogen use management.

Research and demonstration activities are being conducted in northern NSW, Camden, NSW and Western Victoria. These focus areas directly address dairy RD&E gaps identified by previous research into nitrogen loss pathways funded under the Australian Government Nitrous Oxide Research Program, and nitrogen use efficiency RD&E gaps identified in Dairy Moving Forward 2015.

***Managing Climate Variability Program (active)***

The Dairy Australia investment in the cross sector Managing Climate Variability Program supportsthe development of more accurate multi-week seasonal forecasts of rainfall and temperature in dairy regions of southern Australia.

***Technologies for Reducing Greenhouse Gas Emissions and Providing Offset Options for the Beef and Dairy Industries (active)***

This is a multinational collaborative project involving government, industry and private investors with the aim of quantifying the greenhouse gas emissions mitigation potential of a range of novel feed additives and feeding strategies.

***FeedBase (active)***

Developing and delivering information that leads to more informed and effective strategic (longer term), tactical (within season) and operational (day to day) decisions with regards to feed base.

**Emerging tools/resources currently in development:**

* Update: Australian dairy regional climate change fact sheets
* Integration of DairyBase, Dairy Farm Monitor and DGAS to enable easy tracking of tends in emissions intensity on Australian dairy farms.

## Water

**Description of the issue, its implications for sustainable dairy business and relevant industry target**

| Environmental issue/s | Sustainable business need/s | Relevant industry indicator/targets |
| --- | --- | --- |
| Reduced water availability (due to climate change and increasing competition for resources)  Maintaining water quality off-farm | More efficient use of water in the dairy shed (Optimising DM/ML/KwH)  Water-saving irrigation technologies save water and energy  Identifying reliable water resources  Cost/benefit analysis of investment in new water use infrastructure and management | 8.3 Irrigation automation – 80% by 2020 (Baseline: 47%)  (Under review)  8.6 Recycle water on farm – 100% by 2020 (Baseline: 50%)  (Under review)  9.1 Reduce the consumptive water intensity of dairy manufacturers by 20% - litres per litres of milk processed – 1.40 by 2020 (Baseline: 1.75) |
|  |  |  |

**Summary of existing resources/tools for dairy farmers**

| Sub-topic/issue | Existing tool/resources | Link |
| --- | --- | --- |
| Efficient water use | Saving water in dairies – information on water saving options | [Saving water in dairies](http://www.dairyaustralia.com.au/Environment-and-resources/Water/Saving-water.aspx) |
| Precision tools for effective water delivery | Irrigation system selection and design – step by step guidelines | [Irrigation system selection and design](http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/lwm_farmwater_efficient_irrigation_wheel)  [Video – Variable rate irrigation](https://youtu.be/1y2LnnkGPvc) |
| Water security | Simple spreadsheet tool that can be used to assess the risk of running short of stock water. Relevant to all regions. | [Monthly water budget tool](http://www.dairyingfortomorrow.com.au/tackling-specific-issues/water/) |
| Energy efficient irrigation systems | Fact sheet: How does energy efficiency fit into my irrigation system? | [How does energy efficiency fit into my irrigation system](http://www.dairyingfortomorrow.com.au/tackling-specific-issues/energy-2/) |

**Existing programs delivering research and resources to address the topic:**

***Smarter Irrigation for Profit (active)***

Smarter Irrigation for Profit is a partnership between the major irrigation industries of cotton, dairy, rice and sugar. The four dairy projects are:

**Optimised Dairy Irrigation Farms (Dairy Australia):** Five farmer managed “optimised irrigation” demonstration sites on commercial dairy farms in WA, SA, Victoria, NSW and Queensland. Each site will quantify the expected water, energy and labour savings associated with adoption of innovative irrigation technologies over two irrigation seasons, as well as the associated management and skills requirements, maintenance costs and labour and lifestyle implications.

**Smart automated irrigation (Tasmania Institute of Ag.):** This project will look at the use of irrigation water in pastures by collecting data on water use, energy use and pasture production from five sites across Tasmania. Using this data, the team will work with farmers to make changes to improve water use efficiency. The project will also trial an automation system that automatically irrigates pasture and applies variable volumes of water to the same paddock.

**Irrigation Scheduling Technologies (Agriculture Victoria):** The project will develop and test an automatic irrigation module, based on the satellite/weather-based irrigation information system developed in Victoria, on commercial dairy sites using flood irrigation as a preliminary step towards the whole farm automation of future irrigated farms in SE Australia.

**Improved Irrigation Bay Design (Agriculture Victoria): *I***mproved irrigation bay designs that reduce the duration and variation of surface ponding time.

*Catch can testing for pivot efficiency SA*

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## Effluent

**Description of the issue, its implications for sustainable dairy business and relevant industry target**

| Environmental issue/s | Sustainable business need/s | Relevant industry indicator/targets |
| --- | --- | --- |
| Soil nutrient imbalances resulting in nutrient loss off-farm  Potential risk of polluting waterways and groundwater | Cause of soil nutrient imbalances resulting in reduced pasture growth and increased animal health risks  Valuable source of nutrients that can be recycled back onto pastures and crops  Replacement for bought chemical fertilisers | 8.2 Nutrient management plans – 80% by 2020 (Baseline: 30%) |
|  |  |  |

**Summary of existing resources/tools for dairy farmers**

| Sub-topic/issue | Existing tool/resources | Link |
| --- | --- | --- |
| Reporting/ measurement | Effluent management plans  Effluent and manure management database - the central repository of all the information on and recommendations for effluent and manure management in Australian dairying. | [Effluent and manure management database](http://www.dairyingfortomorrow.com.au/tools-and-guidelines/effluent-and-manure-management-database-for-the-australian-dairy-industry/) |
| Effluent management | Effluent video series:   1. Making the most of effluent 2. Avoiding problems with effluent management 3. The value of effluent 4. Effluent system design 5. Minimising effluent volumes 6. Managing storage levels 7. Planning a new pond 8. Constructing a pond – soil testing 9. Pond de-sludging 10. Managing manure | [Effluent video series](http://www.dairyingfortomorrow.com.au/tackling-specific-issues/effluent/)  See also  [Video – Effluent as fertiliser](https://youtu.be/T-0I7KCo1bs?list=PLF43zgg2AAtbbklafcUz3c_wHqGOnAa03) |
| Application rates | Nutrients from effluent and sludge calculator | [Nutrients from effluent and sludge calculator](http://www.dairyingfortomorrow.com.au/tools-and-guidelines/nutrients-from-effluent-and-sludge-calculator/) |
| Regional –specific effluent management | * DairyGains Victorian Guidelines – Effluent * Victorian Guidelines – Feedpads and Freestalls * Environmental management guidelines for the dairy industry NSW * Managing Dairy Farm Effluent in Tasmania * SE South Australian Effluent Guidelines * Mt Lofty Ranges Effluent Guidelines * WA Dairy Effluent Code of Practice | [DairyGains](http://www.dairyingfortomorrow.com.au/wp-content/uploads/2008-DairyGains-Victorian-Effluent-Guidelines.pdf)  [Feedpads and Freestalls](http://www.dairyingfortomorrow.com.au/wp-content/uploads/Victorian-Guidelines-feedpads-and-freestalls.pdf)  [NSW](http://www.dairyingfortomorrow.com.au/wp-content/uploads/Environmental-management-guidelines-for-the-dairy-industryNSW.pd)  [Tasmania](http://www.dairyingfortomorrow.com.au/wp-content/uploads/Managing-Dairy-Farm-Effluent-in-Tasmania.pdf)  [SE South Australia](http://www.dairyingfortomorrow.com.au/wp-content/uploads/SE-SA_effluent_guidelines-2005.pdf)  [Mt Lofty South Australia](http://www.dairyingfortomorrow.com.au/wp-content/uploads/MtLoftyRanges_effluent_guidelines_2006.pdf)  [Dairy Shed Effluent Code of Practice – Western Dairy](http://www.dairyingfortomorrow.com.au/wp-content/uploads/Dairy_Shed_Effluent_WA_Code_of_Practice.pdf) |
| Efficient system design | Video – Effluent system design  Effluent Design Toolkit / Design Livestock Effluent Systems course  Dairy shed effluent and biogas – FAQs  Report - Biogas feasibility for Australian dairy farms | [Efficient system design resources](http://www.dairyingfortomorrow.com.au/tackling-specific-issues/effluent/)  [Fact sheet](http://www.dairyingfortomorrow.com.au/wp-content/uploads/Dairy-Shed-Effluent-and-Biogas_1.pdf)  [Biogas feasibility report](http://frds.dairyaustralia.com.au/wp-content/uploads/2013/05/FINAL_Biogas-technology_A4-report-summary.pdf.) |
| Effluent and greenhouse gas emissions | Video series  Effluent and GHG emissions – farmer  fact sheet | [Video – Minimising emissions from effluent (keep it low)](https://youtu.be/ZMPym6PbwGA?list=PLF43zgg2AAtbbklafcUz3c_wHqGOnAa03)  [Farmer fact sheet](http://www.dairyclimatetoolkit.com.au/~/media/climatetoolkit/reports/pdccf%20-%20getting%20effluent%20right%20-%20farmer%20-%202015.pdf) |

**Existing programs delivering research and resources to address the topic:**

***Increasing Dairy Farm Productivity through Stormwater Harvesting, Resource Recovery and Recycling* *(active)***

This project is trialing a new approach to managing effluent and runoff from dairy sheds designed to improve handling of manure solids and control salt levels in recycled effluent, and in the process increase nutrient recovery rates.

**Emerging tools/resources currently in development:**

Effluent resources for farmers including effluent YouTube clips and associated fact sheets covering practical, cost effective solutions for common issues.

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## Biodiversity and waterways

**Description of the issue, its implications for sustainable dairy business and relevant industry target**

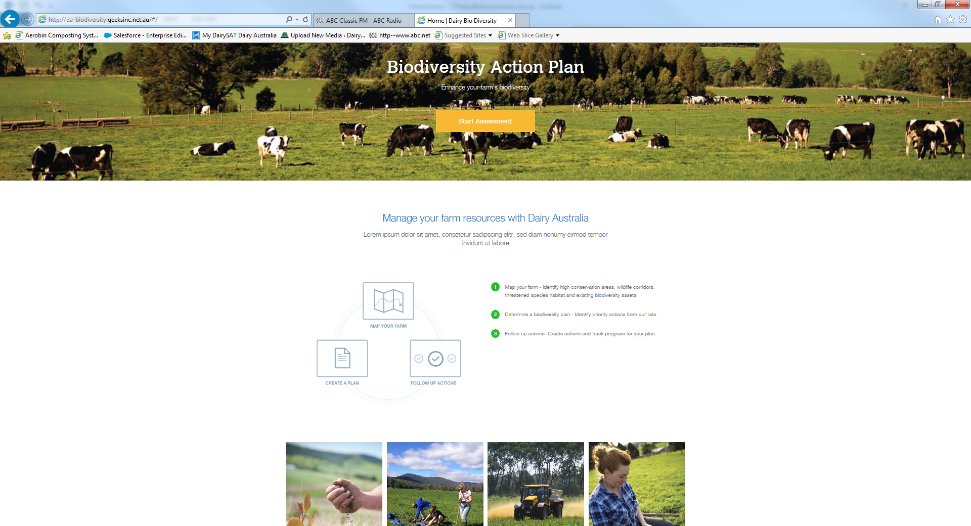
| Environmental issue/s | Sustainable business need/s | Relevant industry indicator/targets |
| --- | --- | --- |
| Loss of habitat and corridors for native wildlife, especially for threatened species  Soil erosion on waterways and slopes can lead to reduced water quality | Understanding market requirements for biodiversity and conservation on-farm  Opportunities for improving pasture and animal health through biodiversity and conservation actions | 8.1 Exclusion of stock from waterways – 90% by 2020 (Baseline: 73%)  8.4 Managing land for conservation and biodiversity – 80% by 2020 (Baseline: 47%)  (under review) |
|  |  |  |

**Summary of existing resources/tools for dairy farmers**

| Sub-topic/issue | Existing tool/resources | Link |
| --- | --- | --- |
| Understanding biodiversity on-farm | Dairy Australia Biodiversity Action Plan -  Web based platform    DairySAT – biodiversity module | [Biodiversity Action Plan](http://biodiversity.dairyaustralia.com.au/)  [DairySAT](http://www.dairysat.com.au/) |
| Actions to improve biodiverse plantings on-farm | Report: “The economic benefits of native shelter belts” (2015)  Case studies:   * Waterway protection benefits dairy farms * Dairying the Green way * ‘Arnum’ land for all * Trees benefit Sale dairy farm * Share farming with nature | [Biodiversity and waterways resources](http://www.dairyingfortomorrow.com.au/tackling-specific-issues/biodiversity-and-waterways/) |
| Regional specific actions | Building Capability to Manage  Giant Gippsland Earthworm  Habitat on Farms | [Giant Earthworm website](http://www.giantearthworm.org.au/) |

**Existing programs delivering research and resources to address the topic:**

***High value modular agroforestry (active)***

This cross sector project aims to explore and quantify the potential for high value modular agroforestry systems in southern Australia. The project will quantify the direct benefits of agroforestry systems to farmers including shelter benefits (including higher animal productivity and welfare as well as crop production), resilience to weather events, sequestration of carbon, and production of biomass/timber resources for direct sale. The project is funded through the Australian Government Rural Research and Development for Profit Programme.

***Australian dairy Biodiversity Action Plan web-based tool*** (right).

## Composting

**Description of the issue, its implications for sustainable dairy business and relevant industry target**

| Environmental issue/s | | Sustainable business need/s | Relevant industry indicator/targets |
| --- | --- | --- | --- |
| Appropriate disposal and/or reuse of organic waste on-farm (e.g. spoilt hay and silage, fouled bedding, manure and effluent treatment pond sludge)  Avoidance of chemical fertilisers  Eliminates or reduces the risk of pathogens, parasites and weed seeds. | | Appropriate composting techniques for different organic wastes  Safety of purchased compost | n/a |
|  |  | |  |

**Summary of existing resources/tools for dairy farmers**

| Sub-topic/issue | Existing tool/resources | Link |
| --- | --- | --- |
| Composting techniques | Composting – is it for my farm?  Making compost on dairy farms  Understanding purchased compost products | [Composting resources](http://www.dairyingfortomorrow.com.au/tackling-specific-issues/composting/)  [Compost on WA dairy farms](http://www.westerndairy.com.au/viewStory/Compost+on+WA+dairy+farms) |
| Mortality composting | Composting of dairy cattle mortalities  Mortality composting – training manual | [Composting resources](http://www.dairyingfortomorrow.com.au/tackling-specific-issues/composting/) |
| Minimising greenhouse gas losses from composting | Technical sheet: Minimising Gaseous Nitrogen Losses | [Composting resources](http://www.dairyingfortomorrow.com.au/tackling-specific-issues/composting/)  [Video – Composting and greenhouse gas emissions](https://youtu.be/VyuJ_QHy2Zc?list=PLF43zgg2AAtbbklafcUz3c_wHqGOnAa03) |

**Existing programs delivering research and resources to address the topic: N/A**

**Emerging tools/resources currently in development:**

* Fact sheets and You Tube clips for farmers

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## Soils

**Description of the issue, its implications for sustainable dairy business and relevant industry target**

| Environmental issue/s | Sustainable business need/s | Relevant industry indicator/targets |
| --- | --- | --- |
| Reduced fertility of soils (quality and compaction)  Potential for soil carbon sequestration | Understanding opportunities for soil carbon sequestration  Improvement of soil condition to maximize pasture production | n/a |
|  |  |  |

**Summary of existing resources/tools for dairy farmers**

| Sub-topic/issue | Existing tool/resources | Link |
| --- | --- | --- |
| Soil fertility | Soil fertility tips (web resource) | [Soil fertility tips](http://www.dairyaustralia.com.au/Environment-and-resources/Soils-nutrients-and-effluent/Soil-fertility-tips.aspx)  [Dairy Soils and Fertiliser manual](http://fertsmart.dairyingfortomorrow.com.au/dairy-soils-and-fertiliser-manual/)  [Video – Soil fertility mapping](https://youtu.be/U-41_6oJ7Zo?list=PLF43zgg2AAtbbklafcUz3c_wHqGOnAa03) |
| Understanding soils | Australian Soil Resource Information System (web tool) is a compilation of publically available land and soil resources  Agriculture Victoria information on soil types for different dairy areas  University of Western Australia sponsored site containing information on Australian agricultural soils and soil biology. | [ASRIS](http://www.asris.csiro.au/)  [Soil types of dairying areas](http://agriculture.vic.gov.au/agriculture/dairy/pastures-management/fertilising-dairy-pastures/soil-types-of-the-dairying-areas)  [Soil health](http://www.soilquality.org.au/) |
| Soil carbon sequestration | A review of literature about Soil carbon sequestration under pasture in Australian dairy regions (2010) focuses on issues associated with soil carbon sequestration for climate change abatement in the dairy industry of southern Australia. The likely challenges and opportunities for dairy farmers are explored. | [Soil carbon sequestration in Australian dairy regions (2010)](http://www.dairyingfortomorrow.com.au/tackling-specific-issues/soils/) |
| Importance of drainage | Video series on drainage and soils | [Video – Hump and hollow drainage](https://youtu.be/uj0n4frSfBg?list=PLF43zgg2AAtbbklafcUz3c_wHqGOnAa03)  [Video – Waterlogging costs production](https://youtu.be/6DS3HrF3XjA?list=PLF43zgg2AAtbbklafcUz3c_wHqGOnAa03)  [Video – Designing drainage](https://youtu.be/tMKomg0nMYs?list=PLF43zgg2AAtbbklafcUz3c_wHqGOnAa03)  [Video – Mole drainage case study](https://youtu.be/XS5ow6zTKz4?list=PLF43zgg2AAtbbklafcUz3c_wHqGOnAa03)  [Video – Mole drainage installation](https://youtu.be/saxApxioDeQ?list=PLF43zgg2AAtbbklafcUz3c_wHqGOnAa03) |

**Existing programs delivering research and resources to address the topic: N/A**

**Emerging tools/resources currently in development: N/A**

## Fertiliser and off farm nutrient loss

**Description of the issue, its implications for sustainable dairy business and relevant industry target**

| Environmental issue/s | Sustainable business need/s | Relevant industry indicator/targets |
| --- | --- | --- |
| Off-farm nutrient loss  Inefficient use of nutrients | Precision tools for fertiliser management  Understanding soil fertility influences, soil biology and soil carbon and nitrogen cycles  Effluent management to reduce need for chemical fertilisers | n/a |
|  |  |  |

**Summary of existing resources/tools for dairy farmers**

| Sub-topic/issue | Existing tool/resources | Link |
| --- | --- | --- |
| Efficient fertiliser management | Fert$mart  Dairy Soils and Fertiliser Manual | [Fert$mart](http://fertsmart.dairyingfortomorrow.com.au/)  [How Fert$mart are you checklist](http://fertsmart.dairyingfortomorrow.com.au/getting-it-right/how-fertmart-are-you/)  [Video – Doing a Fert$mart Plan](http://www.dairyclimatetoolkit.com.au/videos)  [Video – Soil Testing to Optimise Fertiliser](http://www.dairyclimatetoolkit.com.au/videos) |
| Nitrogen management | Nitrogen management fact sheets and resources | [Nitrogen Use on Dairy Farms](http://www.gippsdairy.com.au/LinkClick.aspx?fileticket=LM2ok9TZ47I%3d&tabid=70)  [Fert$mart Nitrogen](http://tftt.dairyaustralia.com.au/~/media/tacticsfortighttimes/documents/fact%20sheets/tftt%20nitrogen%20timing%20and%20rates%20fact%20sheet.pdf?la=en)  [Winter Nitrogen](http://tftt.dairyaustralia.com.au/~/media/tacticsfortighttimes/documents/fact%20sheets/winter%20nitrogen%20fact%20sheet.pdf?la=en)  [Video – Green Seeker:](https://www.youtube.com/watch?v=oFVfflqVaAc&feature=youtu.be&list=PLF43zgg2AAtbbklafcUz3c_wHqGOnAa03)  [Plant nitrogen measurement](https://www.youtube.com/watch?v=oFVfflqVaAc&feature=youtu.be&list=PLF43zgg2AAtbbklafcUz3c_wHqGOnAa03)  [Video – Timing of nitrogen application](https://www.youtube.com/watch?v=KD7TBp4vt_0) |
| Off-farm movement of nutrients | The Farm Nutrient Loss Index (FNLI), is a decision support tool to assess the risk of nutrient loss from the paddock to the off farm environment in the format of a user-friendly computer program. It is available from asris.csiro.au | [FNLI](http://www.asris.csiro.au/themes/nutrient.html#Nutrient_FNLI) |

**Existing programs delivering research and resources to address the topic:**

***More Profit from Nitrogen (active – commenced 1st July 2016)***

Collaborative cross-sector national program. Dairy component has four focus areas for improving the productivity and profitability of nitrogen use:

* Optimizing nitrogen use efficiency through efficient irrigation practices
* Quantifying the timing and rate of nitrogen mineralization
* Extracting value from Enhanced Efficiency Fertilisers: Developing new products and optimizing existing ones
* Turning research into outcomes: Testing and developing best practice nitrogen use management.

Research and demonstration sites are located in Northern NSW, Camden NSW and Western Victoria. *More Profit from Nitrogen* is funded the Australian Government Rural Research and Development for Profit Programme.

***Stocktake of the Nutrient Loss to Water Risk for the Australian Dairy Industry (active)***

This project is conducting an industry wide stocktake of soil, nutrient and pathogen loss risk from dairy farms in Australia. This stocktake information will enable the industry to better understand the current status of water quality and nutrient loss in dairy catchments, associated trends in water quality over time and the biophysical links between dairy land management practices and catchment water quality.

***The NSW Nitrogen Use Efficiency (NUE) Trial Project (active)***

This project is a partnership between Dairy Australia, Hunter Local Land Services and South East Local Land Services. The objective of the project is to improve strategic use of nitrogen to increase pasture production and farm profitability, primarily concentrating on the feed gap experienced by NSW coastal pasture systems. Reports available [here.](http://www.dairyingfortomorrow.com.au/tackling-specific-issues/soils/trial/)

***Waste to Revenue: Novel fertilisers and feeds (active)***

This cross sector project is investigating the potential for new waste treatment technologies such as low–cost algal systems, anaerobic digestion, and aerated composting to covert waste into high quality animal feed and concentrated, balanced fertilisers or soil conditioners (e.g. composts, pellets, granulates, nutrient extracts and microbial stimulants). The project is funded through the Australian Government Rural Research and Development for Profit Programme.

**Emerging tools/resources currently in development:**

* Revised Fert$mart reporting – reducing the length and complexity of reports for farmers and streamlining resources for deliverers
* Soil and fertiliser basics workshop/module for farmers
* Video series on nitrogen BMPs
* Fert$mart N.

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## Energy

**Description of the issue, its implications for sustainable dairy business and relevant industry target**

| Environmental issue/s | Sustainable business need/s | Relevant industry indicator/targets |
| --- | --- | --- |
| Inefficient energy use contributes to greenhouse gas emissions | Reduce energy costs through more efficiency energy use  Investigate potential for energy self-sufficiency via on-farm renewable energy systems | n/a |
|  |  |  |

**Summary of existing resources/tools for dairy farmers**

| Sub-topic/issue | Existing tool/resources | Link |
| --- | --- | --- |
| Understanding energy use on farm | On-farm energy audit  [Australian dairy shed energy costs](http://www.dairyaustralia.com.au/Environment-and-resources/Energy-costs.aspx) (2013)  Regional fact sheets on energy use  Regional specific resource – saving energy on Western Dairy farms resource booklet | [Smarter energy program resources](http://www.dairyingfortomorrow.com.au/tackling-specific-issues/energy-2/)  [Smarter energy use program webpage](http://frds.dairyaustralia.com.au/events/smarter-energy-use/)  [Saving energy on WA dairy farms](http://frds.dairyaustralia.com.au/wp-content/uploads/2013/05/WA-booklet.pdf) |
| Actions for saving energy on-farm | National booklet - Saving energy on dairy farms (2013)  Farmer case studies – implementation of energy saving actions  Variable Speed Drive video | [Smarter energy use resources](http://www.dairyingfortomorrow.com.au/tackling-specific-issues/energy-2/)  [Variable Speed Drives](http://www.dairyclimatetoolkit.com.au/videos) - video |
| Anaerobic digesters | Fact sheet: Biogas feasibility  ERF method for destruction of methane from manure in dairy | [Feasibility of Biogas](http://www.dairyingfortomorrow.com.au/wp-content/uploads/0781_Biogas-technology-A4-report-summary_160726.pdf)  [ERF Dairy methods](http://dairyclimatetoolkit.com.au/reducing-farm-emissions/emissions-reduction-fund) |
| Renewable energy on-farm | Fact sheet: Feasibility of stand-alone renewable systems  Fact sheet: Is renewable energy right for my farm? | [Feasibility of stand-alone renewable energy systems](http://frds.dairyaustralia.com.au/wp-content/uploads/2015/06/0277-7-FS-Feasibility-of-stand-alone_20150615.pdf)  [Is renewable energy right for my farm?](http://frds.dairyaustralia.com.au/wp-content/uploads/2014/08/Renewable-energy-pamplet_-rev-3.pdf) |

**Existing programs delivering research and resources to address the topic: N/A**

**Emerging tools/resources currently in development: N/A**

## Land management

**Description of the issue, its implications for sustainable dairy business and relevant industry target**

| Environmental issue/s | Sustainable business need/s | Relevant industry indicator/targets |
| --- | --- | --- |
| Conservation of natural resources on-farm  Noxious weeds | Understanding market sustainability expectations  Sustainability guidelines/reporting tools relevant to Australian dairy systems  Identifying tools and mechanisms to enable reporting against sustainability framework targets, integrated or aligned with existing industry data collection activities | 8.4 Managing land for conservation and biodiversity – 80% by 2020 (Baseline: 47%)  (Under review)  8.5 All dairy farmers managing noxious weeds where relevant – 100% by 2020 (Baseline 28%)  (Under review) |
|  |  |  |

**Summary of existing resources/tools for dairy farmers**

| Sub-topic/issue | Existing tool/resources | Link |
| --- | --- | --- |
| Dairy-specific environmental schemes | The Dairy Self-Assessment Tool (DairySAT) is an environmental self-assessment and action planning tool for Australian dairy farmers. | [DairySAT](http://www.dairyingfortomorrow.com.au/tools-and-guidelines/dairysat/) |
| Noxious weeds | See module in DairySAT | [DairySAT](http://www.dairyingfortomorrow.com.au/tools-and-guidelines/dairysat/) |

**Existing programs delivering research and resources to address the topic: N/A**

**Emerging tools/resources currently in development:**

* Review of DairySAT (TBA)

## Recycling

**Description of the issue, its implications for sustainable dairy business and relevant industry target**

| Environmental issue/s | Sustainable business need/s | Relevant industry indicator/targets |
| --- | --- | --- |
| Silage wrap disposal  Chemical Drum disposal | Understanding market sustainability expectations  Sustainability guidelines/reporting tools relevant to Australian dairy systems | 11.1a Waste to landfill intensity of dairy manufacturers (tonnes of waste per ML milk processed) – 1.61 by 2020 (Baseline: 2.69)  11.1b Manufacturers: signatories to Australian Packaging Covenant (APC) – All manufacturers by 2020 (Baseline: 9)  11.2 Farm level waste reduction (under review) |
|  |  |  |

**Summary of existing resources/tools for dairy farmers**

| Sub-topic/issue | Existing tool/resources | Link |
| --- | --- | --- |
| Silage Wrap | Plasback recycling. Requires farmer to drop off silage wrap in approved bags. | [Plasback](http://www.plasback.com.au/) |
| Chemical Drums | DrumMUSTER program. Provides a way of disposing of empty farming chemical containers across rural Australia. | [drumMUSTER](http://drummuster.com.au/) |
| General Farm waste | EPA Victoria guidelines | [Farm Waste](http://www.epa.vic.gov.au/~/media/Publications/1049%201%20poster.pdf) |

**Existing programs delivering research and resources to address the topic: N/A**

**Emerging tools/resources currently in development: N/A**

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# Measuring practice change

**Key summary of measurement of practice chance:**

**NRM Survey:** Dairy Australia conducts a practice change survey every 3-6 years, with the next survey due in 2018.

**DairyBase:** Dairy farmers can use DairyBase to measure their farm performance against industry benchmarks.

The key drivers for measuring practice change and environmental condition within the dairy sector:

1. To evaluate performance of the industry against the Environmental Indicators (set out within the Sustainability Framework)
2. To aid in prioritization of NRM research, development and extension investment
3. To help dairy farmers identify land management practices that will improve resource condition on-farm
4. To help dairy farmers identify natural capital risks.

While not comprehensive, this section aims to identify existing examples of data collation within the dairy sector.

[**Dairy NRM Survey**](http://www.dairyingfortomorrow.com.au/reports/)

In order to measure the performance of the Australian dairy industry against the Sustainability Framework targets and to continue to provide resources and tools that help enable dairy farmers to manage their on-farm sustainability, a national NRM survey is conducted by Dairy Australia.

Three NRM surveys have been conducted to date – in 2000, 2006, 2012 and [2015](http://www.sustainabledairyoz.com.au/reducing-environmental-impact) (Note: 2015 survey was a shortened version of the survey used to inform progress against the Dairy Sustainability Framework).

Achieving the national targets depends on actions delivered within each of the eight dairy regions. Business cases are currently being developed by the dairy regions for implementing and monitoring NRM activities against the Sustainability Framework (from 1 July 2016).

[**DairyBase**](http://www.dairybase.com.au/)

In order to manage resources dairy farmers need to measure their performance against business indicators.

DairyBase is a web-based tool that enables dairy farmers to measure and compare their farm business performance over time. DairyBase was established to provide dairy farmers, service providers and industry with a national database of [Dairy Farm Monitor Project](http://www.dairyaustralia.com.au/Business-and-financials/Dairy-Farm-Monitor-Project.aspx) (DFMP) data, and other validated datasets from consultants and service providers at a later date.

**Other examples of measurement of environmental performance**

See Ben & Jerry’s Caring Dairy case study over page.

**Farm metrics business example:** [**Ben & Jerry’s Caring Dairy initiative**](http://www.benjerry.com/whats-new/caring-dairy-standards)

Caring Dairy provides participating farmers a program for evaluating, implementing and continuously improving sustainable agricultural practices on their farms. To participate in Caring Dairy, farmers must meet the Basic Requirements of the program by Jan. 1, 2017. There are also opportunities to move beyond the Basic level of participation by achieving either Silver or Gold level performance. Each tier is compensated differently given the increased level of requirements.

The Caring Dairy program is based on three annual requirements:

* Complete the Caring Dairy Assessment of 13 Indicator sections (including one on farm metrics – see below)
* Attend three workshops
* Implement two process improvement plans.

Of note farmers are required to collect **farm metric data** as part of this program including:

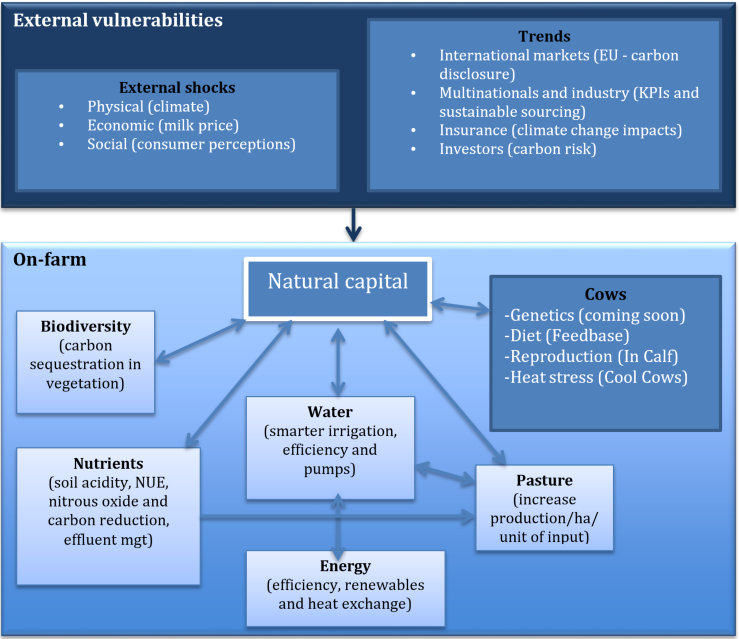
* Electricity use per unit of milk produced
* Fuel use per unit of milk produced
* Mastitis cases per cow
* Fertilizer use per acre
* Milk Urea Nitrogen (MUN) testing score.
* Percent of annually tilled acres cover cropped.



# Appendix 1: International sustainability initiatives

As the PDCCF project has progressed the key messages and tools have been refined. The operating context has changed – i.e. with the increasing interest from international markets on carbon disclosure and domestically the interest in defining natural capital and carbon risk. Emerging trends have reinforced the need for carbon reduction to be integrated with wider NRM and productivity. Figure 1 provides a preliminary map of the integration of carbon and NRM topics.

Figure 1: Integration of carbon and NRM issues within the dairy industry



In order to better understand the changing operating context, a review of key sustainability initiatives relevant to the Australian dairy industry have been investigated. A summary of each of these initiatives, as well as its relevance to the sector, has been provided below.

**1.1** [**Sustainable Agriculture Initiative Platform**](http://www.saiplatform.org) **(SAI Platform)**

SAI Platform is the global food value chain initiative for sustainable agriculture. The [Dairy Working Group](http://www.saiplatform.org/activities/working-groups/dairy) is one of SAI Platform’s largest Working Groups with membership being drawn from Europe, North America and Australasia. SAI Platform encourages greater collaboration for the sector and supports the [Global Dairy Agenda for Action](http://www.saiplatform.org/activities/alias/climate-change/global-dairy-agenda-for-action). It facilitates a group of global dairy sector representatives who regularly meet by conference call to share ideas and discuss issues in the dairy sector.

*Relevance to Australian dairy sector:*

* *High level facilitation of dairy sector representatives including Australian representatives*
* *Founding signatory of the Global Dairy Agenda for Action and the Dairy Sustainability Framework (see below)*
* *Facilitates the development of dairy sustainability frameworks, guidelines and principles*
* *Promotes the need for integrating climate change into sustainability activities.*

**1.2** [**Global Dairy Agenda for Action**](http://dairysustainabilityframework.org/the-gdaa/background/) **(GDAA)**

Launched in October 2009, the GDAA committed the dairy industry to actively reducing GHG emissions and also took the opportunity to profile the efforts of the sector to reduce GHG emissions throughout the value chain.

In order to facilitate the industry’s efforts to reduce greenhouse gas emissions and promote the long term sustainable supply of milk and dairy products, the global dairy industry committed to:

* Promote the development of a standard methodology framework for assessing the carbon footprint of milk and dairy products based on robust science;
* Promote adoption of world’s best practices within the global dairy sector and actions that:
  + Lead to the reduction of global greenhouse gas emissions from dairy production on a per unit of production basis
  + Promote the use of technologies and methods that improve the processing and distribution efficiency of dairy products;
  + Optimize economic, environmental and social outcomes for global dairy stakeholders,
  + Recognize different levels of development and local conditions,
  + Build on existing frameworks and knowledge, including for scientific advancement and technology transfer,
  + Promote decision making based on robust science, and
  + Complement initiatives in other areas of sustainability.
* Seek to advance the establishment of tools to facilitate measurement and monitoring of emissions both on-farm and in dairy manufacturing.
* Promote improved farmer understanding of agricultural emissions and opportunities to reduce greenhouse gas emissions on farm.
* Support sharing information and aligning research efforts to develop cost effective mitigation technologies for both on farm and manufacturing application.

SAI Platform is a founding Signatory and is a Governor of this dairy collaboration. Signatories and participants in this Agenda for Action commit to reporting progress against the commitment on a regular basis. The latest report is available online (2009-2011).

*Relevance to Australian dairy sector:*

* *The GDAA provides governance for the global dairy sector’s efforts in addressing its sustainability challenges*
* *It confirms partner’s commitment to addressing climate change (reducing GHG emissions from dairy farming) and reporting on progress against actions (via the Dairy Sustainability Framework).*

**1.3** [**Dairy Sustainability Framework**](http://dairysustainabilityframework.org/) **(DSF)**

The DSF is the GDAA program for aligning and connecting sustainability initiatives to demonstrate leadership and progress globally. Its vision is for a vibrant dairy sector committed to preserving natural resources and ensuring livelihoods across the industry (see Figure 2 for vision and Principles).

There are eleven key sustainability criteria (Global Criteria), identified as relevant to the dairy sector globally (see Figure 3). Individual groups, regions or organizations are encouraged to develop different initiatives and programs on a local basis that work towards addressing the Criteria and Strategic Intents of the framework.

Key resources recently developed via SAI Platform and the DSF include “[Reducing GHG emissions from livestock: Best practice and emerging options](http://www.saiplatform.org/uploads/Modules/Library/lrg-sai-livestock-mitigation_web2.pdf)” and “[Principles and Practices 2015](http://www.saiplatform.org/uploads/Modules/Library/principles-and-practices-of-sustainable-dairy-farming-2015.pdf)”.

Dairy Australia has a governance position on GDAA.

Relevance to Australian dairy sector:

* *DSF provides global framework for sustainability actions and benchmarking, which align with Australian Dairy Industry Sustainability Framework*
* *Annually reports on global action against the eleven key sustainability criteria, which is useful for comparing what other sustainability initiatives, tools and resources are being developed globally (latest annual report is 2014 and is available via DSF website).*

**Figure 2: Dairy Sustainability Framework - Vision and Principles (Source: DSF website 21 June 2016).**



**Figure 3: Dairy Sustainability Framework - Key Sustainability Criteria (Source: DSF website 21 June 2016).**

[Click here](http://dairysustainabilityframework.org/?p=1684) for the 2016 DSF Report

**Eleven key sustainability criteria within DSF**

1. **Greenhouse Gas Emissions -** GHG emissions across the full value chain are quantified and reduced through all economically viable mechanisms.
2. **Soil Nutrients -** Nutrient application is managed to minimize impacts on water and air, while maintaining and enhancing soil quality.
3. **Waste -** Waste generation is minimized and, where unavoidable, waste is reused and recycled.
4. **Water -** Water availability, as well as water quality, is managed responsibly throughout the dairy value chain.
5. **Soil -** Soil quality and retention is proactively managed and enhanced to ensure optimal productivity.
6. **Biodiversity -** Direct and indirect biodiversity risks and opportunities are understood, and strategies to maintain or enhance it are established.
7. **Market Development -** Participants along the dairy value chain are able to build economically viable businesses through the development of transparent and effective markets.
8. **Rural Economies -** The dairy sector contributes to the resilience and economic viability of farmers and rural communities.
9. **Working Conditions -** Across the dairy value chain, workers operate in a safe environment, and their rights are respected and promoted.
10. **Product Safety & Quality** - The integrity and transparency of the dairy supply chain is safeguarded, so as to ensure the optimal nutrition, quality, and safety of products.
11. **Animal Care** - Dairy animals are treated with care, and are free from hunger and thirst, discomfort, pain, injury and disease, fear and distress, and are able to engage in relatively normal patterns of animal behaviour.

**1.4** [**Livestock Environmental Assessment and Performance (LEAP) Partnership**](http://www.fao.org/partnerships/leap/en/)

The LEAP Partnership was founded in 2012 and involves stakeholders across the livestock sectors, all who share an interest in improving the environmental performance of livestock supply chains. The objective is to develop comprehensive guidance and methodology for understanding the environmental performance of livestock supply chains.

The LEAP Partnership Secretariat is hosted by the Food and Agriculture Organization of the United Nations (FAO). Australia is represented through the International Dairy Federation.

Key goals:

1. Sector specific guidelines and methods for the life cycle assessment of GHG emissions from livestock food chains
2. Global database of GHG emissions related to feed crops
3. Development of indicators and methods for the evaluation of wider environmental performance of livestock.

Publications on biodiversity assessment and environmental performance are available on the website. The [LEAP Database](http://www.fao.org/partnerships/leap/database/ghg-crops/en/) on feed-crops is a global database of emissions, emission intensities and life cycle inventory for 5 main crops: maize, wheat, barley, soybean and cassava.

*Relevance to Australian dairy sector:*

* *Wider collaborative platform than GDAA (includes countries, private and NGOs), but with focus on LCA method development*
* *Have developed principles for biodiversity assessment (2016 publication).*
* *Australian dairy is represented on the Biodiversity Technical Action Group at the invitation of the International Dairy Federation.*

**1.5** [**International Dairy Federation**](http://fil-idf.org)

The IDF represents the global dairy sector. IDF’s membership is made up of National Committees, constituted by dairy organizations in each country and representing as fully as possible the various dairying activities of the country (such as milk production, manufacture, distribution, technology, science, human nutrition, marketing, economics, education and administration).

The IDF Standing Committee on Environment is currently focused on two key work programs, water foot printing methodology development and the development of guidelines for the quantification of biodiversity at farm level. The SAI Platform Dairy Working Group supports the work of the IDF in these areas.

The IDF has published: ['A Common Carbon Footprint Approach for Dairy: The IDF Guide to Standard Lifecycle Assessment Methodology for the Dairy Sector’](http://www.idf-lca-guide.org/Public/en/LCA+Guide/Introduction)

The IDF Standing Committee on Environment – Action Team on Biodiversity are in the process of developing Guide on Biodiversity (Draft - May 2016). Dairy Australia is represented on this Action Team.

*Relevance to Australian dairy sector:*

* *IDF is involved in a number of the above mentioned sustainability initiatives (e.g. DGAA/DSF)*
* *IDF released a standard LCA method for the dairy sector*
* *In the process of developing Guide for Biodiversity assessment (in draft).*

**1.6** [**UK Dairy Environmental Roadmap 2015**](http://dairyroadmap.com/areas-of-work/environment-sustainability)

The Dairy Roadmap is a partnership of Britain’s dairy industry, including farmers, dairy manufacturers, retailers, government and industry partners, that defines targets and produces regular reports on progress that the industry is making on environmental matters. It started in 2008 as the Milk Roadmap that focused solely on the liquid milk sector and has now released 3 reports (2009, 2013 and 2015).

The Dairy Roadmap relates to 6 of the 11 DSF sustainability criteria (GHG emissions, soil nutrients, waste, water, soil and biodiversity).

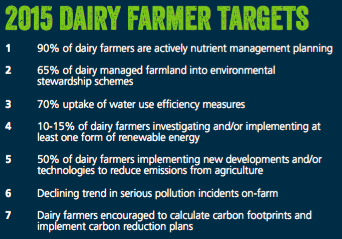
The 2015 report provides updates on targets set for 2015, 2020 and in turn sets new targets for 2025 for both farmers (Figure 4) and manufacturers (Figure 5).

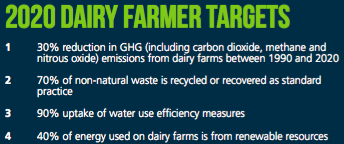
Note that biodiversity action is required within the new 2025 targets. Although the potential to enhance biodiversity is most likely to occur at farm level, the Dairy Roadmap recognises that processors can play a significant part in biodiversity through the management of their site. Dairy UK has therefore developed a [Dairy UK Processors Biodiversity Commitment](http://dairyroadmap.com/dairy-uk-processor-biodiversity-commitment), with the aim to encourage and promote biodiversity at all sites, where feasible.

*Relevance to Australian dairy sector:*

* *The UK Dairy Roadmap has now set 2025 targets for both farmers and manufacturers, including actions to address biodiversity*
* *The Roadmap has support of all major retailers.*

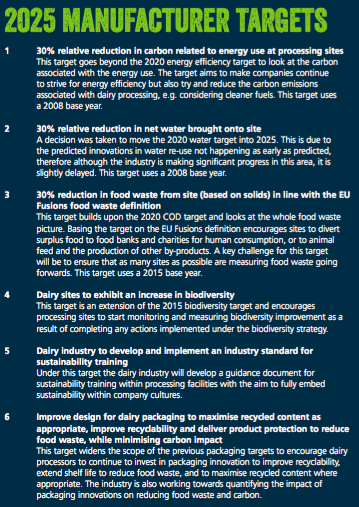
**Figure 4: UK Dairy Roadmap - 2015, 2020 and 2025 farmer targets (Source: Dairy Roadmap 2015)**







**Figure 5: UK Dairy Roadmap 2025 Manufacturer targets (Source: UK Dairy Roadmap 2015)**



**1.7** [**Unilever – Sustainable Living Plan**](https://www.unilever.com/sustainable-living/the-sustainable-living-plan/reducing-environmental-impact/sustainable-sourcing/)

There are four pillars to the “Reducing environmental impact” component of the Sustainable Living Plan: Greenhouse gases, water use, waste and packaging and sustainable sourcing.

By 2020 Unilever intends to sustainably source 100% of its raw materials. This means all raw materials must either be certified to an approved standard (as listed in the Unilever Sustainable Sourcing Programme for Agricultural Raw Materials – Scheme Rules) or committed to the Unilever Sustainable Agriculture Code (SAC 1.0). In 2015 approximately 60% of raw materials and 59% of all dairy raw material meet this criteria (Unilever website 21 June 2016). The Australian dairy industry is currently the country to achieve country level accreditation as a sustainable supplier and is recognized by Unilever as fully compliant with the principles of sustainable agriculture. Retaining this accreditation requires demonstration of continuous improvement in three key areas, soils, biodiversity and waste and the benchmarking tool used is DairySAT.

Unilever is key partner in [Field to Market](https://www.fieldtomarket.org/) (focus on U.S. corn, cotton, potato, rice, soybean and wheat production) and SAI Platform.

*Relevance to Australian dairy sector:*

* *Suppliers to Unilever need to be aware of these medium-term targets and ensure compliance (e.g. through DairySAT or other approved standards).*

**1.8** [**Natural Capital Protocol**](http://naturalcapitalcoalition.org)

The Protocol outlines a common approach for the accounting of natural capital. The Protocol Framework covers four stages, “Why”, “What”, “How”, and “What Next”. These Stages are further broken down into nine Steps, which contain specific questions to be answered when integrating natural capital into your business processes. It is high level and is not prescriptive in the method used to value and/or measure natural capital for individual businesses.

Accompanying the Protocol are two Sector Guides developed for ‘Apparel’ and ‘Food and beverage’. The sector guides do not provide additional methodologies, but assist in the implementation of the Protocol.

The Natural Capital Protocol and Sector Guides are products of the Natural Capital Coalition. The Coalition is a collaboration of the world’s leading organizations from business, accountancy, science and academia, membership organizations, standard setting, finance, policy and conservation.

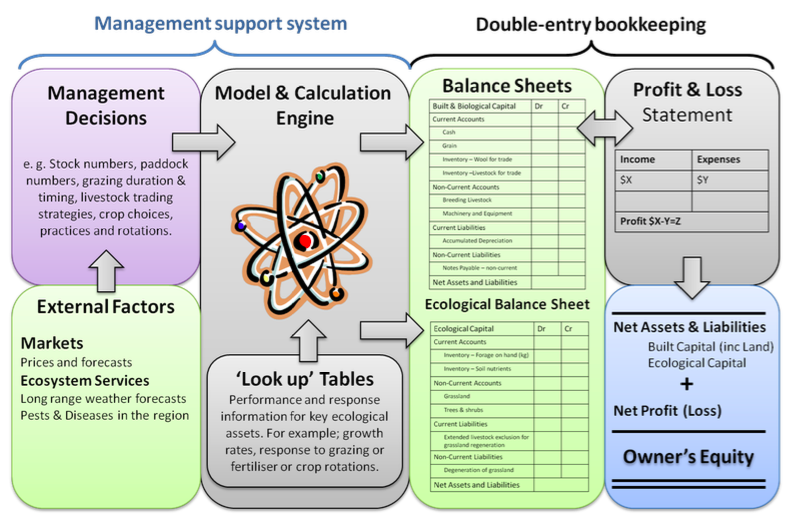
While not Australian or agriculture specific (yet), there is interest in valuing agricultural landscapes and there was an example of a potential methodology for agriculture (Figure 6) via a submission made by Australian National University researcher, Sue Ogilvy, titled [‘Ecological Balance Sheet for Agricultural Sustainability’](http://www.myfarmshop.com.au/images/%20downloads/Developing-the-ecological-%20balance-sheet-for-agricultural-%20sustainability-Ogilvy-2015.pdf).

The Coalition welcomes dialogue with sector-specific initiatives interested in working towards developing additional guides for their sectors.

*Relevance to Australian dairy sector:*

* *Demonstrates the significant global appetite for accounting for natural capital across supply chains and sectors.*
* *Reinforces the need for dairy industry to pursue its own Natural Capital Risk project (see more detail on this further in the document).*

**Figure 6: Conceptual scheme for an Ecological Balance Sheet to support Double-entry bookkeeping and Accrual Accounting (Source: Ogilvy, 2015)**



# Appendix 2: Australian Dairy Industry Sustainability Framework

**Key summary of Australian Dairy Industry Sustainability Framework:**

The Australian Dairy Industry Sustainability Framework outlines the commitment of the sector to livelihoods, well-being and the environment. It aligns with international efforts in these areas.

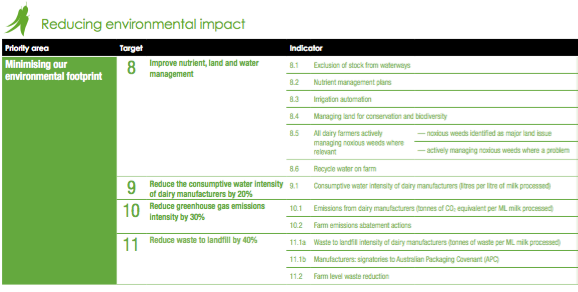
Twelve environmental indicators have been set to measure the progress of the industry towards the 2020 targets within the framework.

**Industry commitment to reducing environmental impact**

The Australian dairy industry has committed to reducing environmental impact under the [Dairy Industry Sustainability Framework](http://www.sustainabledairyoz.com.au/) (Figure 7). The Framework was developed in 2012 and sets the direction for continual improvement, providing guidance to farmers, manufacturers and industry bodies on our shared priorities and commitments. The Sustainability Framework is led by the Australian Dairy Industry Council (ADIC), supported by an industry Steering Committee and underpinned by Dairy Australia.

Figure 7: Dairy Industry Sustainability Framework Objectives (Source: Australian Dairy Sustainability Progress Report 2015)





**Long-term outcomes**

Under the ‘Reducing environmental impact’ component of the Sustainability Framework there are four long-term outcomes (to 2020):

1. Improve nutrient, land and water management
2. Reduce the consumptive water intensity of dairy manufacturers by 20%
3. Reduce greenhouse gas emissions intensity by 30%
4. Reduce waste to landfill by 40%.

Twelve environmental indicators have been set to measure the progress of the industry towards these 2020 targets (Figure 7). The industry reports annually against the indicators.

As of July 2016 Dairy Australia will be working more closely with Regional Development Programs to deliver and report against the Sustainability Framework within the eight dairy regions in Australia.

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