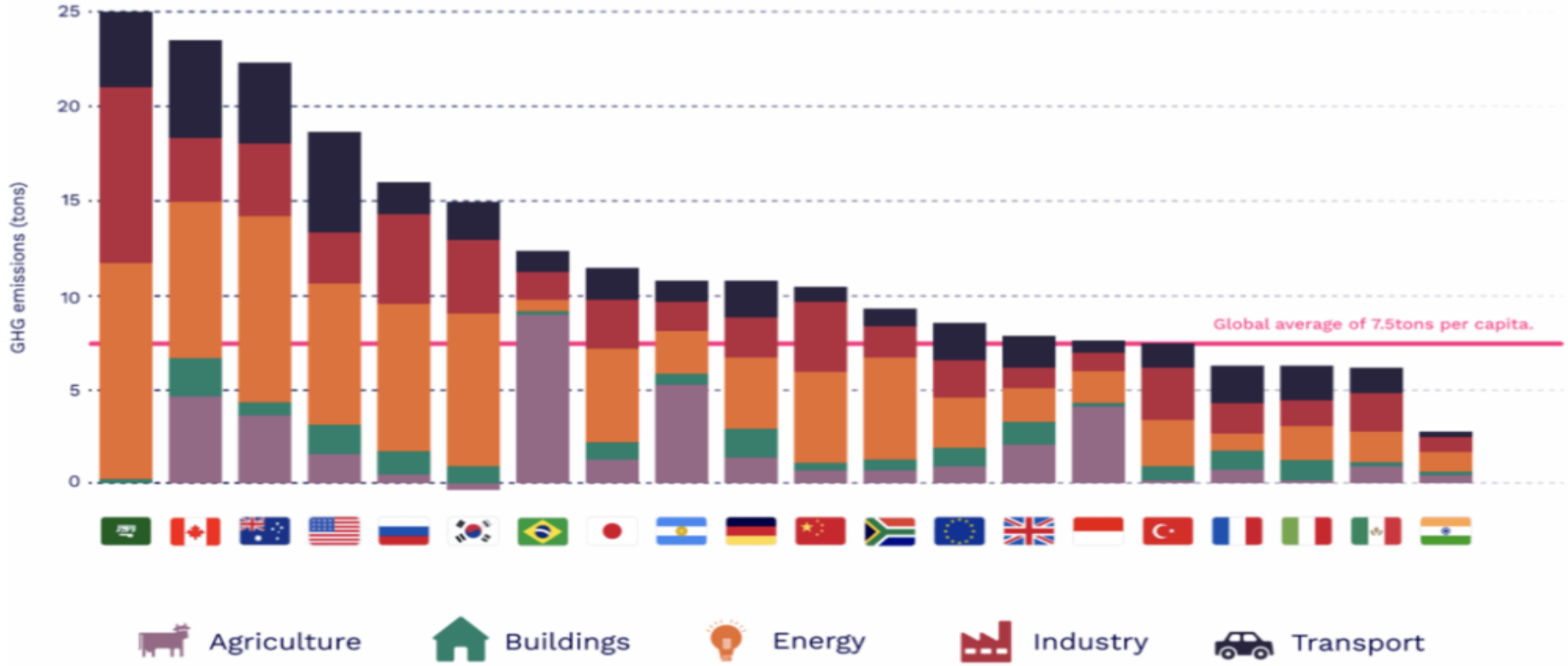
Better together for climate & sustainability & Australian agriculture

Alexandra Gartmann

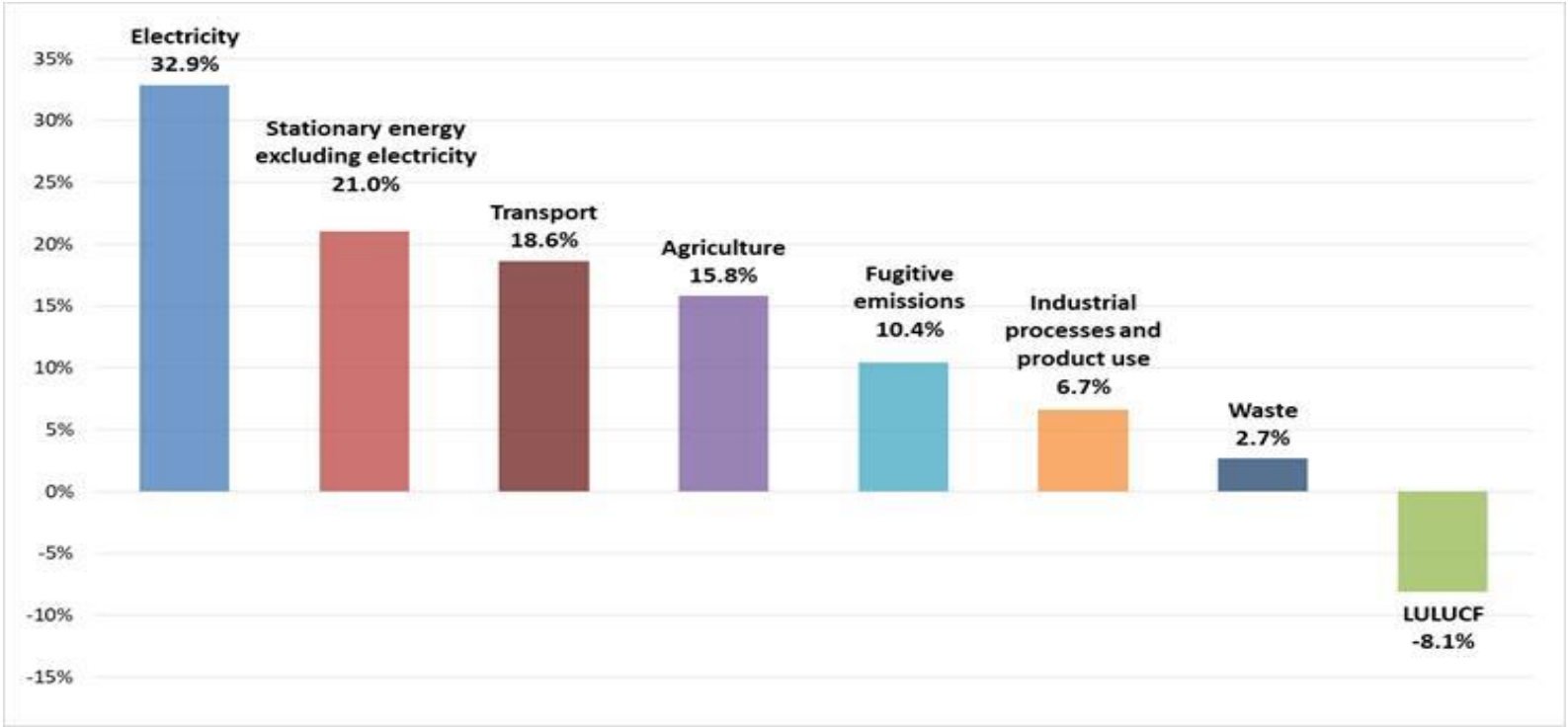
March 2023

Per capita emissions by country & sector



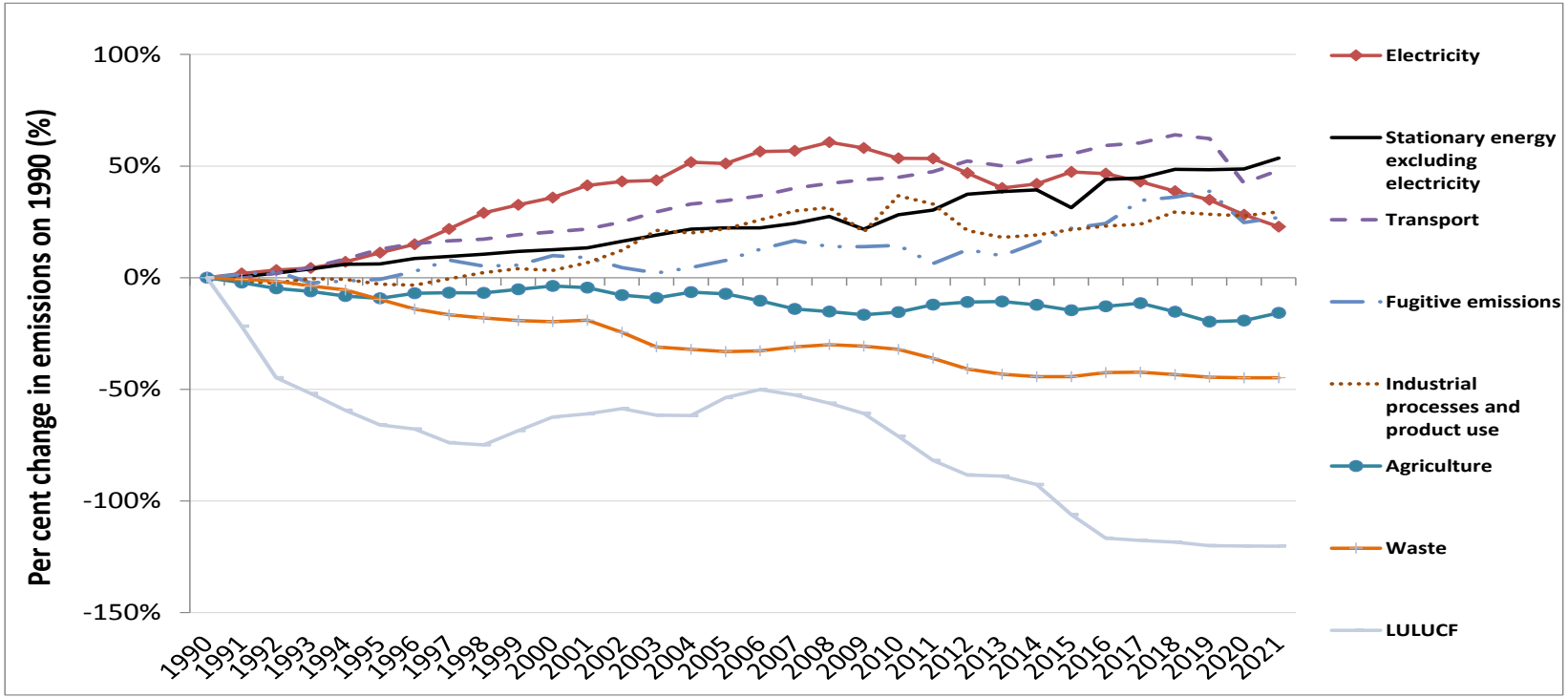
Source: World Data Lab, [World Emissions Clock](#))

Share of total Australian emissions, by sector, for the year to December 2021



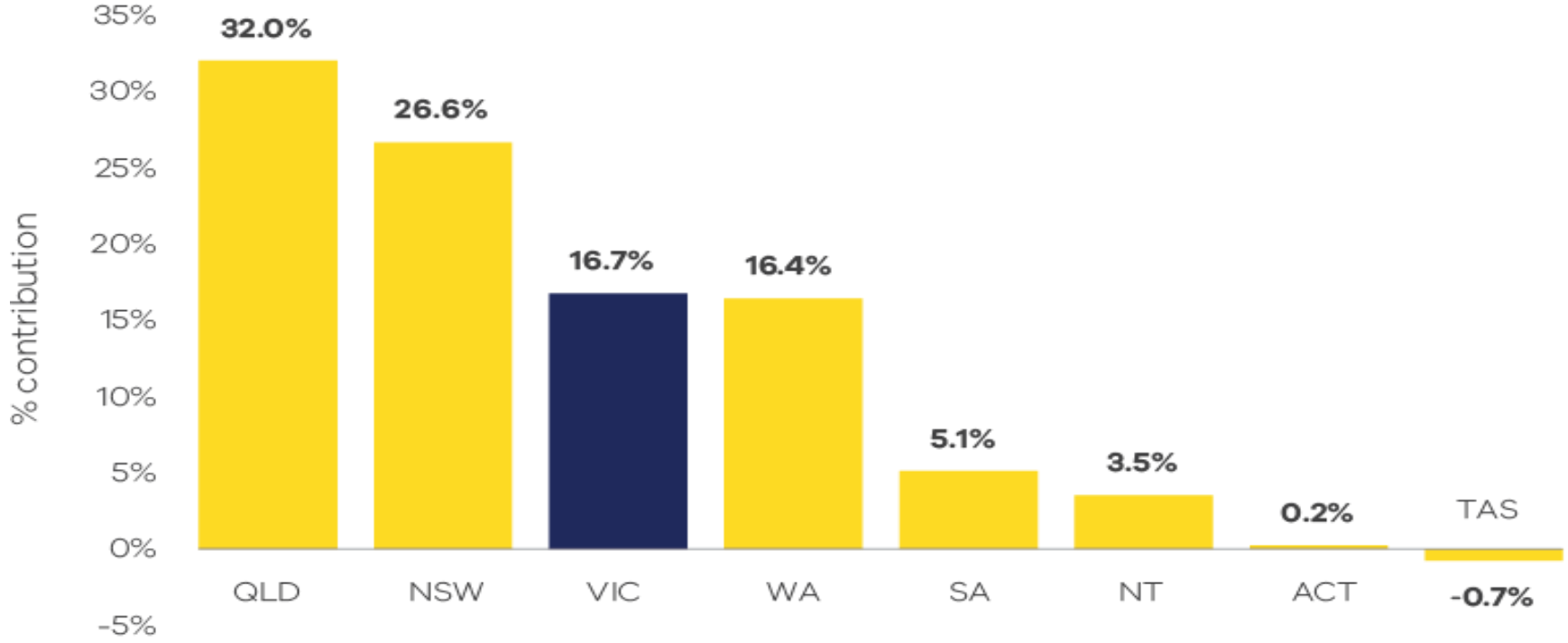
- *Source: Department of Industry, Science, Energy and Resources*

Percentage change in emissions, by sector, since year to December 1990



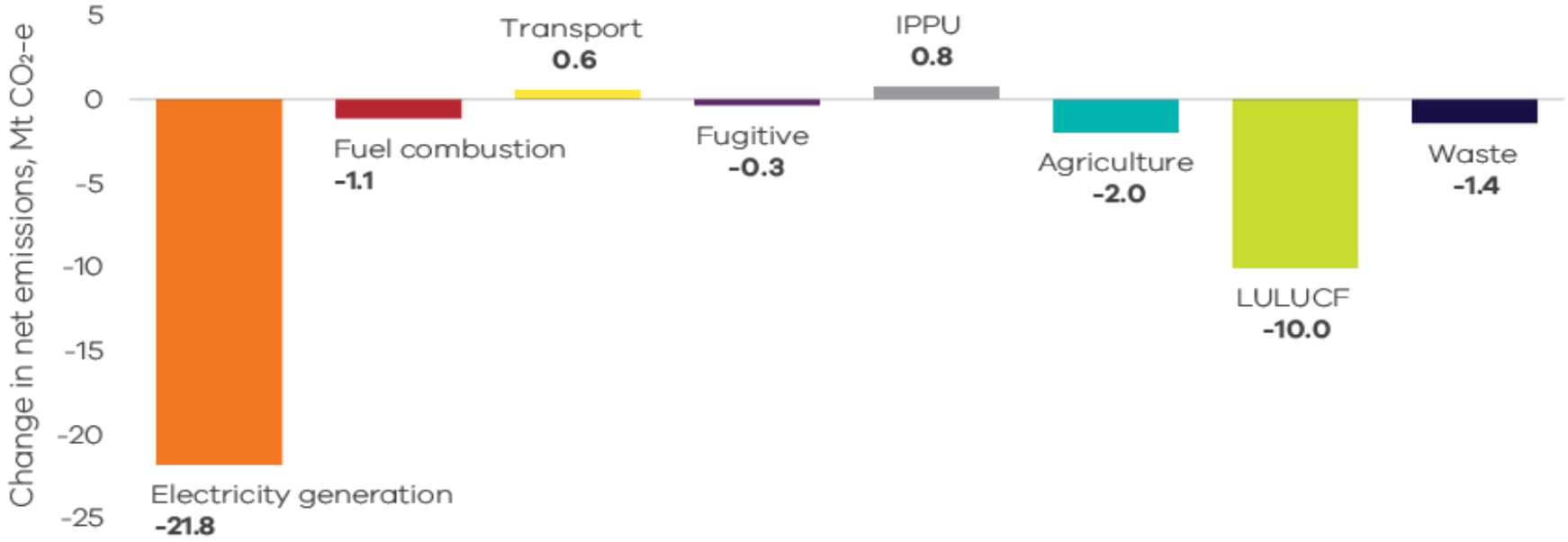
Source: Department of Industry, Science, Energy and Resources

Victoria contributes around 17% of Australia's emissions



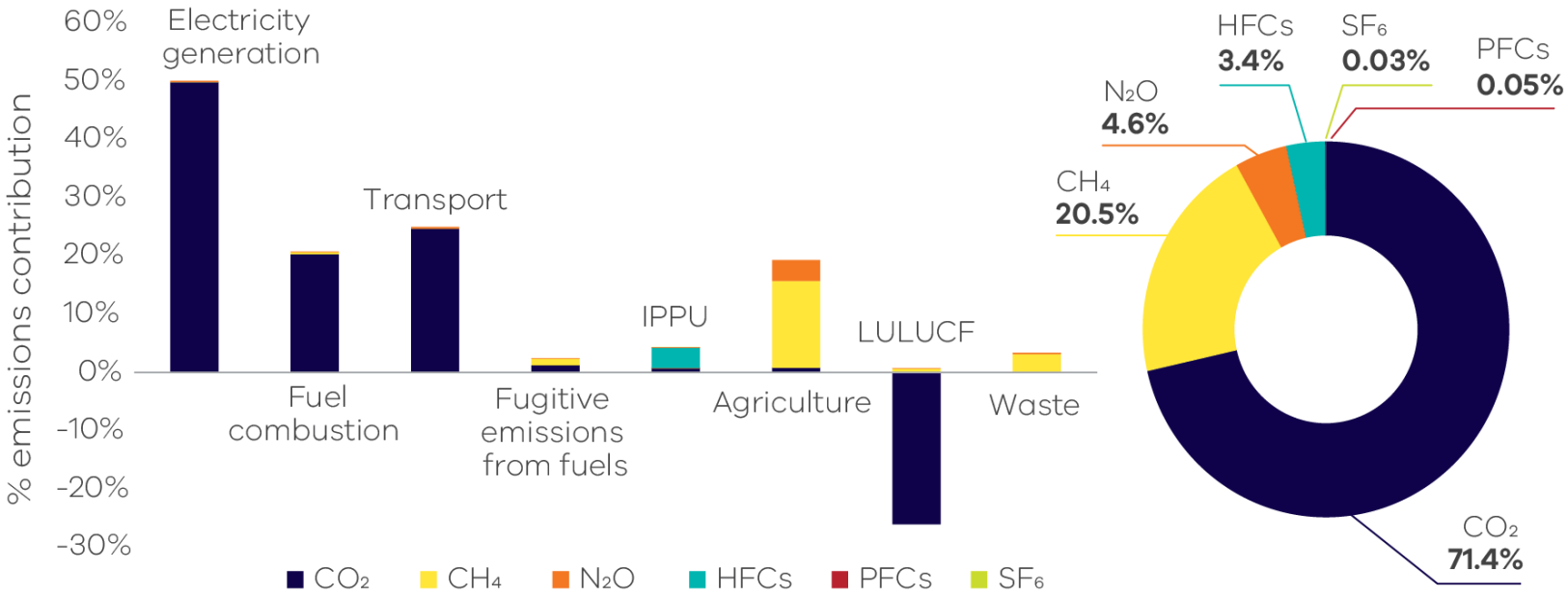
Source: Australian Greenhouse Emissions Information System (DCCEEW 2022a)

Change in emissions between 2005 and 2020 by sector and energy sub-sector, Victoria



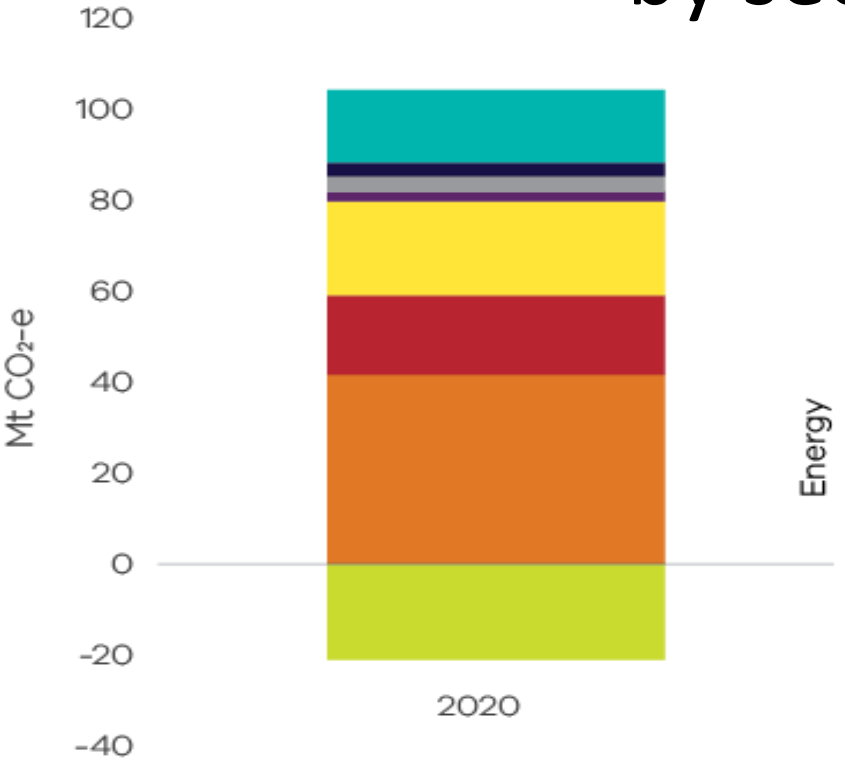
Source: Australian Greenhouse Emissions Information System (DCCEEW 2022a)

Victoria's greenhouse gas emissions by gas type and sector, 2020



Source: Australian Greenhouse Emissions Information System (DCCEEW 2022a)

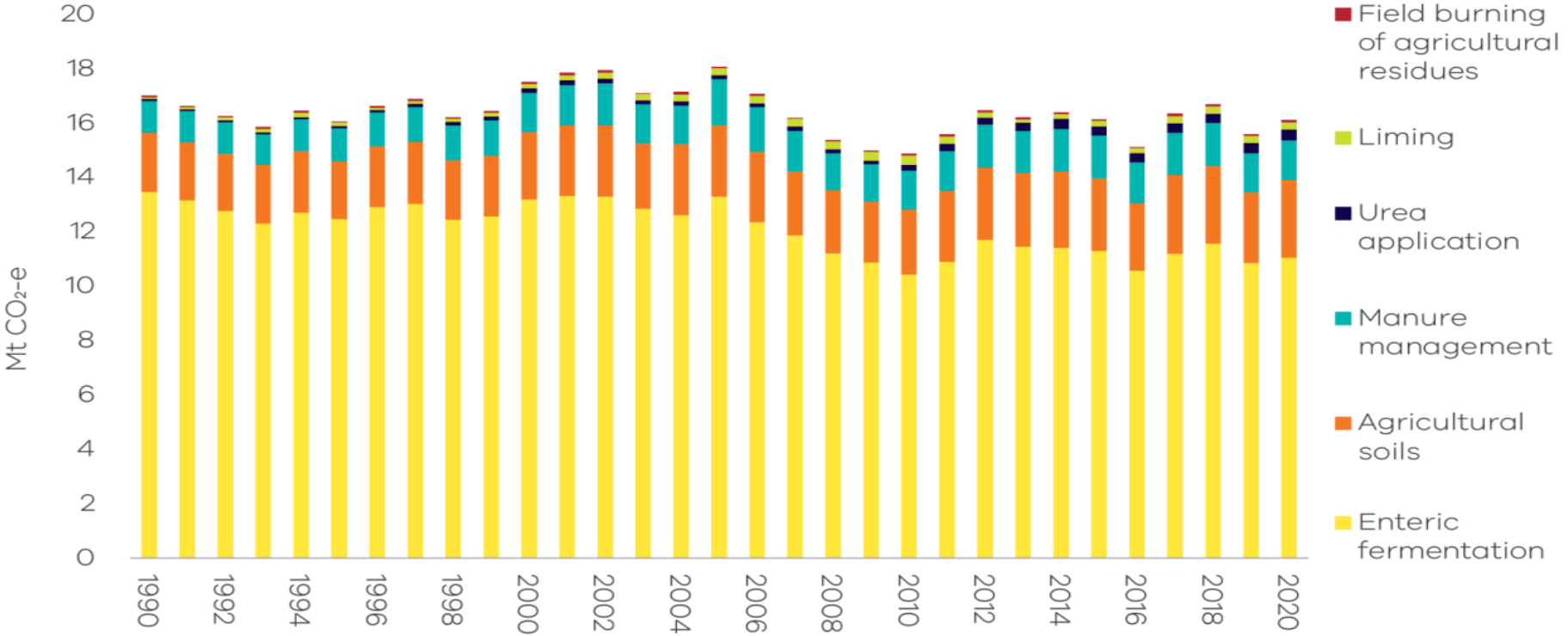
Victoria's greenhouse gas emissions by sector in 2020



		Share	Mt CO_2-e
	Agriculture	19.3%	16.1
	Waste	3.4%	2.8
	Industrial processes and product use	4.3%	3.6
Energy	Fugitive emissions from fuels	2.4%	2.0
Energy	Transport	25.0%	20.8
Energy	Fuel combustion	20.8%	17.3
Energy	Electricity generation	50.1%	41.7
	LULUCF	-25.3%	-21.1
	Total	**100%**	**83.3**

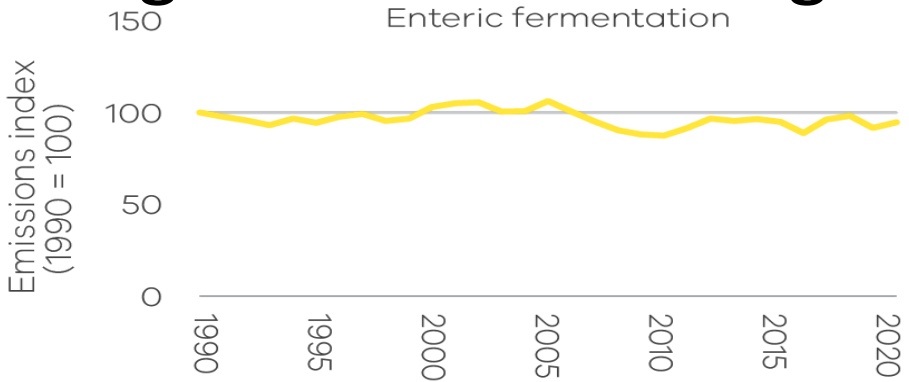
Source: Australian Greenhouse Emissions Information System (DCCEEW 2022a). Note: numbers may not sum due to rounding

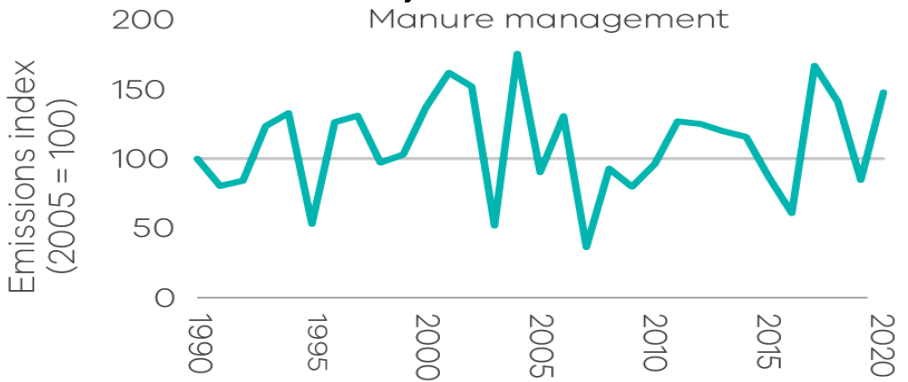
Emissions by agriculture sector sub-category – Victoria, 1990 to 2020

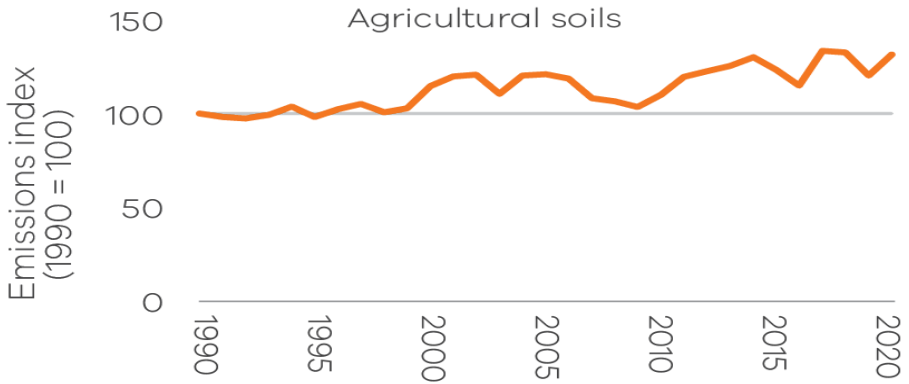


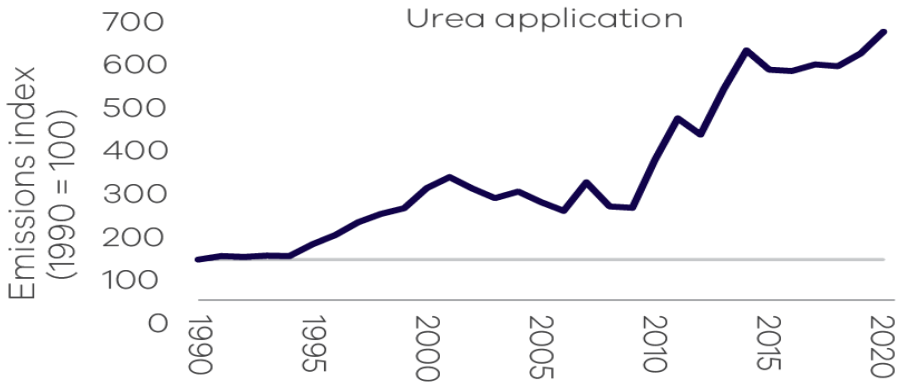
Source: Australian Greenhouse Emissions Information System (DCCEEW 2022a)

Trends in emissions for the four major agriculture sub-categories – Victoria, 1990-2020



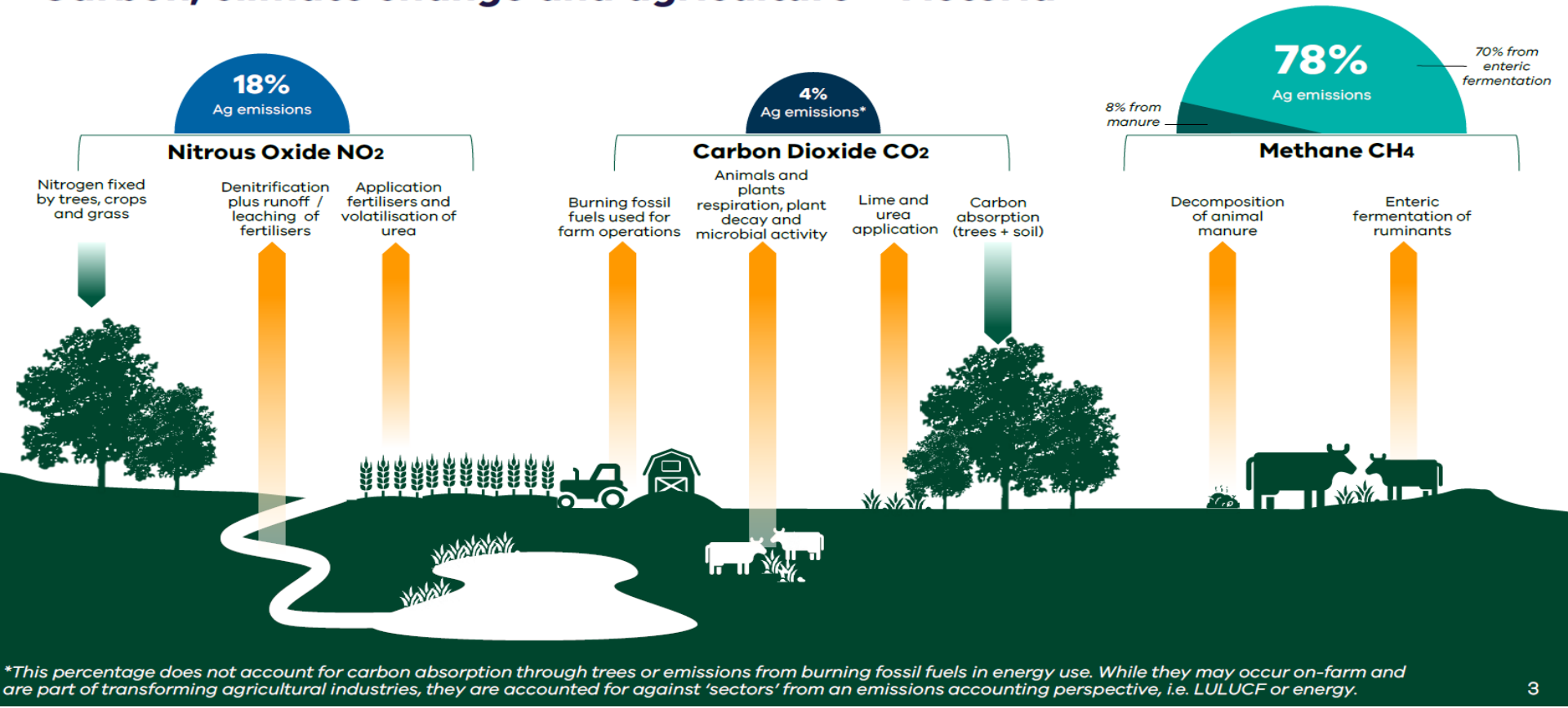






Source: Australian Greenhouse Emissions Information System (DCCEEW 2022a)

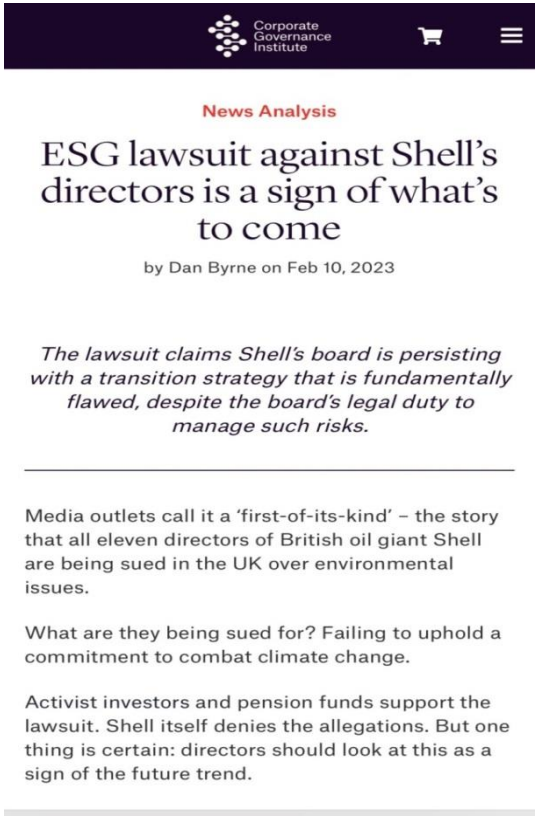
Carbon, climate change and agriculture - Victoria



*This percentage does not account for carbon absorption through trees or emissions from burning fossil fuels in energy use. While they may occur on-farm and are part of transforming agricultural industries, they are accounted for against 'sectors' from an emissions accounting perspective, i.e. LULUCF or energy.

Percentages are equivalent to the entire Victorian agriculture sector emissions, and are not reflective of an individual farm level emissions profile.

Corporate sector drivers



Corporate Governance Institute

News Analysis

ESG lawsuit against Shell's directors is a sign of what's to come

by Dan Byrne on Feb 10, 2023

The lawsuit claims Shell's board is persisting with a transition strategy that is fundamentally flawed, despite the board's legal duty to manage such risks.

Media outlets call it a 'first-of-its-kind' – the story that all eleven directors of British oil giant Shell are being sued in the UK over environmental issues.

What are they being sued for? Failing to uphold a commitment to combat climate change.

Activist investors and pension funds support the lawsuit. Shell itself denies the allegations. But one thing is certain: directors should look at this as a sign of the future trend.

- Shareholders
  - ESG
  - TCFD
  - TNFD
- Regulators
  - APRA – banks
  - ASIC – greenwashing
- Reporting
  - Scope 3 EUSX
- Employees
- Customers

FoodNavigator EUROPE

How Mondelēz is sowing regenerative agriculture into European wheat production

By Flora Southey

23-Feb-2023 - Last updated on 23-Feb-2023 at 16:34 GMT

SHARE

Mondelēz defines regenerative agriculture as a holistic approach to farming which aims to produce high quality crops, while also restoring

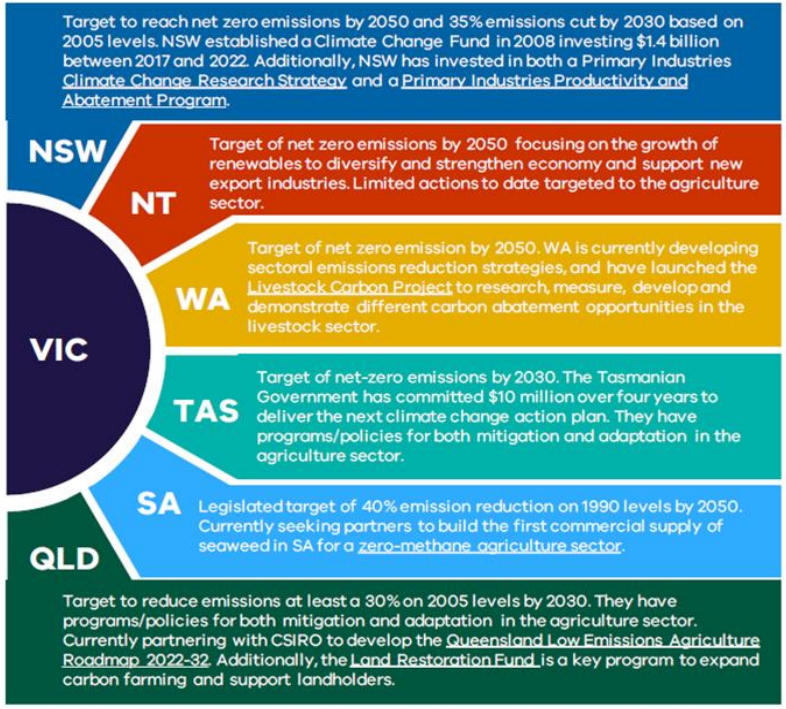
The snacks and confectionery major aims to grow 100% of the wheat volume needed for production of its European biscuits according to regenerative agriculture practices by 2030. We ask Marie Ellul-Karamanian, Harmony Program Lead at Mondelēz, what this will look like on the ground.

Mondelēz International has announced the next stage of its third-party verified European wheat sustainability program: Harmony Ambition 2030.

Now in its 15th year, today the Harmony program collaborates with 1,360 farmers across seven European countries. Its latest iteration incorporates regenerative farming practices, and by 2030, the company wants 100% of the wheat volume needed for production of its European biscuits – including its belVita, Milka, LU, Oro and Opavia brands – grown according to these practices.

Programs & investment to reduce agricultural emissions is gaining momentum

Other jurisdictions



Commonwealth

- The **Climate Change Act 2022 (Cth)** legislated a 43% reduction below 2005 levels by 2030 and net zero by 2050.
- The Australian Government joined the **Global Methane Pledge** 2022, agreeing to contribute to global efforts to reduce methane at least 30 per cent from 2020 level by 2030
- Key programs and investments include:
  - ✓ **Australia Sustainable Seaweed Alliance ($8 M)**
  - ✓ **Methane Emissions Reduction in Livestock program ($29 M)**
  - ✓ **Carbon Farming Outreach program (20.3 M)**
  - ✓ **Emissions Reduction Fund**

Supply chain

Market and supply chain expectations are changing with direct implications to farmers.

- Many supply chain partners have committed to net-zero emissions in 2050 which may have flow-on impacts on farmers as suppliers: **Coles, Woolworths, Metcash, ALDI, JBS, Fonterra, Saputo and more.**
- Given consumers have increasing interest in products with lower environmental impact and sustainability credentials, industry peak bodies are also setting ambitious emissions reduction and net-zero targets: **National Farmers Federation, Meat & Livestock Australia, Dairy Australia and Australian Pork**

International

New Zealand: He Waka Eke Noa Primary Sector Climate Action Partnership a government-industry partnership to design a pricing mechanism for agricultural emissions

Canada: On-Farm Climate Action Fund to improve land management on farm, targeting improved nitrogen management, cover crops and rotational grazing practices.

Wales: Let's Get Greener – Farming Connect program to increase implementation of sustainable farm practices through extension services.

Ireland: National credentialling program for farm businesses and processors called "Origin Green"

Netherlands: The Herd Size Reduction Plan is focused on reducing ammonia by reducing 30% of livestock herd numbers by 2029.

Victorian climate change framework

Legislation

Climate Change Act 2017

Long-term and interim emissions reduction targets

Objectives and principles to embed climate change in government decision-making

Climate Change Strategy – *5 yearly*
How Victoria will meet its targets and adapt to the impacts of climate change

Interim emissions reduction targets – *5 yearly*

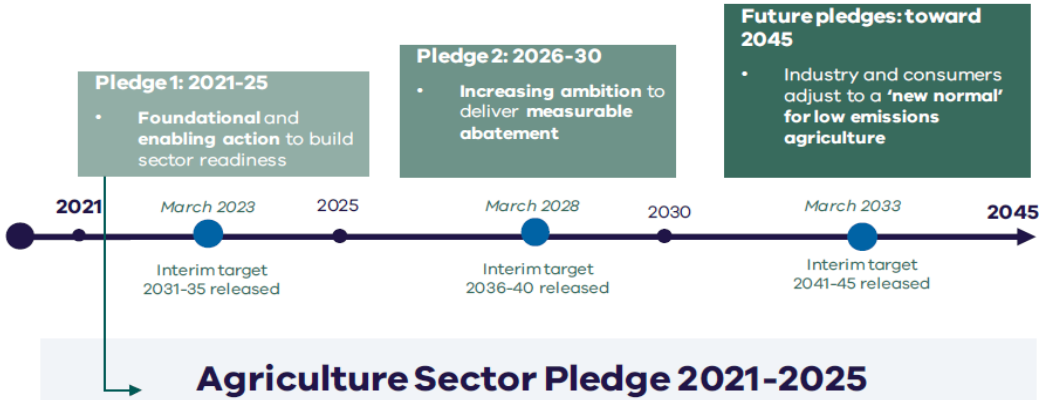
Sector Pledges – *5 yearly*
Actions to drive emissions reductions across each sector

Adaptation Action Plans – *5 yearly*
Actions to prepare key systems for the impacts of climate change

Regular reporting requirements

Economy-wide emissions reduction targets

- Victorian Government has **committed to reaching net-zero emissions across the economy by 2045**
- **Interim** emissions reduction targets on the path to net-zero have been set for:
  - 28-33% (below 2005 levels) by **2025**
  - 45-50% (below 2005 levels) by **2030**
- The **2035** interim target is due to be released in March 2023.



Agriculture Sector Pledge 2021-2025

Outlines how government and industry will work together to reduce emissions. Includes investment and action across **four areas**:

Victorian Agriculture and Climate Change Statement

Shared vision and pathway for agriculture's role in net-zero emissions and climate-resilient economy

Research trials

Ground-breaking research, innovation and deployment of low-emissions technologies and practices

On-Farm Emissions Action Plan Pilot

Test approaches to build sector awareness and capability to reduce on-farm emissions

Spatial data and tools

Deliver tools to strengthen the industry's capability to reduce emissions and adapt to climate change impacts

Victorian Agricultural Sector Pledge

Agriculture & Climate Change Statement

Statement

We are committed to a profitable and productive agriculture sector that takes ambitious action on climate change.

We are working together to accelerate climate change solutions, including taking steps to:

- *Understand and reduce our emissions*
- *Adapt to climate risks and*
- *Capture future opportunities*

Research trials

Overview:

- Research studies in pasture-based system to test potential **methane inhibiting technologies**
- Position the **Ellinbank SmartFarm** to become the **world's first carbon neutral dairy farm**

Update:

- **Results**: Recent publication that shows that twice daily feeding of canola oil steeped in Asparagopsis reduced methane emissions of lactating dairy cows with no effect on feed intake or milk yield.

On-farm Action Plan Pilot

Overview:

- Working with up to **250 farmers & growers** to calculate and understand their **on-farm emissions, develop emissions action plans** and implement emissions reduction actions from a **pool of up to $5 million in grants**

Update:

- Round 1 (beef) – 23 participants now have a tailored action plan to reduce emissions.
- Round 2 (dairy) – 1 on 1 farm visits underway.
- Round 3 (sheep) – EOI closed Jan 23.

3.2 Spatial data and tools

Overview:

- Building an Agriculture Climate Spatial Online Tool containing maps and analytics including climate change impacts on productivity and yield and climate thresholds for specific commodities.

Update:

- Prototype being tested.

AgVic Climate & Emissions Reduction Programs

Agriculture Strategy commitments

- Position Victoria as a leader in low-emissions agriculture.
- Ensure Victorian agriculture is well-placed to manage climate risks and continues to be productive and profitable under a changed climate.
- Support Victorian producers to be more profitable, exporting more products to more markets, more often.
- Support farmers with information and tools to build resilience.

Agriculture Sector Pledge 2020-2025

- Victorian Agriculture and Climate Change Statement; On-Farm Emissions Action Plan Pilot ; Agriculture Climate Spatial Tool; flagship methane research trials.

Primary Production Adaptation Action Plan

National frameworks

- Future Drought Fund, national Drought Agreement and Disaster Recovery Framework
- National Soils Strategy

▶ ***Setting direction and building capability***

Carbon and emissions communication programs

- Climate Dogs
- The Break and Very Fast Break / Climate Webinars
- Soil Moisture Monitor / Farm Monitor
- Making Sense of Carbon / Climate e-learn products

▶ ***Building awareness and climate literacy***

Research and demonstration at SmartFarms

- Ellinbank: Aiming to be world's first carbon neutral dairy farm by 2026; Heat stress R&I combining genomic research and nutritional information
- DairyFeedBase research program
- GreenCow Genomic Index
- Tatura: Sundial Orchard & Agrivoltaic experiment
- Horsham: Free Air Temperature Extreme Facility
- Hamilton: Evaluation of forages for drier climates with climate scenarios and modelling

▶ ***Building evidence to inform action***

Sector partnerships

- Victorian Agriculture and Climate Change Council
- On-ground networks and strong partnerships with service providers
- Opportunities for integrated delivery across DEECA land sector entities and managers

National advocacy

- AMM Climate Change Task Group

▶ ***Engaging the sector and advocating for Victoria's interests***

What does this mean at the farm level

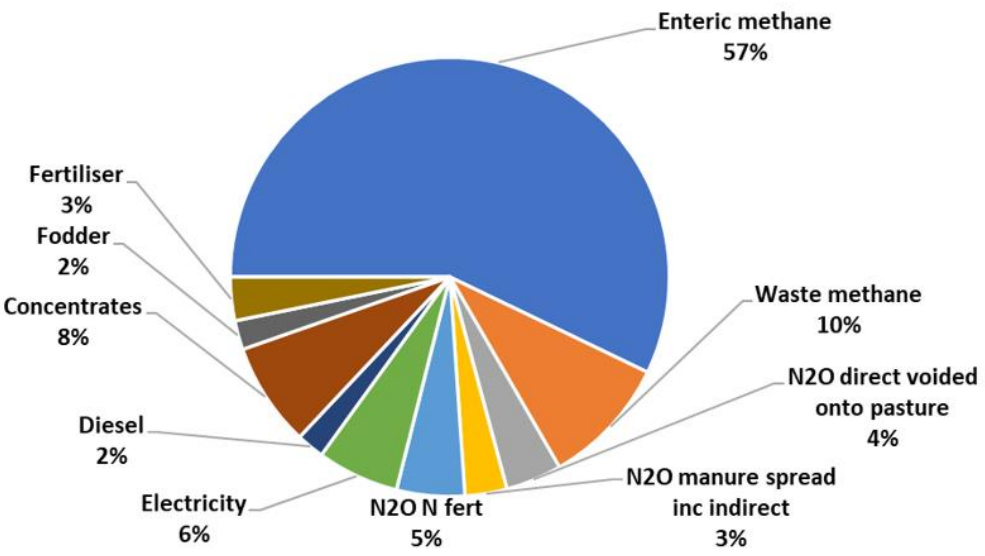
1. **Demonstrating a reduction in emissions -** Markets and investors are pricing in emissions reduction to their activities – climate change is a material risk to businesses, so resources and effort are being directed to reducing this risk. Either through changes in financing criteria and/or purchasing power
2. **Responding to and adapting to a warmer climate -** Agricultural production will be impacted by continued warming of our climate – we have an interest in supporting actions to reduce warming

So what?

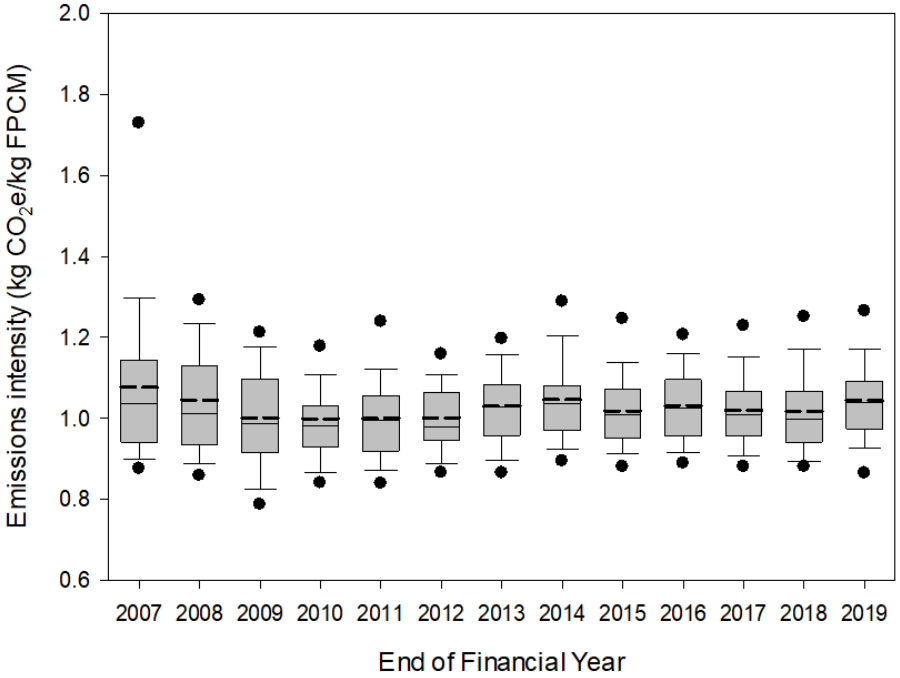
- Expect to be asked about your emissions (if not now, in time, KNOW YOUR NUMBER)
- Expect consumer interest in 'low-emission' product options (where possible, REDUCE YOUR EMISSIONS AND PROTECT ANY SINKS)

Not starting from zero knowledge.
Dairy has emissions data, benchmarks & tools available

Sources of emissions – typical dairy

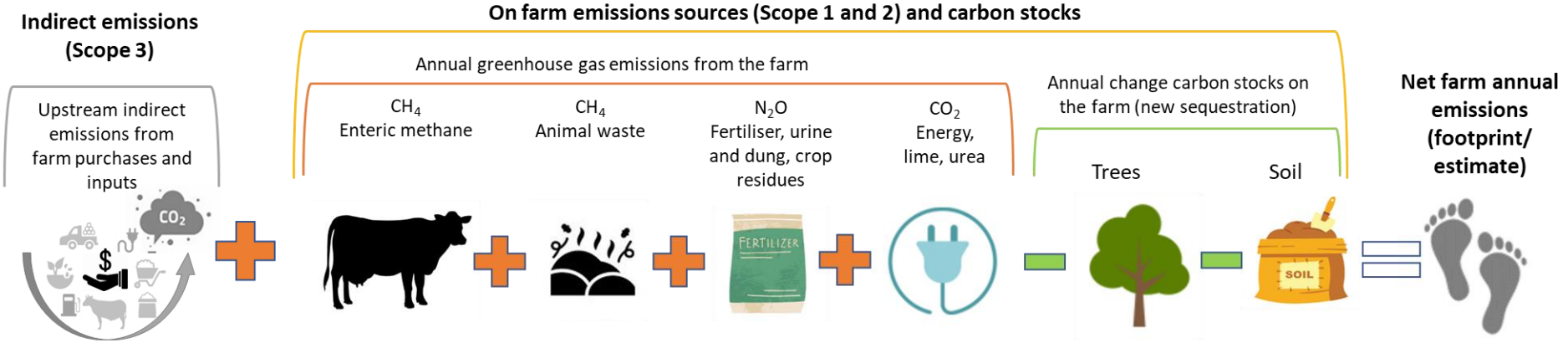


Trend in emissions intensity



Source: DairyBase full dataset analysis

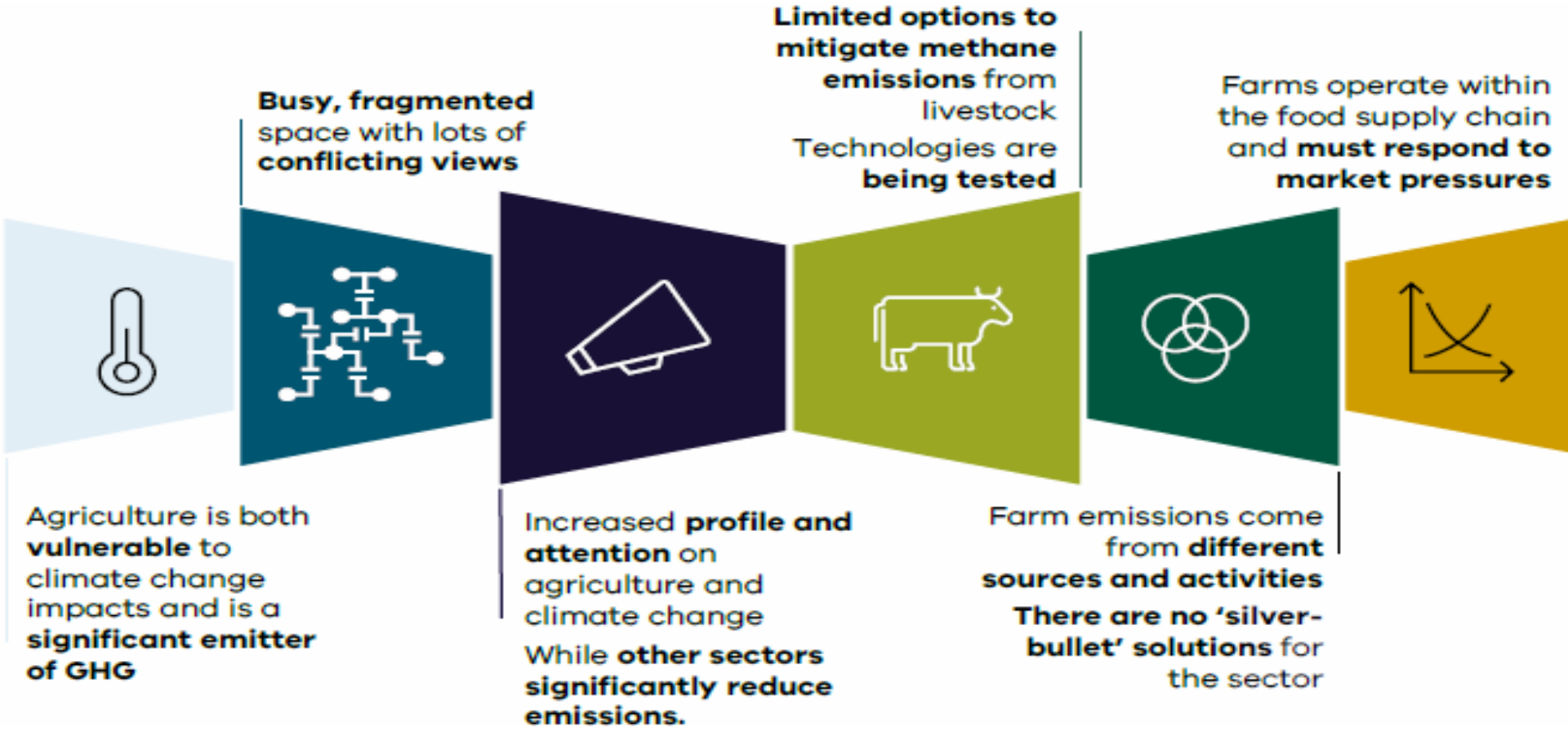
Example – Gippsland Dairy emissions profile 2021/22



On farm emissions and stocks only	1,871 t CO_2-e 69 %	349 t CO_2-e 13 %	382 t CO_2-e 14 %	90 t CO_2-e 3 %	- 223 t CO_2-e - 8 % emissions (3% of property)	- N/A t CO_2-e STABLE	2,470 t CO_2-e
Now including Scope 3 …							
210 t CO_2-e 7 %	1,871 t CO_2-e 64 %	349 t CO_2-e 12 %	382 t CO_2-e 13 %	90 t CO_2-e 3 %	- 223 t CO_2-e - 8 % emissions (3% of property)	- N/A t CO_2-e STABLE	2,680 t CO_2-e

Source: AgVic On farm Emissions Action Plan Pilot 2022
Tool: Australian Dairy Carbon Calculator v5

Feeling uncertain? That's OK



Consider….

- **Listen, consider, understand the implications and hasten slowly**.
- **Don't sell what you don't yet measure or deeply understand**. In other words – do not sell your carbon! Understand how you might need to use it to offset your own business emissions first, and think about the true value and how you might use them as your evolve your business.
- **Know Your Numbers** – most of you will know your production metrics to the decimal figure. You will need to start measuring and really understanding your environmental and social metrics – your carbon, your emissions intensity, your biodiversity metrics, your workforce safety and well being.
- What **tools** are available to your industry/business to measure and capture your data
- What climate **actions** suit your business - Adaptation and/or Mitigation
- What **resources** do you need to implement these – time, capital or skills/knowledge
- What **benefits** do you expect to see – how will you measure those
- Who in your **supply chain** is walking the talk and able to work with you
- Who in your **circle of influence** needs to uplift their capability to support you

Thank you

Victorian Agriculture and Climate Change Council

E: vaccc@agriculture.vic.gov.au

Resources to feed your curiosity

- Latest IPCC report outlines the main drivers of climate change. Find the summary for policy makers here: Summary for Policymakers (ipcc.ch)
- ABARES infographic here: https://daff.ent.sirsidynix.net.au/client/en_AU/search/asset/1034061/0
- Build/tailor graphs using FAO data here: https://www.fao.org/faostat/en/#data/GT
- Further info from emissions from the entire food production: Food production is responsible for one-quarter of the world's greenhouse gas emissions - Our World in Data
- The Commonwealth has an interactive dataset which you can search by state/territory and type of emissions: https://www.greenhouseaccounts.climatechange.gov.au/
- Victorian whole economy emissions: Greenhouse gas emissions (climatechange.vic.gov.au)
- Victorian Agricultural emissions: located in section 2.4 from the Victorian Greenhouse Gas Emissions Report 2020 (climatechange.vic.gov.au)
- Victorian emissions by economic sector https://www.climatechange.vic.gov.au/__data/assets/pdf_file/0026/521297/Victorian-Climate-Change-Strategy.pdf
- Victorian Agriculture and Climate Change Council https://agriculture.vic.gov.au/support-and-resources/networks/victorian-agriculture-and-climate-change-council

Where to start - Calculating emissions on your farm is possible now

- FarmPrint
  - CSIRO - initial focus on dryland broadacre cropping
  - Cradle-to-farm-gate approach
  - Still in development
- CoolFarm*
  - High level of detail
  - Good for international comparison
  - Not consistent with Australian NGGI method
- FarmGAS*
  - Comprehensive coverage of all industries
  - AFI - not current with inventory method
- **LOOC-C**
  - **Sequestration estimate**
  - **Selection of ERF methods**
  - **ERF methodology calculations**

- **GAF tools**
  - **UniMelb/PICCC - Excel based**
  - **Separate tools for Cropping, Livestock, Dairy, Feedlots, Sugar, Cotton etc**
  - **Recent upgrade to Climate Active format**
- DGAS
  - Dairy-specific tool, with D-GAF underneath
  - Includes pre-farm emissions
  - Recent upgrade to Climate Active format
- Zero30 Beef Farmer Carbon Tracker Tool
  - UNE - Web-based version of B-GAF
  - Climate Active format
- FullCam
  - Official carbon model for Australia
  - Tree and soil carbon only
  - Complex and spatial

Australian Dairy Carbon Calculator

Tips before starting – know your purpose, choose the most appropriate tool/approach for what you need, ensure you have the appropriate data/records, seek advice

Rule of thumb: Estimates are 'generally right, but specifically wrong'. Allow for +/- 20% accuracy.