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For the latest in red meat R&D

Towards carbon neutrality – practical steps for Eyre Peninsula producers

Cam Nicholson

Nicon Rural Services

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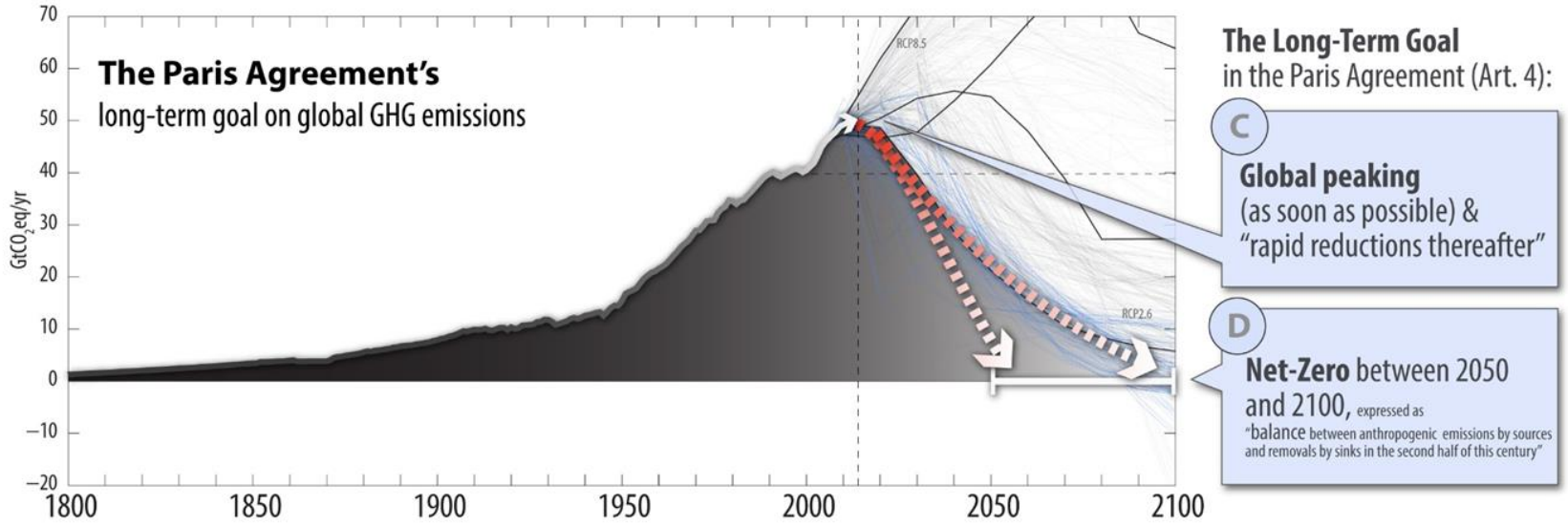
A two minute history of the carbon story

Intergovernmental Panel on Climate Change (**IPCC**). Estab by UN in 1988.

- AIM: *To stabilize GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system*



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A two minute history of the carbon story

- IPCC meet annually - since 1995 (Conference of Parties – COP) – COP 27 Egypt.
  - Kyoto protocol 1997 (COP 3) – benchmarks, submit inventories,
  - Paris 2015 (COP 21) (legally binding treaty – CN by 2050). Different tiers of compliance.

- IPCC also put out assessment reports (**AR6** - 2022) – the 'rules' based on best science. ***But this changes the goalposts***

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A two minute history of the carbon story

- Aust – set up ERF (2015), voluntary schemes.
- Trade issues - GHG compliance barriers, CBAM (2023, ag reviewed in 2026), Methane pledge, NZ pricing agricultural emissions.

Of the 100 largest economies in the world, 69 are companies and 31 are countries. Government policy may now be less influential than market forces.

Prof Richard Eckhard (UoM)

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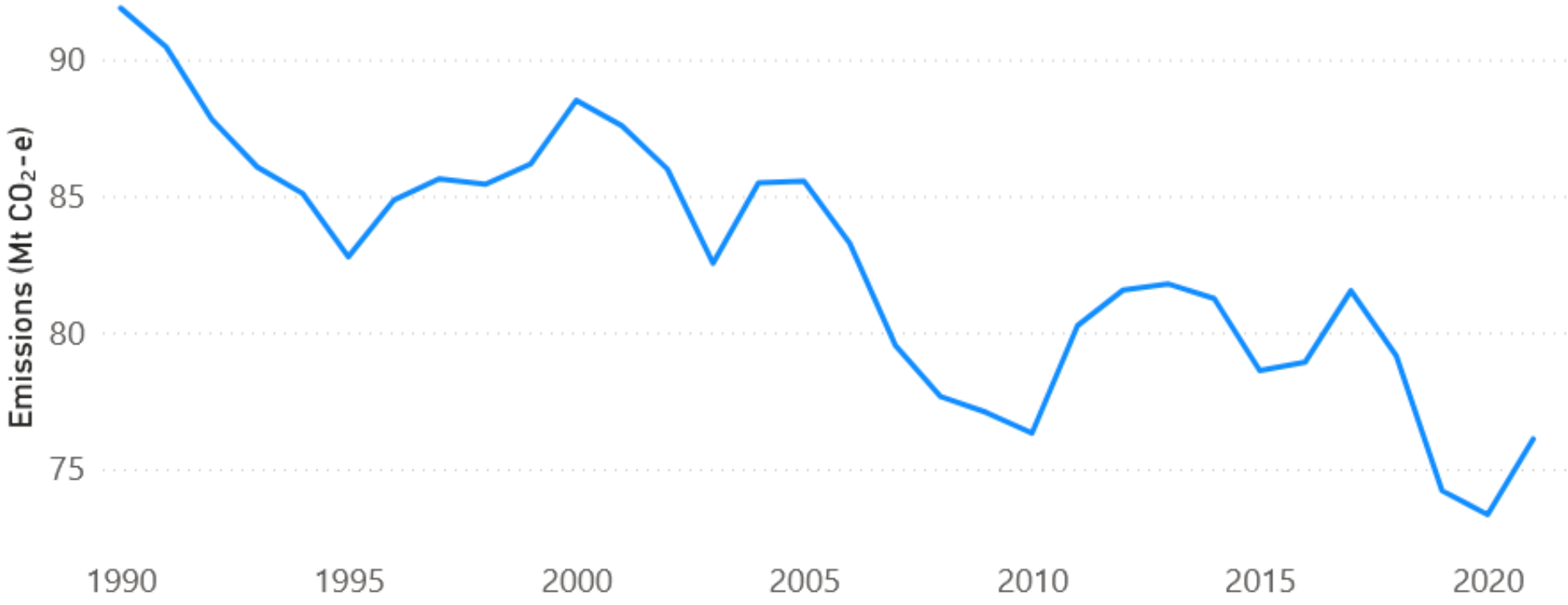
Australian Agriculture

Aust 1.4% (domestic) to global, ~5% inc exports (coal, gas)

~ 15% of Australia's total emissions

Export ~70%



Source: Department of Industry, Science, Energy and Resources

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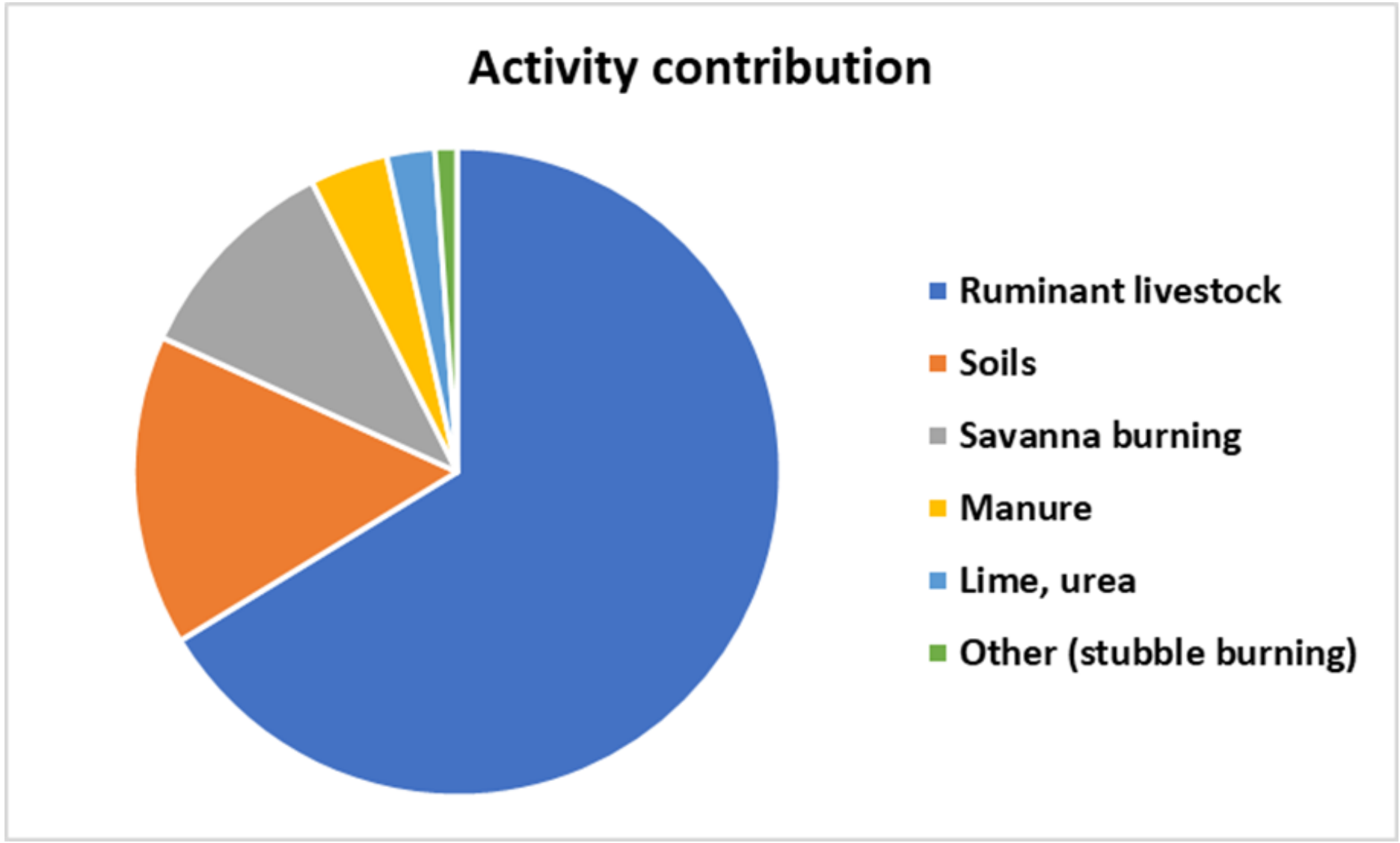
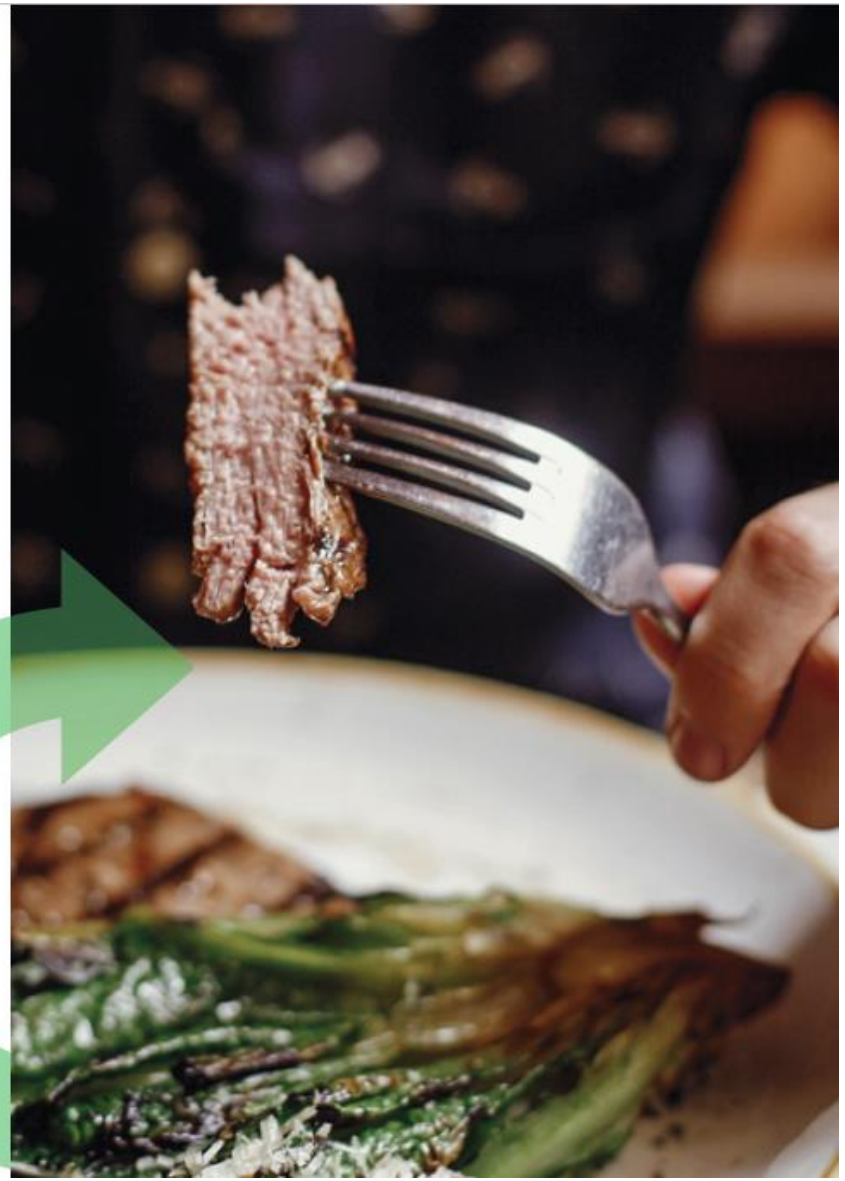

Activity contribution
Ruminant livestock
Soils
Savanna burning
Manure
Lime, urea
Other (stubble burning)

The Australian
Red Meat Industry's

Carbon Neutral by 2030 Roadmap

CN30



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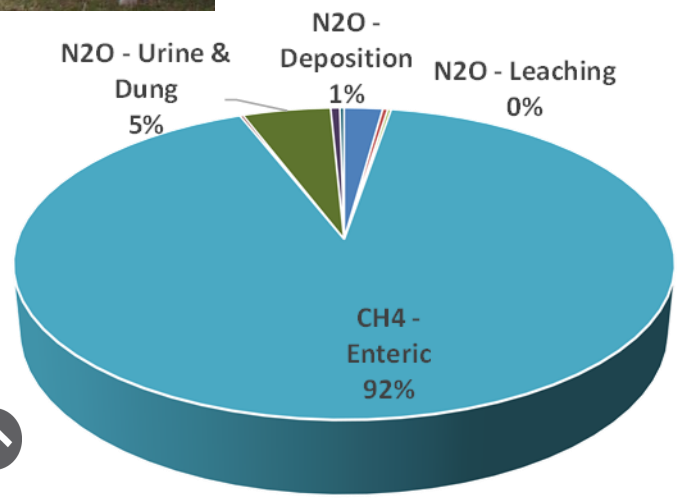
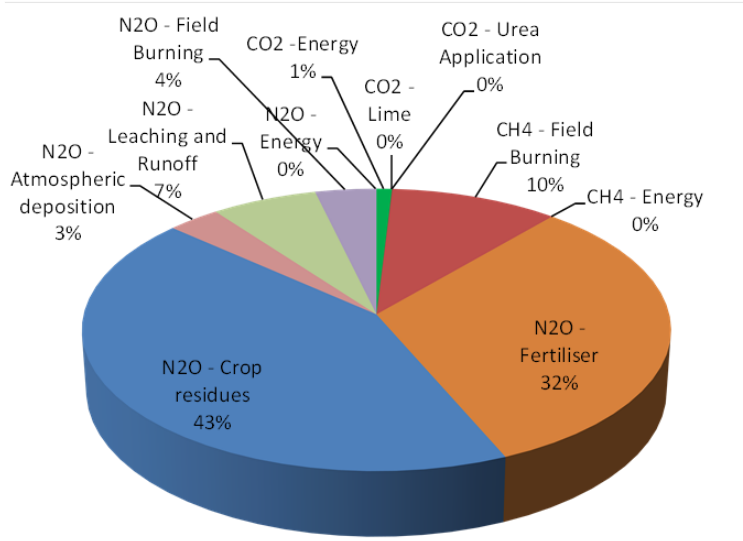
Understanding the greenhouse bit

Global Warming Potential and Conversion Factors

Gas	CO2-e
CO2	1
CH4	28
N2O	265





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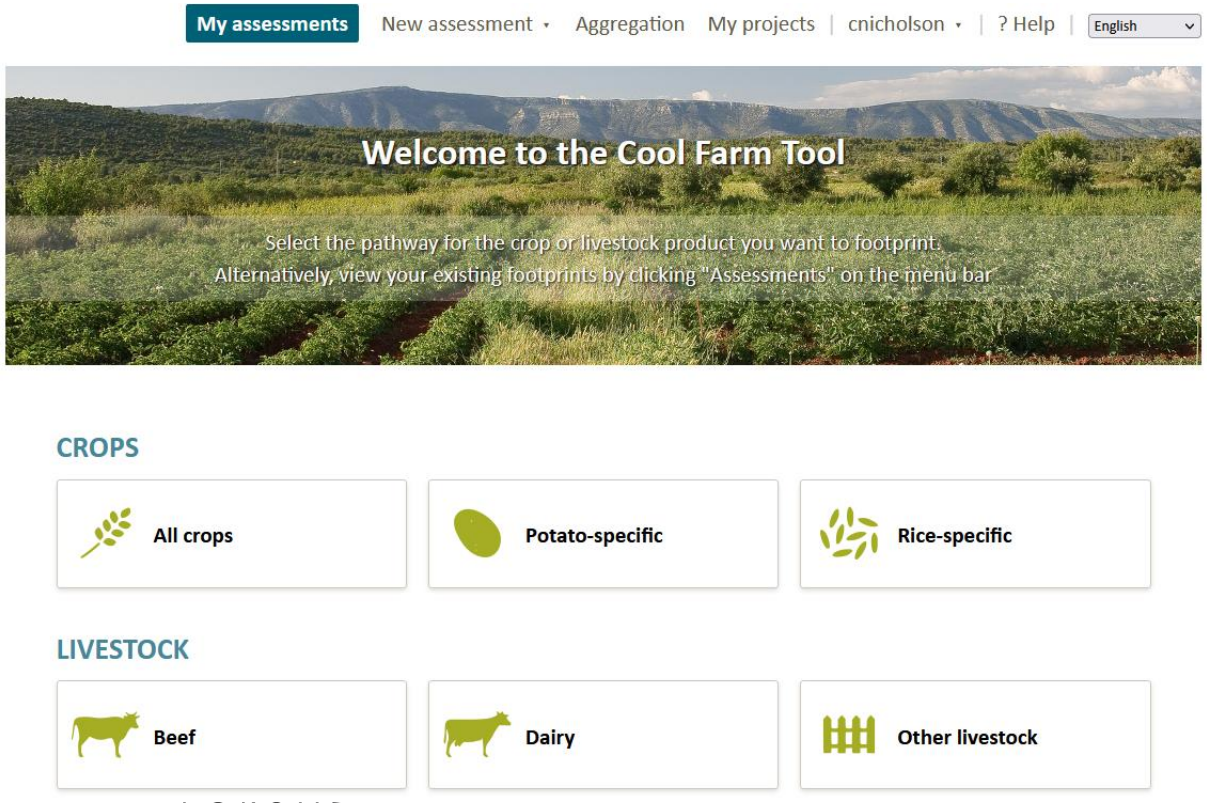
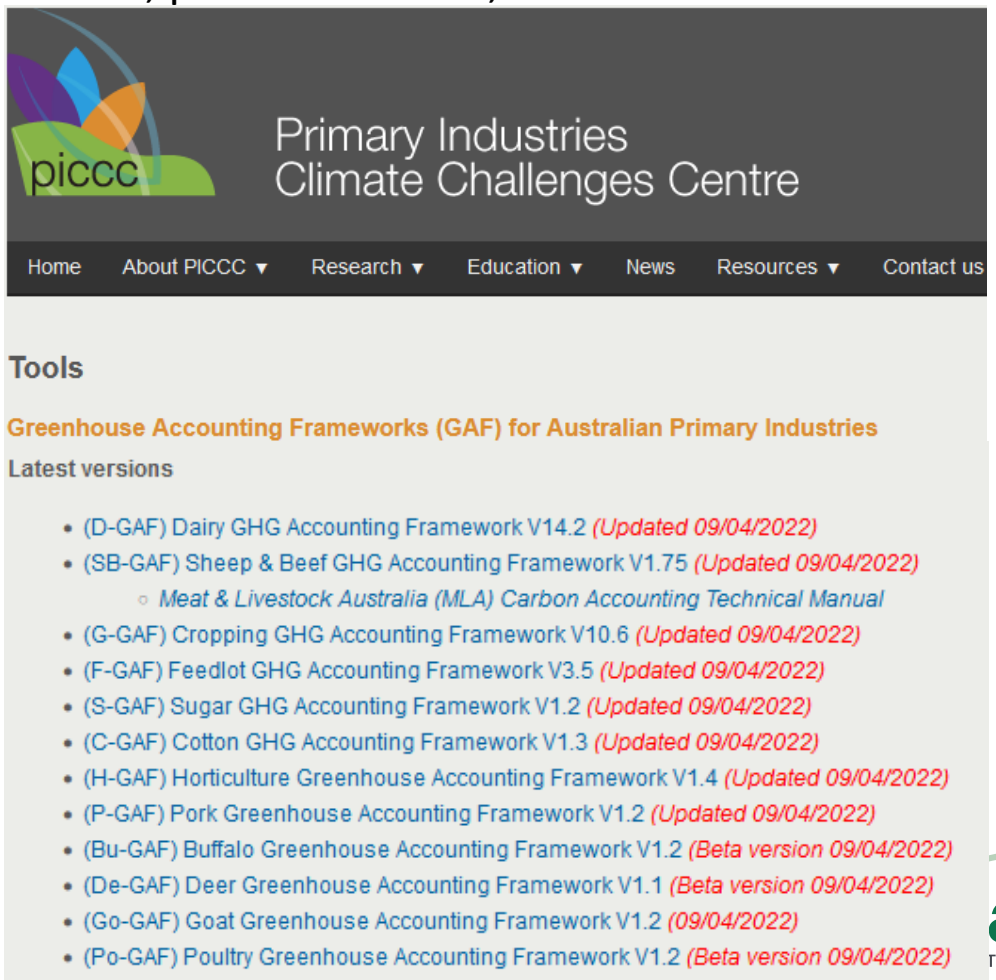
So what should you do?

1. Understand your carbon emissions

- **Scope 1** = direct, you own and can control – animals, fuel, fertiliser, lime, manure management, burning
- **Scope 2** = indirect energy emissions – electricity
- **Scope 3** = indirect on inputs – fertiliser manufacture, purchased animals, purchased feeds, herbicides, animal health products etc





Emissions intensity

Emission per unit of product

Commodity	Range	Units
Beef	11 to 15	kg CO2-e/kg Lwt
Sheep	6 to 8	kg CO2-e/kg Lwt
Wool	20 to 26	kg CO2-e/kg gsy
Wheat	0.3 to 0.5	t CO2-e/t crop
Canola	~0.7	t CO2-e/t crop
Barley	~0.5	t CO2-e/t crop

Reduce emissions intensity – Livestock efficiency

1. Livestock growth rates (feeding, genetics, fecundity, animal health)

2. Remove passengers

3. Rumen modifiers (methane loss ~ 15% of total ME animal consumes)

4. Others

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But the ‘goal posts’ keep moving!!!!

Warming potential (GWP 100)

Greenhouse gas	AR2 (2008/9 to 2014/15)	AR4 (2015/16 to 2019/20)	AR5 (2020/21 onwards)	AR6 (2022 onwards*)
Carbon dioxide	1	1	1	1
Methane	21	25	28	27.2
Nitrous oxide	310	298	265	273

Source: Intergovernmental Panel Climate Change (IPCC)

Climate impact of ruminant methane (GWP*) – 12 years (fossil fuel methane is additional)

Emission intensity compared to carbon neutral

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2. Understand possible offsets – Revegetation

Calculating carbon sequestration

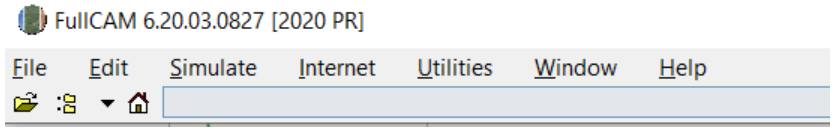
1. Revegetation / trees (Full CAM) – (ACCU)

Reafforestation by environmental or mallee plantings

Carbon Credits (Carbon Farming Initiative) (Reforestation by Environmental or Mallee Plantings—FullCAM) Methodology Determination 2014

made under section 106 of the

Carbon Credits (Carbon Farming Initiative) Act 2011



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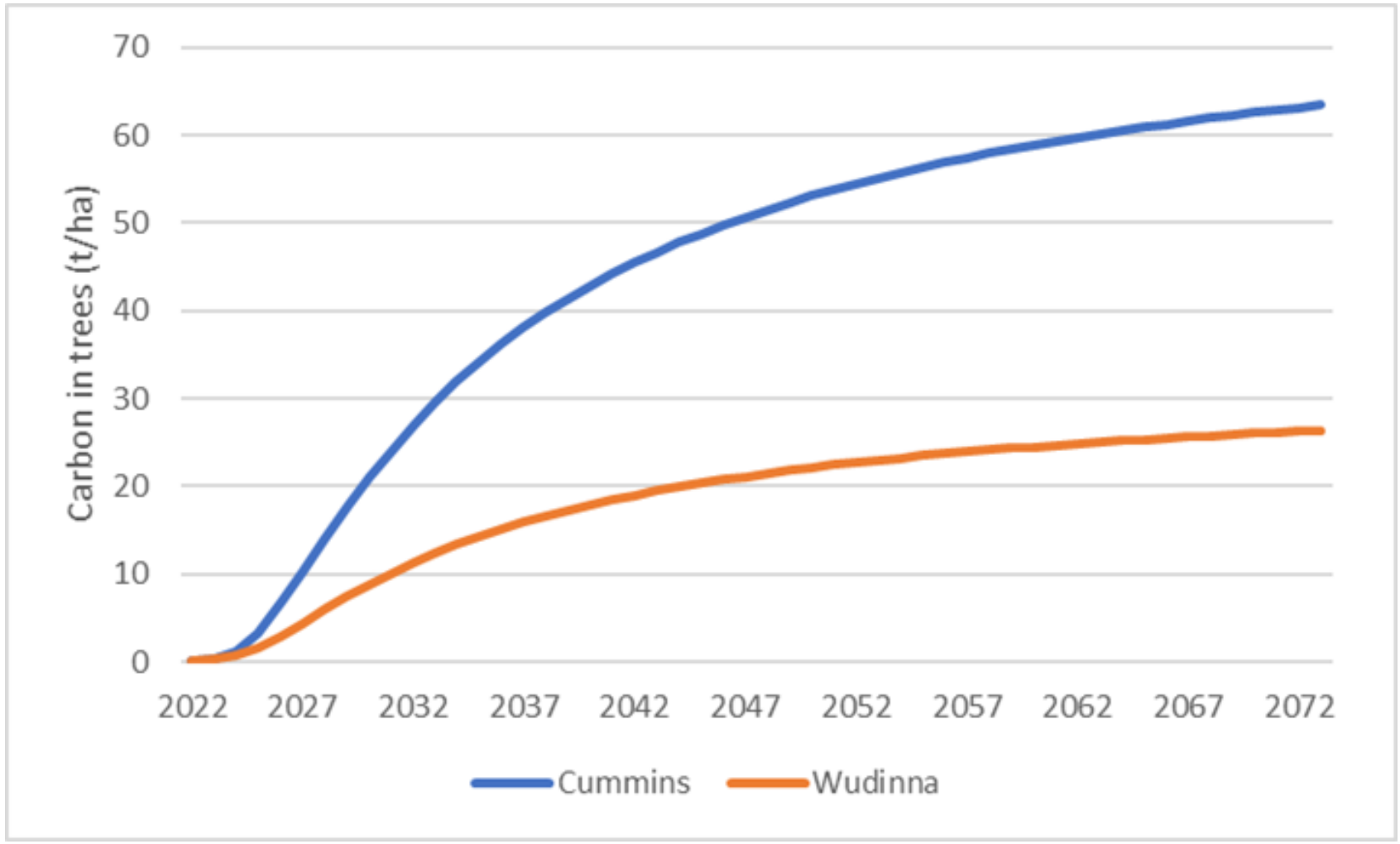
Environmental plantings



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Possible offsets - Soil carbon

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Soil carbon balance

Inputs

- Net primary productivity (capture by plants and added to soil)
- Addition of organic materials from offsite

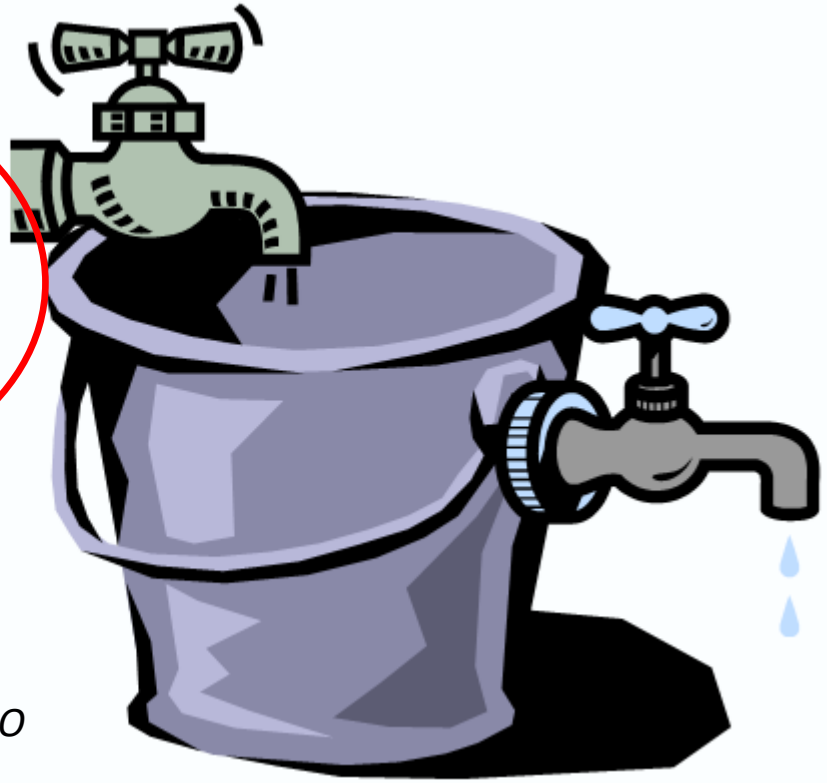

Image: Jeff Baldock CSIRO

Losses

- Conversion of organic C to CO_2
- Removal of products containing C
- Cultivation / erosion

Only **about 5% to 10%** of the organic matter we supply as raw inputs turns into “stable” soil organic carbon, the rest eventually goes back into the atmosphere

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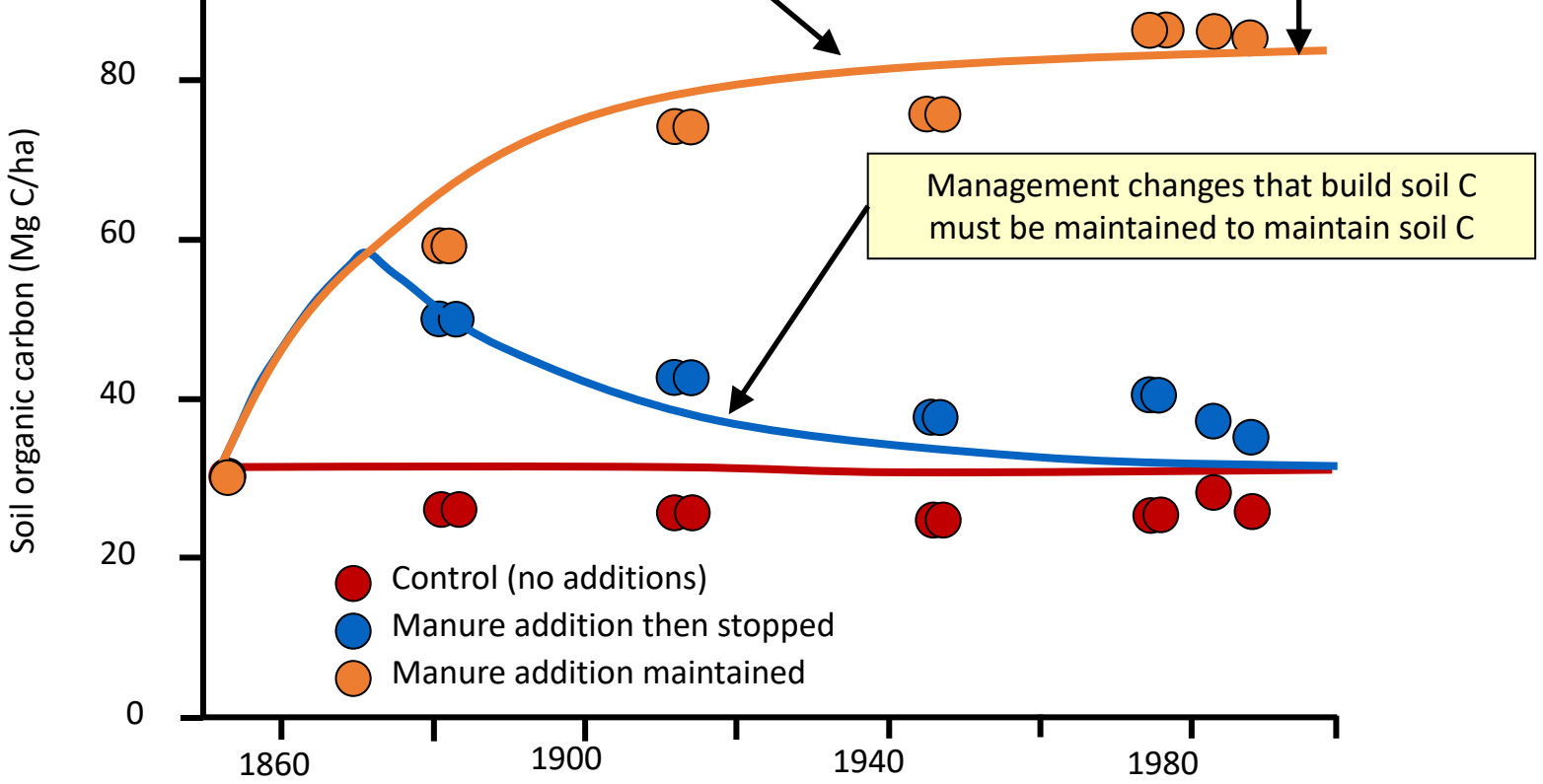
Permanence of changes in soil carbon stocks

Soil C storage capacity is finite for a defined rate of input and the largest changes happen early

Soil C changes take place over long time periods

Management changes that build soil C must be maintained to maintain soil C



Source: Petersen et al. (2005) Soil Biol Biochem

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Soil carbon sequestration

LOOC-C

A landscape options and opportunities for carbon abatement calculator

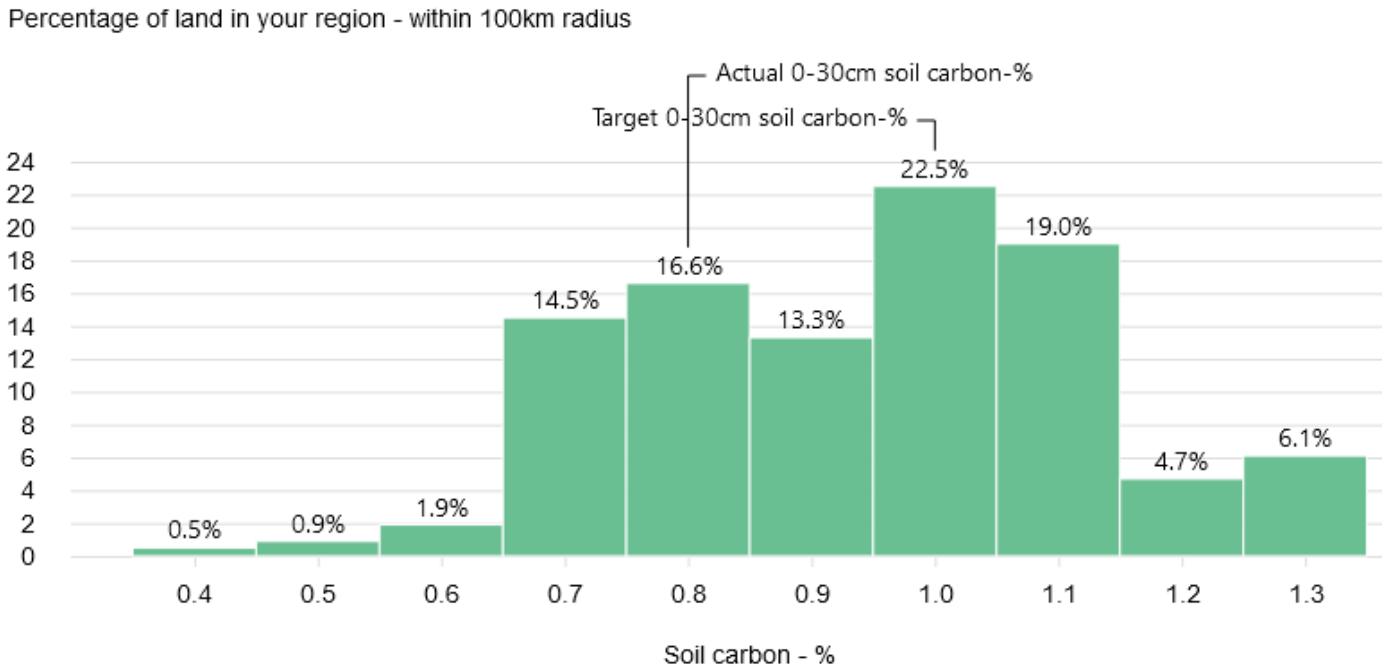
Introduction | Farm details | Method discovery

Welcome to LOOC-C

LOOC-C allows you to quickly assess options on the land for certain projects offered under Australia's federal carbon emissions programme, the Emissions Reduction Fund (ERF).

Now updated with forestry methods for Victoria.

Wudinna – long term pasture



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Calculating carbon sequestration

2. Modelled soil carbon methods - (ACCU)

Measured

Carbon Credits (Carbon Farming Initiative—Measurement of Soil Carbon Sequestration in Agricultural Systems) Methodology Determination 2018

I, Josh Frydenberg, Minister for the Environment and Energy, make the following determination.

Dated 25/1/18

Josh Frydenberg
Minister for the Environment and Energy

Modelled

Carbon Credits (Carbon Farming Initiative—Estimating Sequestration of Carbon in Soil Using Default Values) Methodology Determination 2015

made under section 106 of the

Carbon Credits (Carbon Farming Initiative) Act 2011

Compilation No. 2

Compilation date: 17 February 2018

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3. Understanding Carbon schemes and obligations (Govt / voluntary)

1. Additionality
2. Permanency
3. Net balance
4. Loss of use / manage for others
5. Verification
6. Scheme integrity

Insetting

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Take home messages

Carbon accounting WILL be part of farming in the future

Just what will be required is still a work in progress (risky)

Start by knowing your emissions (and emissions intensity) – learn carbon 101 (MLA Carbon Neutral)

Then examine your sequestrations potential (but follow the credible science). Possible baselining?

Avoid ‘selling’ unless you accept the ‘terms’

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Tools and resources

MLA resources (www.mla.com.au/cn30)

- *Get your business CN30 ready*.
- *Carbon neutral red meat product catalogue.*
- *Carbon 101 elearning modules.*
- *Measuring your own emissions.* (Sheep and Beef GHG Accounting Framework (SB-GAF) tool).

Other useful resources - Primary Industries Climate Challenges Centre (PICCC).

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