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For the latest in red meat R&D

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We need to talk…
About the weather

Emma Thomas

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My business

Family partnership

Between Cowra and Forbes running south toward Grenfell

A typical business for this region, merino sheep, feedlot lambs and cropping

RWS Accredited wool

And one day (soon) Carbon Neutral lamb and grain!

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We need to talk…

Framing the conversation

- What have you seen at home, in your community and in Australia?
  - Ask, listen, and look for shared experiences
- Adaptation
- Opportunities

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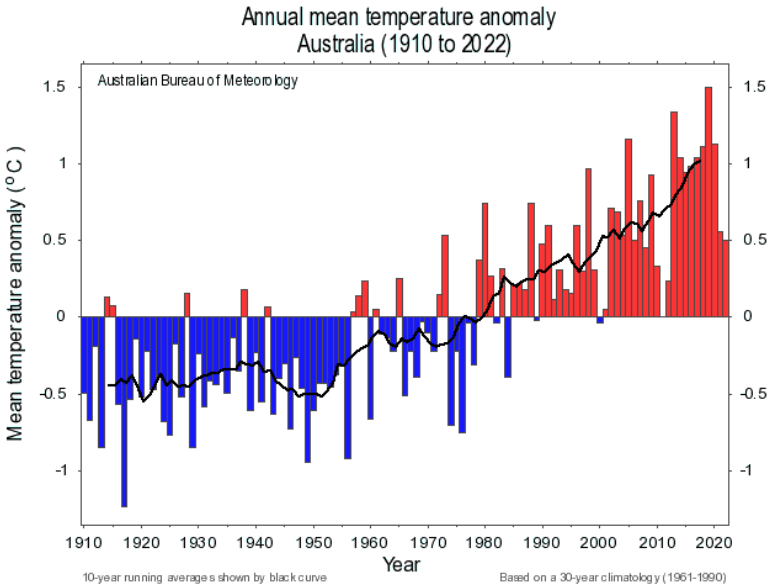
Framing the conversation!

Australia: record temperatures



BoM 2023

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Reframe - Adaptation

'The process of adjustment to actual climate and the effects'

Shelterbelt have co-benefits

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Carbon Neutral Agriculture *Supply chain responses to Paris Agreement*

- **Fonterra**
  - Climate-neutral growth to 2030 for pre-farmgate emissions from a 2015 base year
- **Unilever**
  - Reducing the GHG impact of their products by 50% by 2030, compared to baseline of 2010
- **Mondelez**
  - Reduce absolute GHG from manufacturing 15%
  - 100% renewable energy
- **Nestle**
  - Zero environmental impact in our operations
- **Heineken**
  - Carbon neutral barley-malt supply chain
- **Rabobank**
  - Carbon neutral supply chains
- **Mars**
  - Reduce GHG across our value chain 27% by 2025 and 67% by 2050 (from 2015 levels)
- **Kellogg Company**
  - 65% reduction by 2050
  - 100% renewable energy
- **Pfizer**
  - 60 to 80% by 2050
- **Wilmar international**
  - 89.72% less GHG from 2013 to 2020
  - 100% renewable energy
- **Olam**
  - Reduce GHGs by 50% by 2030 both in our own operations and in our supply chain
  - By 2050, we aspire to be carbon positive in operations, requiring a 5% emissions reduction per year from 2031 – 2050

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What is carbon farming?

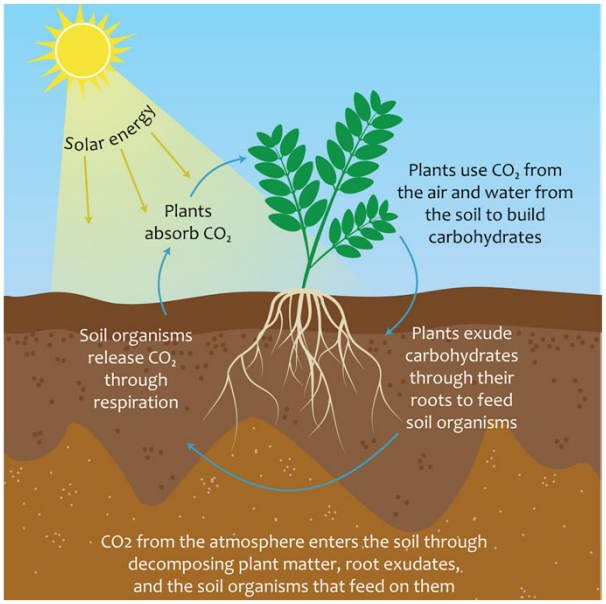
- A change in farm management that leads to either a reduction in emissions or a removal of carbon dioxide from the atmosphere.

Emissions reduction:

- Livestock/Waste
- Fire
- Fertilizer use

Carbon removal:

- Reforestation
- Soil carbon/Biochar
- Methane digestor



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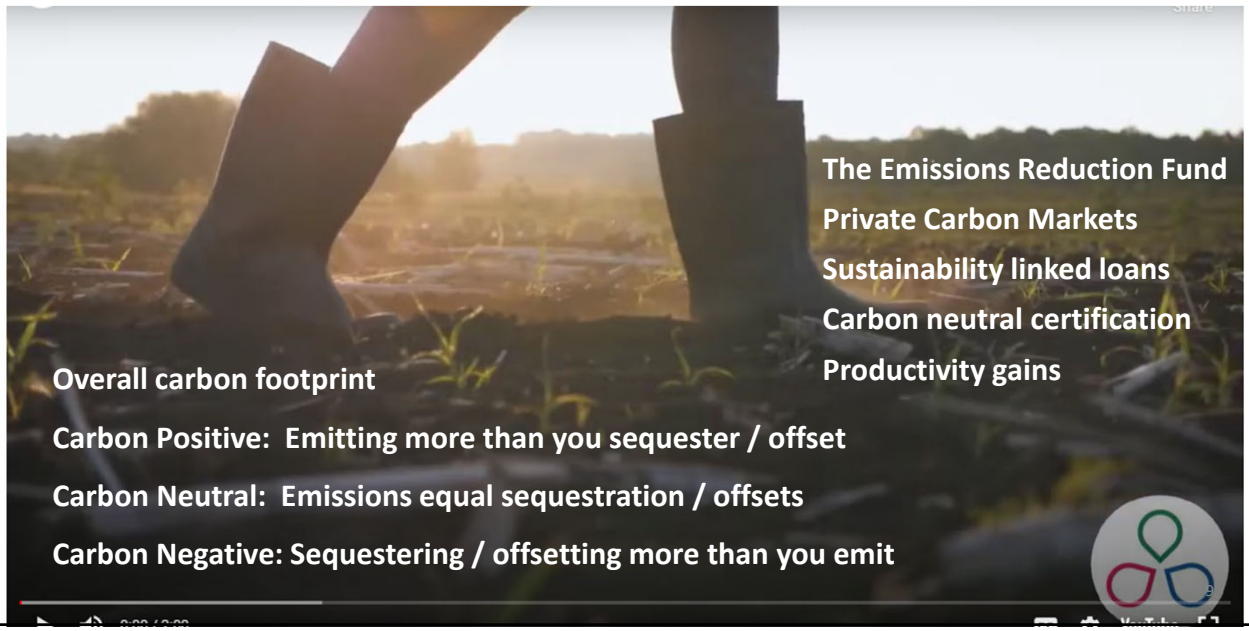
Carbon Opportunity Decision Support Tool



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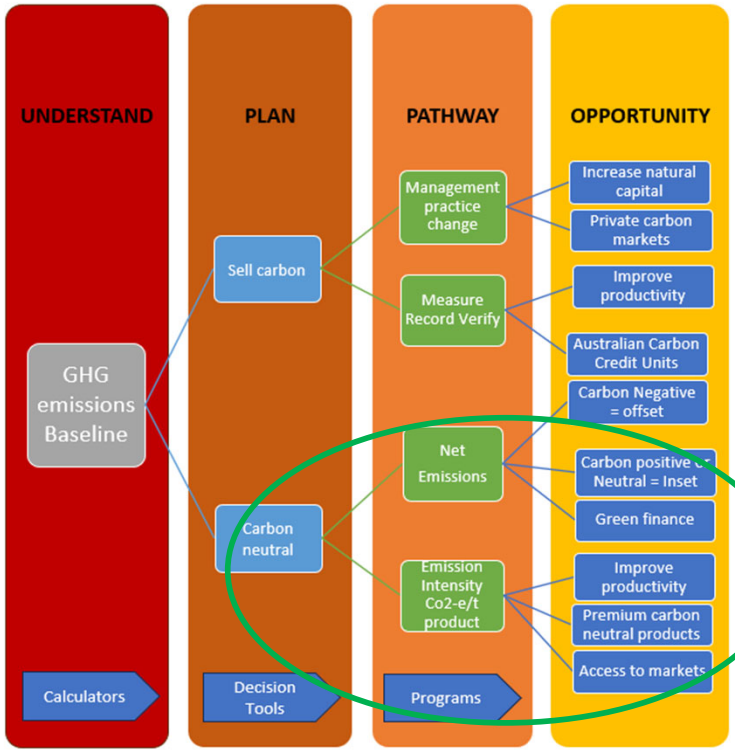
What options are there?



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How do we calculate our Net Emissi

Net Emissions = Emissions – sinks/stocks

Measure Emissions

Scope 1 Direct emissions
- Livestock – enteric digestion

Scope 2 Energy
- Energy consumption

Scope 3 Indirect Inputs
- Along value chain

Measure Carbon S

Soil carbon

Paddock trees

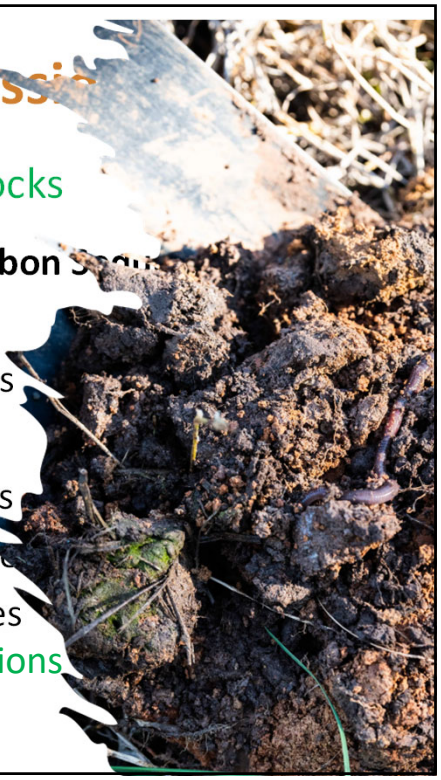
Shelter belts

Forage shrubs

Remnant veg

Riparian zones

Stocks can be used to inset our own emissions



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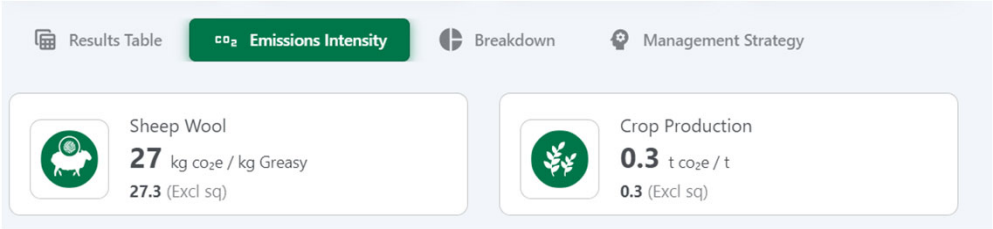
Emissions Intensity

Emissions intensity = Kg CO_2 e (emitted) / Kg product (meat/wool)



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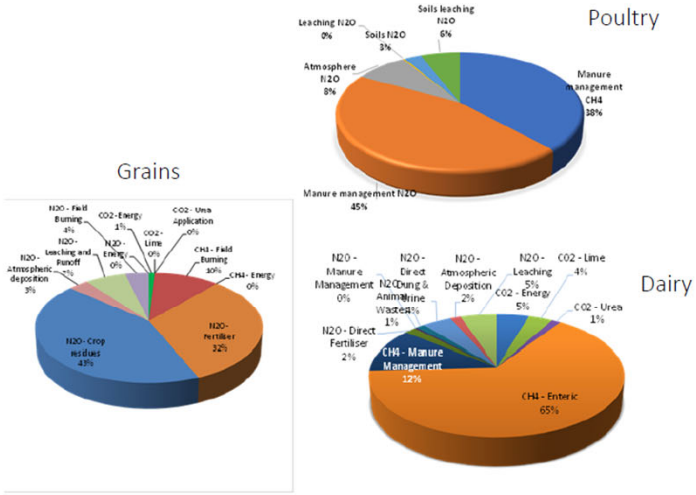
Emissions Intensity

- Chicken meat
  - 1.8 to 2.2 kg CO_2e/kg carcass weight
- Grain production
  - 0.10 to 0.25 kg CO_2e/kg grain
- Dairy
  - 1.0 to 1.2 kg CO_2e/kg FPCM
  - 8 to 21 t CO_2e/t MS
- Red meat production
  - 20 to 26 kg CO_2e/kg carcass weight
- Wine
  - 0.6 to 1.5 kg CO_2e/L



Wiedeman *et al.* (2015); Browne *et al.* (2011); Alvarez-Hess et al. (2019); Abbott *et al.* (2016)

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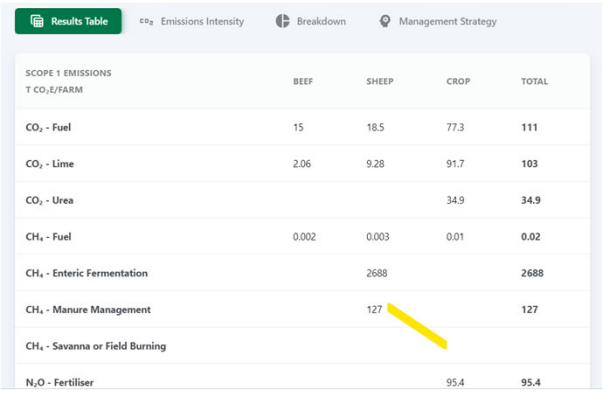
MLA Carbon Calculator



Data required

- Livestock numbers per season
- Live weight and Live weight gain
- Wool inventory
- Purchase / Sales
- Fertilizer and chemical applications and area planted to each crop type
- Energy consumption
- Fuel use
- Vegetation types

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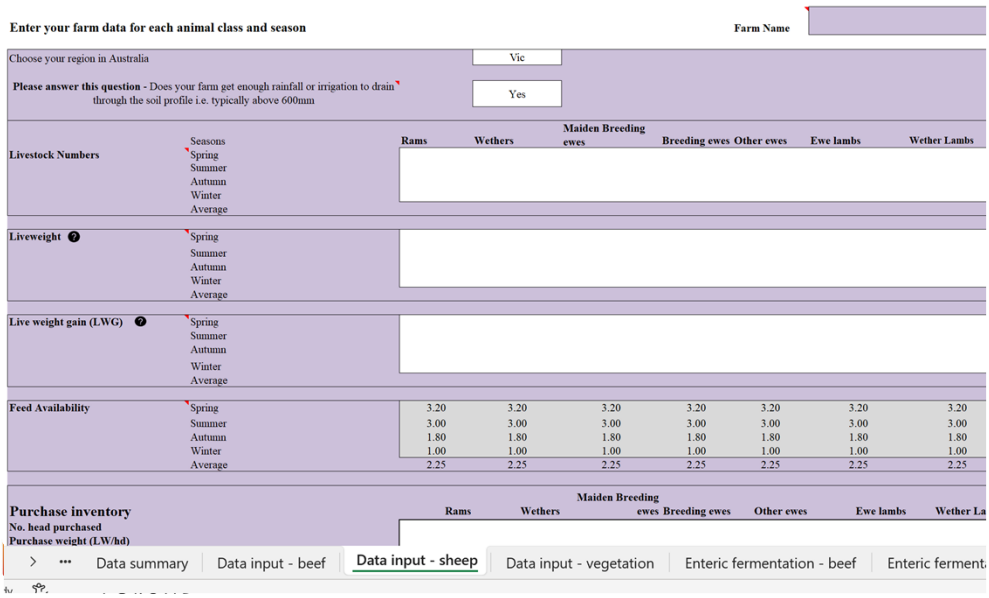
GAF Tool - carbon calculator



Enter your farm data for each animal class and season

Farm Name

Choose your region in Australia		Vic						
Please answer this question - Does your farm get enough rainfall or irrigation to drain through the soil profile i.e. typically above 600mm		Yes						
Livestock Numbers	Seasons	Rams	Wethers	Maiden Breeding ewes	Breeding ewes	Other ewes	Ewe lambs	Wether Lambs
	Spring							
	Summer							
	Autumn							
	Winter							
	Average							
Liveweight	Spring							
	Summer							
	Autumn							
	Winter							
	Average							
Live weight gain (LWG)	Spring							
	Summer							
	Autumn							
	Winter							
	Average							
Feed Availability	Spring	3.20	3.20	3.20	3.20	3.20	3.20	3.20
	Summer	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	Autumn	1.80	1.80	1.80	1.80	1.80	1.80	1.80
	Winter	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Average	2.25	2.25	2.25	2.25	2.25	2.25	2.25
Purchase inventory		Rams	Wethers	Maiden Breeding ewes	Breeding ewes	Other ewes	Ewe lambs	Wether La
No. head purchased								
Purchase weight (LW/hd)								

Data summary | Data input - beef | Data input - sheep | Data input - vegetation | Enteric fermentation - beef | Enteric ferment

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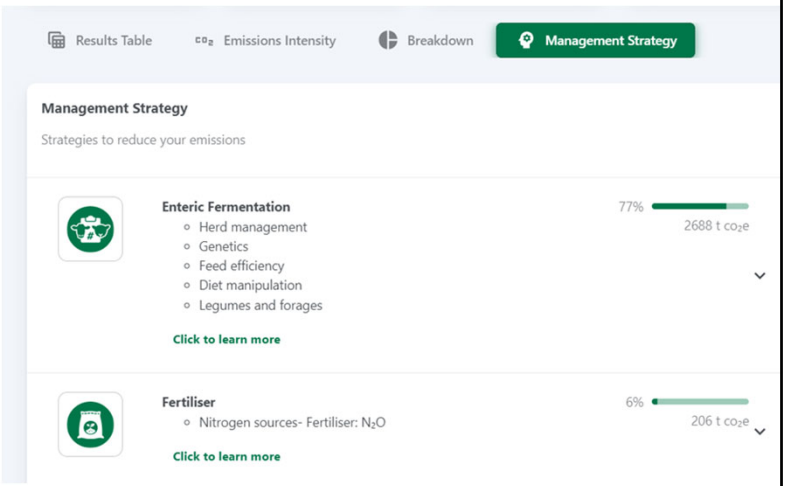
What if my emissions are greater than my sinks

Management Strategies

- Identify ways to reduce Emissions
- Create a Whole Farm Carbon Management Plan
- Measure over time to see the difference between Baseline, Year 1 ……



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What are we doing to reduce our emissions?

- Implementing eID to manage animal performance in feedlot
- Reduce days on earth
- Retaining high performing animals
- Reducing inputs - cover crops, pasture cropping, green fertilizers
- Increasing groundcover to improve soil health
- Energy – moving to renewables (solar development)

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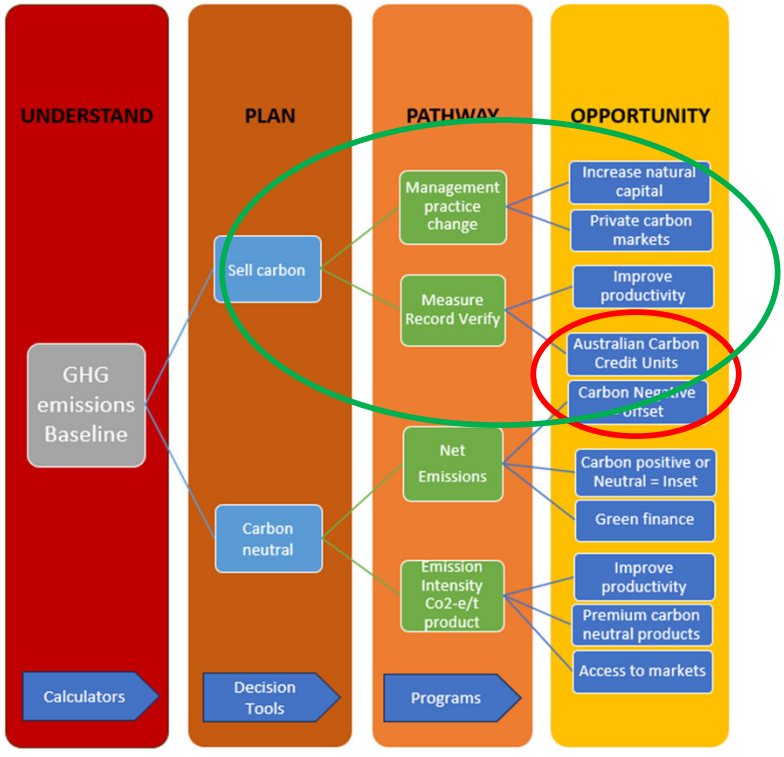
What options are there?



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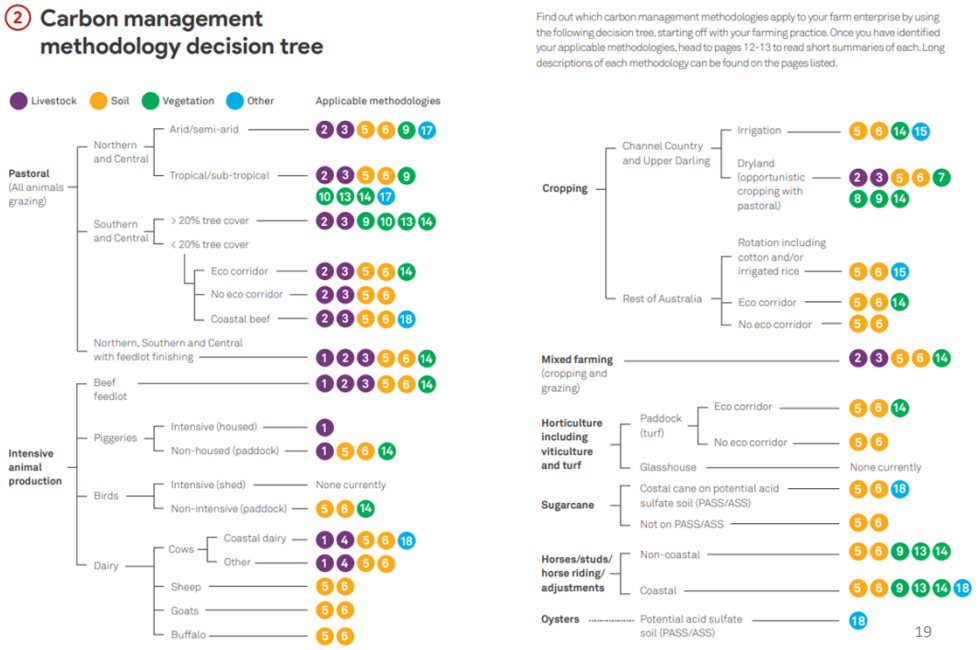
A Farmers handbook to on-farm carbon management



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How does the carbon market work?

Read the Clean Energy Regulator's website
Tools like CSIRO's LOOC-C can assist in estimating return (with caution!)

Carbon Market Institute

Look out for the industry Code of conduct

ACCUs are a financial product
Require financial service licence to buy, sell and trade in the carbon market

Landholder → **Eligible Interest Holder** → **Project Developer /Aggregator** → **Registry (CER)** → **Brokers, Traders and Exchanges** → **Carbon Market**

Requires consent from person/ organisation with specific legal interest in land

Apply, establish a contract. Measure Report & Verify (audit)

What is the market doing?

OR

Do it yourself!

OR

Fee for service Consultant

- Developers can be expensive
- DIY is a lots of preparation & time
- Consultant, up-front cost to establish, but no profit share

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Take home messages

- Conversations about climate change and the drivers for going carbon neutral can
  - Reframe to find solutions for adaptations that make your business more resilient
  - Explore emerging opportunities in the carbon market that suit your business
- Carbon is a new commodity – just need to understand the opportunities and risks
  - Increased production, efficiencies and co-benefits
  - Access to emerging markets, for carbon neutral products, green finance ACCU's
- Data is paramount we need good record keeping
  - to calculate our emissions and sinks over time
  - we need to show the results to benefit from the gains.

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Tools and resources

- CODST Carbon Opportunity Decision Support Tool
- A Farmers Handbook to on-farm carbon management carboncount.com
- MLA Carbon Calculator MLA Carbon Calculator
- GAF Tool Primary Industries Climate Challenges Centre
- Soil Organic Carbon Reserves and Transformations in EcoSystems SOCRATES - Home
- Carbon Farming Opportunities for NSW Home (pairtree.co)
- Methane Emissions Management Strategy Department of Primary Industries

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