



# Starting your carbon emissions journey on-farm

*Toolkit*



**This toolkit is designed to provide the key points for sheep and cattle producers to understand the basics of carbon accounting, create an emissions profile and start identifying strategies to reduce emissions and emissions intensity.**

### **Does my farm need to improve emissions intensity?**

**The Australian red meat and livestock industry has moved away from the target of being carbon neutral by 2030 instead focusing on lowering emission intensity. It is recommended, producers start reducing their emissions intensity in ways that also deliver productivity improvements.**

## **TOOLKIT SNAPSHOT**

### **✓ MAKING A START**

Understand the basics  
Create an emission profile

### **➔ WHAT'S NEXT**

What to do with this number now?  
More information and training options

### **👤 CASE STUDIES**

Alan and Bec Hoggart, Condingup, WA  
Bruce and Trudy Pengilly, Cascade, WA  
Wes Graham, Monjigup, WA  
Leigh and Karina West, Gibson, WA  
Mark and Liv Walter, Cascade, WA  
Ryan Willing, Boyatup, WA

### **📖 GLOSSARY**

# **MAKING A START**

## **Understand the basics**

### **What is an emissions profile and why do I need one?**

An emissions profile is a calculation of your net farm emissions at a point in time. It is generated by using a carbon accounting tool. There are many reasons why producers might need to measure greenhouse gases and reduce emissions. An important one is because, in time, you may need a net farm emissions number (total emissions) or an emissions intensity figure (emissions per kg of product) to access a market. This could come from a buyer that you're hoping to sell your cattle or sheep to or from a processor wanting to market a net zero product.

### **What do I need to know before I start?**

Carbon accounting is a complex topic involving a lot of science, much of it is still being refined. Here are some key basics to get you started.

### **Understanding greenhouse gases**

The major greenhouse gases (GHG) reported under the Australian Government's National GHG Inventory (also known as the National Inventory Report (NIR)) include:

- carbon dioxide (CO<sub>2</sub>)
- methane (CH<sub>4</sub>)
- nitrous oxide (N<sub>2</sub>O)
- sulphur hexafluoride (SF<sub>6</sub>)
- other hydrofluorocarbons and perfluorocarbons.

The main emissions from agricultural production are CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O. GHG emissions are measured in carbon dioxide equivalents (CO<sub>2</sub>-e) to allow for comparison in terms of the quantity and potency of emission sources. Each gas has a different capacity to contribute to global warming. For example, methane, a potent GHG, is expressed as 25 CO<sub>2</sub>-e. This is the largest source of sheep and cattle emissions.

**Understanding scopes**

According to the GHG protocol, emissions are defined into three scopes:

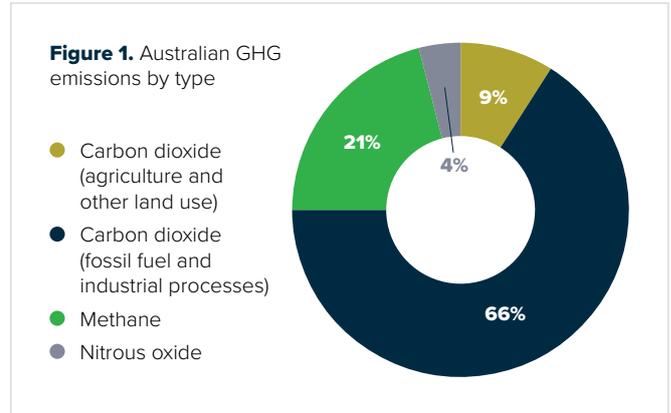
**Scope 1:** your business (GHG emissions from sources that are owned or controlled by your company)

**Scope 2:** electricity used by your business (GHG emissions from the generation of purchased electricity consumed by your company)

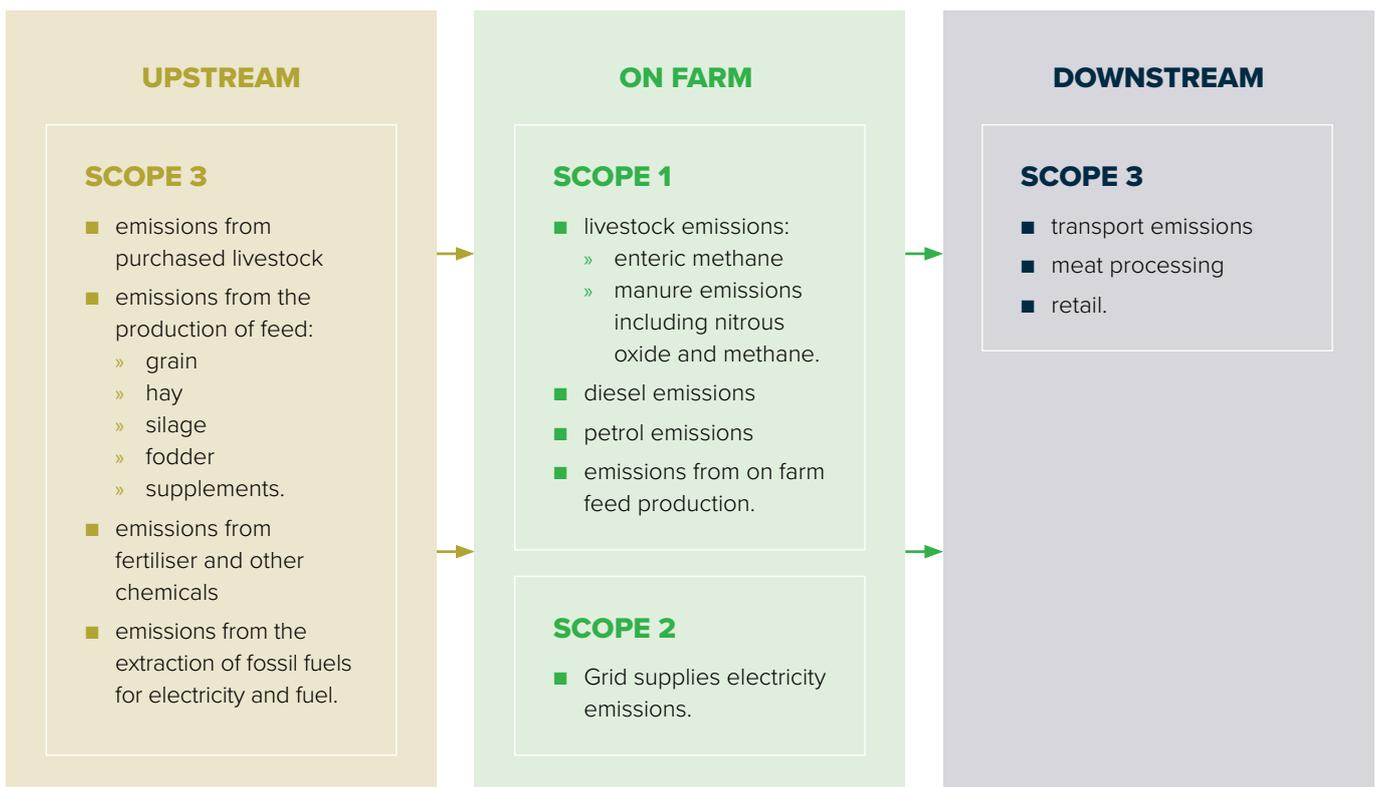
**Scope 3:** is broken into two; upstream and downstream (emissions are a consequence of the activities of your company but occur from sources not owned or controlled by your company):

- upstream: emissions from pre-farm sources, such as the production of purchased supplementary feed, fertilisers and purchased livestock
- downstream: Emissions from post-farm sources, such as meat processing.

An emissions profile requires Scope 1, 2 and 3 emissions to be included. Your buyer will want to know your net farm emissions because your Scope 1 is their Scope 3 upstream.



**Figure 2.** GHG protocols – emission scopes



## Create an emissions profile

### Carbon accounting tools and calculators°

There are a few calculators available. Richard Brake, the consultant ASHEEP & BEEF has been working with, recommends using the Primary Industries Climate Challenges Centre (PICCC) Sheep and Beef Greenhouse Accounting Framework (SB-GAF). It is freely available as an Excel document. The calculator is in ongoing development – updated versions are released based on feedback and new information (see the link to the calculator below).

### What information do I need?

The information needed should be available from your farm taxation records, management records, or your memory. This includes:

- **livestock numbers:** Births, deaths, purchases, sales, weights and liveweight gain (LWG), weaning rates and reproductive status of animals. These figures are used to predict livestock-related emissions, such as enteric methane. This information could exist in livestock reconciliation records for taxation purposes or in a livestock management program
- **records of farm inputs:** Fertilisers, brought-in animal feed, fuel, electricity and purchases. This information is needed to estimate GHG emissions resulting from goods that you purchase from other companies. The figures should be available in your tax records
- **tree planting:** including area (ha), species and planting date (if available)
- **general farm information:** such as your region, rainfall, soil type etc (usually you can do this from memory).



Image: Dan Paris

**Accessing and using the carbon accounting tool**

To access and download the Sheep and Beef GHG Accounting Framework tool (SB-GAF), go to [piccc.org.au/resources/Tools](https://piccc.org.au/resources/Tools) then click on the **(SB-GAF) Sheep & Beef GHG Accounting Framework** link. You can choose between the seasonal version and the monthly version. The seasonal version requires less date specific livestock information.

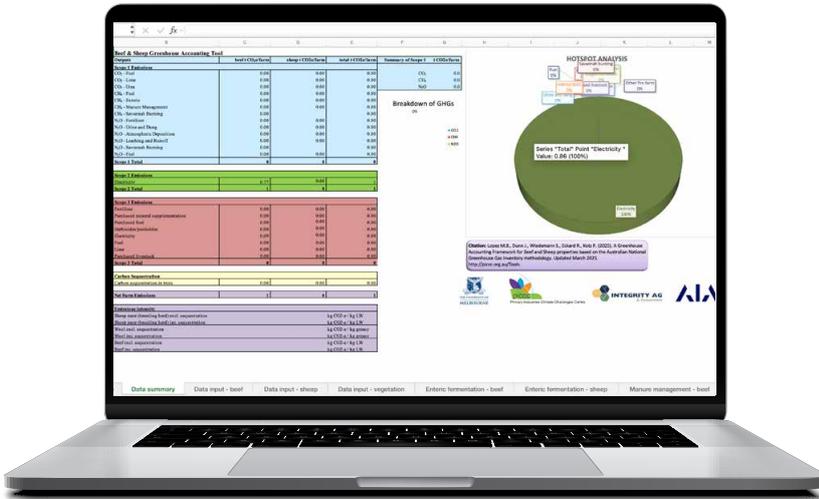
The Microsoft Excel file should automatically download into your ‘downloads’ folder on your computer or ask you to download.

1. Open the file.
2. Rename the file – include the year the carbon accounting tool applies to.
3. Save the file.

You will notice this is a very complex spreadsheet with many tabs. Don't let that frighten you! Most of the tabs are the background calculation sheets. You only use the first three tabs:



- Start entering as much information as you can. As you enter information you will get a better understanding of what is required and why.
- The ‘Data summary’ tab is where you will find the summary of your information and the Carbon emission profile with your ‘net farm emissions’ and ‘emissions intensity’ breakdown.



- Remember, you can always go back and update the accounting tool with more accurate information as it becomes available. For example, if you had already averaged your power use but later received the actual usage, it can be updated. You will also see how different information has a greater or lesser effect on your final numbers.
- If your enterprise includes cropping, you will need to complete the Cropping GHG Accounting Framework tool (G-GAF). Visit [piccc.org.au/resources/Tools](https://piccc.org.au/resources/Tools) then click on the **(G-GAF) Cropping GHG Accounting Framework** and combine the two numbers.

**If you have made it this far, you have started the emissions journey. Congratulations!**

**TIPS & TRICKS**

**Adjust display size of spreadsheet:** Check that you can see all the fields across the spreadsheet. Use the + - at the bottom right of the screen. Also, check the little red triangles for additional information.

**Entering liveweight gain (LWG):** Use the increased weight amount and divide it by 91.25 days for the seasonal version or 30.41 days for the monthly version to get kg/day.

**Save the current years calculator to your desktop** so you can enter information through the year.

**If you don't complete a Cropping Calculator G-GAF** enter home grown hay & grain as purchased in feed.

# WHAT'S NEXT

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## What to do with this number now?

Your net farm emissions and emission intensity numbers are your starting point.

These numbers are probably as high as it gets because we haven't done any work on the carbon sequestration part of the calculator. You can also start to think about the numbers you entered and how you might reduce some of those inputs.

Enteric methane will be a big number and will look impossible to reduce, but there is hope. There are ways to reduce enteric methane, including anti methanogenic pastures and pasture composition, but the most important factor is production efficiencies such as increased lambing/calving rates, reduced mortalities and shorter turn-off time.

Also, in Australia there is no requirement for producers' enteric methane emissions to be zero. Under the Global Methane Pledge there is only an expectation to reduce enteric methane by 30%. This is in recognition of the shorter lifespan of methane in the atmosphere compared to carbon dioxide.

## More information and training options

To learn about carbon terminology, GHGs and carbon farming, we recommend you complete the freely available self-paced MLA Carbon 101:

👉 [mla.com.au/elearning-carbon101](https://mla.com.au/elearning-carbon101)

MLA has developed the Carbon Calculator – a digitised version of the Excel SB-GAF calculator. It is a simplified version for producers to try before diving into carbon accounting:

👉 [carbon-calculator.mla.com.au](https://carbon-calculator.mla.com.au)

MLA has developed a Carbon EDGE training package. Carbon Edge is a two-day training program for the red meat industry, providing participants with an understanding of the opportunities for emissions reduction and carbon storage activities in a livestock grazing business.

Participants use their own information to develop an action plan for their business as they learn about the practices and technologies that could reduce their carbon footprint and improve sustainability and productivity.

👉 [mla.com.au/carbon-edge](https://mla.com.au/carbon-edge)

Consultants can also help complete a carbon emissions profile. If you do use a consultant, it's a good idea to check that they will provide a breakdown of how they calculated your farm emission so you can work on reducing them. Also check the data sharing and ownership arrangements.

Richard Brake from Richard Brake Consulting Pty Ltd is the consultant ASHEEP & BEEF engaged to support the delivery of the **Emission intensity: Getting started on farm** PDS project.

👉 [richardbrakeconsulting.com.au](https://richardbrakeconsulting.com.au)

## Alan and Bec Hoggart, Condingup

**Alan and Bec Hoggart run a shedding sheep enterprise in the Condingup area, on the south coast of Western Australia.**

Alan was part of the first group of producers in 2023 to join ASHEEP & BEEF’s Emission Intensity: Getting started on farm, – a Meat & Livestock Australia Producer Demonstration Site project, previously known as Carbon Neutral 2030. Alan spoke with project coordinator Jan Clawson on his thoughts so far.

### Why did you join the project?

“I wanted to become more informed on carbon. I was interested in completing an emissions profile to understand why livestock were being portrayed as the bad guys and to be able to stand up for livestock production,” Alan said.

Following the first project workshop Alan completed his first carbon emissions profile using the PICCC SB-GAF tool.

“We run, what I would call, a medium sized basic sheep only enterprise so I found completing the calculator a simple exercise. I know my sheep numbers for each time of the year, so it was straightforward to complete, especially with no wool to consider,” Alan said.

Alan estimated the calculator took less than two hours to complete. He had to go through the diary for a few things and he did round some of his sheep numbers, but being sheep only made it easy.

“Probably the only thing that took a little more work was the herbicide figure,” Alan said.

The calculator asks for kilograms of active ingredients per enterprise. Alan knew how many litres of herbicide he’d sprayed so it was a quick calculation to get it back to active ingredients weight.

### What is your advice to someone thinking about completing a carbon emissions profile?

“Complete the tool for your own interest, so you know where you sit. Just do it! Get informed and keep learning,” Alan said.

Alan found the percentage pie chart and the data summary table interesting. Seeing where the information came from and identifying what might be able to be moved or reduce. Alan wants to lower his emissions and understand what’s involved so he can better inform non-agricultural people and defend the livestock production industry.



**“Complete the tool for your own interest, so you know where you sit. Just do it! Get informed and keep learning.”**

In the original emissions profile Alan averaged his ewe weights. After weighing 50 sheep he found they ranged from 75kg to 105kg. He entered this information into the calculator which increased his enteric methane figure. This left Alan wondering if he could save emissions by running more 75kg ewes which produce the same number of lambs, and therefore, whether the heavier ewes were less efficient.

The Hoggarts’ feedbase is predominantly permanent pastures, and the farm has a small pine plantation and an area of native bush. Over the years they have increased the farm’s soil carbon from 1% to between 3–4%. Not all these points can be captured in the current calculator, but the calculators are still evolving.

The Hoggarts haven’t yet identified a specific strategy to reduce carbon emissions, but Alan is thinking that a way to increase production might be to plant shelter belts against the prevailing winds across the farm, which is quite close to the coast, which could contribute to increasing his lambing percentage. They have also considered planting trees on marginal land to sequester carbon.

## Bruce and Trudy Pengilly, Cascade

**Bruce and Trudy Pengilly run a Merino sheep flock including a stud and a cropping enterprise in the Cascade area with their son Thomas and his wife Courteney.**

Cascade is 100km northwest of Esperance, in the south of Western Australia. The Pengillys were part of the first group to join ASHEEP & BEEF's Emission Intensity: Getting started on farm, – a Meat & Livestock Australia Producer Demonstration Site project, previously known as Carbon Neutral 2030. Bruce spoke with project coordinator Jan Clawson on his thoughts so far.

### Why did you join the project?

“We had been thinking a carbon profile was something we would need to do in the future but didn't know where to start. We saw joining the ASHEEP & BEEF project as a great opportunity, especially being involved right from the start of the project,” Bruce said.

They have now completed two Carbon emission profiles with the first being completed by their bank as part of their farm review. The second was completed after the first project workshop.

“We found the second profile a lot easier to complete, maybe because we had learnt more, but also, because during the workshop Richard Brake, the consultant for the project, recommended we refer to the net farm emissions as a ‘profile’ as opposed to a baseline or benchmark as we had been calling it. A profile feels more like a snapshot in time requiring less rigorous data,” Bruce said.

The Pengillys used the PICCC SB-GAF tool. While Bruce felt they could have completed the calculation in about an hour, they actually took a couple of hours because they completed it as a family, with a lot of discussion.

They had no trouble finding any of the required information. What they did find difficult was where to record some information like planted trees or soil sample results. This information is not required in the SB-GAF tool.

Bruce noted that the accounting tool is constantly changing, the first profile they completed didn't have provision for wool, which has now been included in the second profile.

### What advice would you give someone thinking about completing an emissions profile?

“Don't over think it, just make a start. Don't stress the little stuff like how much fuel went into the generator or even chemical use. The big ones are fertiliser and enteric methane,” Bruce said.

Now that they have their net farm emissions number and emissions intensity, they plan to concentrate on improving their production efficiencies and let the carbon emissions reduce over time. The strategies they are using include reducing the age of the flock by selling older ewes, mating ewe lambs, sowing more vetch to increase legumes in the system, as well as applying to join a sheep methane trial to get a better understanding of sheep methane production.

In future, Bruce is interested in using the Feed Efficiency Australian Sheep Breeding Value (ASBV) which is being developed. In the meantime, they are looking to reduce the overall frame size of their sheep, having come to the view that bigger sheep can be less feed efficient.



**“Don't over think it, just make a start. Don't stress the little stuff like how much fuel went into the generator or even chemical use.”**

## Wes Graham, Monjingup

### Video: Why complete a farm carbon emissions profile?

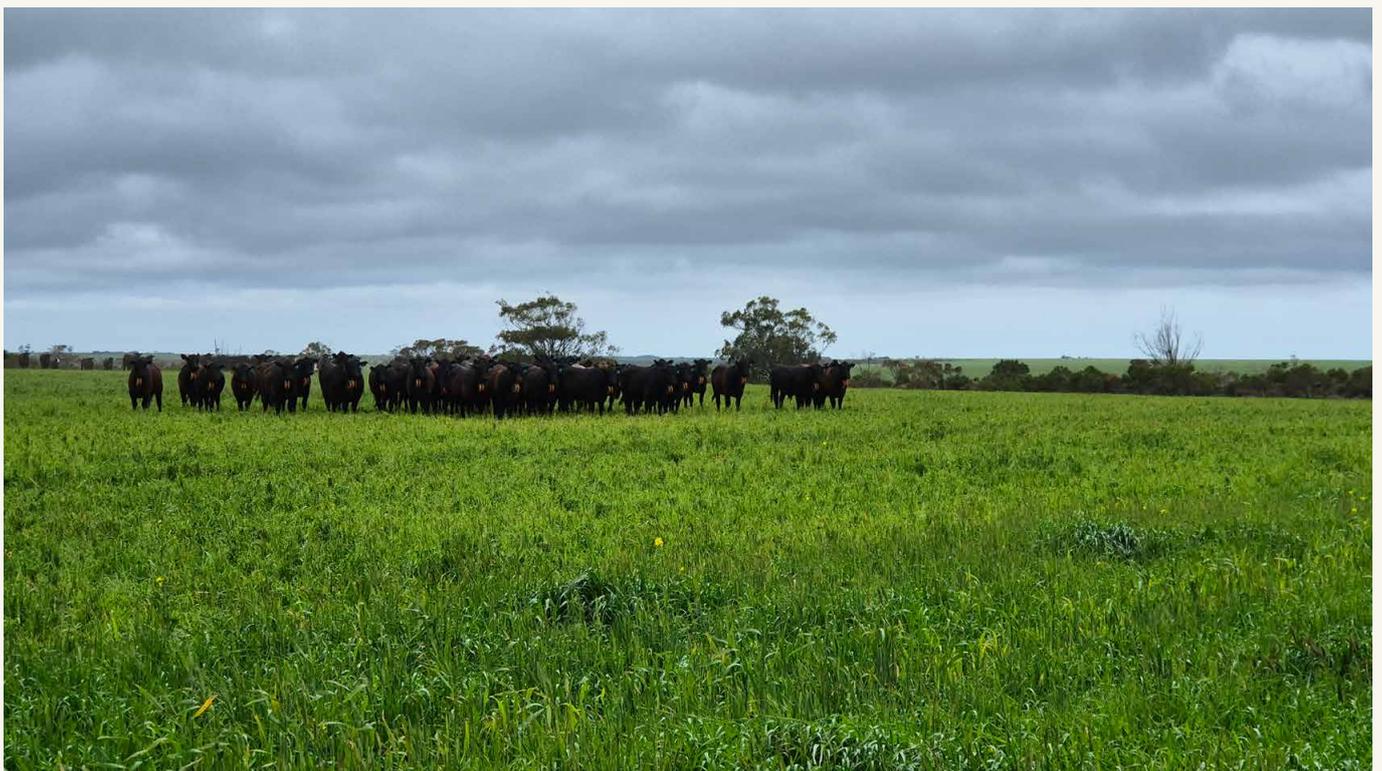
Wes Graham owns and operates a mixed sheep, cattle, cropping enterprise near Esperance on the south coast of WA.

He is part of the first group of producers to join ASHEEP & BEEF's project, previously known as 'Carbon Neutral 2030: Getting started on-farm' – a Meat & Livestock Australia funded Producer Demonstration Site project. His farm is one of 14 farm businesses that were involved in the project.

In this video, Wes explains why it was important for him and his business to participate and why other producers should consider completing a carbon emissions calculator.



Use this QR code to watch the YouTube video



## Leigh and Karina West, Gibson

**Leigh and Karina West run a mixed sheep and cropping enterprise in the Gibson area.**

The Wests were part of the first group of producers in 2023 to join ASHEEP & BEEF's Meat & Livestock Australia Producer Demonstration Site 'Carbon Neutral 2030 – Getting started on-farm'. Karina spoke to project coordinator Jan Clawson about their involvement in the project and the emissions results they have achieved.

### Why did you join the project?

"We had completed the Melbourne Uni calculator a couple of times, but we found all the tabs very confronting," Karina said.

"We weren't sure it was accurate once completed, and therefore didn't know what to do with the results."

Knowing requirements to report on carbon emissions were likely coming, Karina and Leigh joined the project because they wanted more information.

Following the project's third annual workshop, they're feeling a lot more confident completing the calculator – so much so that they're making small adjustments while entering the year's figures.

"In the beginning, completing the calculator was daunting, but that's not the case anymore because most things are the same, so it's just a matter of making a few small adjustments to capture the year's information," Karina said.

As part of the project, Leigh and Karina had a one-on-one meeting with consultant Richard Brake before the 2023 workshop. During that meeting, Richard explained how to record chemical active ingredients. It's not just how many litres of chemical has been used; you need to work it back to kilograms of active ingredients (e.g. Glyphosate 450 is 0.45kg per litre). This, along with the review of the calculator, has given Karina and Leigh the confidence to know the calculator is accurate.



**"We need to ensure we're being good custodians of the land we farm to ensure sustainability for future generations."**

### What have your results shown?

At the annual workshops, each producer's calculator results are reviewed. This summary includes the number of breeding animals in the herd or flock, the area and age of planted trees, enteric methane, net farm emissions and emission intensity (net emission divided by kilogram of product sold) for each commodity.

Before the Wests' results were reviewed, Leigh made it very clear that emissions figures didn't inform their management.

"We're primarily focused on profit drivers and production efficiencies – we don't make decisions based on carbon emissions," Leigh said.

Despite this, the results showed that their emission intensity had still reduced each year.

Leigh and Karina use genetic selection to select rams for good early growth, focus on good fat and muscle traits, but not too high to maintain fleece weight. They look for early growth with an aim of getting wether lambs off early to avoid feeding longer than required. This along with the crop and pasture rotation, has combined to give them good production while also reducing their emission intensity.

Karina said she now knows their emission numbers have value and will continue to follow Richard’s advice to protect their emission numbers rather than giving them away.

**What’s next?**

“Our focus will remain on productive legume crops and pastures to enable us to continue to increase production while lowering input costs (fertiliser) and carbon emissions,” Karina said.

“We need to ensure we’re being good custodians of the land we farm to ensure sustainability for future generations.”

The couple won’t be establishing any registered carbon projects to sell carbon credits, because the advice is that producers will need to keep those credits for themselves.

“I can see Natural Capital Accounting and Sustainability Statements as the next step,” Karina said.

The Wests are a great example of how focusing on production efficiencies can naturally lead to a reduction in carbon emissions.



Image: Dan Paris

## Mark and Liv Walter, Cascade

**Mark and Liv Walter run a mixed sheep and cropping enterprise in the Cascade area, west of Esperance.**

In 2023, they were among the first group of producers to join the Producer Demonstration Site ‘Emission Intensity – Getting started on-farm’. Liv spoke with project coordinator Jan Clawson about their involvement and progress to date.

### Why did you join the project?

According to Liv, their original plan was to investigate what establishing a tree-planting ‘carbon project’ would involve.

They had an area of land that was partially cleared in the 1960s, along with the rest of the farm. However, this site was found to contain many rocks and poisonous plants, making it a low productivity area, so development was stopped. The area was re-fenced and ripped in preparation for trees in 2022 - prior to joining this project. This presented the first hurdle, as a carbon project must be registered before any changes are made.

Liv said further investigations revealed a series of complications.

“We were told ‘you can do X, Y, or Z’ or ‘if you pay this organisation or consultant, you could...’ – however, the ever-changing rules and methods (each requiring significant time and money) made it difficult to identify a clear and straightforward path,” Liv said.

As part of this project, Mark and Liv attended the Katanning Research Station Tour in 2023, where emission reduction strategies were identified and they visited the North Stirling Downs tree planting project. In 2024, they joined the Eastern States Tour, which included a visit to Jigsaw Farms, one of the first farms to achieve carbon neutrality in 2011. These tours, along with their own research, led them to decide not to pursue the ‘carbon project’ path, as it presented too much risk for future generations.

Instead, they decided to continue their longstanding land management approach by expanding the native revegetation they began years earlier.

“We wanted trees that could be harvested, while also providing a source of seeds and bush tucker,” Liv said.

She selected nine different tree varieties, including:

- two Callistemon species: Fiery and One-Sided Bottlebrush
- five Eucalyptus species: Sugar Gums, Red Flowering Yellow Gums, Flat Topped Yate, Salt River Gum and Coral Gum
- two Melaleuca species: Western Black Tea Tree and Broombush.

“The July school holidays provided the perfect opportunity to begin planting, with our children home from school,” Liv said.



A keen group of willing helpers and farm staff started planting between the new fence and the remaining native vegetation using six pogo sticks tree planters. After lunch, they moved to the main revegetated area, planting about half of the 20,000 tree seedlings in one day. Mark, Tara and Davina completed the planting a week later using a mechanical tree planter – covering roughly one-quarter of the 28ha area.

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In addition, Mark and Liv planted 3,000 saltbush seedlings and another 10,000 mixed-species trees seedling on a separate farm. In total, they planted over 27,000 trees this year, the latest reports indicates they are growing well.

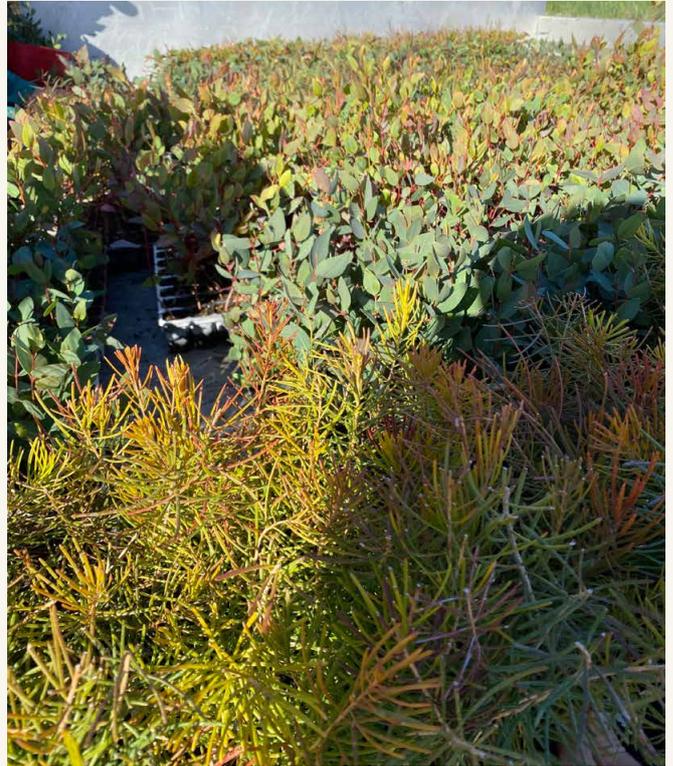
“We’re hoping to continue planting in 2026 – weather permitting – using seedlings and direct seeding, if a seed supplier can be found.”

This revegetation will increase biodiversity to the top end of the Young River catchment. Although Mark and Liv won’t be selling Australian Carbon Credit Units (ACCU), there are still significant benefits. Once the 28ha of mixed species is included in the Sheep & Beef Greenhouse Accounting Framework (SB-GAF) calculator, the trees will increase sequestration by:

- 43 tonnes of CO<sub>2</sub>e at five years
- 96 tonnes of CO<sub>2</sub>e at ten years.

This will reduce overall farm emissions. At 10 years, with no other changes, it will lower emission intensity by 0.4kg CO<sub>2</sub>-e per kilogram of liveweight.

Mark and Liv also participated in a Murdoch University first-year Veterinary Medicine student study. They shared their SB-GAF calculator data to help students understanding how to complete the calculator using real numbers from a working farm business. The students estimated that the tree planting area could yield 125 tonnes of CO<sub>2</sub>e over a 25-year permanence period using the current FullCAM model, had they pursued the ‘carbon project’ path.



**“We wanted trees that could be harvested, while also providing a source of seeds and bush tucker.”**



## Ryan and Elisha Willing, Carnigup

**Ryan and Elisha Willing own and operate a cattle and cropping enterprise in the Boyatup area, east of Esperance WA.**

They were among the first group of producers in 2023 to join the Producer Demonstration Site project 'Emission Intensity – Getting started on-farm'.

### Why did you join the project?

Ryan joined the project because he believed there would be an immediate requirement for carbon reporting and wanted to understand what was needed and to be prepared. He feels there is still a need to understand carbon emissions, but the reporting requirements are further away. That said, financial institutions will require producers' emissions data as part of their reporting.

"In the first year of the project, it was all about understanding carbon emissions and the information required to complete the calculator. In years two and three, we focused on fine-tuning the calculator information." Ryan said.

### What have been the benefits of getting involved?

According to Ryan, there has been a real benefit in learning as a group - sharing ideas, discussing what works and what doesn't.

"Having a group of like-minded people sharing ideas around a table always helps identify different ways to achieve productivity gains," Ryan said.

"For us, this included considering earlier turn-off time and gaining a better understanding of cattle weights – which provides opportunity for productivity gains and influences emissions intensity."

### Hosting the demonstration

In addition to being the lead producer for this project, Ryan is also a demonstration site host. The aim for his demonstration site was to reduce carbon emissions by improving pastures and better pasture utilisation.

The objective was to show by planting higher quality perennial pastures and implementing a rotational grazing strategy, he could reduce enteric methane, net carbon emissions, and emission intensity over the life of the project.



**“Having a group of like-minded people sharing ideas around a table always helps identify different ways to achieve productivity gains.”**

Ryan had intended to plant lucerne in spring 2024 but due to an early and short finish to the season, he postponed this until conditions were more favourable.

During the 2025 growing season, Ryan focused on improving the quality and quantity of his annual legumes and grasses and worked to improve pasture utilisation through rotational grazing.

Ryan had used rotational grazing before the project and knew it worked with weaner cattle but hadn't used it for cows and calves before. He was concerned using a single hot wire would allow the calves to end up everywhere, but that wasn't the case.

Ryan runs the rotational grazing system on his best pastures. This also requires mapping the lighter soil types, so cells have the same number of grazing days available without becoming overgrazed.

In early April, Ryan seeded RM4 Vetch at 9 kg/ha and Abundant Rye Grass at 5 kg/ha. With favourable rainfall and growing conditions, the result has been outstanding.

The area also received fertiliser treatments of 50 kg/ha of MOP pre-seeding, followed by 70 kg/ha of MAP and 70 kg/ha of Urea at seeding.

Ryan commenced rotational grazing on the 1 June 2025, maintaining 1.5 cow-calf units per hectare until the end of October 2025. While the Rye grass remained green, growth slowed as soil moisture reduced.

Following weaning, Ryan believes the area should continue to support two weaners per hectare through November and December.

The standard stocking rate for unimproved pasture in this area is typically one cow-calf unit on two hectares. This represents a 200 percent increase for Ryan.

The high rotational grazing stocking rate has also improved weed management. Ryan was able to control radish easily by using a weed wipe after a graze – ensuring the weeds were out of the withholding period before cows returned to that section.

Another project benefit has been better understanding of cattle weights by taking the opportunity to weigh cattle while they are in the yards. At the beginning of this project in 2023, Ryan had no recorded weights for his cattle and instead relied on educated estimates. In 2024 he weighed around 75% of his cattle. This weighing identified his weaners experienced a flat spot of reduced growth in May. He found by providing supplementary feed during May, he was able to turn his finished cattle off a month earlier in 2025.

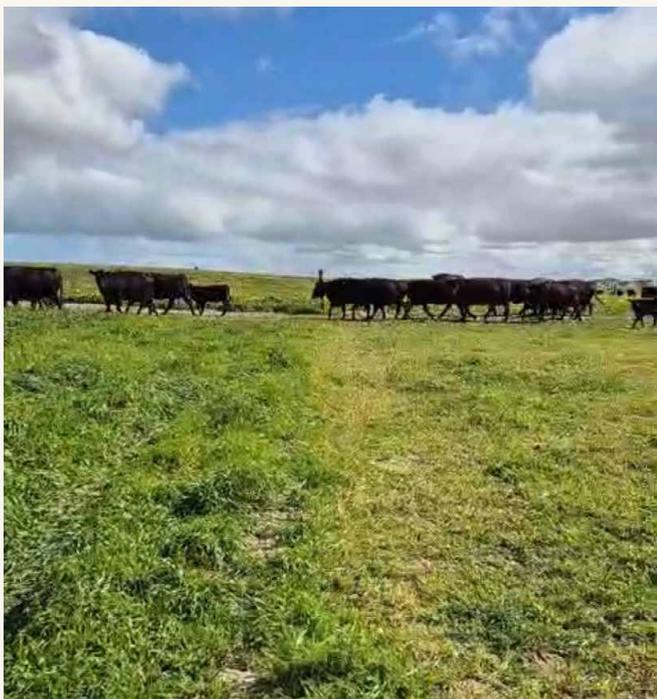
### **Would you recommend the carbon calculator to other producers?**

“Completing the calculator is absolutely worth doing,” Ryan said.

“Gathering the information and completing the calculator is a great way to understand the factors that affect production and carbon emissions, and how small changes can make a difference. The development of the easy-to-read ‘Starting your emissions journey’ toolkit has also helped make it less daunting.

“The data you needed to complete the calculator is data you should be collecting anyway and is worthwhile knowing. It’s also good to see it all in one place.”

Ryan said he will continue to complete the calculator every year after the project has finished, as it will be good to know how he’s progressing.



# GLOSSARY

<b>Carbon accounting</b>	The process used to quantify greenhouse gas (GHG) emissions from an enterprise.
<b>Carbon foot printing</b>	The process of quantifying GHG emissions emitted directly or indirectly by an individual, company or product.
<b>Carbon neutrality</b>	Net-zero carbon emissions.
<b>Carbon sequestration</b>	The process whereby carbon dioxide is removed from the atmosphere and stored in carbon sinks such as soils and vegetation.
<b>Carbon sink</b>	A reservoir that absorbs carbon dioxide from the atmosphere. Natural carbon sinks include plants, soil and the ocean.
<b>Carbon stocks</b>	A carbon stock refers to the quantity of carbon that has been sequestered from the atmosphere and is stored in a carbon sink.
<b>CO2-e</b>	Carbon dioxide equivalents are a unit used to compare emissions from different GHGs based on their global warming potential (GWP) over a specified time period, typically 100 years (GWP100).
<b>Emission intensity</b>	Emission intensity values are based on the net emissions relative to the output (e.g. per kg beef, sheep meat or greasy wool). Emission intensity values allow for comparison and benchmarking between farms of different sizes. They are the standard unit for a product carbon footprint.
<b>Enteric methane</b>	Enteric methane is produced through enteric fermentation where plant material is broken down in the rumen. Enteric methane is the by-product of this process and is expelled by the animal through belching.
<b>ESG</b>	Environmental, Social and Governance is a term used to represent an organisation's interests that focus mainly on sustainable and ethical impacts. Markets use ESG to evaluate organisations and determine societal integrity.
<b>GHG</b>	Green House Gases – Collective term encapsulating all gases that contribute to global warming.
<b>Insetting</b>	Insetting carbon emissions involves an organisation reducing its own carbon emissions or carbon projects without purchasing carbon credits from a third party.
<b>Livestock inventory</b>	All information relating to livestock such as births, deaths, sales, purchases, weights and weight gain, and pregnancy status. Typically reported either at a point in time (such as June 30) or over a whole year.
<b>Net emissions</b>	Net emissions = total emissions minus carbon sequestration.
<b>NGGI</b>	The National GHG Inventory (NGGI) accounts for and estimates Australia's GHG.
<b>Offsetting</b>	Offsetting carbon emissions allows an organisation to purchase carbon credits from a carbon project they do not own or operate.
<b>SOC</b>	Soil organic carbon (SOC) is the carbon component of organic matter in the soil.
<b>SOM</b>	Soil organic matter (SOM) is the living and dead organic materials, other than living plant roots, found in the soil.
<b>SB-GAF</b>	The Sheep and Beef GHG accounting tool which can be used to generate a carbon account. The current version at the time of publishing: (SB-GAF) Sheep & Beef GHG Accounting Framework V2.3

# RESOURCES

Scan or click the QR code to download the *Carbon Accounting Technical Manual* – developed for wider industry use, is based on the outcomes and feedback received from a series of pilot carbon accounting workshops run in early 2020 across Australia. The manual provides background information on carbon accounting and guidance around building a carbon account using the GHG Accounting Framework calculators developed by the University of Melbourne.



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📍 [mla.com.au/emission-intensity](https://mla.com.au/emission-intensity)

Producer Demonstration Sites are funded by MLA to support producers through peer-to-peer groups to pursue new skills, knowledge and management practices applicable to their own commercial livestock production systems.

📍 [mla.com.au/pds](https://mla.com.au/pds)

ASHEEP & BEEF is a grower group formed by producers in 2003 in Esperance, WA. The group has a core focus on raising sheep and cattle production standards and maximising profitability.

📍 [asheepbeef.org.au](https://asheepbeef.org.au)

Care is taken to ensure the accuracy of the information contained in the *Starting your carbon emissions journey on-farm toolkit*. However, MLA and ASHEEP & BEEF Inc cannot accept responsibility for the accuracy or completeness of the information or opinions contained in the *Starting your carbon emissions journey on-farm toolkit*. You should make your own enquiries before making decisions concerning your interests. MLA and ASHEEP & BEEF Inc accepts no liability for any losses incurred if you rely solely on the *Starting your carbon emissions journey on-farm toolkit* and excludes all liability as a result of reliance by any person on such information or advice. Apart from any use permitted under the Copyright Act 1968, all rights are expressly reserved. Requests for further authorisation should be directed to the Content Manager, PO Box 1961, North Sydney, NSW 2059 or [info@mla.com.au](mailto:info@mla.com.au).

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