Farm Carbon Toolkit

Farm Carbon Toolkit Carbon and calculators

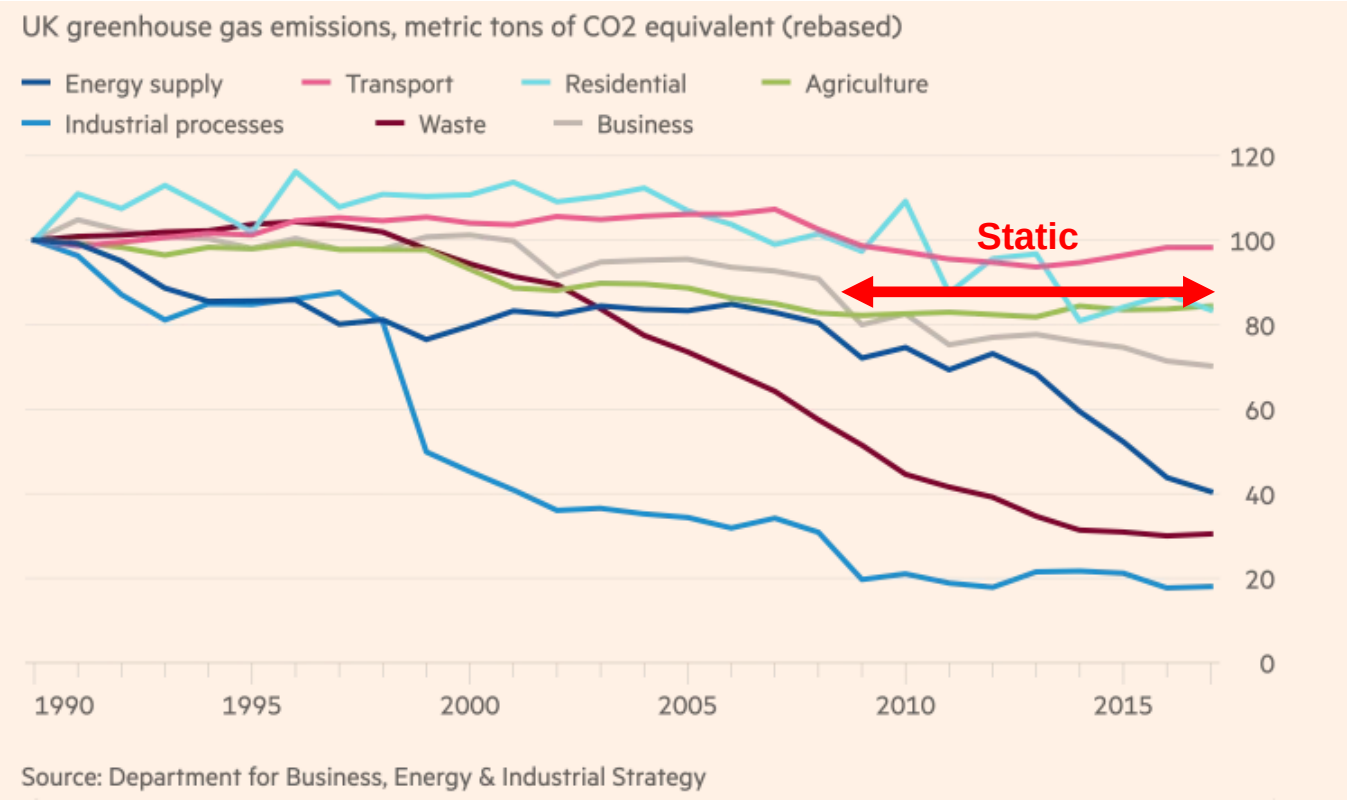
Hannah Jones

Farm Carbon Toolkit

For over a decade, we've worked to further the understanding of greenhouse gas emissions in agriculture.

We provide tools and services to measure impact and projects that inspire real action on the ground.

Climate change and Agriculture



10% of UK green house gas emissions

Greenhouse gases

Carbon dioxide	Methane	Nitrous oxides
Combustion	Animal digestion	Leaching
Animals	Breakdown of matter in waterlogged soil	Slurries and manures
Production of fertilizer	Degradation of peat	Mineral fertilisers
Global Warming potential for 100 years	Global Warming potential for 100 years	Global Warming potential for 100 years
1	23	296

Why do we talk about carbon so much?

- Currency

Carbon is the currency by which we can combine the Greenhouse warming potential (GWP) of the range of gases

- Efficiency

Carbon management and business efficiency are closely linked

- Offset

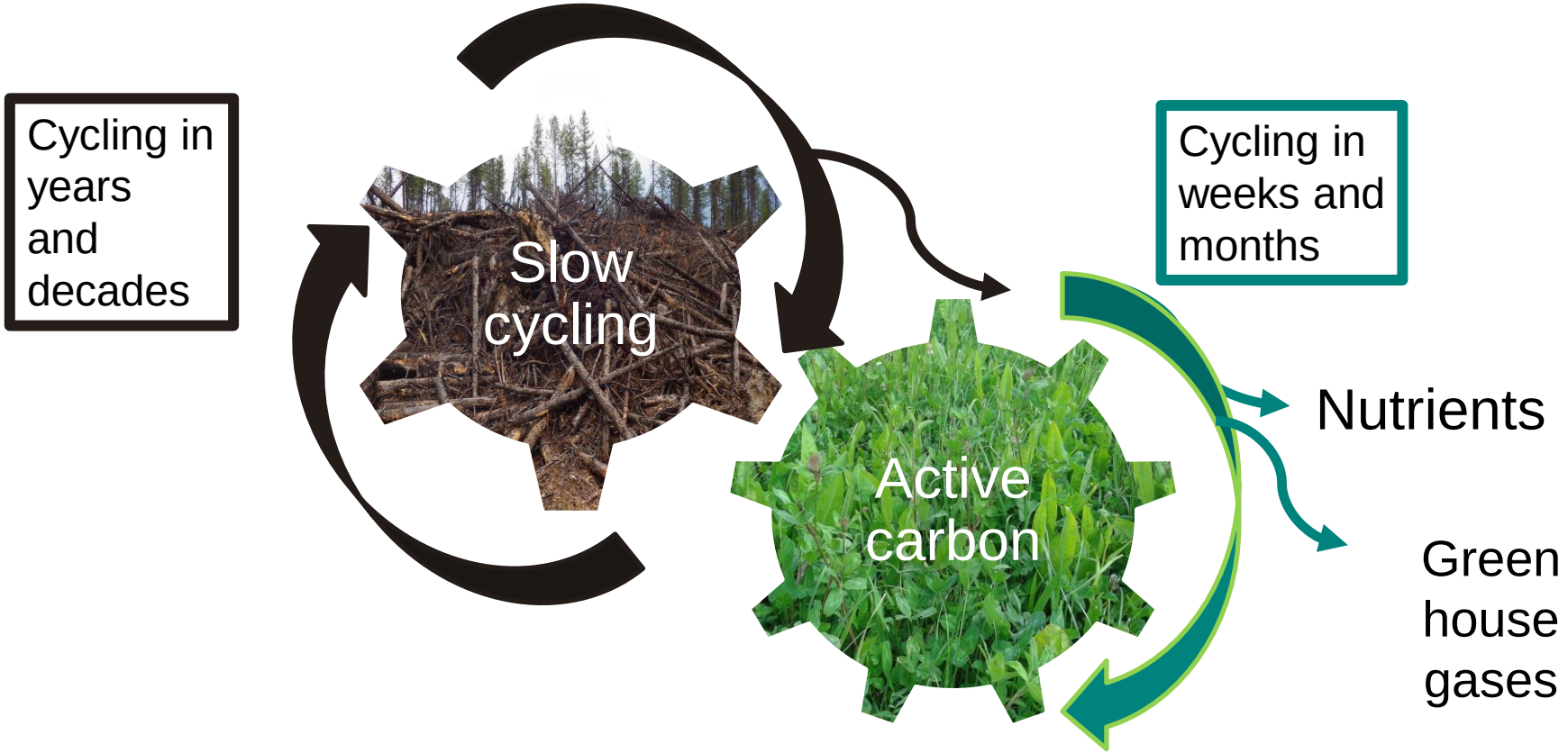
There is a large potential to off set Greenhouse gas emissions from agriculture with carbon storage

What is the relevance of soil organic carbon

Soil Organic Carbon is the carbon content of Soil Organic Matter

1) Dissolved organic matter <5% rapid breakdown in days
2) Particulate organic matter 2-25% breakdown 2-50 years
3) humus up to 50% breakdown in 10s to 100s of years
4) resistant organic matter e.g. charcoal breaks down in 100s to 1000s of years

* Basic conversion factor is 1.72 but this has some in accuracy, it depends upon the source of SOM


Cycling in years and decades
Slow cycling
Cycling in weeks and months
Active carbon
Nutrients
Green house gases

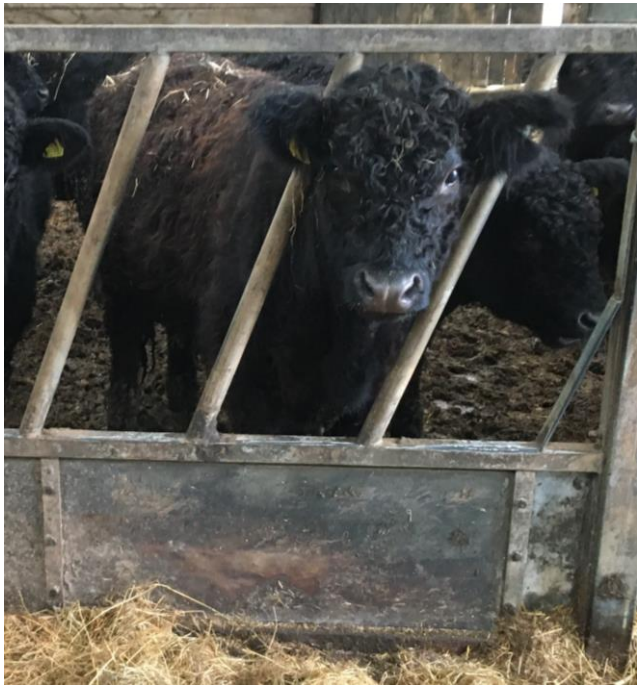
Soil carbon in context

Soil carbon
8 ha, BD 0.8g/cm3 increase in OM by 1% in 5 years
-226 tCO2e

Mixed woodland
8ha, 20-25year old
-180 t CO2e

Sheep*
1000 ewes at 80kg each, in field manure
61.2tCO2 e

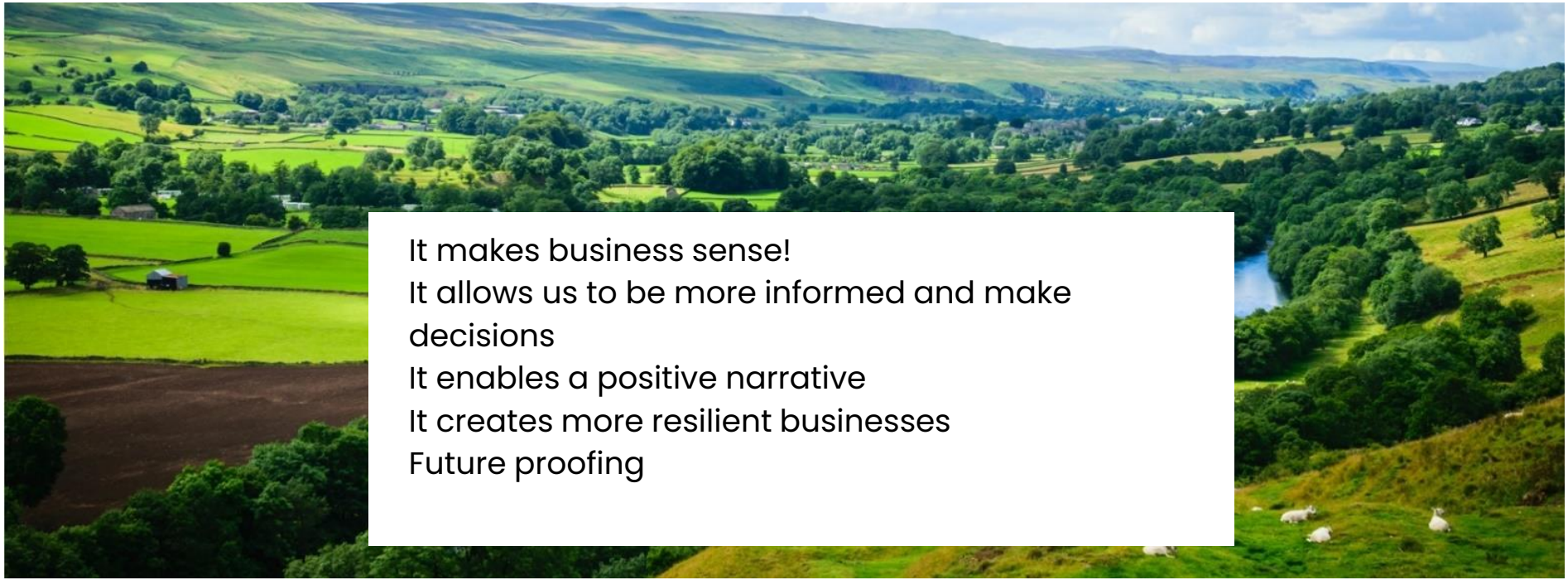
Cows*
50 beef cows at 650kg each, in field manure
128tCO2e



What is the Soil Carbon Code

- Formal protocols for farmers
- Measures greenhouse gas emission reductions
- Measures soil carbon capture
- Free
- Universal for all carbon accounting uses
- Updated when evidence is robust for existing and future practices

Managing carbon on-farm



It makes business sense!
It allows us to be more informed and make decisions
It enables a positive narrative
It creates more resilient businesses
Future proofing

Why carry out whole farm accounting?

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Quantity and sources of CO2, CH4 and N2O emitted from the farm

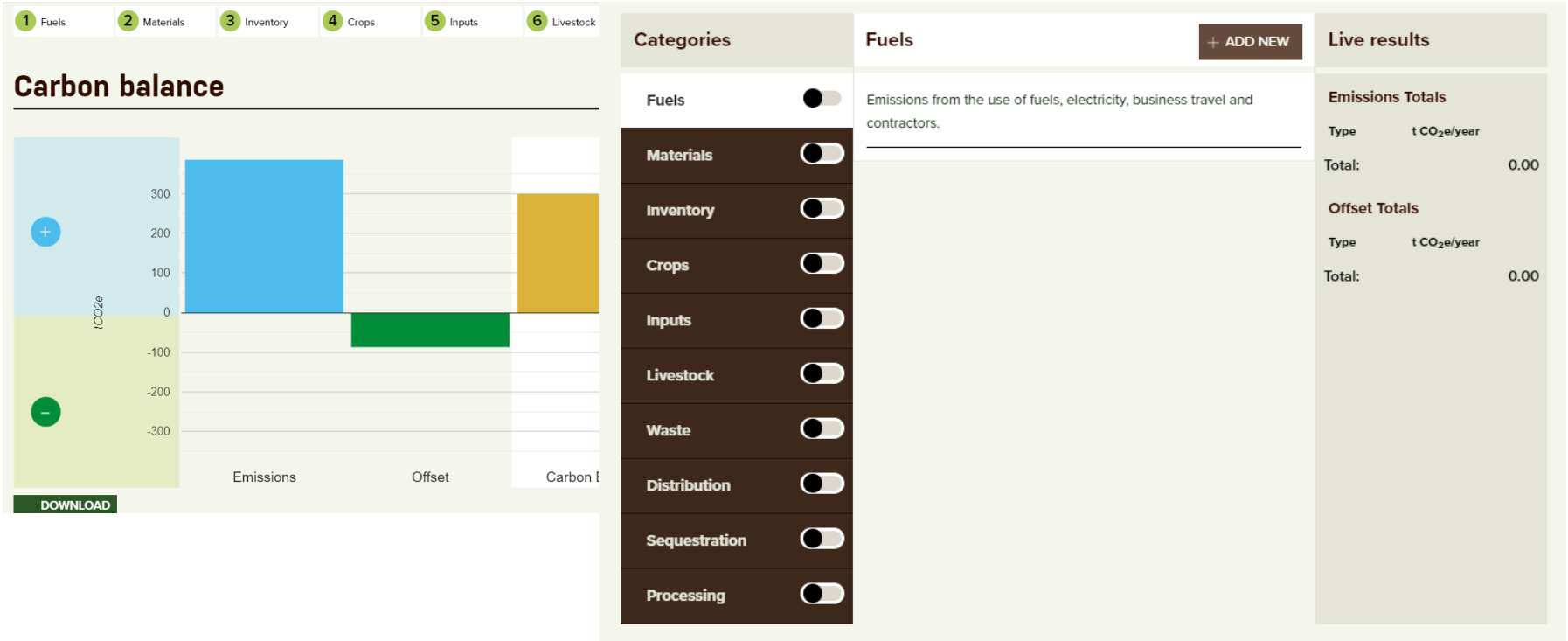
Highlights where improvements or changes can be made to reduce GHGs.

Current sequestration and offsetting options and evaluates future projects

Informs behavioural change.

Identified inefficiencies

Using the Farm Carbon calculator



The Farm Carbon Calculator – results

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Headline figures

Summary categories

Emissions	tonnes CO_2e	%
Fuels	181.43	7.63%
Materials	4.45	0.19%
Inventory	902.92	37.98%
Crops		
Inputs		
Livestock		
Total		

Fuels

Accomodation

Description	Usage	tonnes CO_2e	%	Confidence	Link
Hotel stays	2 nights in hotel	0.03	0.03%		

Electricity

Description	Usage	tonnes CO_2e
Average tariff	20,622 kWh	6.53

Liquid fuels

Description	Usage	tonnes CO_2e
Lubricant oil	205 litres	0.66

Detailed input information

What next?

Reducing GHG emissions from manure management

Emissions occur as CH4 and N2O – the most significant being as N2O because of its much higher effect on climate change ('Global Warming Potential').

There is limited research to demonstrate the levels of mitigation that can be achieved by different manure management systems and some actions may have opposite effects on the different GHGs.

Storing wastes in a solid form rather than slurry will result in less CH4 but possibly greater N_2O losses and covering any store reduces the amount of CH4 released and possibly N2O as well (by reducing ammonia losses). Therefore **from an emissions stand point it is better to store wastes as solids**.

Contextualising carbon

Why do footprint tools vary?

- Farm level or enterprise level
- Where is the ‘carbon line’ drawn – include / exclude scope 3
- Supply chain focussed or farmer driven
- Using different data sources
- Defra currently working on a national standard approach
- Data going in from farmers

Current barriers to carbon footprinting

- Lack of consistency
- Lack of clarity in potential for soil carbon sequestration and payments
- Lack of policy clarity in next steps – shall I act now or wait?
- Simplification of the issue by media which leads to challenges in overcoming preconceptions with farmers
- Lack of knowledge on mitigation / adaptation opportunities by advisor sector as well as farmers
- Farmers coming into with some (often bad) experience of footprinting process
- Still an evolving science! – what we do know versus what is developing.

Payments for gains in farm carbon

- Currently few actors actively paying farmers for carbon credits (~ 645 Woodland projects)
- Several schemes are being piloted this year – Gentle Farming, Green Farmers Collective, Soil Capital, Indigo Ag and others
- Range of codes supporting offsetting marketplace which offer a consistent approach but currently not including soil in the UK
- Group working together to develop a code currently

Watchout 1: What claims can you make about your carbon footprint?

- **Balance sheet**

In a carbon offset, the sequestered carbon being sold is effectively taken off the farm or landowners carbon balance sheet and appears on the balance sheet of another business or individual: the "buyer".

- **Exclusive ownership**

This means that the buyer has an exclusive claim to the carbon reductions or removals made by the farm.

- **Farm claims**

The farm may no longer be able to make claims about any associated produce being "low carbon". Some or all of their sequestered carbon is on the balance book of the "buyer' of carbon credits.

- **Double accounting**

A farm claiming it is low-carbon could be misleading, amounting to double claiming, propagating a false view of our overall progress against climate change.

- **Supply chain**:

Farmers in supply chains at a disadvantage?

Watch outs for carbon trading #2

Credibility of an offset scheme can be tested through its approach to:

- **Scale**

Are the different carbon sequestering practices scaled and provide value for money?

- **Permanence**

Continuity of practice to keep greenhouse gases locked up

- **Additionality**

Is this payment providing the make or break moment?

- **Transparent**

Beware of double accounting

- **Measurement, verification and scope**

UK context specific?
Including all activities happening on farm?
Measurement or model based approach

Watch outs for carbon trading - 3

Transparency and choice in the buyer

Oxford offsetting principles

Have some say about who is buying the carbon – do farmers get a choice?

Take home messages

- The time to act is **now**
- The level of regulation, bureaucracy and legislation is only moving in one direction
- Monitoring business performance and driving efficiencies makes good business sense, saves money, safeguards resources and cuts carbon footprint
- Measuring and verifying soil carbon will provide business opportunities in the future through ELMS and private finance schemes
- Need data driven decisions, skills development and pilot schemes.

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Thank you for listening!

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