



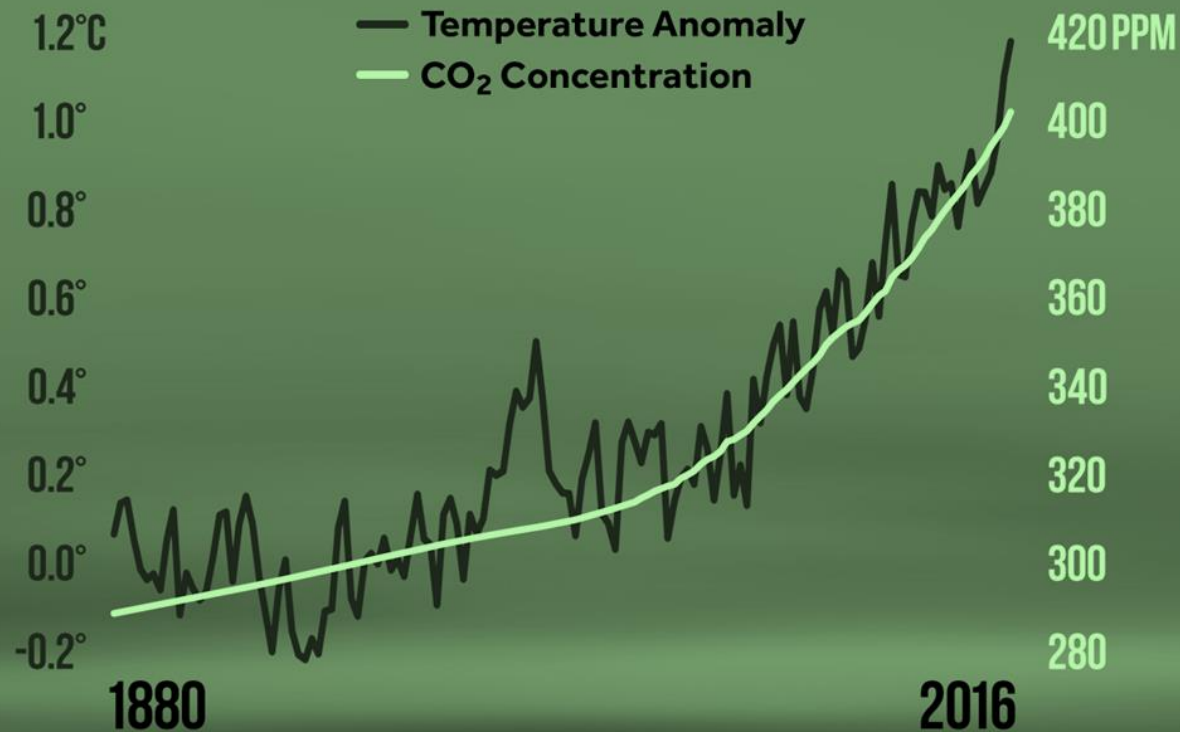
Carbon and water footprinting: Current status

21-9-2023



What is the main driver for carbon and water footprinting?

Global Temperature and Carbon Dioxide

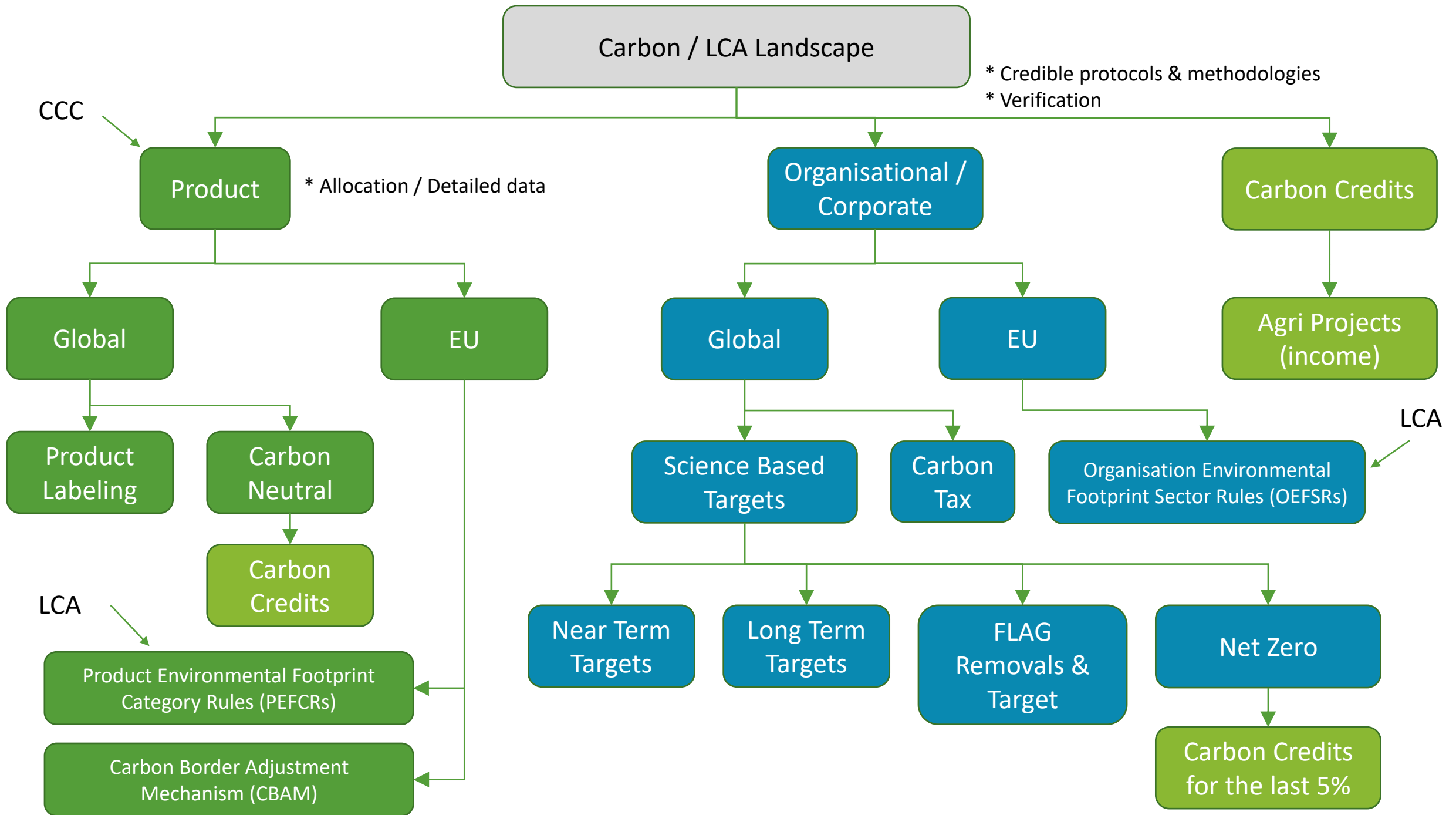


Global temperature data averaged and adjusted to early industrial baseline (1881-1910).
Source: NASA GISS, NOAA NCEI, ESRL

CLIMATE  CENTRAL

How is the world responding?

- **EU Green Deal**
- **Carbon Border Adjustment Mechanisms** – EU and others to follow.
- **Taskforce on Nature-Related Financial Disclosures (TNFD)** – recognizes the importance of nature's health and resilience for societies, economies, business and finance
- **Science-based targets** - <https://sciencebasedtargets.org/>
- **Science-based Targets for Nature** –Nature positive future
<https://sciencebasedtargetsnetwork.org/how-it-works/the-first-science-based-targets-for-nature/>
- The list goes on!





Carbon emissions measurement in South Africa

11 years of high-quality data!



[HOME](#)

[CARBON HEROES](#)

[WORKSHOPS](#)

[CONTACT](#)

What's more, to recognise our Carbon Heroes for the outstanding environmental stewards they are, we also collaborate with the World Wide Fund for Nature (WWF).



1 Year Label

I calculate my carbon footprint and have my data sense checked against industry norms and values.



3 Years Label

I have calculated my carbon footprint for three consecutive years or more and have my data sense checked.

WWF Conservation Champions



Recognition to those CCC Carbon Heroes in SA's wine industry that are also involved with WWF to tackle environmental risks, protect conservation-worthy land, are superb water stewards, and are implementing energy efficient solutions.

Our offering to users



Training: certain types of training workshops free of charge, whilst others presented at a reduced cost to license holders.



Local, knowledgeable support in the use of the tool and completion of data input: included in license fee.



Sense-check and B-grading of data: included in license fee.



Detailed carbon footprint report, highlighting “hotspots” in terms of carbon emissions.

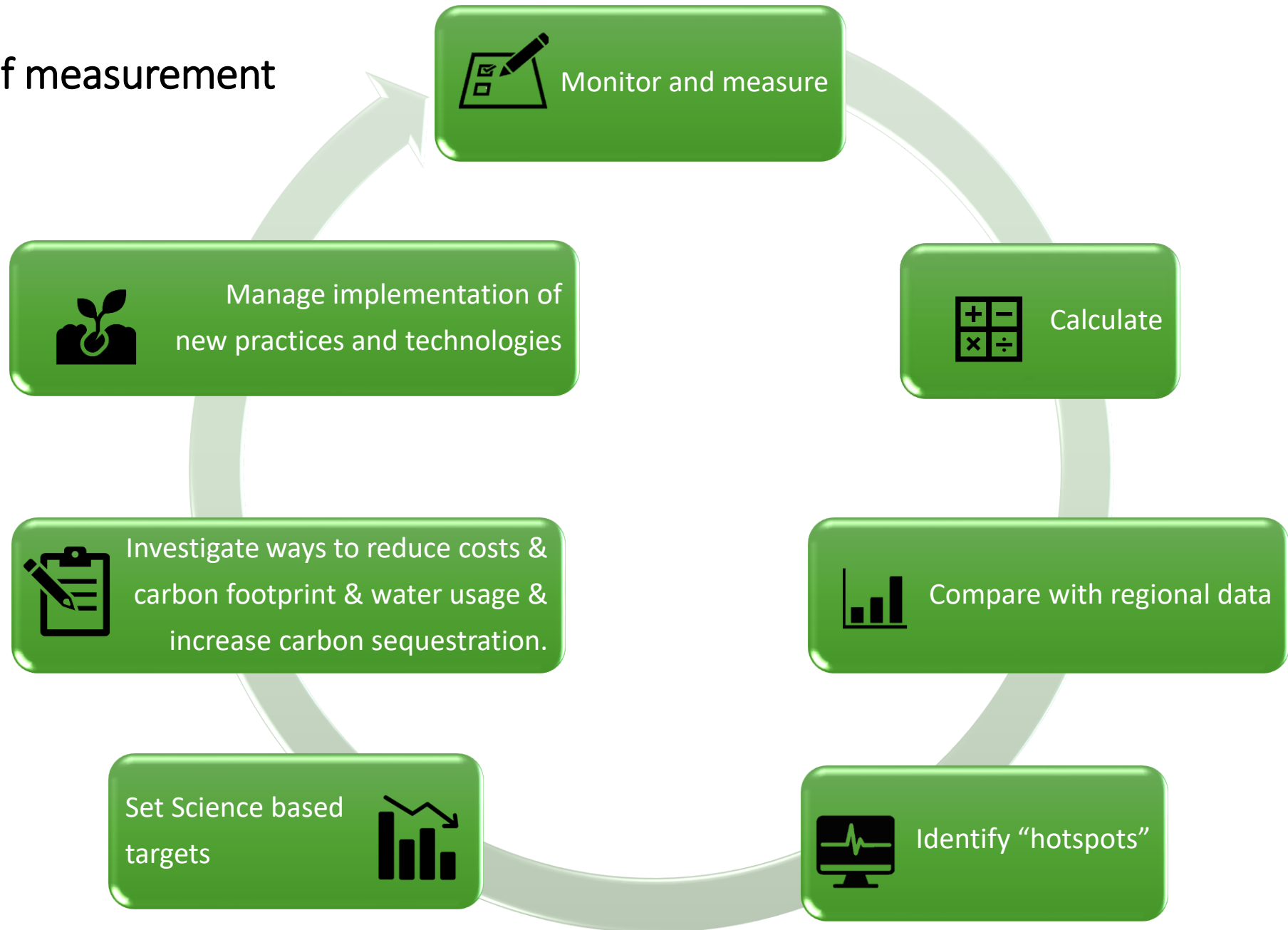


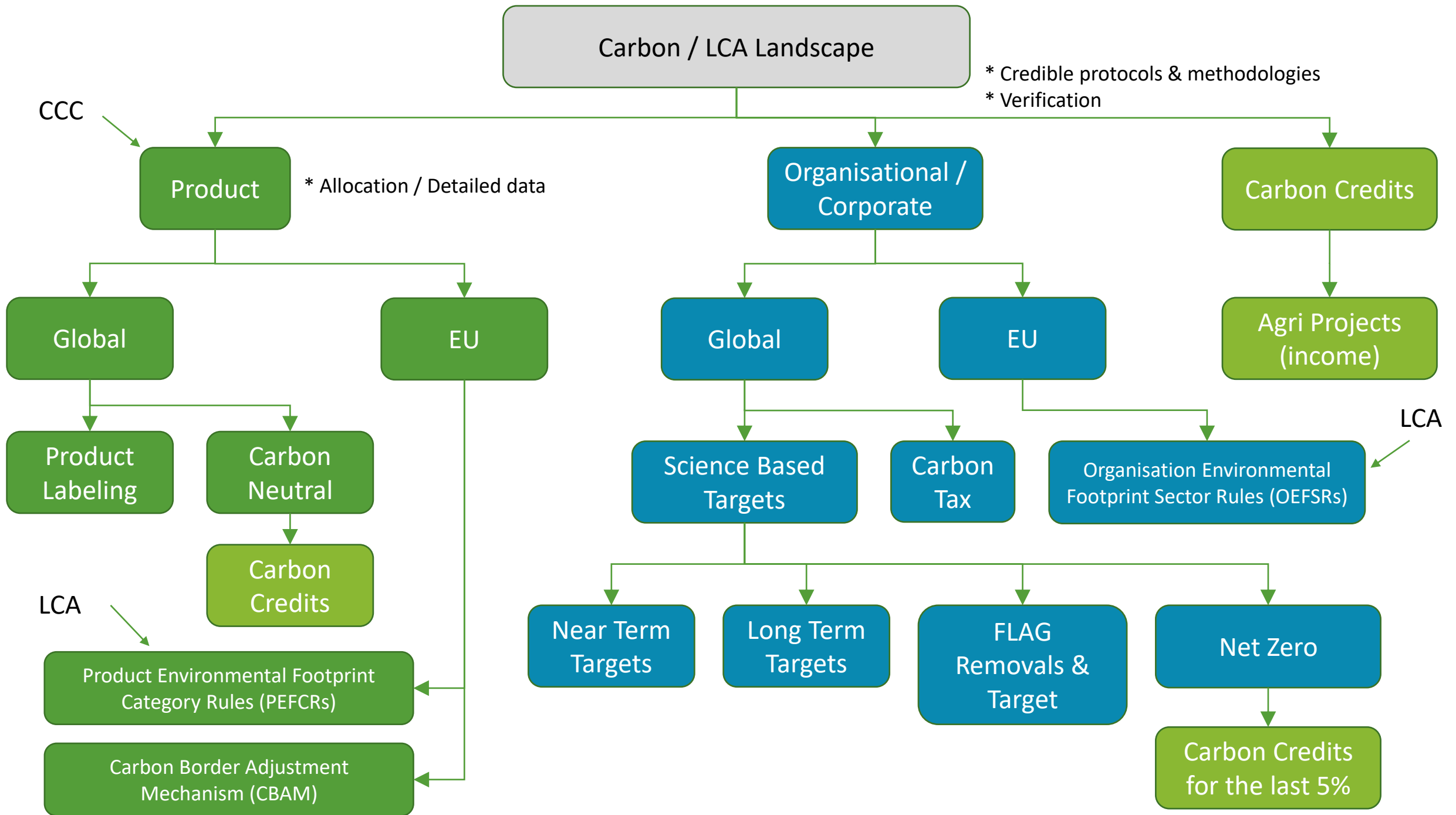
Provision of benchmark values per region and commodity in their carbon footprint report.



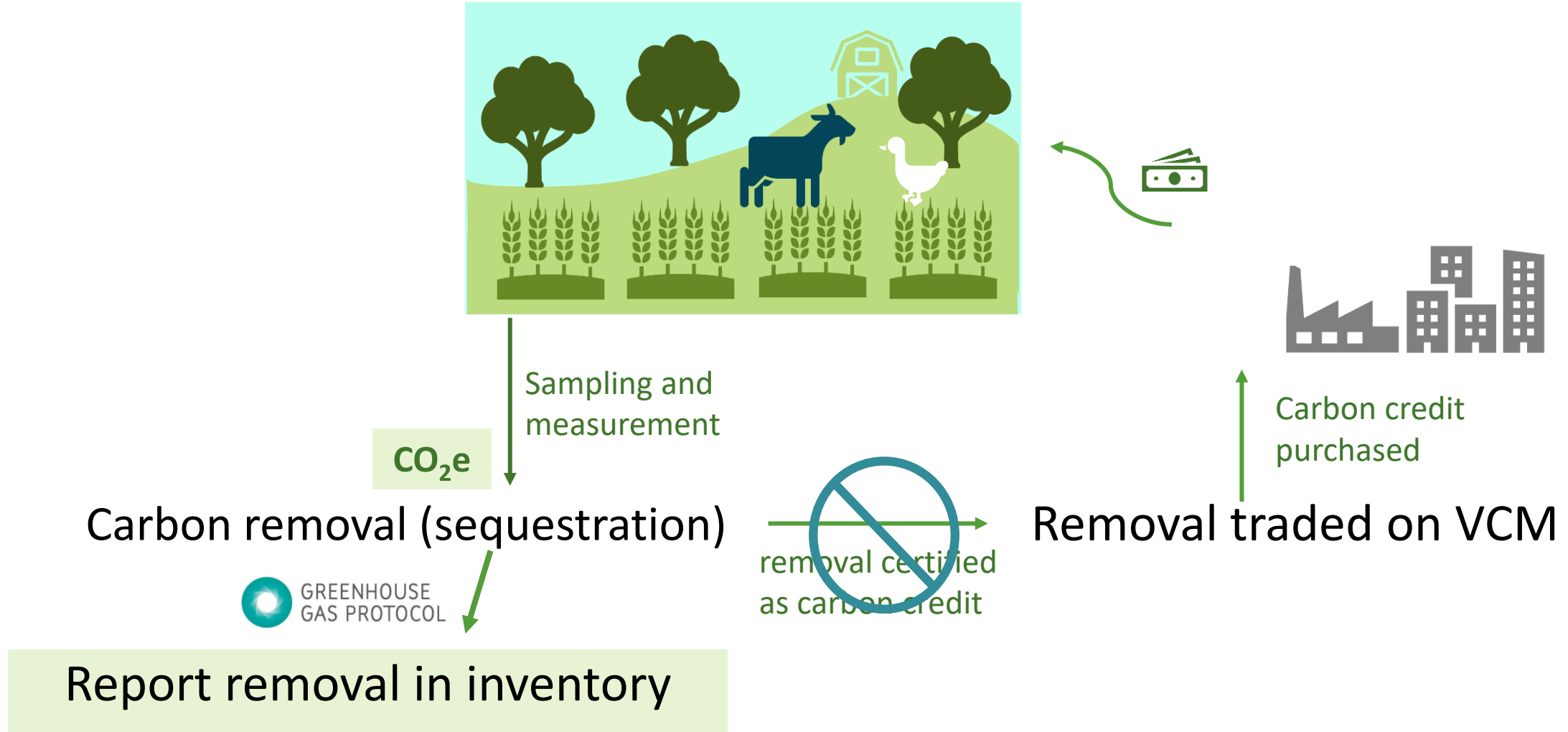
Carbon Heroes www.carbonheroes.co.za. For all B-graded datasets.

Importance of measurement





What is a carbon footprint? What about removals?





GHG Protocol

- Supplies the world's most widely used greenhouse gas accounting standards
- New **Land Sector and Removals Guidance**
- Draft 1 release 2022, final to be released mid-2024

New:

- 'Land' emissions (biogenic and non-biogenic) fully addressed
- Removals can be reported in Scope 1 or 3
- Protocol to be used by Agri companies with **Science Based Targets**



SCIENCE
BASED
TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

Science Based Targets Initiative

3451

with science-
based targets

5997

companies taking action

2399

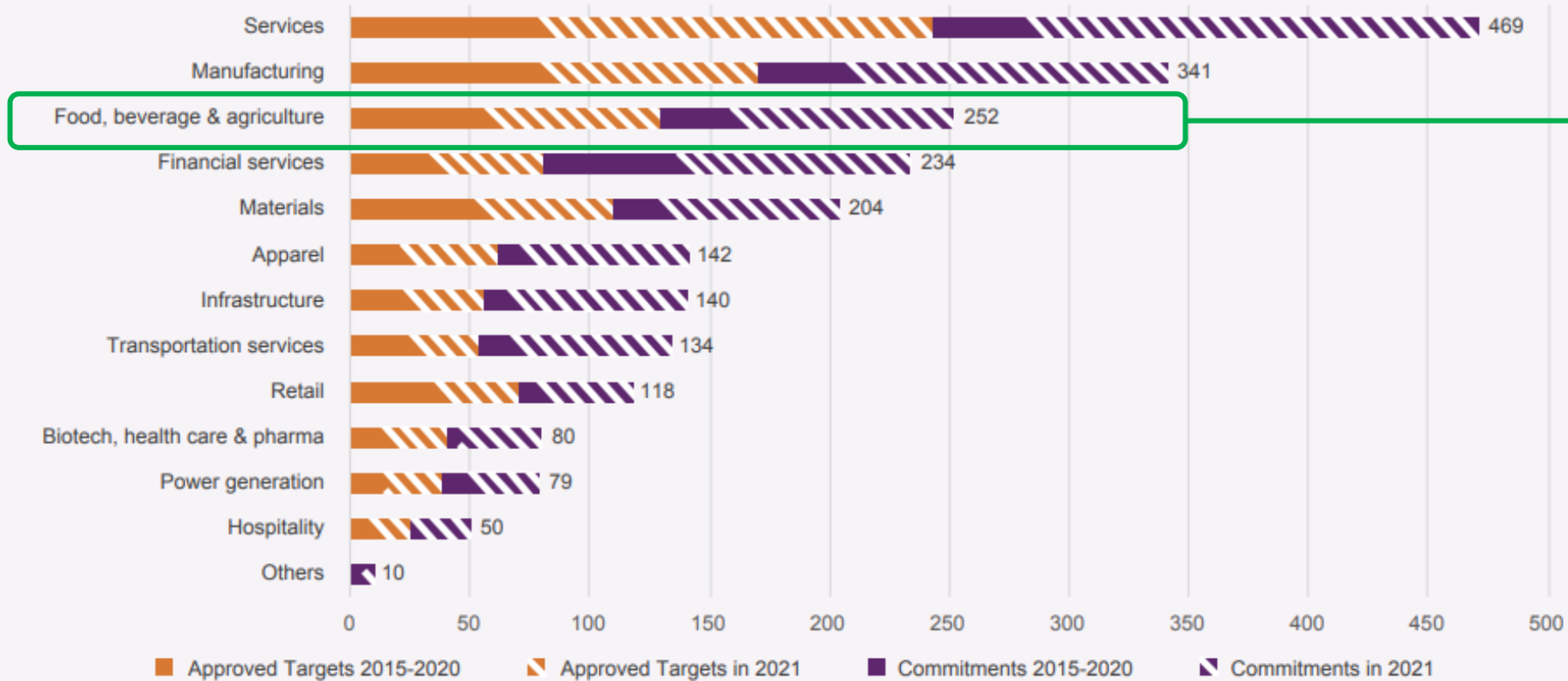
net-zero
commitments



Sectors with SBTs

SCIENCE-BASED TARGETS BY INDUSTRY

Total number of companies by industry with approved targets and commitments as of December 31 2021.



Now **618**
companies



Food, beverage, and agriculture companies with SBTs

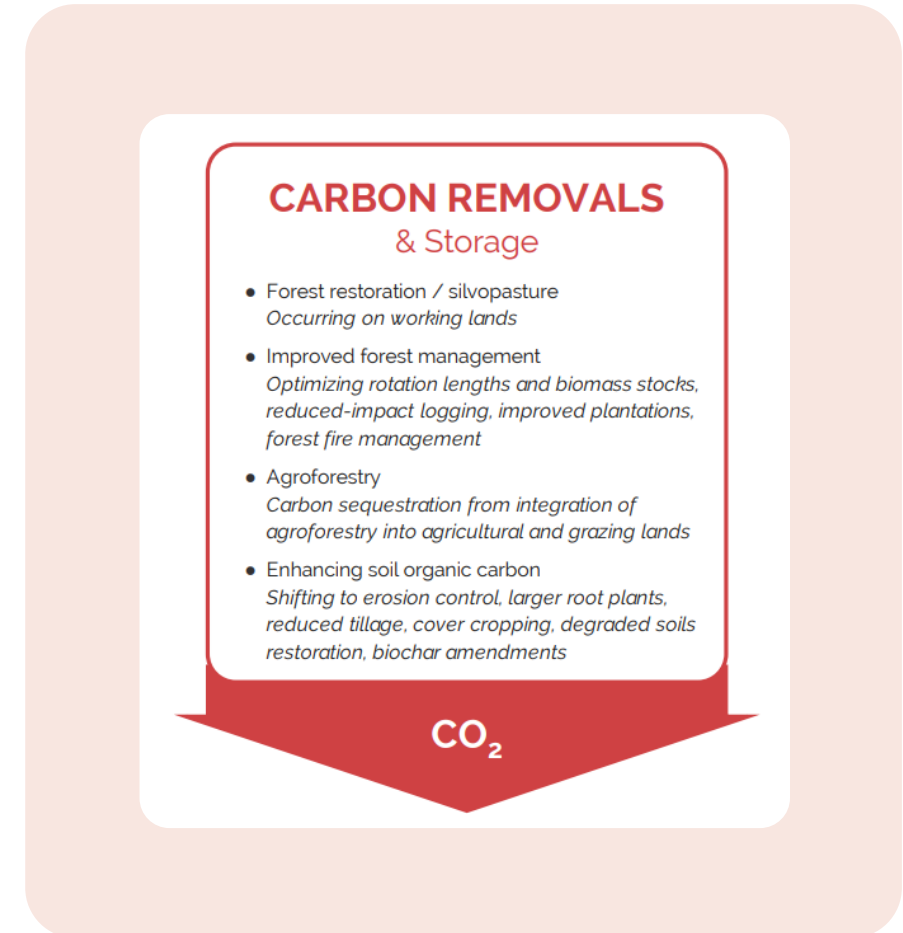
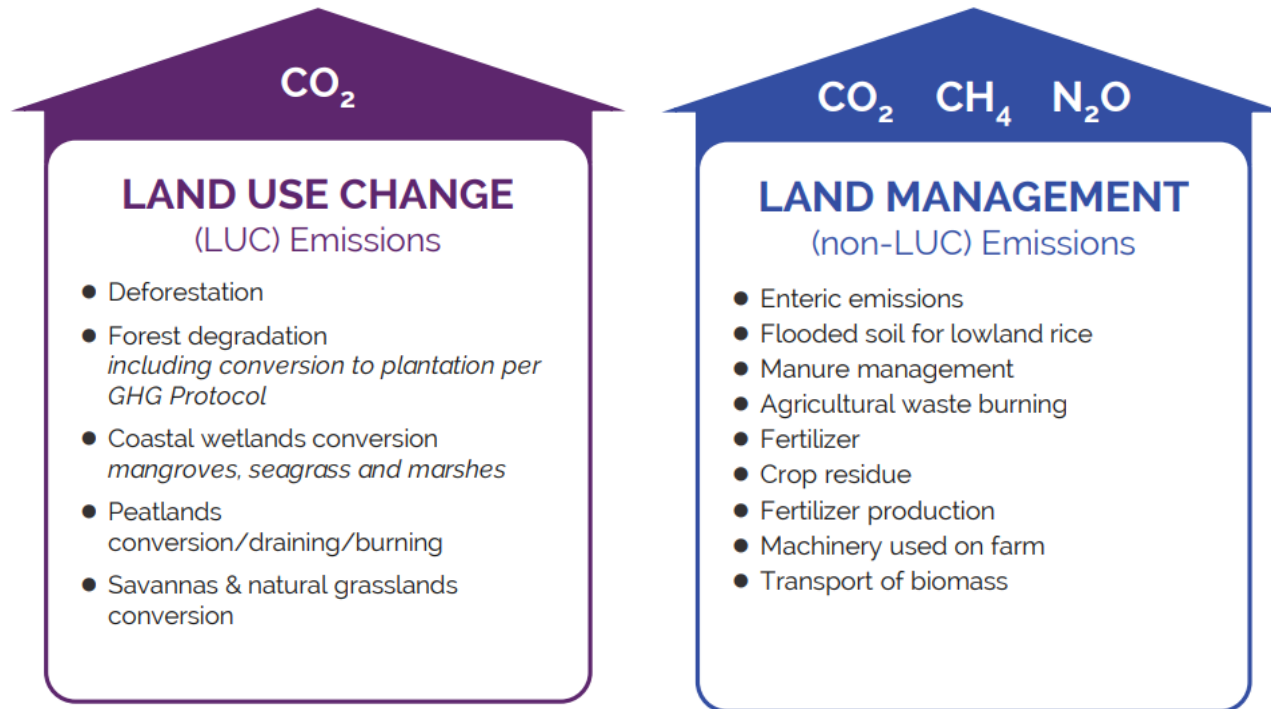


World region	Number of companies
Europe	391
North America	91
Asia	80
Latin America	38
Oceania	14
Africa	4



SBTi Forest, Land and Agriculture (FLAG)

New FLAG target kicks in 6 months with release of GHG Protocol's Land Sector and Removals Guidance



Investment into on-farm carbon removals

- Net zero roadmap: moving away from investing in carbon credits
- Focus on GHG emissions reductions and removals within own value chain by investing in programs and practices



PEPSICO



Nestlé

- Target: reduce GHG emissions by 40% by 2030 without credits
- Rolling out regenerative agriculture in supply chain
- In 2022 reported 4.3m tons CO₂eq of removals
- 14m tons of ingredients through regenerative agriculture by 2030

UK Retailer GHG emission reduction targets

Company	Scope 3 target (Supply chain emissions)	Net Zero Target
 M&S EST. 1884	From 2017 a 55% reduction by 2030	Net zero across full value chain by 2040
 WAITROSE & PARTNERS	From 2020 a 42% reduction by 2030, and 90% by 2050 FLAG target: 30% reduction by 2030, and 72% by 2035	Net zero across full value chain by 2040
 Sainsbury's	From 2019 a 30% reduction by 2030	Net zero across full value chain by 2040
 Morrisons	From 2019 a 30% reduction by 2030 (for own-brand products only)	Net zero own operations by 2035
 TESCO	From 2015 a 17% reduction by 2030	Net zero across full value chain by 2050

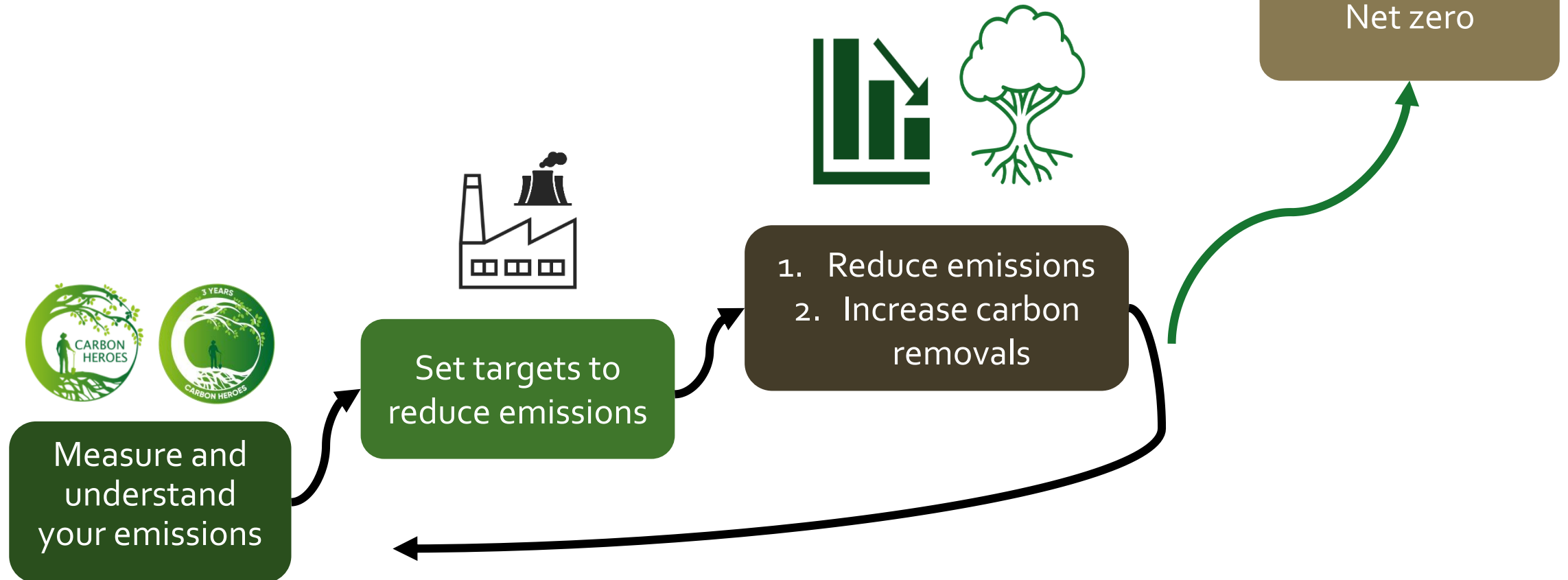
SBTi: South Africa Retailer targets

Company	Scope 3 target (Supply chain emissions)
 WOOLWORTHS	25% of its suppliers to have science-based targets by 2024
	Currently working on defining a scope 3 target for SBTi. Pick n Pay will collaborate with their largest suppliers to ensure that they have set their own carbon reduction and net zero targets.
	From 2020 a 25% reduction by 2030 (for use of sold products only)

What should the agricultural sector be doing?



- Step 1:** Change the way you do things! Reduce emissions as much as possible, cutting emissions is **more beneficial** than carbon removal, and some GHGs cannot be removed once emitted.
- Step 2:** Enhance carbon removals to neutralise emissions that cannot be reduced. Keep records!
- Step 3:** Science based targets: Set long-term and short-term targets to reach net-zero by 2050,



What is a water footprint?

- Measures the amount of water used to produce each of the goods and services we use.
- Examples:
 - single process, such as growing rice,
 - a product, such as a pair of jeans,
 - fuel we put in our car, or
 - an entire multi-national company.
 - can also tell us how much water is being consumed by a particular country – or globally – in a specific river basin or from an aquifer.

Water footprint: what does it tell you?

- Where is the water dependence in my company's operations or supply chain?
- How well are regulations protecting our water resources?
- How secure are our food or energy supplies?
- Can I do something to reduce my own water footprint and help us manage water for both people and nature?

How is it measured?

- It depends on the question you are asking
- Example: cubic metres per tonne of production or per hectare or other functional units.
- It varies geographically and depends on production systems.
- Example: production of 1kg beef requires approx. 15 000litres of water (93% green, 4% blue, 3% grey water)
- Concept developed by Hoekstra A.Y.
- Website: Water footprint network:
<https://www.waterfootprint.org/>

How does water footprinting work?

- **3 options:**

- **Green water:** footprint is water from **precipitation** that is stored in the root zone of the soil and evaporated, transpired or incorporated by plants. It is particularly relevant for **agricultural, horticultural and forestry products**.
- **Blue water:** footprint is water that has been sourced from **surface or groundwater resources** and is either evaporated, incorporated into a product or taken from one body of water and returned to another, or returned at a different time. **Irrigated agriculture**, industry and domestic water use can each have a blue water footprint.
- **Grey water:** footprint is the amount of fresh water required to assimilate pollutants to meet specific water quality standards. The grey water footprint considers **point-source pollution discharged** to a freshwater resource directly through a pipe or indirectly through runoff or leaching from the soil, impervious surfaces, or other diffuse sources.

What should water users be doing?

- Ensuring accurate water monitoring of all water resources
- It includes rainfall; water extracted from surface and groundwater; wastewater returned to environment (even treated wastewater)
- Understanding crop requirements in your specific area
- Only irrigate optimal crop requirement.
- Reporting on water use per kg crop will only become more important in future.

We are looking forward to the journey of measuring and reducing carbon emissions.

“A significant part of the pleasure of eating is in one’s accurate consciousness of the lives and the world from which food comes.”

Wendell Berry

Contact details: Anel Blignaut

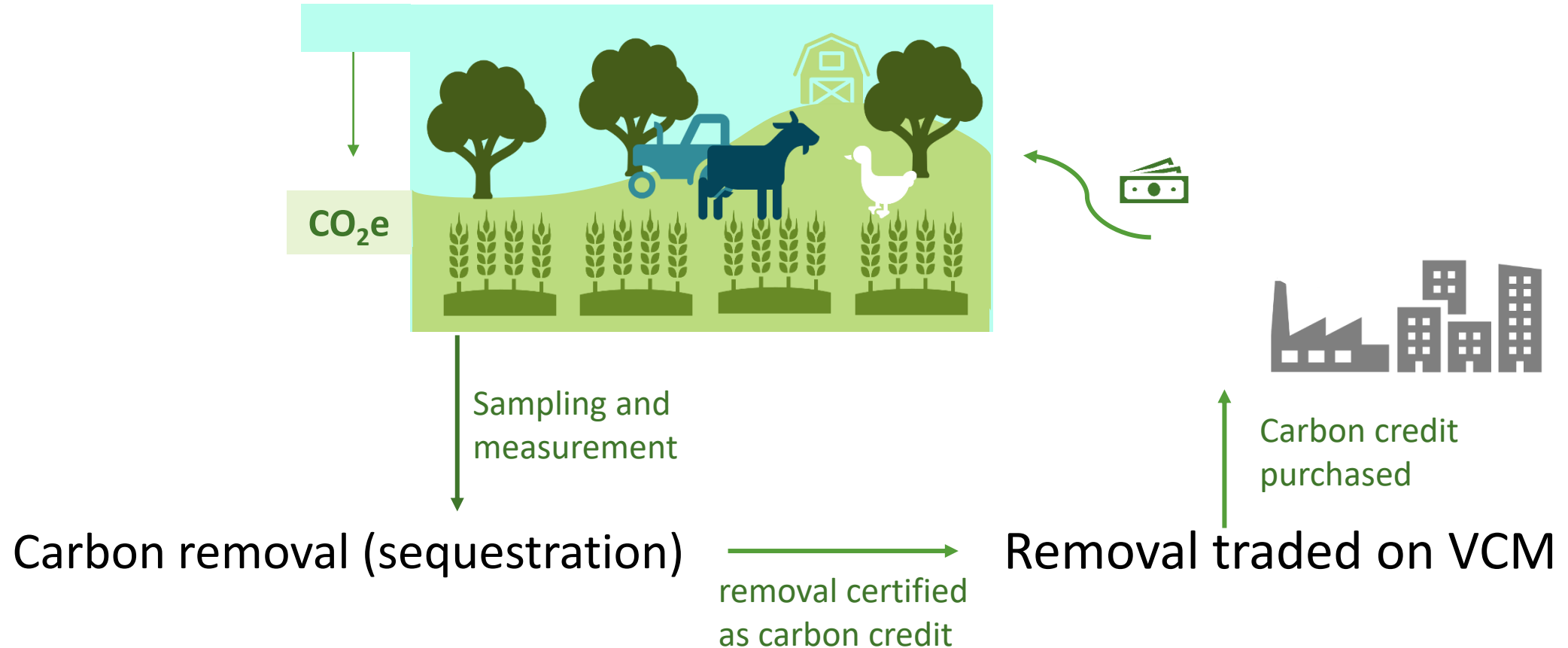
anel@bluenorth.co.za



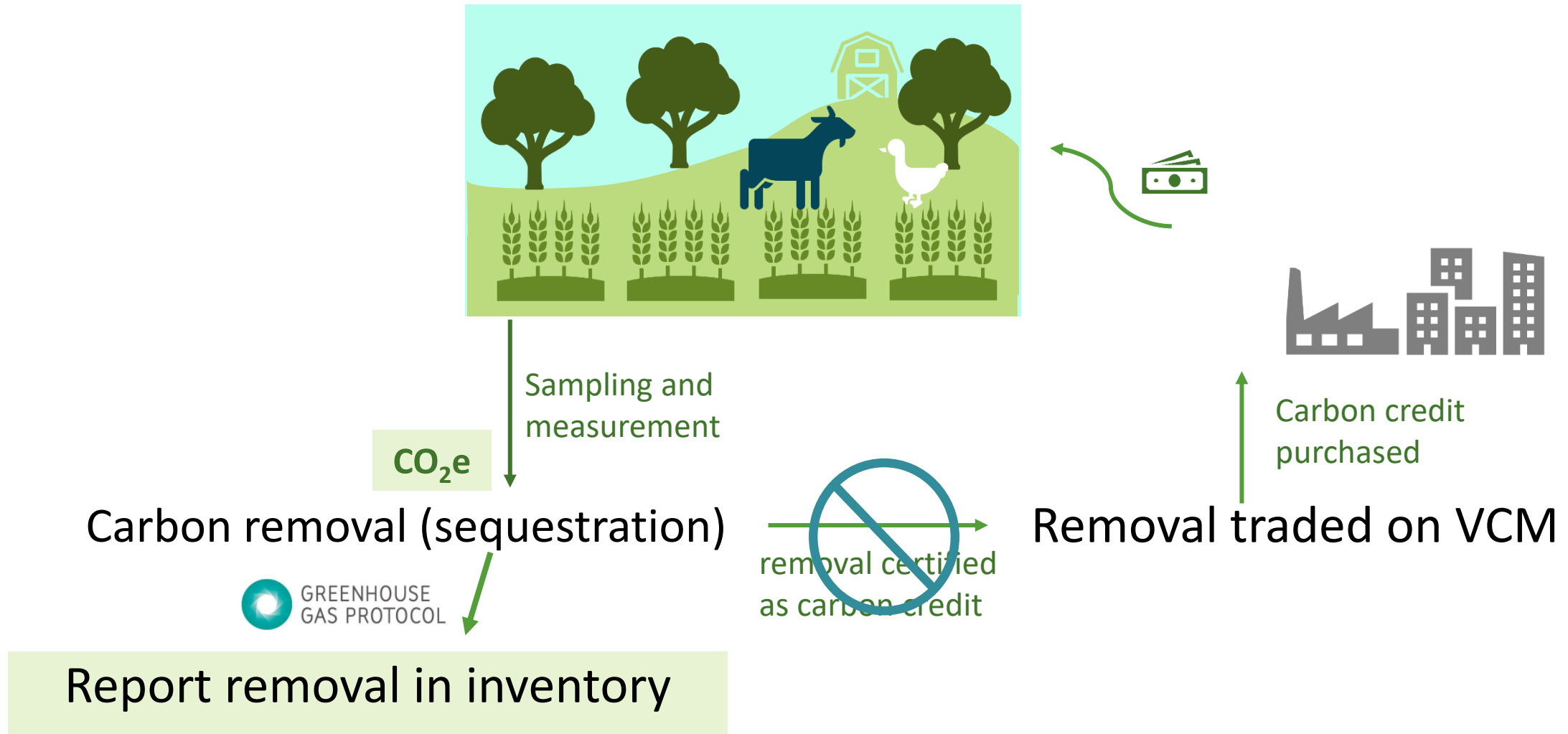
IPCC Sixth Assessment Report

- All assessed models that limit warming to 2°C by 2100 rely on mitigation from the AFOLU sector
- To reach-net zero the use of carbon dioxide removals is unavoidable
- Top 3 land-based mitigation strategies
 - Prevent conversion of natural areas
 - Carbon sequestration in agriculture
 - Ecosystem restoration
- Farms can play an important climate mitigation role!

Carbon removals vs. carbon credits

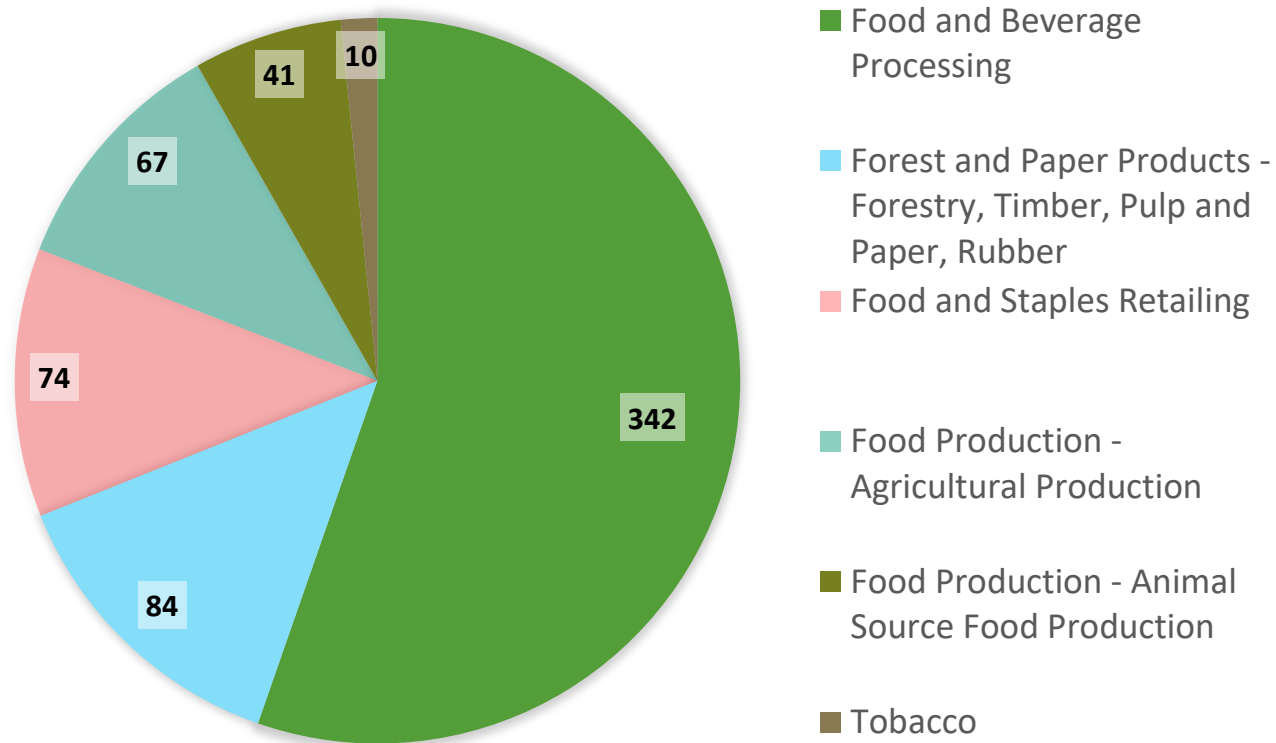


Carbon removals vs. carbon credits





Food, beverage, and agriculture companies with SBTs



Reporting removals

- Biogenic (nature-based) carbon removals previously excluded from corporate carbon footprinting
- New guidance around reporting removals from GHG Protocol
- Allows reported removals to offset 'land emissions' in corporate footprints & in Science Based Targets
- This applies not only to producer but across the value chain
- I.e. Food processors, distributor, retailers, you supply can benefit
- But strict reporting requirements



SBTi

- Removals activities are required in FLAG
- No double counting
- Removals from outside supply chain activities (credits) not included in FLAG.
- Removal activities:
 - Soil sequestration on farm and pasture
 - Conservation set-asides
 - Agroforestry
 - Silvopasture
 - Biochar
 - Improved forest and plantation management (extended rotation length, climate smart forestry)

Pressure for agricultural carbon removals

For SBTi, Carbon credits cannot be used to offset their near-term targets, but can use carbon removals for FLAG emissions

First producers feeling the pressure:

- Producers exporting to EU
- Producers supplying to large multinational food groups and retailers
- Quality data available showing carbon accumulation on farm makes commodities more valuable to retailer
- Carbon removal remains yours (ownership of not traded)

Carbon Border Adjustment Mechanism (CBAM)

- To commence January 2023 as transition phase – GHG certificates to be issued without payment
- Full implementation January 2026 – payment on certificates
- Sectors covered: cement, fertilizers, iron, steel, aluminum and electricity
- If appropriate GHG footprinting is not conducted, default values will be determined.
- When Farm to Fork strategy comes into effect (2026) then agricultural exports may also become liable for taxation.

UK Retailer net zero commitments

Company	Target(s) Scope 1+2	Climate targets validated by SBTi [Yes/No] - When?	Scope 3 target(s) [YES/NO] - if yes, please specify	Net Zero Y/N
M&S	Scope 1+2 - 55% by 2030 (2017) net zero in own operations by 2035	no, but 2022 committed	Yes, 55% reduction by 2030 (2017)	Net zero business across full value chain by 2040 the zero-road map in place in line with SBTi 1.5-degree Paris Climate Agreement.
Waitrose	Reduce Energy Consumption x 25% by 2028 (2018). Reduce refrigerants leaks - 7% ending the use of fossil fuels in transport (across groups) by 2030 – NET ZERO for scope 1 & 2 x 2035.	no, but 2021 committed	will be set in 202/23 for full value chain (1,2 + 3)	Net zero across own operations by 2035. UK Farming Net Zero By 2035 Expect Scope 3 Net Zero Update Soon.
Sainsbury	Scopes 1 and 2, these include the reduction of greenhouse gas (GHG) emissions from our own operations to Net Zero by 2035	The Science Based Targets initiative (SBTi) has approved their Science Based Targets for Scopes 1, 2 and 3.	Scope 3 reducing their GHG emissions in the value chain 30% by 2030	Net Zero across all scopes by 2040 In line Paris Agreement
Morrison	Scope 1 & 2 – net zero by 2035	TBC	Morrisons Scope 3 emissions will follow a well below 2 degrees pathway. It is also working with the Science Based Targets initiative (SBTi) on the approval of its ‘Scope 3’ targets. It will report on progress every year.	Committed to Net Zero Carbon Emissions from within its own operations by 2035 Awaiting Full Value Chain Net Zero Commitment
Asda	Reducing Green House Gas emissions (Scope 1 and 2) by 50% by 2025	No but committed to meaningful climate change action, including our science-based reduction aligned targets	committed to setting a Scope 1, 2, 3 and FLAG2 science-based target. We’ll set this ahead of our previous 2025 deadline.	Net Zero business by 2040 – Also o committed to reducing waste by 50% and having a net “regenerative impact on nature” no later than 2050.
Tesco	Reduction 1+ 2 by 60% (2015) x 2025 & carbon neutral by 2035"	Yes - 2017	"Yes, net zero across the whole footprint by 2050 reduction Scope 3.1, 3.3, 3.4 and 3.5 by 17% (bl 2017) by 2030"	Net Zero across full value chain / whole footprint by 2050

In conclusion

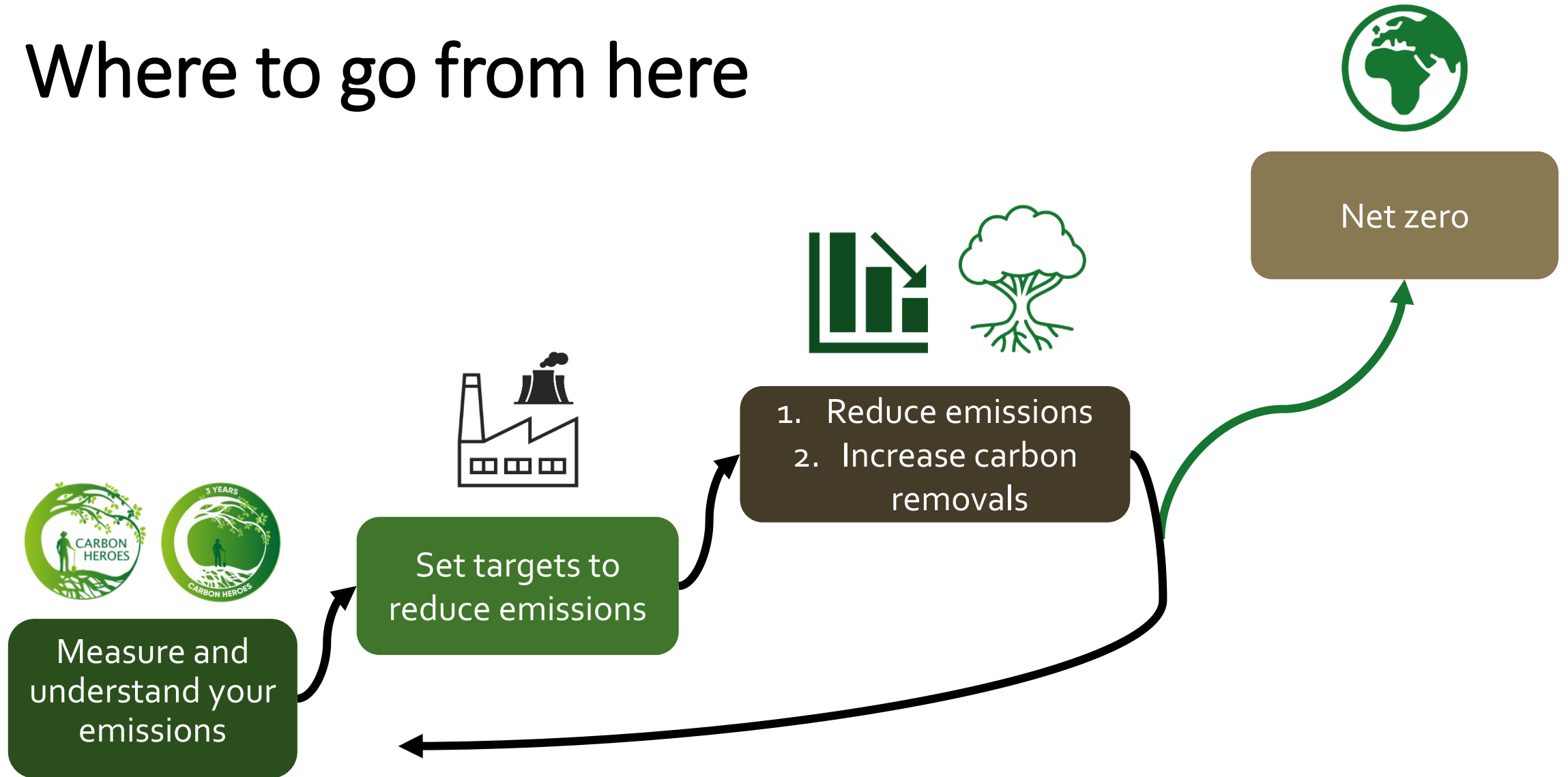
But:

- Environmental limitations on how much carbon can be removed
- Removal reporting comes with requirements of extensive sampling, data collection, and indefinite monitoring
- Cost-benefit to see if will be worth it
- **Smart sampling:** future potential for sampling combined with remote sensing, smartphones, modelling and even AI

Carbon removals is a rapidly evolving space!



Where to go from here



How does water footprinting work?

- Green, blue and grey....
 - Expressed as xxx
 - Water footprinting network
-
- Can be calculated as business, product etc.

Humans as part of the earth system

- Modern living leaves many disconnected from nature and disconnected from the source of food.
- The interconnectedness of humans, nature, and the atmosphere around us is like a long-term relationship: it is deeply rooted in the past and has become more complex and nuanced over time. This evolution is organic—part intuition, part intent. And the strength lies in all of the pieces coming together as a cohesive, singular whole.
- [Source: Pictures Show the Interconnected Worlds of Humans and the Wild \(nationalgeographic.com\)](#) 21 Nov 2017 Lucas Foglia



We are part of the bigger system and do not stand outside of nature.



The way we produce food potentially have both positive and negative impacts on the larger system.



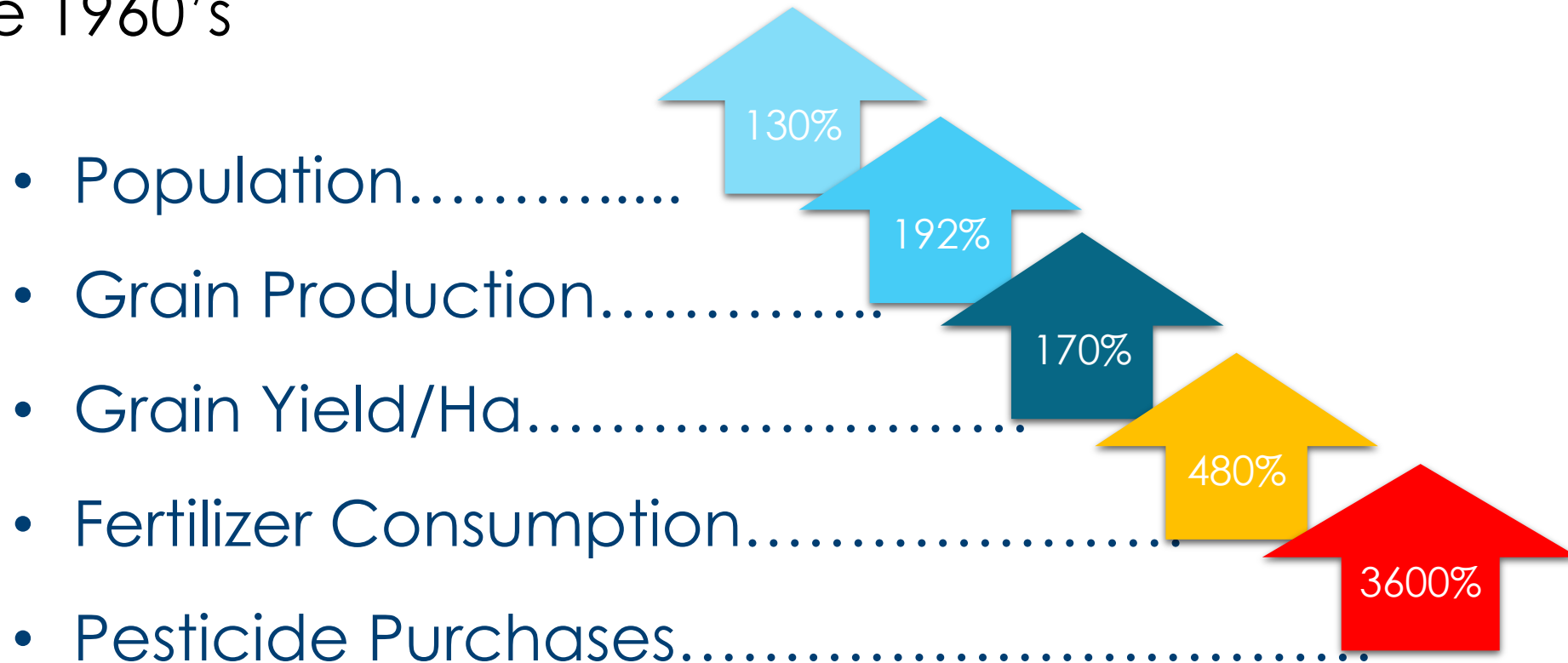
The system then adjusts and impacts the environment that we live in and how we grow food.



What is the problem?

These stats give us a hint...

Since 1960's



Highlights two issues

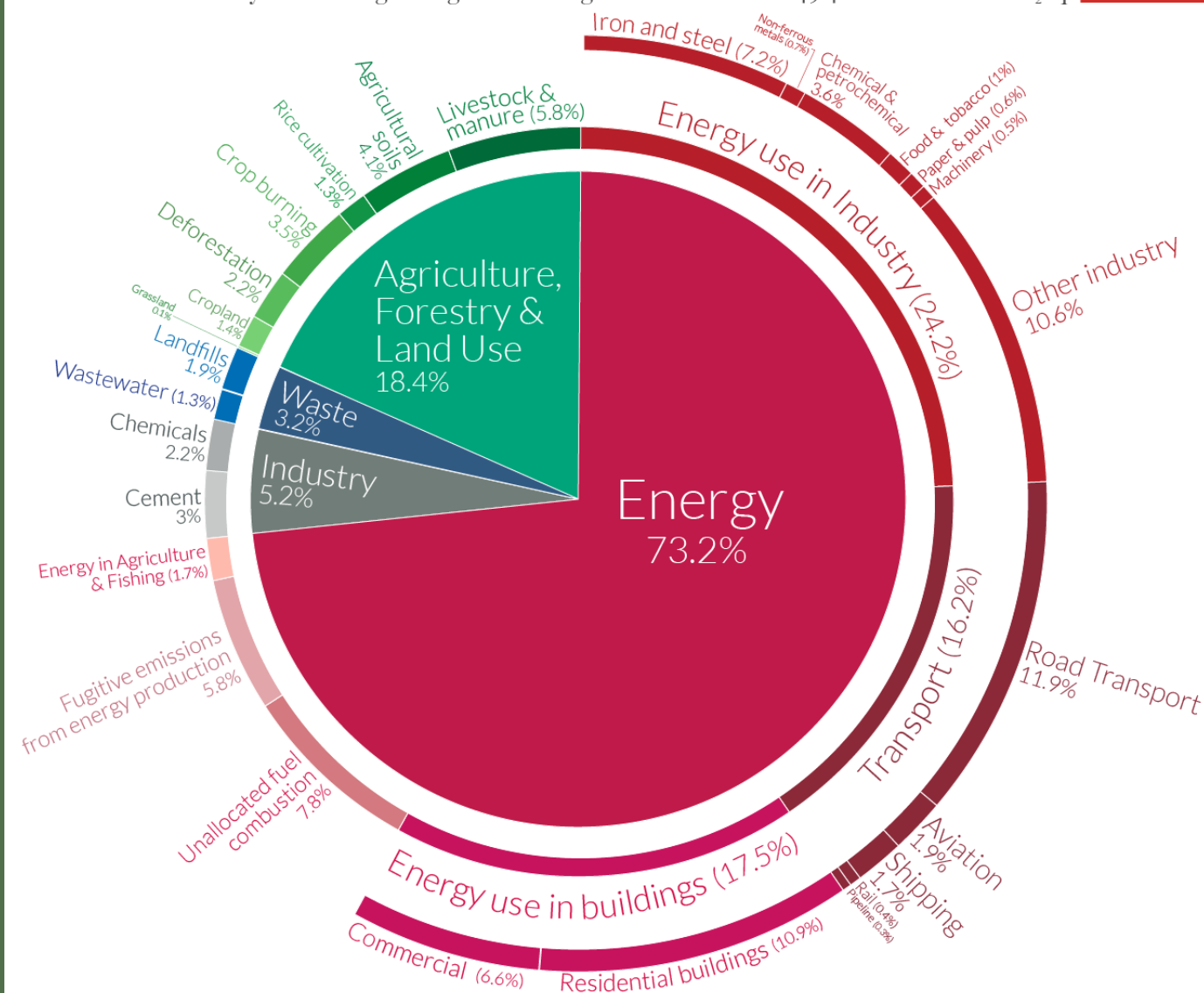
1. Agricultural productivity is **heavily subsidised** (fossil-fuel intense inputs)
2. Providing that subsidy is at a **devastating cost** to the biophysical underpinnings of agriculture
 - Biodiversity loss
 - Top-soil loss
 - Groundwater depletion
 - Water system pollution
 - Climate change
 - Etc.

Loss of healthy ecological / landscape function that underpins agriculture

Global greenhouse gas emissions by sector

Our World
in Data

This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO₂eq.



OurWorldinData.org – Research and data to make progress against the world's largest problems.

Source: Climate Watch, the World Resources Institute (2020).

Licensed under CC-BY by the author Hannah Ritchie (2020).

Global greenhouse gas emissions by gas

Greenhouse gas emissions are converted to carbon dioxide-equivalents (CO₂eq) by multiplying each gas by its 100-year 'global warming potential' value: the amount of warming one tonne of the gas would create relative to one tonne of CO₂ over a 100-year timescale. This breakdown is shown for 2016.

Our World
in Data



OurWorldinData.org – Research and data to make progress against the world's largest problems.
Source: Climate Watch, the World Resources Institute (2020).

Licensed under CC-BY by the author Hannah Ritchie.

EU Green Deal

4 broad pillars:

- Consumer demand – labelling to inform choices (2024)
- Food production – targets fertilizers (especially Nitrogen and Phosphorus) & pesticides; feed additives and animal welfare
- Industry behavior – commitments from agri-business to integrate sustainability in corporate strategies.
- Trade Policy – commitment from third countries on use of pesticides, animal welfare and antimicrobial resistance.

Other countries incl RSA must adhere to the new regulations to access markets.

- Guidance will be provided to Third countries in the period 2021-2027.

Pressure is building

- EU Carbon Border Adjustment Mechanisms to support the objectives of the EU Green Deal.
- Goal – 55% reduction in carbon emissions by 2030.
- Farm to Fork Strategy – Climate Neutral in 2050.
- 2030 targets:
 - Reducing the use and risk of chemical pesticides by 50%
 - Lowering fertilizer use by 20%
 - Increasing agricultural land under organic farming by at least 25%
- 2030 Biodiversity Strategy – recovery of biodiversity by 2030.

South African Carbon tax

1. Plays an important role in achieving South Africa's Nationally Determined Contribution Targets to limit global warming.
2. Agriculture, Forestry and other land-use sector not yet liable.
3. Phase 1 of Carbon Tax ends 31 Dec 2025 with changes to be implemented and increase in carbon tax rate.
4. Regenerative agricultural practices may earn additional income through carbon credits or for use as an offset.