Australian vegetable industry carbon footprint tool: grower adoption and education component

Natasha Wojcik
ARRIS Pty Ltd

Project Number: VG09152

VG09152

This report is published by Horticulture Australia Ltd to pass on information concerning horticultural research and development undertaken for:
Hort General (not industry specific)
Vegetables

The research contained in this report was funded by Horticulture Australia Ltd with the financial support of Landcare Australia Limited.

ISBN 0 7341 2491 0

Published and distributed by:
Horticulture Australia Ltd
Level 7
179 Elizabeth Street
Sydney NSW 2000
Telephone: (02) 8295 2300
Fax: (02) 8295 2399

HAL
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Australian Vegetable Industry Carbon Footprint Tool: Grower Adoption and Education

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10th September, 2010

HAL Project Number VG09152

This final report details the outcomes of the grower adoption and education component of the Australian Vegetable Industry project to develop a carbon footprinting tool. This project was designed as a lead-in program for the carbon footprinting tool, to give growers a basic understanding about carbon accounting before the launch of the tool.

Arris appreciates the time given by industry leaders and growers to develop the content for this education program, providing us with valuable feedback on the discussion topics.

This project was facilitated by HAL, with funding also provided by Woolworths Drought Action Day, through Landcare Australia, which has been matched by Government research dollars through Horticulture Australia Limited.

Disclaimer

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MEDIA SUMMARY

A grower adoption and education program was developed for the Australian vegetable industry to provide vegetable growers with an awareness and understanding of carbon footprinting: what it means to them as a farmer and business owner; how they can prepare for carbon accounting; the benefits of carbon accounting; and the changes they can make to make their farm and business more sustainable.

The program involved a series of workshops (delivered in-person) and webinars (delivered online). Growers who took part in each presentation were provided with slide handouts and a more detailed grower manual.

Attendance numbers at the workshops varied significantly from State to State, with only 1 grower attending in the Northern Territory, and up to 30 attending in Tasmania, New South Wales and Queensland. About 30 growers participated in the webinars.

As the project developed, Arris found that carbon accounting was not a priority in the daily business activities of growers. So to ensure that the webinar resource would be available to growers when their interest in the topic became more of a priority, Arris chose to develop the material further and place it online. This element was outside the original scope of the project, and was completed instead of running the final four webinars. A dedicated 'Understanding Carbon' page has been added to the 'Carbon Calculator Tool' website (www.vegiecarbontool.com.au). The website houses a recording of the 'Understanding Carbon' presentation, including the presentation slides. Growers can also download the 'Understanding Carbon' grower manual that was written and produced as part of the project.

In terms of making the most of this project, Arris feels it would be worthwhile keeping the 'Understanding Carbon' page on the Vegie Carbon Tool website and making reference to its existence throughout the life of the Carbon Calculator project. This would allow growers that missed out on participating in the initial education activities the opportunity to take part and build on their knowledge and understanding of carbon. Arris is more than happy to make adjustments or additions to the web page (i.e. adding new links and/or new information about carbon) to ensure that the Vegetable Industry is getting the most value out of their industry projects and resources. As the Carbon Calculator develops, and ultimately becomes active, growers will be accessing this site more frequently and this is a prime opportunity to give them as much information about carbon as possible.

TECHNICAL SUMMARY

The project VG09152 Australian Vegetable Industry Carbon Footprint Tool: Grower Adoption and Education was developed to work along-side another HAL funded project (VG09187) working on the development of a Carbon Calculator Tool for the Australian Vegetable Industry.

Woolworths approached Horticulture Australia with an interest to fund a project to support growers' education in carbon accounting. Horticulture Australia asked Arris if they could assist in the development of an education and adoption package to support the Carbon Calculator Tools. Arris felt it would be an invaluable project in terms of building grower awareness, understanding and confidence with carbon footprinting, prior to the launch of the Carbon Calculator tools as these are the biggest hurdles to overcome when trying to impress upon growers the value and importance of developing and adopting sustainable on-farm practices.

The program structure of the Carbon Footprint Tool project (VG09187) had built-in training in the use of the tool and topics related to carbon accounting featured as one of the final tasks. The opportunity to grow the adoption and education component of this project opened the door for training to start earlier and broaden its scope.

Arris recommended developing a training package that provided growers with a clear understanding of carbon footprinting, what it means to them as a farmer and business owner; how they can prepare for carbon accounting; the benefits of carbon accounting to them and their business; and the changes they can make to make their farm and business more sustainable. It was also important for this package to provide growers with links to resources and avenues for obtaining further advice and assistance, which it does.

INTRODUCTION

The project VG09152 Australian Vegetable Industry Carbon Footprint Tool: Grower Adoption and Education was developed to work along-side another HAL funded project (VG09187) working on the development of a Carbon Calculator Tool for the Australian Vegetable Industry.

Woolworths approached Horticulture Australia with an interest to fund a project to support growers' education in carbon accounting. Horticulture Australia asked Arris if they could assist in the development of an education and adoption package to support the Carbon Calculator Tool. Arris felt it would be an invaluable project in terms of building grower awareness, understanding and confidence with carbon footprinting, prior to the launch of the Carbon Calculator Tool as these are the biggest hurdles to overcome when trying to impress upon growers the value and importance of developing and adopting sustainable on-farm practices.

The Australian Horticulture industry, and specifically the vegetable industry, did not have a carbon accounting tool. The Industry Management Committee, Future Focus process and HAL Environment Portfolio all identified the need for an across-industry approach to the development of an accounting tool.

The Australian Vegetable Industry Carbon Footprint Tool - stage 2 (national development and adoption of the tool) (VG09187) follows on from the HAL-managed carbon footprinting project (VG07195): *Environmental footprint analysis of salad producer for development of an industry greenhouse gas calculation tool*.

Houston's Farm in conjunction with technical experts, industry members and HAL completed a desktop study of existing carbon accounting tools and an analysis of their own greenhouse gas emissions, and then used the information to develop a model for carbon accounting. That Houston's project has acted as a base for the development of a common understanding and single widely accepted method for calculating a carbon (greenhouse gas) footprint agreed by domestic retailers and agrifood businesses.

The Australian Vegetable Industry Carbon Footprint Tool will help growers to identify the carbon footprint for their entire operation and for specific crops or crop categories. It will identify the carbon emissions associated with:

- Fertiliser use
- Electricity
- Fuel
- Waste
- Refrigerant gases
- Land use change

The program structure of the Carbon Footprint Tool project (VG09187) had built-in training in the use of the tool and topics related to carbon accounting featured as one of the final tasks. The opportunity to grow the adoption and education component of this project opened the door for training to start earlier and broaden its scope.

Arris has a long history of providing extension and adoption materials to the Australian Vegetable Industry. Our years' of experience have given us a clear understanding of the communication, training and education needs of growers. We are very aware of the time constraints they face, the locality issues they need to overcome and the reluctance to deal with technology and new ideas (although this reluctance is on the decline).

As a result, Arris recommended developing a multi-pronged training package that provided growers with a clear understanding of carbon footprinting, what it means to them as a farmer and business owner; how they can prepare for carbon accounting; the benefits of carbon

accounting to them and their business; and the changes they can make to make their farm and business more sustainable.

Giving growers the option to choose the training method that best suits their needs takes you one step closer to getting them to participate. It was also important for this package to provide growers with links to resources and avenues for obtaining further advice and assistance, which it does.

We envisaged this training being delivered throughout the life of the project, building on the interest and momentum created by the project. At the project's outset, we developed a detailed delivery plan, including a variety of delivery methods. We recognised there would be a need to develop alternative training methods for growers who could not attend workshops due to their location, inability to leave their property or time constraints. As a result, we developed a series of webinars that allowed growers to log in via the internet (for the visual presentation) and a telephone (for the audio component) to a group training session. This gives them the benefit of training with a real person even though their circumstances may normally prevent them from being involved.

As the project progressed, we found the level of interest amongst growers in the topic of carbon accounting was not as high as we had first anticipated. We expect interest dropped following the collapse of the Federal Government's Emissions Trading Scheme. Growers decided to focus on other areas of production that they considered to be more pressing.

However as the project developed, interest in carbon accounting seemed to increase again. We put this down to the issue being mentioned in the media again: partly in the lead in to the Federal election, and as Planet Ark's campaign to introduce carbon labeling gathered steam. The project itself also generated interest in the topic, with word-of-mouth bringing more growers into contact with us, wanting to participate in the program.

MATERIALS AND METHODS

- Training package for carbon footprinting in vegetable industry, including a grower manual.
- Seminar series = 7 seminars
- Webinar series = 6 web events (webinars)
- Other communication outputs, including promotional material for the events, media releases, and online presentation/resources.

We had aimed to deliver the training package to at least 300 growers via the workshops and webinars. However as the project progressed, we found the level of interest amongst growers in the topic of carbon accounting was not as high as we had first anticipated. We expect interest dropped following the collapse of the Federal Government's Emissions Trading Scheme. The feedback we received was that growers had decided to focus on other areas of production that they considered to be more pressing.

Interest amongst growers in carbon accounting seemed to increase again as the project developed. We put this down to the issue being mentioned in the media again: partly in the lead in to the Federal election, and as Planet Ark's campaign to introduce carbon labeling gathered steam. The project itself also generated interest in the topic, with word-of-mouth bringing more growers into contact with us, wanting to participate in the program.

Attendance numbers at the workshops varied significantly from State to State, with only 1 grower attending in the Northern Territory, and up to 25 attending in Tasmania, New South Wales and Queensland. About 30 growers participated in the webinars.

Other sectors of the vegetable industry were also involved in the project, participating in a range of capacities. For instance, industry representatives such as Jeff McSpedden (Independent chair of the Vegetable Industry Advisory Committee), Helena Whitman (Hort-Ag), Mel Fraser (NT DPI) and Alison Anderson (NSW Farmers Association) took part in our early webinars and provided us with feedback on the content and presentation format. Following the first webinar, we took their feedback on board and made a few changes to the presentation, such as making the information more concise and adding some more information from the supermarket chains about their level of interest in carbon accounting with reference to the vegetable industry.

Industry representatives were also supportive of the project by assisting us in ensuring growers were aware of the training opportunity by distributing flyers or emails through their mailing lists. In Queensland (Applethorpe) for instance, Clinton McGrath (IDO, Agri-Science Queensland, DEEDI) helped us by contacting growers in his region to encourage them to attend the seminar, and Peter Deuter (Agri-Science Queensland) added to our carbon presentation, giving the participants another presentation on the same day, titled 'Climate Change, trends and opportunities from a Granite Belt perspective', adding to their knowledge on the topic.

Our communication method to inform growers and the wider vegetable industry of the 'Understanding Carbon' training package varied from State-to-State depending on the level of support we could access. We placed regular notices in the AUSVEG e-newsletter, and sent emails to other 'grower' mailing lists, supplied to us by former State IDO's in most cases. We also placed articles in industry magazines, 'Vegetables Australia' and 'Good Fruit and Vegetables' magazine. In Tasmania we placed an advertisement in one of the local regional newspapers (Tasmanian Country Newspaper), as we believed there was stronger awareness of carbon accounting in this region. In New South Wales, we made the presentation at the Camden Horticultural Branch meeting of the NSW Farmers Association, which gave us access to their member list. Media releases were also sent to ABC Radio 'Country Hour' reporters in each capital city to promote the event. In some cases (New South Wales, Western Australia and Tasmania), the reporters followed up on the flyers and conducted an interview with trainer Karl Forsyth.

Understanding Carbon – Seminar Attendance

State / Location	Date	Attendance No.(Approx.)
South Australia Virginia Horticulture Centre	7 April	14
Western Australia, Delivered one-on-one to a few growers who registered interest in the topic, mainly to the south of Perth	10 May	5
Tasmania, Devonport	17 May	23
Queensland, Applethorpe	2 June	22
New South Wales, Cobbitty (Camden Horticultural Branch meeting, NSW Farmers Assoc.)	7 June	25
Victoria, Werribee	14 July	15
Northern Territory, Katherine	17 May	1

Understanding Carbon – Webinar Attendance

Date	Attendance No.
March 4	5
March 31	9
May 4	4
May 11	3* *Cancelled after participants had trouble logging in or simply forgot to log in
May 18	7
May 25	5

Specific data on the occupations of each of the attendants at the seminars and webinars was not compiled as part of this project. But anecdotally, we believe the information was delivered to a variety of sectors within the vegetable industry. For example, at the South Australian seminar a member of the AUSVEG Board attended, along with two agri-business supply company representatives.

As mentioned previously, in our opinion we found that interest in the topic of carbon accounting was not on the radar of the majority of growers in the Australia Vegetable Industry. This is why Arris chose to approach Horticulture Australia (Alison Turnbull) and request approval to alter the delivery method of the training package. To ensure that the training will be available to growers on an ongoing basis, and once interest in the topic increases again Arris chose to further develop the resources created for this project and place them online.

A dedicated 'Understanding Carbon' page has been added to the 'Carbon Calculator Tool' website (www.vegiecarbontool.com.au). The website houses a recording of the

‘Understanding Carbon’ presentation, including the presentation slides. Growers can also download the ‘Understanding Carbon’ grower manual that was written and produced as part of the project.

DISCUSSION

We aimed to deliver the training package to at least 300 growers via the workshops and webinars. However, as the project progressed we found the level of interest amongst growers was not as high as we had first anticipated, possibly due to the collapse of the Federal Government's Emissions Trading Scheme. Interest in carbon accounting seemed to increase again as the project developed, possibly due to the issue being mentioned in the media again: partly in the lead in to the Federal election, and as Planet Ark's campaign to introduce carbon labeling gathered steam. The project itself also generated interest in the topic; word-of-mouth encouraging growers to contact us to participate in the program.

Following the seminars and webinars, we found that most of the participants found the topic to be interesting but it wasn't necessarily on their radar (i.e. as a high priority to their operation). Growers had little understanding of the rules and conditions involved in carbon accounting, and had minimal background knowledge on the topic. Participants were interested to hear that the carbon accounting rules would exclude permaculture (tree crops) from being considered for carbon sequestration.

When carbon accounting does come back onto the radar of growers (and wider industry), we believe there will be a need for workshops across Australia to educate growers on the principles of carbon accounting and life cycle assessment. The work that we have done to date highlights that growers don't have a significant interest in the topic at this point though.

At the South Australian meeting (at the Virginia Horticulture Centre), discussion became quite heated and controversial in that the South Australia AUSVEG board member present raised significant concerns during the meeting with regard to the potential for the major supermarkets chains to use carbon accounting and labeling as a market access barrier to growers. This led us to seek comment from Woolworths (who part-funded the project) and add their statement to the presentation and documentation. We were able to reinforce to growers that carbon accounting was not compulsory in Australia at this point in time, and that its introduction would only be made by industry or, in the supermarkets case, if consumers requested carbon labeling on products.

Workshop attendance varied significantly from State to State: with 1 grower attending in the Northern Territory, and up to 30 attending in Tasmania, New South Wales and Queensland. About 30 growers participated in the webinars (see table in 'Materials and Methods' section).

It's difficult to provide an overall reasoning for the different responses in each region/State, as the circumstances were different in each case. The response in many cases depended on the availability of communication channels to reach the relevant growers. For instance, in the New South Wales example we were able to communicate with growers via the NSW Farmers Association – directly to their members. We also had the support of local media in NSW (ABC Radio) promoting the training opportunity. In the Northern Territory however, we found it more difficult to communicate with growers in this region. From our understanding, for many growers in this area English is not their primary language and they are not confident using technology such as e-mail and internet (making accessing webinars more difficult).

The varying levels of interest led Arris to decide to expand the resources and make them available on an ongoing basis. The dedicated 'Understanding Carbon' page on the 'Carbon Calculator Tool' website (www.vegiecarbontool.com.au) houses a recording of the 'Understanding Carbon' presentation, including the presentation slides, as well as a downloadable version of the 'Understanding Carbon' Manual.

TECHNOLOGY TRANSFER

Initially the training was to be delivered via (in-person) seminars and (online) webinars. However, as has been mentioned previously, Arris altered the delivery method during the project and created an on-going online resource from the initial training materials that were developed.

The resources that were created included a Powerpoint presentation (see attachments), including notes for presenters. This was accompanied by the 'Understanding Carbon' Manual (attached) which featured space to take notes next to the slides while listening to the presentation (online or in-person), along with expanded information on the topic. The manual was distributed to participants of the seminars and webinars.

These resources were developed further and placed onto the Vegetable Carbon Calculator website (www.vegiecarbontool.com.au). From this site, participants can download the 'Understanding Carbon' Manual and/or watch the 'Understanding Carbon' video presentation, which is a polished version of the Powerpoint slides with a voice-over.

A separate training program to teach growers and the wider vegetable industry how to use the Vegetable Carbon Calculator will be established as part of that project (VG09187). Arris' aim is that as growers discover the online tool, they will be able to access the background information provided in the 'Understanding Carbon' resources to build on their knowledge base. It is also a reference they will be able to return to at any stage. The Vegetable Carbon Calculator has been designed to help growers calculate their on-farm greenhouse gas emissions, and identify the carbon footprint of their entire operation (within their farm boundary), as well as for specific crops or crop categories. The Carbon Calculator will provide information which will help growers make critical business decisions and increase their sustainability. (More information on the Carbon Calculator Tool is available online at www.vegiecarbontool.com.au) The Carbon Calculator will be launched in late 2010 via a series of seminars and webinars across Australia.

These additional elements were developed by Arris as a way to accommodate the lagging interest in this topic. The project changed from a combined workshop and webinar project to an online education resource that can be accessed by growers at any given time – giving growers much more flexibility in terms of their commitment. As a result Arris has delivered a project that has no definite end date; that can be used indefinitely; and is providing the industry with increased value for spend. Not only did the initial workshop and webinar series take place, a lasting education resource was developed and made available to growers at their convenience.

RECOMMENDATIONS

In hindsight it may have been more worthwhile to hold off on some of the training and education elements until the Carbon Calculator Tool was closer to being finished and accessible. However, there were a number of other external elements that we believe led to a decrease in interest from vegetable growers regarding carbon accounting, such the Federal Government's Emissions Trading Scheme (ETS) not proceeding.

We still believe this was a very valuable project for Industry, if not more valuable than initially expected as there is now a permanent training and education resource available to growers. In order to maximise this project's value even further, it is important that the 'Understanding Carbon' page is highlighted within the activities of the Carbon Calculator Tool.

If at all possible it would be valuable to hold another round of webinars once the Carbon Calculator Tool is functioning as this will highlight the importance of carbon and garner further interest in the training available.

Along with discussion surrounding the release of the Carbon Calculator Tool, we believe there will be two main drivers in garnering greater interest from Industry in relation to carbon footprinting.

1. The introduction of an Emissions Trading Scheme (ETS)

   In our view, once the Federal Government's ETS was dropped, there was a direct correlation between that and growers decreased interest in the topic of carbon accounting. If an ETS was to be introduced in the future, or once it is debated in the media and by the Federal Government again, we believe interest in carbon accounting amongst growers would increase again. This would be an ideal opportunity to re-issue the training across Australia.

2. Market Access

   If carbon accounting becomes a market access issue, either due to Industry pressure or by directive from the major supermarket chains, in our view carbon accounting would return to the radars of growers. At this stage, we are not seeing widespread roll-out of carbon footprinting or labelling on products in Australia. Supermarkets have suggested it will only happen if consumers demand it. If that was to occur, growers again would be interested in learning more about the topic.

Once either of these issues becomes more topical, we would recommend that the training that's available online is publicised to the Australian Vegetable Industry, including both growers and the wider industry. It would also be worthwhile to consider running more training sessions, either in person or online (via webinars), giving Industry another chance to participate and learn about carbon accounting.

MORE INFORMATION

For more information about the ‘Understanding Carbon’ visit the Australian Vegetable Industry Carbon Calculator website: www.vegiecarbontool.com.au

Click on the ‘Training’ tab at the top of the screen, and follow the links. Here you will find links to download the ‘Understanding Carbon: Manual’ and links to view the online video presentation of ‘Understanding Carbon’.

ATTACHMENTS:

Understanding Carbon Manual (.pdf)

Understanding Carbon Powerpoint presentation (.ppt)

Direct link to ‘Understanding Carbon’ training page on the Carbon Calculator website, from which the ‘Understanding Carbon’ manual can be downloaded.
http://www.vegiecarbontool.com.au/index.php?id=6

Direct link to ‘Understanding Carbon’ videos page on the Carbon Calculator website

http://www.vegiecarbontool.com.au/index.php?id=8

UNDERSTANDING CARBON

Manual

VG09152 Australian Vegetable Industry Carbon Footprint Tool: Grower Adoption and Education

arris

HAL

Know-how for Horticulture™

Understanding Carbon
Manual

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This Understanding Carbon manual is a product of the project VG09152 Australian Vegetable Industry Carbon Footprint Tool: Grower Adoption and Education, funded by Horticulture Australia Ltd, the Federal Government and Woolworths.

Graphic design, images and printing by:

Arris Pty Ltd
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Printed 2010 by Arris Pty Ltd

Project Overview

'Understanding Carbon' is a training program that has been designed specifically for the Australian Vegetable Industry. The training will give growers a clearer understanding of carbon footprinting: what it means to them as a grower and a business owner, how they can prepare for carbon footprinting, and the benefits of carbon footprinting to them and their business.

Growers will also be taught about the changes they can make to ensure they have a more sustainable farm and business. The training will be delivered using in-person seminars, as well as webinars (i.e. an online presentation, with sound via teleconference), in each State.

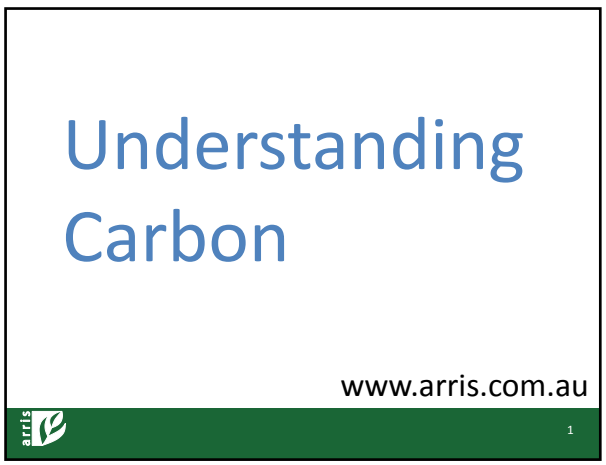
The program has been developed as a lead in to the introduction of a carbon calculator, which is currently being developed specifically for the Australian Vegetable Industry. It's anticipated that the online tool will be released in late 2010. This program has been funded by Horticulture Australia Limited and Woolworths with matching funds from the Federal Government.

This manual has been written as a resource to support the 'Understanding Carbon' training program. It provides Australian vegetable growers with all of the latest information on greenhouse gas emissions and associated carbon footprinting and management systems.

'Understanding Carbon' is being run as part of VG09152 Australian Vegetable Industry Carbon Footprint Tool: Grower Adoption and Education. This project supports VG09187 Australian Vegetable Industry Carbon Footprint Tool: Stage 2 (National Development and Adoption of the Tool).

The objective of this manual and the associated seminars is to provide information to growers regarding:

- the proposed mechanism of climate change;
- the different ways of calculating a carbon footprint;
- on-farm carbon footprints;
- product (vegetable) carbon footprints; and
- trends in the international marketplace.



Project Overview

- VG09152 – Australian Vegetable Industry Carbon Footprint Tool: Grower Adoption and Education ('Understanding Carbon' presentation)

and

- VG09187 - Australian Vegetable Industry Carbon Footprint Tool: Stage 2 (On-Farm Footprint Tool)

VG09187 – Australian Vegetable Industry Carbon Footprint Tool

- This tool will help growers to work out their on-farm carbon footprint.
- This tool is NOT for business comparisons.
- It will be used by growers for continual on-farm improvement - as Freshcare does for food safety.

Presentation Content

- Climate Change Background
- Carbon Accounting Methods
- The carbon footprint of an **Organisation**
  - National Greenhouse and Energy Reporting Act (NGER)
- The carbon footprint of a **Product**
  - Carbon labelling
- Becoming carbon neutral
  - Green marketing campaigns

Climate Change

Have you noticed a change in the climate?

Has it affected the way you grow your produce?

Over the past few decades, concerns associated with climate change have continually increased. Scientists are convinced that the world's climate is changing. The message we receive from mainstream media suggests that over recent decades droughts have increased, storm events have increased and rainfall patterns are changing. These effects are all considered 'elements' of climate change.

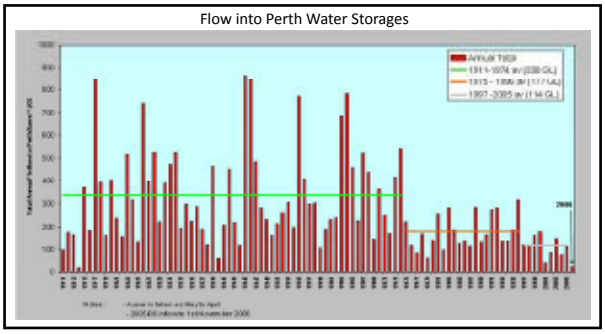
The Intergovernmental Panel on Climate Change (IPCC) is a leading scientific body, established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) to provide a clear scientific view on the current state of climate change and its potential environmental and socio-economic consequences (1).

The IPCC produces Assessment Reports, collating and summarising scientific consensus on climate change. Their Fourth Assessment Report (2007) concluded that the evidence of a warming climate is 'unequivocal' (2). There is strong evidence to suggest that human activity, namely the production and release of greenhouse gases into the atmosphere, is the major cause of climate change (1).

Major evidence of climate change occurring around the world includes:

- Arctic Sea ocean ice and glaciers diminishing [see Slide 8] (14);
- increased severe weather events;
- increase in average temperatures; and
- reduced rainfall run off [see Slide 10].

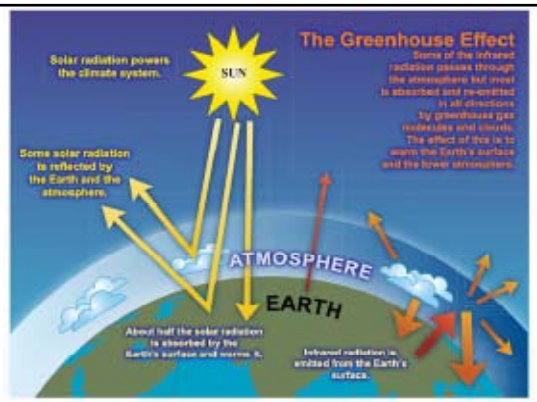
Importantly for the Australian Vegetable Industry, climate change has also resulted in reduced run off in many catchments in Australia due to changes in rainfall and


Flow into Perth Water Storages

increases in evaporation (3). Climate change may not just result in reduced rainfall, but is also likely to affect rainfall patterns with summer rains becoming more predominant in some areas. In some cases this reduction has been severe and has impacted dramatically on the water inflows into dams which supply communities with water. The figure above shows how rainfall levels have decreased in Perth. A decline of 10-20% in rainfall has seen a magnified reduction in dam inflow by 30-60%.

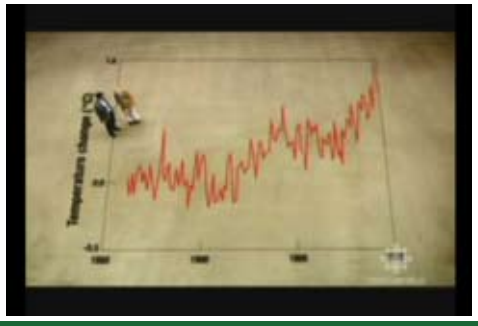
There are still some who debate whether or not climate change is occurring. This booklet presents the commonly held views of the Australian Government and the wider scientific community. It is worth noting that Australian observations and international scientific consensus support the claim that the average global temperature is increasing (4). There is never-the-less some uncertainties associated with climate change science.

Climate Change



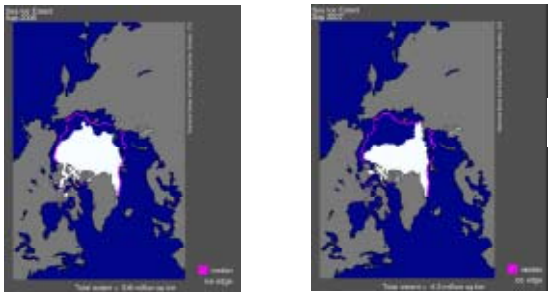
The Evidence

VIDEO



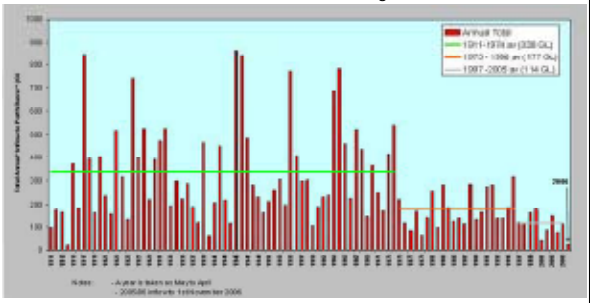
Arctic sea ice in 2005 & 2007

National Snow and Ice Data Centre



Reduced Run Off

Flow into Perth Water Storages



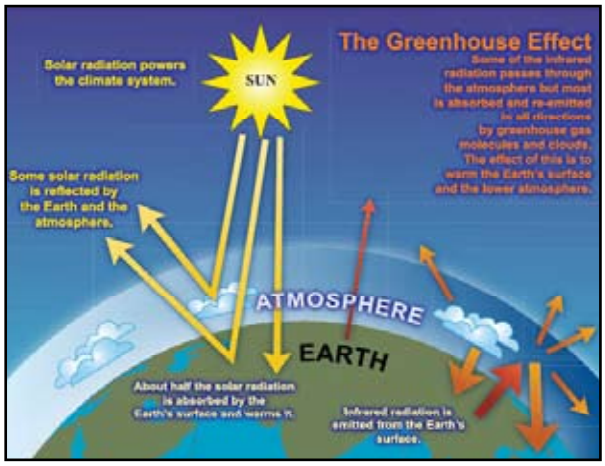
The Greenhouse Effect

Our planet is surrounded by gases, called the atmosphere. The atmosphere is predominantly comprised of nitrogen (78%), oxygen (21%) and argon (0.9%), along with a set of gases called greenhouse gases. These greenhouse gases act as a blanket, trapping the sun's heat and contributing to the warmth of the planet.

Greenhouse gases are important. Without them, the earth would be too cold to be habitable. Greenhouse gases are produced in nature, for example by volcanos. Human practices, such as burning fossil fuels, also create greenhouse gases. When the emissions are caused by humans we refer to this as an anthropogenic emission.

Since the industrial revolution the concentration of greenhouse gases in the atmosphere has been increasing.

The presence of greenhouse gases in the atmosphere (0.1% by volume) helps to keep the Earth's average global surface temperature at 14°C. That's 33°C warmer than if there were no greenhouse gases at all (2). This process is known as the greenhouse



effect (see the figure above), because the Earth's atmosphere behaves like the roof of a greenhouse. The gases in the atmosphere that are responsible for re-radiating heat towards the Earth's surface are known as greenhouse gases.

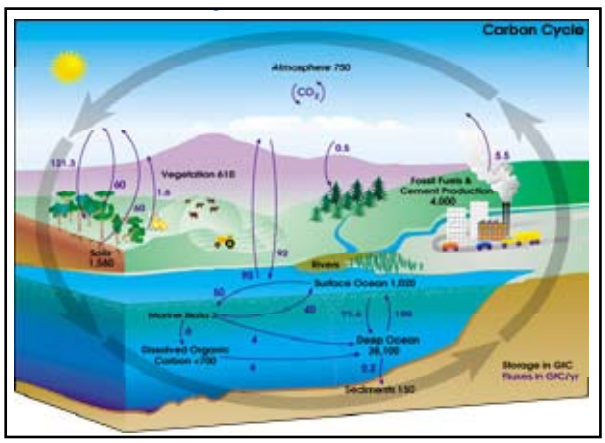
The main greenhouse gases arising from human activity, and associated with vegetable production, are:

- carbon dioxide;
- methane; and
- nitrous oxide.

The Carbon Cycle

The carbon cycle is used to illustrate the flows of carbon between the different systems that exist on earth. There are four main pools of carbon, which are:

- the atmosphere;
- the terrestrial biosphere, which is usually defined to include fresh water systems and non-living organic material, such as soil carbon;
- oceans, including dissolved inorganic carbon and marine biota; and
- sediments including fossil fuels (5).



The carbon cycle is made up of both long-term and short-term cycles. The short-term cycle includes the rapid exchange of carbon between plants and animals through respiration and photosynthesis, and through gas exchange between the oceans and the atmosphere (5).

An example of a short-term carbon cycle within the vegetable industry is photosynthesis associated with vegetable and vegetable plant growth. In the same way the decomposition of discarded parts of the plant are not considered an emission source.

Most carbon accounting methods exclude the short-term carbon cycle.

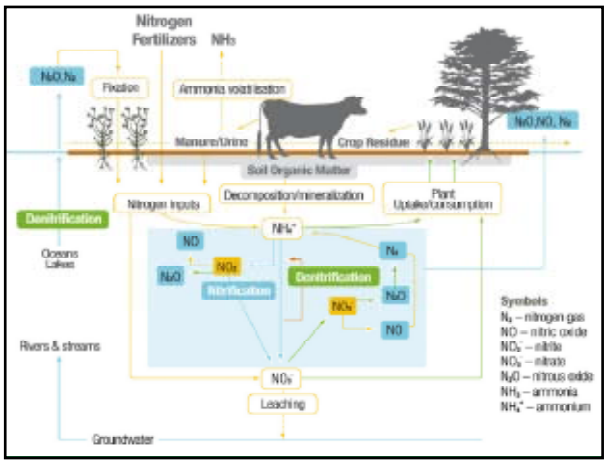
Note: The carbon footprinting tool in development for the vegetable industry (VG09187 Australian Vegetable Industry Carbon Footprint Tool: Stage 2) will ONLY account for the long-term carbon cycle.

The Nitrogen Cycle

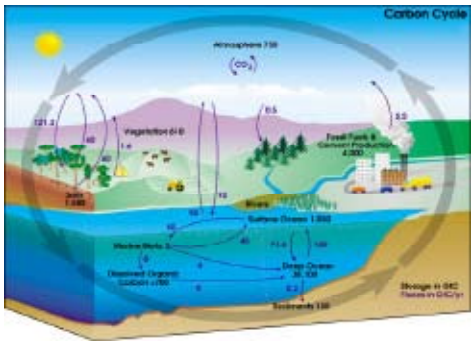
Nitrous oxide (N_2O) can be formed by a number of processes, and is determined by soil properties and external conditions such as moisture content, oxygen availability, amount and form of nitrogen and other influences such as tillage practices.

The chemical and biological pathways which see nitrogen, converted to N_2O is complex. The important thing to take away from the nitrogen cycle is that all forms of nitrogen, (i.e. synthetic, natural, organic or animal manure) added to soil will emit a varying degree of N_2O. This will contribute to the carbon footprint of your farm.

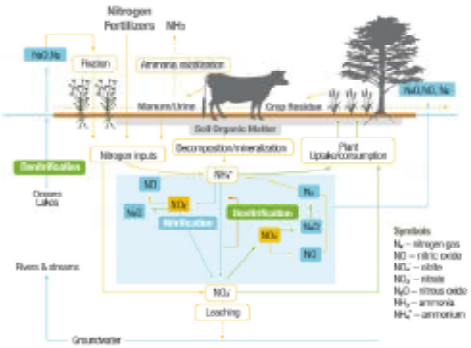
Note: The carbon footprinting tool in development for the vegetable industry (VG09187 Australian Vegetable Industry Carbon Footprint Tool: Stage 2) will account for N_2O emissions.



The Carbon Cycle



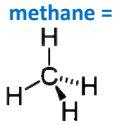
The nitrogen cycle



Global Warming Potential

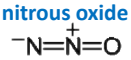
- Used to compare different gases
- Reporting regulations in Australia use:

methane = 21 x carbon dioxide



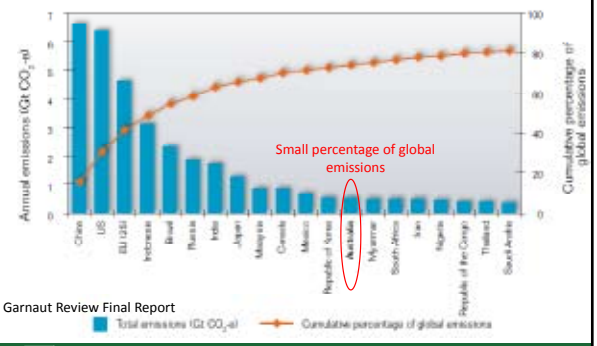
O=C=O

nitrous oxide = 310 x carbon dioxide

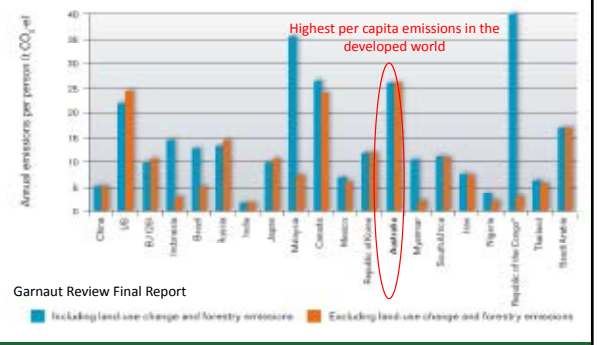


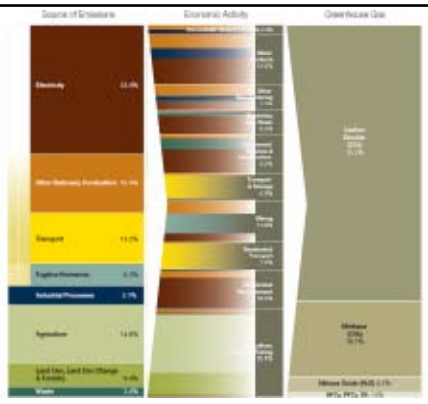
O=C=O

The 20 largest Emitters, c. 2004 data



The 20 largest Emitters, c. 2004 data





Carbon Accounting Methods

What is a carbon footprint?

There are a lot of different definitions for carbon footprinting. Basically, it is a neat ecological term to help us conceptualise our environmental impact. Your carbon footprint is a measurement of your environmental impact in terms of greenhouse gas emissions.

In Australia mandatory greenhouse gas accounting is only applicable to very large businesses and facilities. This is regulated by an emissions threshold. If your company emits more that 25 kilotonnes (1 kilotonne= 1000 tonnes) of carbon dioxide emissions (CO_2-e), then you must account for your carbon emissions under the National Greenhouse and Energy Reporting Act. [see Slide 30-31] You must also account for your carbon dioxide emissions if you consume or produce more than 100TJ of energy.

How much is 25kt of CO_2-e?

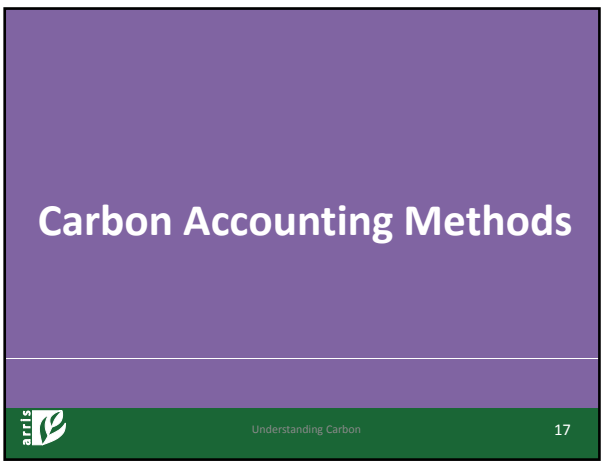
It's about the amount of emissions that would be generated from the consumption of 20,000-30,000 MWhr/yr of electicity. If that's difficult to picture, then consider this: 2,600,000 litres of diesel contains 100TJ of energy [see Slide 32]. Most, if not all, horticultural business will not exceed the mandatory threshold and therefore will not have to participate in mandatory carbon accounting. However, this does not mean that vegetable growers are excluded from the voluntary carbon accounting systems. In Australia, guidance on how to participate in the voluntary carbon market is found in the National Carbon Offset Standard (6).

Within the National Carbon Offset Standard there are two predominant methods used in quantifying carbon emissions. The first considers emissions associated with facilities, such as farms or steel works. For the purpose of vegetable growers anything within their farm gate is considered their facility. The Life Cycle Assessment completed using the Carbon Calculator Tool (VG09187 Australian Vegetable Industry Carbon Footprint Tool: Stage 2) will ONLY consider the activities within a growers fenceline that contribute to the production of vegetables. The other main form of accounting considers the carbon embedded in a particular product, such as a jar of jam or a bag of capsicums. This method accounts for all of the greenhouse gas emissions involved in producing a product, packaging it and delivering it to the point of sale and often beyond. Life Cycle Assessments are used to quantify emissions associated with a particular product.

Which method is suitable for you?

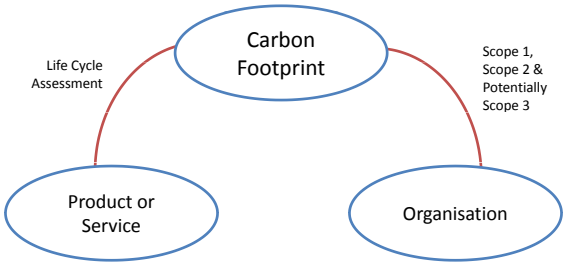
This will depend upon your carbon accounting requirements. Horticulture Australia in conjunction with the South Australian Research and Development Institute (SARDI) and Arris Pty Ltd are developing a vegetable carbon calculator (VG09187 Australian Vegetable Industry Carbon Footprint Tool: Stage 2) to simplify on farm emissions estimations for vegetable growers. It's anticipated the online tool will be available to use in late 2010. For more information about the tool and its development, visit:

www.vegiecarbontool.com



What is a carbon footprint?

The National Carbon Offset Standard



Carbon Footprint: The Farm

Understanding On-Farm Emissions

On-farm emissions can be thought of as all emissions occurring within the farm gate or farm boundary (see image below).

This might include emissions from:

- tractor operations;
- motorbike and ute operations;
- fertiliser application; and
- electricity (pumping, lighting and cooling).

Understanding the emissions that occur from your farm is a critical step in being able to reduce your overall carbon footprint.

On-farm emissions estimations are based on the World Resources Institute's Greenhouse Gas Protocol. The protocol is a widely used accounting tool for Governments and businesses to understand, quantify, and manage greenhouse gas emissions within their organisation or facility. The Greenhouse Gas (GHG) Protocol provides standards and guidance for companies preparing a greenhouse gas emissions inventory. It covers the six greenhouse gases within the Kyoto Protocol. The standard was designed to help companies calculate their greenhouse gas emissions fairly and consistently.

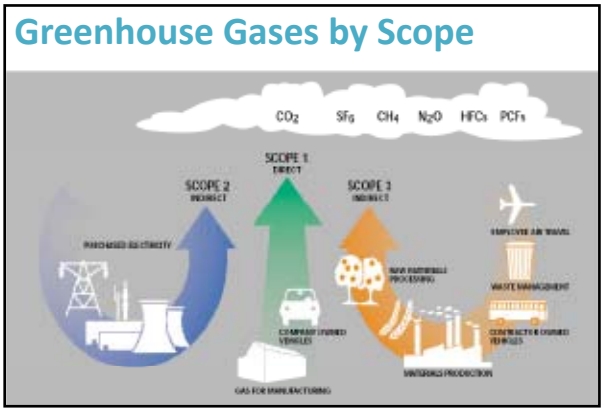
The GHG Protocol's main feature is the use of three 'Scopes' used to help delineate greenhouse gas emissions for accounting purposes.

The GHG Protocol clearly defines the Scope's as follows:

Scope 1: Direct greenhouse gas emissions. These are emissions that occur from sources directly controlled or owned by the company (i.e. emissions from tractors, utes, motorbikes and fertiliser applied to the farm).

Scope 2: Indirect greenhouse gas emissions from utilities (i.e. electricity).

Scope 3: Other greenhouse gas emissions.

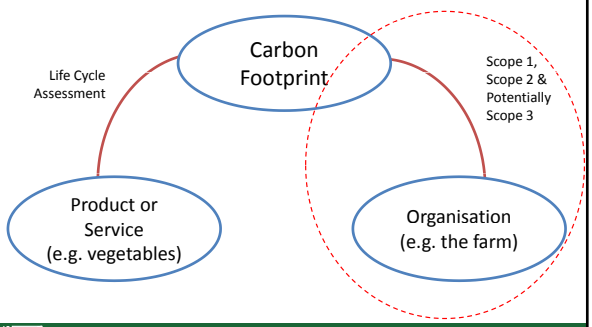


Scope 2 is reserved for emissions from the generation of purchased utilities. For the vegetable industry this is likely to be limited to electricity. Scope 2 emissions physically occur at the electrical generators site. However these emissions must be included within the greenhouse gas inventory of the company that uses this electricity.

Scope 3 emissions occur from sources not owned or controlled by the farm but are necessary to produce and sell that farms products. Examples include warehousing, freight and supermarket emissions.

Carbon Footprint: The Farm

The National Carbon Offset Standard



Carbon Footprint - Organisation

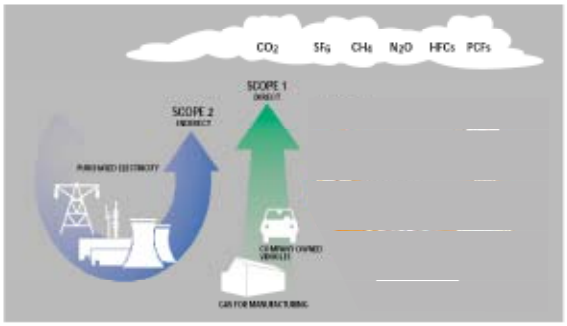
- Used by **corporations** and **governing** bodies
- Australian Government Methodologies
- Used internationally
- Identifies emission reduction opportunities
- Not sufficient for comparative purposes

The Organisation

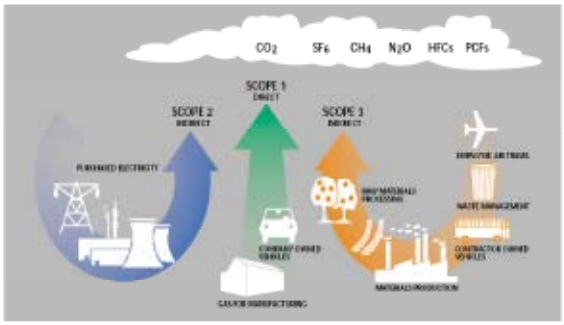
International Standard ISO14064

- The **GHG Protocol** was published in 2004
- The International Standards Organisation built on the method and formalised it **with ISO 14064, released in 2006**
- The two standards are **consistent** and can be used together in a **complimentary** manner

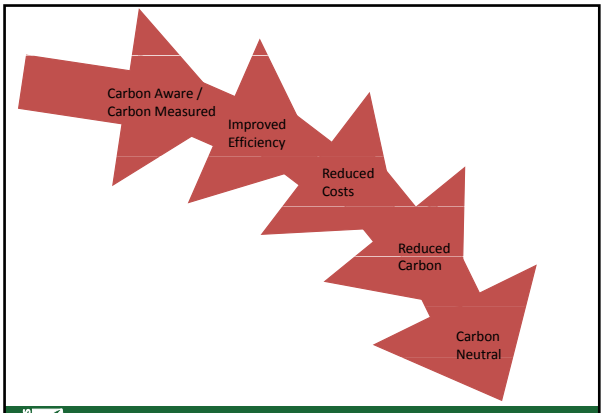
Greenhouse Gases by Scope

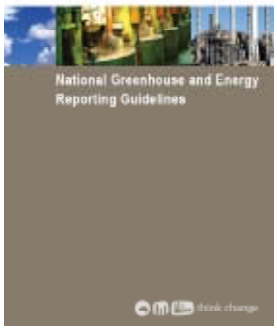


Greenhouse Gases by Scope



$GHG_{Diesel} = E_f \times Q_{Diesel}$





National Greenhouse and Energy Reporting Scheme (NGER)

NGER Thresholds

	2008 -2009 Reporting year 1	2009 -2010 Reporting year 2	2010 - onwards Reporting year 3 onwards
Facility thresholds	25 kt CO_2-e 100 TJ	→	
Corporate group thresholds	125 kt CO_2-e 500 TJ energy	87.5 kt CO_2-e 350 TJ energy	50 kt CO_2-e 200 TJ energy
Corporations to apply for registration by	31 August 2009	31 August 2010	31 August 2011
Corporations to report by	31 October 2009	31 October 2010	31 October 2011
Government to publish data by	28 February 2010	28 February 2011	28 February 2012

How much is 100 TJ energy or 25ktCO_2-e GHG emissions?

- **20,000-30,000 MWhr/yr** of electricity consumption, depending on state
- **2,600 kL** of Diesel is 100TJ (but only 7 kt CO_2-e)
- **3,000 kL** of Petrol is 100TJ (but only 6.9 kt CO_2-e)

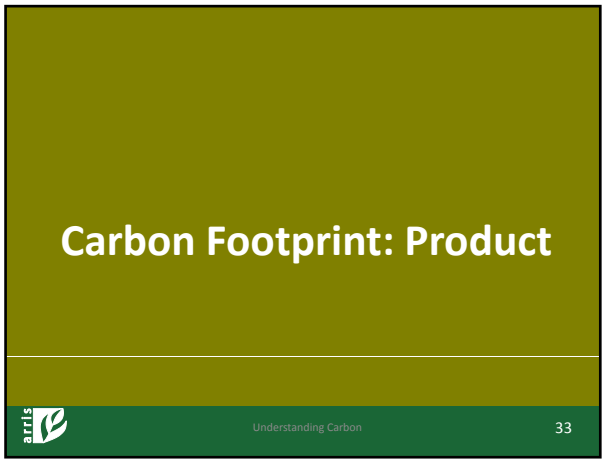
Carbon Footprint: Product

Understanding Life Cycle Emissions

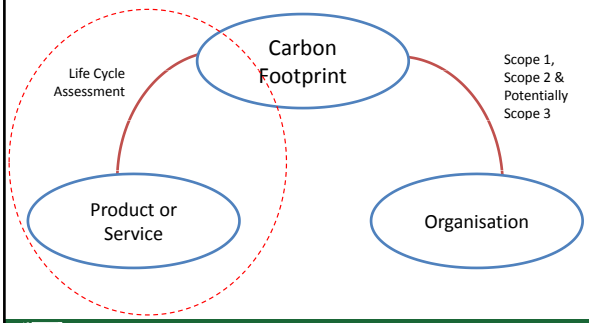
The National Carbon Offset Standard also provides guidance for companies wishing to make claims about the carbon impact of the products they produce. For the vegetable industry, 'products' refers to the vegetables being grown and sold by a grower.

In order to calculate the emissions associated with products, the National Carbon Offset Standard recommends the use of Life Cycle Assessment (LCA). This is a method used to identify the environmental impact of a product over all stages of the product's life including growing, harvesting, processing, warehousing, transport, cooking and waste disposal (7).

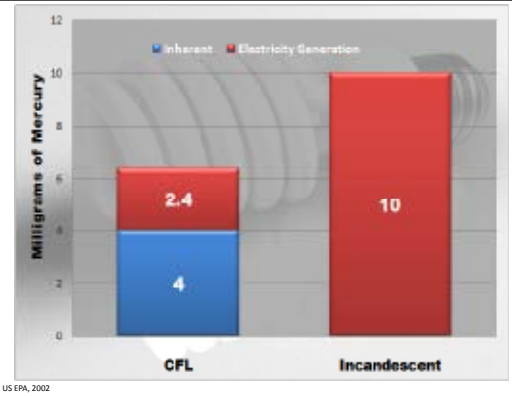
When completing a Life Cycle Assessment, the scope, including system boundary and level of detail, depends on the subject and the intended use of the study. The depth and the breadth of an LCA can differ considerably depending on the goal of a particular Life Cycle Assessment.



The National Carbon Offset Standard



VIDEO

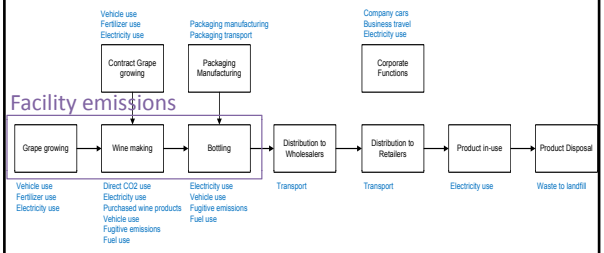


Source: US EPA, 2002

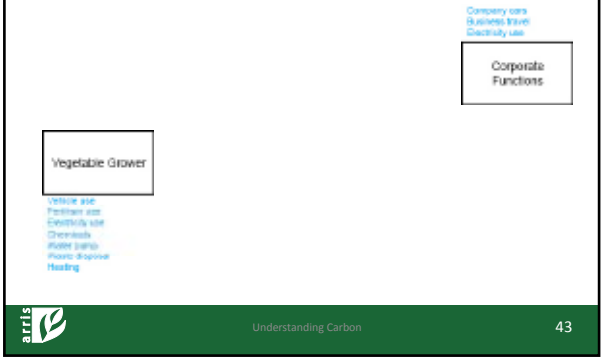
Product Example

- This example looks at carbon dioxide and chip production
- A breakdown of the carbon in a life cycle assessment from the farm to landfill
- The percentage figures are the greenhouse gas contributions for each component of the value chain

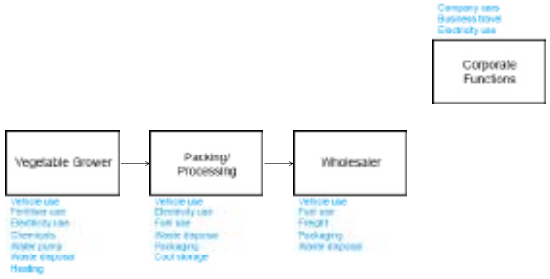
Life Cycle Example – Winery



Life Cycle Example – Producer



Life Cycle Example – Producer/Packer/Wholesaler



Life Cycle Example – Producer/Packer/Wholesaler

Understanding Carbon 45

Carbon Labelling

At this point there is NO statutory or regulatory requirement for Australian growers to comply with any carbon labelling for produce/products sold on the Australian market.

However, recent research suggests that more than 70% of Australian and New Zealand consumers would value information about the carbon footprint of a product when making purchasing decisions (8).

Internationally some entrepreneurial producers have capitalised on this by developing and using a 'carbon label' which presents the life cycle carbon emissions associated with the product in much the same way as the fat and salt content are displayed on food products.

The purpose of a carbon label is to communicate to the consumer the carbon impact of particular products. The objective is to give consumers an opportunity to make informed decisions on the items they purchase.

On an international scale, retailers are increasingly investing in the development of carbon labelling programs for food and grocery items. The examples above can be found on products in supermarkets in the UK, France and Japan.

Carbon Labelling in Australia

At present there are no products with a carbon label sold on Australian supermarket shelves. However, several retailers around the world (including retailers in Australia) are currently reviewing carbon footprint methods with a view to including them in supplier guidelines. This may include the use of carbon labels, or the establishment of minimum standards for emissions performance.

Environmental group Planet Ark are aiming to introduce carbon labelling in Australia towards the end of 2010. But supermarket chains in Australia, including Woolworths who have sponsored this training program, are not enforcing carbon labelling as a requirement at this stage.

A spokesperson from Woolworths Supermarkets has said they do not intend to introduce carbon labelling to their products in the near future. They do however support vegetable growers in making sustainable choices on their farms. Woolworths said carbon labelling would most likely only be introduced if their customers requested it in the future.

NOTE: Carbon labelling may be a market access issue for Australian businesses seeking to access international markets.

International Examples

Carbon Labelling

- The **purpose** is to communicate the **carbon impact** of a product
- The **objective** is to provide an opportunity for consumers to make **informed decisions** on the items they purchase
- Carbon labelling internationally, has been driven by **consumers** not **retailers**

Carbon Labelling and Retailers

VIDEO

Just-food

UK: Tesco adds carbon footprint to milk

18 August 2009| Source: just-food.com

Tesco yesterday (17 August) began including carbon footprint information on milk as part of the UK retailer's aim for all its products to carry carbon labels.

Tesco has set the target of having "footprinted" 500 products by the end of the year.

The move comes in response to increasing awareness among consumers of the impact of the food supply chain on climate change. According to Tesco, 50% of shoppers now understand the meaning of the term "carbon footprint", up from 32% last year.

Tesco also said that consumers increasingly "want to be green", with over half of shoppers included in its survey stating that they would actively seek out products that had lower carbon footprints.

Tesco community and government director David North said that Tesco had decided to introduce carbon labels to milk because it is a "prominent", "iconic" product that will enable the company to help consumers "understand climate change".

Carbon Labelling Internationally

Carbon Labelling in Australia

Carbon labels on food to be introduced in 2010

THE AUSTRALIAN

GROCERY shoppers bewildered by nutritional information disclosing a product's fat content and sugar levels may soon be confronted with a new label revealing its greenhouse gas emissions.

Consumers will be able to compare, buy and reject products based on their greenhouse emissions as early as next year after the launch of a carbon footprint labelling scheme today. Australia will be the third country, after Britain and the US, to get the foot-shaped Carbon Reduction Label, which is being billed as the greenhouse equivalent of a nutritional panel.

Environmental group Planet Ark will run the voluntary scheme in conjunction with Britain's Carbon Trust.

Becoming Carbon Neutral

'The Jewel in the Crown...'

There are many companies who are keen to promote their 'green' credentials by developing and marketing carbon neutral products. Most products that are sold as carbon neutral still have carbon emissions associated with their life cycle; however, these emissions are balanced out by the use of carbon offsets. Carbon offsets can be thought of as negative carbon emissions. One tonne of carbon offsets cancels out one tonne of carbon emissions.

When embarking upon a carbon neutrality project it is important to note that the National Carbon Offset Standard makes it clear that any carbon neutrality projects associated with products must use Life Cycle Assessment techniques to estimate the carbon impact of products. They recommend the use of ISO 14040-44, which includes a peer review stage to ensure all emissions have been accurately accounted.

Carbon offsets can take many forms but are generally produced through forestry, methane capture or renewable energy projects. The Victorian Environmental Protection Authority and RMIT University have developed a very informative website about carbon offsets.

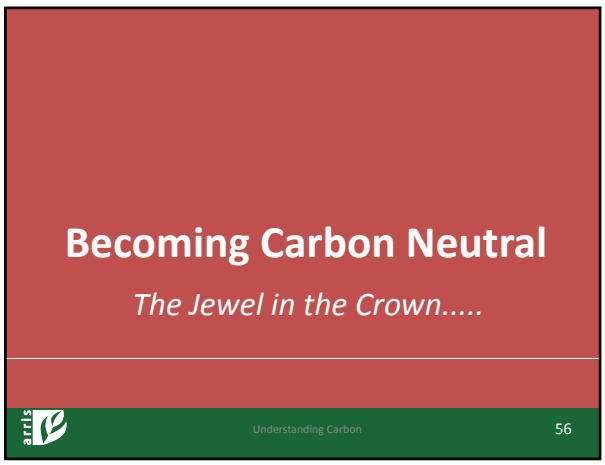
www.carbonoffsetguide.com.au

Taylors

One Australian company has chosen to brand some of their products as Carbon Neutral. Taylors have completed a Life Cycle Assessment on their 'Eighty Acres' wines to show that it is 100% carbon neutral.

www.taylorswines.com.au/eighty-acres

This decision has been beneficial to the company, who gained significant publicity for their product when it was chosen to be served at an official function at the 2009 United Nations Climate Change Conference in Copenhagen, Denmark. Since the Summit, Taylors have signed a deal to distribute the 'Eighty Acres' range in Denmark. (9)



Carbon Offsets and Carbon Neutrality

- The National Carbon Offset Standard
- Carbon offset program with real credibility
- Can be used in product marketing
- ISO 14044 – Life Cycle Assessment

Carbon Neutral Products

Forest Sinks

As many vegetable producers are land holders, it may be possible for growers to produce carbon offsets by establishing forest sinks. To create a forest sink, growers must meet a number of requirements.

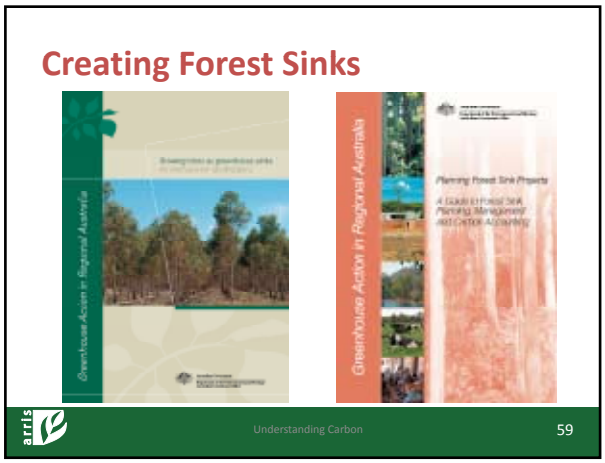
The plantation must:

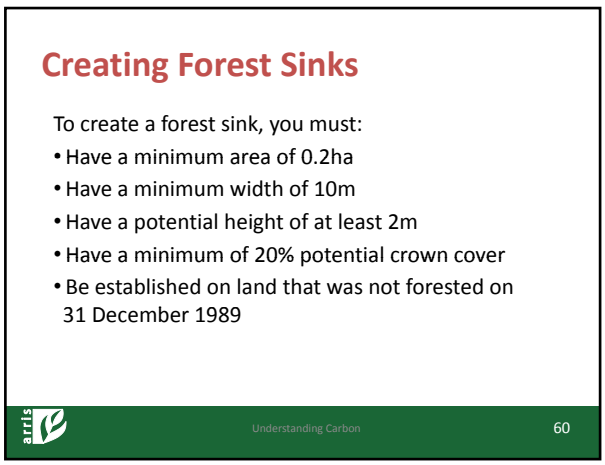
- have a minimum area of 0.2 hectares;
- have a minimum width of 10 metres;
- have a potential height of at least 2 metres;
- have a minimum of 20% potential crown cover; and,
- be established on land that was not forested on 31 December 1989.

Gaining certification of a forest to generate saleable offsets can be a costly exercise, which could exceed $100,000. To reduce this cost, small growers and landholders may want to consider pooling forests so that one certifier can consider a number of different plantations in the same exercise.

Further information on forest sink projects is available at the Department of Climate Change website.

www.climatechange.gov.au/land/forest-sinks.html





Greenwashing

The term ‘greenwashing’ is used to explain misleading environmental claims. For example, stating that your products are carbon neutral when this is not the case is considered to be ‘greenwashing’. The Australian Competition and Consumer Comission (ACCC) monitors ‘green’ claims in the marketplace and has prosecuted a number of companies who have misled consumers.

The ACCC recently released a report on how the Trade Practices Act applies to claims about carbon embedded in goods and services (10). The actual legislation, which is important with regard to ‘greenwashing’ is the Trade Practices Act which prohibits misleading and deceptive conduct. It is important to note the Act also prohibits acts that are likely to mislead or deceive.

Further information on ‘green’ marketing can be found on the ACCC’s website.

http://www.accc.gov.au/content/index.phtml/itemId/815763

For specific information about carbon claims and the Trade Practices Act please refer to:

http://www.accc.gov.au/content/index.phtml/itemId/833279

Greenwashing Case Studies

Saab Australia’s “Grrrreen” campaign

Between 27 July and 1 September 2007, GM Holden, trading as Saab Australia, published newspaper and magazine advertisements across Australia promoting the Saab range of motor vehicles. The “Grrrrreen” campaign used phrases such as “Every Saab is green. With carbon emissions neutral across the entire Saab range” and “Shift to Neutral”.

In proceedings undertaken by the Australia Competition and Consumer Commission (ACCC), the Federal Court found GM Holden Ltd’s claims to be false and misleading (11). For example, the advertisements said that in the first year following the purchase of a Saab motor vehicle, GM Holden would plant, on behalf of the purchaser, 17 native trees which would offset the carbon dioxide emissions for the life of that motor vehicle. When in fact, the 17 trees would only provide a carbon dioxide emission offset for a single year’s operation of the motor vehicle. [Slide 62]

Coopers

A Coopers marketing campaign was investigated by the Australian Competition and Consumer Commission (ACCC) in 2008, after the company claimed that its beer was better for the environment. The advertisements labelled Coopers as Australia’s greenest beer, and used the line “big beer – tiny footprint.” (12)

Consumer organisation ‘Choice’ complained about the ads to the ACCC, saying they were false and misleading (13).

Coopers ended up changing their slogan to “Reduce Carbon Emissions: Walk to the pub.” [Slide 63]

Greenwashing

Greenwash – *verb:* the act of misleading consumers regarding the environmental practices of a company or the environmental benefits of a product or service.

TerraChoice 2007

Saab 'Grrrrrreen' claims declared misleading by Federal Court

www.accc.gov.au

September 18 2008

ACCC to probe green beer claims

www.theage.com.au

August 25, 2008

The ACCC and carbon claims

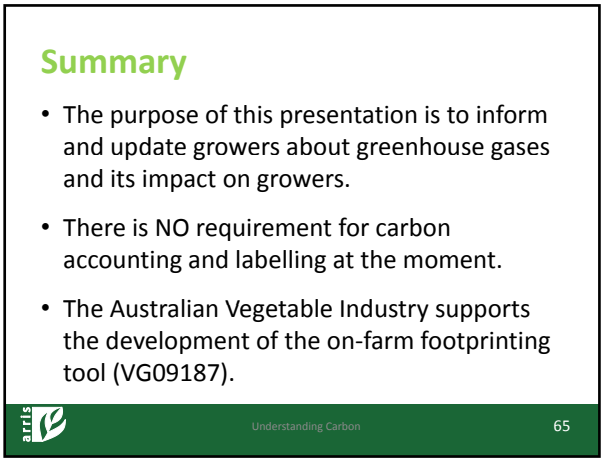
- Think about the **message** that will be taken away by your target audience
- Provide accurate and complete information to consumers
- Misleading conduct can include **silence**
- **Clarify** your carbon claims
- When making claims of **carbon neutrality**, spell out exactly what is included in your claim to avoid misleading consumers
- If you are making statements as to the future, ensure you have a **reasonable basis**

Summary

The purpose of the 'Understanding Carbon' presentation and this supporting manual is to inform and update Australian vegetable growers about greenhouse gases and its impact on growers.

While it is not compulsory for growers to calculate their on-farm carbon footprint at this stage, it is becoming increasingly important for growers to be aware of the concept as it may be more greatly introduced by industry or retailers in the future.

The Australian Vegetable Industry has shown its interest in carbon footprinting by supporting the development of the on-farm footprinting tool (VG09187Australian Vegetable Industry Carbon Footprint Tool: Stage 2).



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Horticulture Australia Pty Ltd Climate Research Programs

Current* Programs/Projects (*Information current as of 13/05/10)

* Across-horticulture program
* Climate Change Research Strategy for Primary Industries – Phase 2
* Managing Climate Variability Program
* Critical thresholds ('tipping points') and climate change impacts/adaptation in horticulture (HG08037)
* Vegetable Carbon Footprint Project (VG09142)

Completed Programs/Projects

* Australian horticulture's response to climate change and climate variability (AH06019)
* Climate Change Research Strategy for Primary Industries – Phase 1
* Houston's Farm Carbon Footprint project (VG07195)
* Scoping study into climate change and climate variability for the vegetable industry (VG05051)
* Understanding and identifying the threats and opportunities posed by climate change for the banana industry (BA08014)
* Vegetable Industry Carbon Footprint Scoping Study - Discussion Papers and Workshop (VG08107)

For more information about these projects visit:
http://www.horticulture.com.au/areas_of_Investment/Environment/Climate/climate_research_programs.asp?src=side

Understanding Carbon

www.arris.com.au

Project Overview

- VG09152 – Australian Vegetable Industry Carbon Footprint Tool: Grower Adoption and Education (‘Understanding Carbon’ presentation)

and

- VG09187 - Australian Vegetable Industry Carbon Footprint Tool: Stage 2
(On-Farm Footprint Tool)

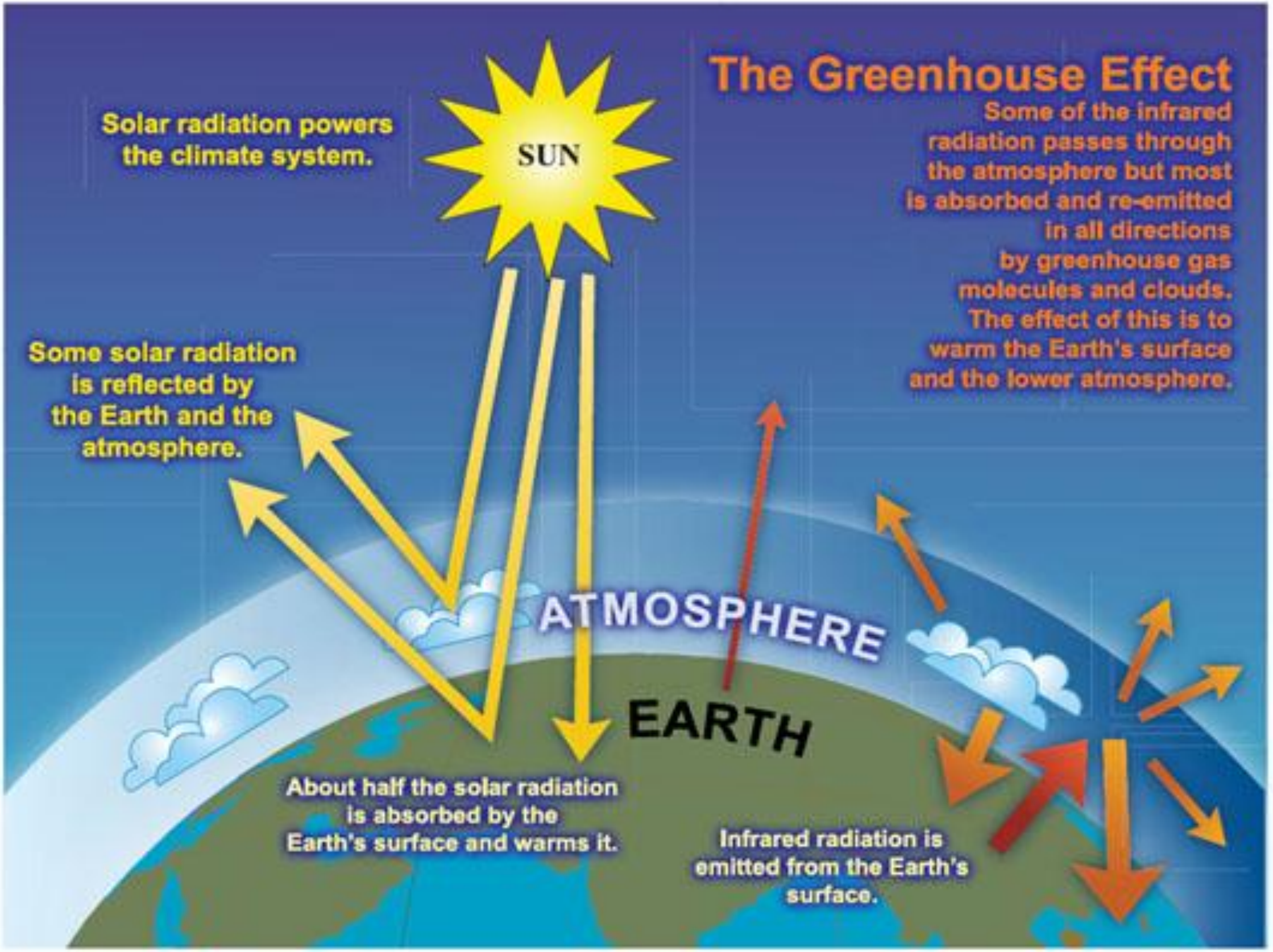
VG09187 – Australian Vegetable Industry Carbon Footprint Tool

- This tool will help growers to work out their on-farm carbon footprint.
- This tool is NOT for business comparisons.
- It will be used by growers for continual on-farm improvement - as Freshcare does for food safety.

Presentation Content

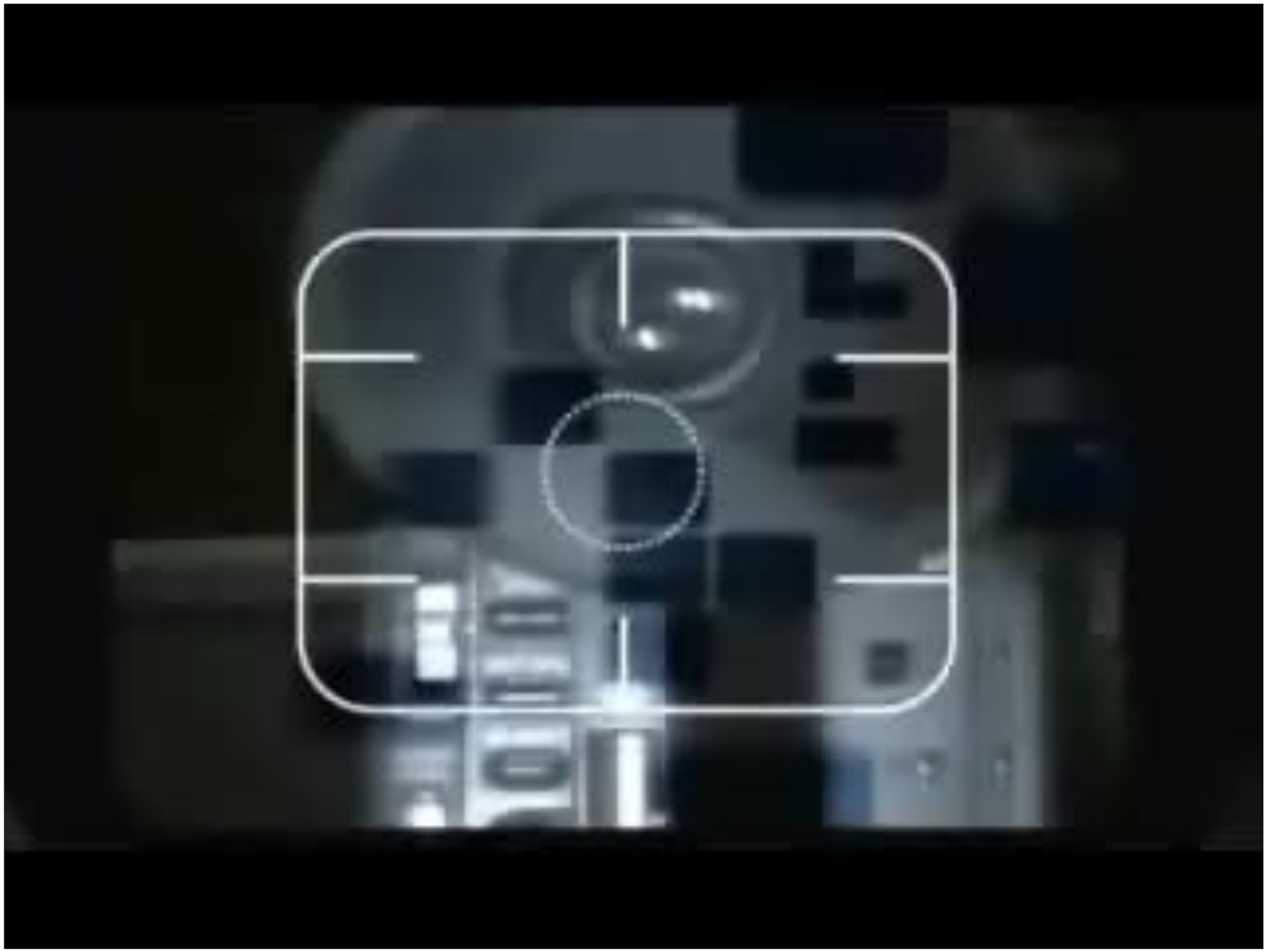
- Climate Change Background
- Carbon Accounting Methods
- The carbon footprint of an **Organisation**
  - National Greenhouse and Energy Reporting Act (NGER)
- The carbon footprint of a **Product**
  - Carbon labelling
- Becoming carbon neutral
  - Green marketing campaigns

Climate Change


The Greenhouse Effect
Solar radiation powers the climate system.
SUN
Some of the infrared radiation passes through the atmosphere but most is absorbed and re-emitted in all directions by greenhouse gas molecules and clouds. The effect of this is to warm the Earth's surface and the lower atmosphere.
Some solar radiation is reflected by the Earth and the atmosphere.
ATMOSPHERE
EARTH
About half the solar radiation is absorbed by the Earth's surface and warms it.
Infrared radiation is emitted from the Earth's surface.

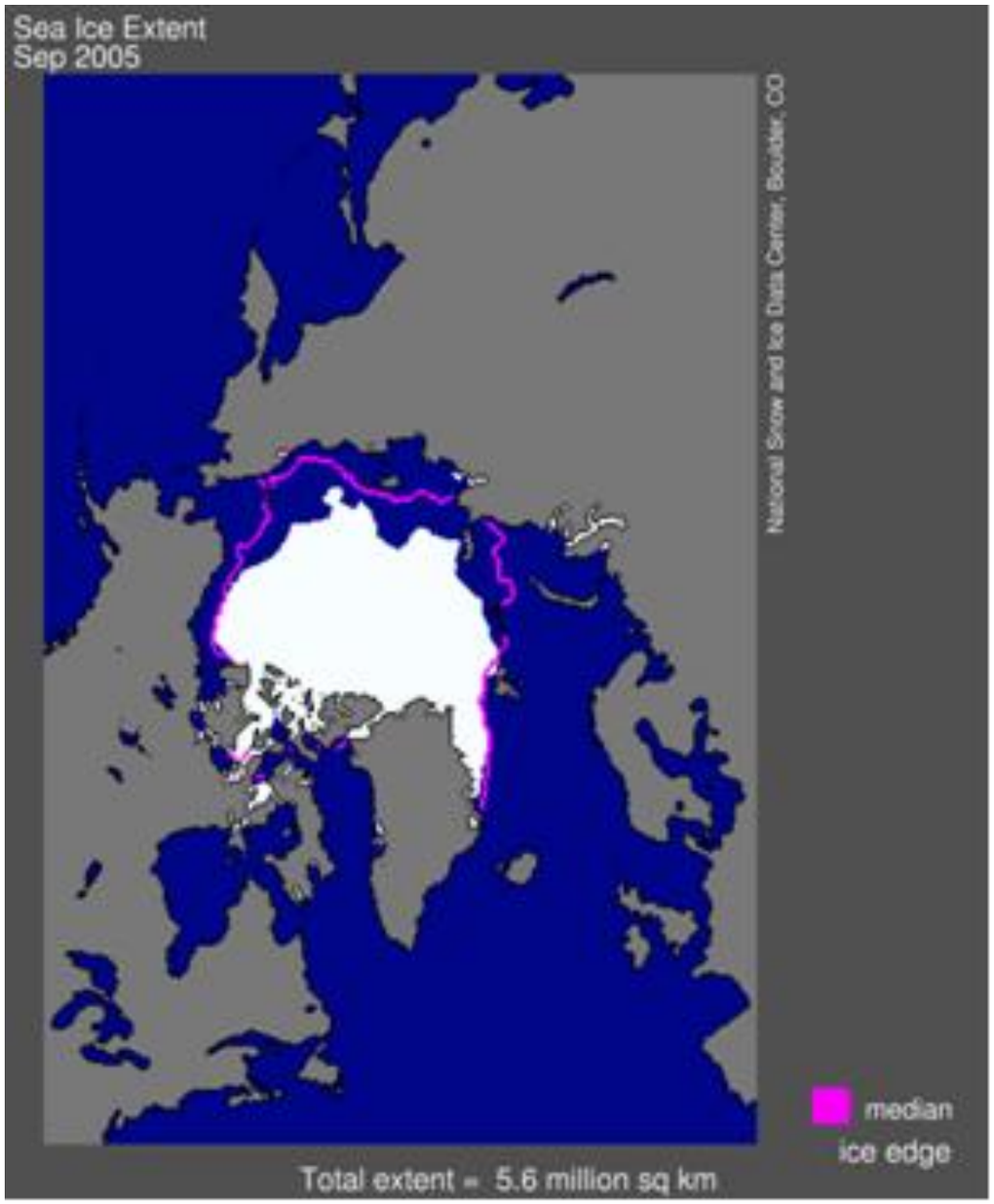
The Evidence

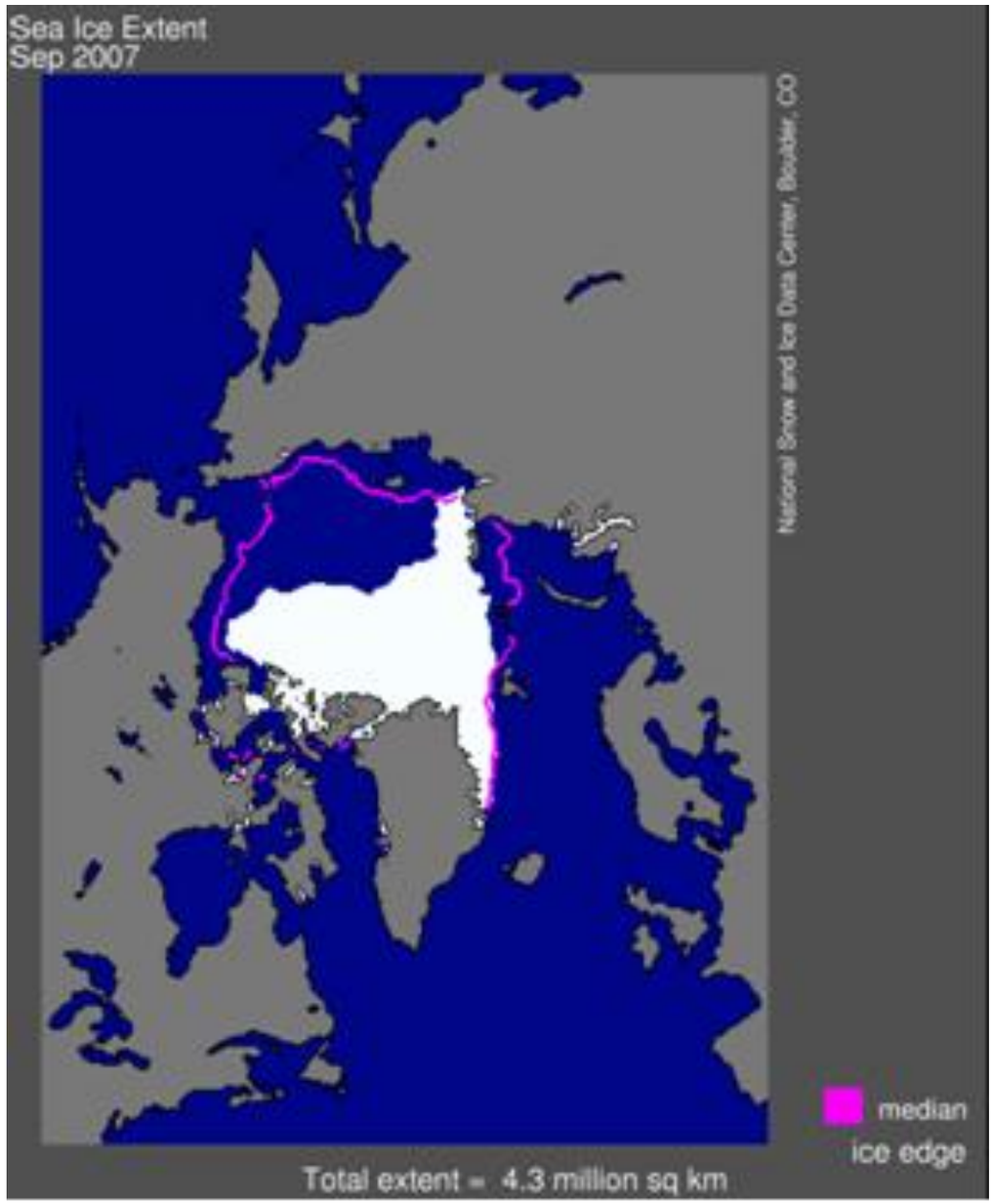
VIDEO



Arctic sea ice in 2005 & 2007

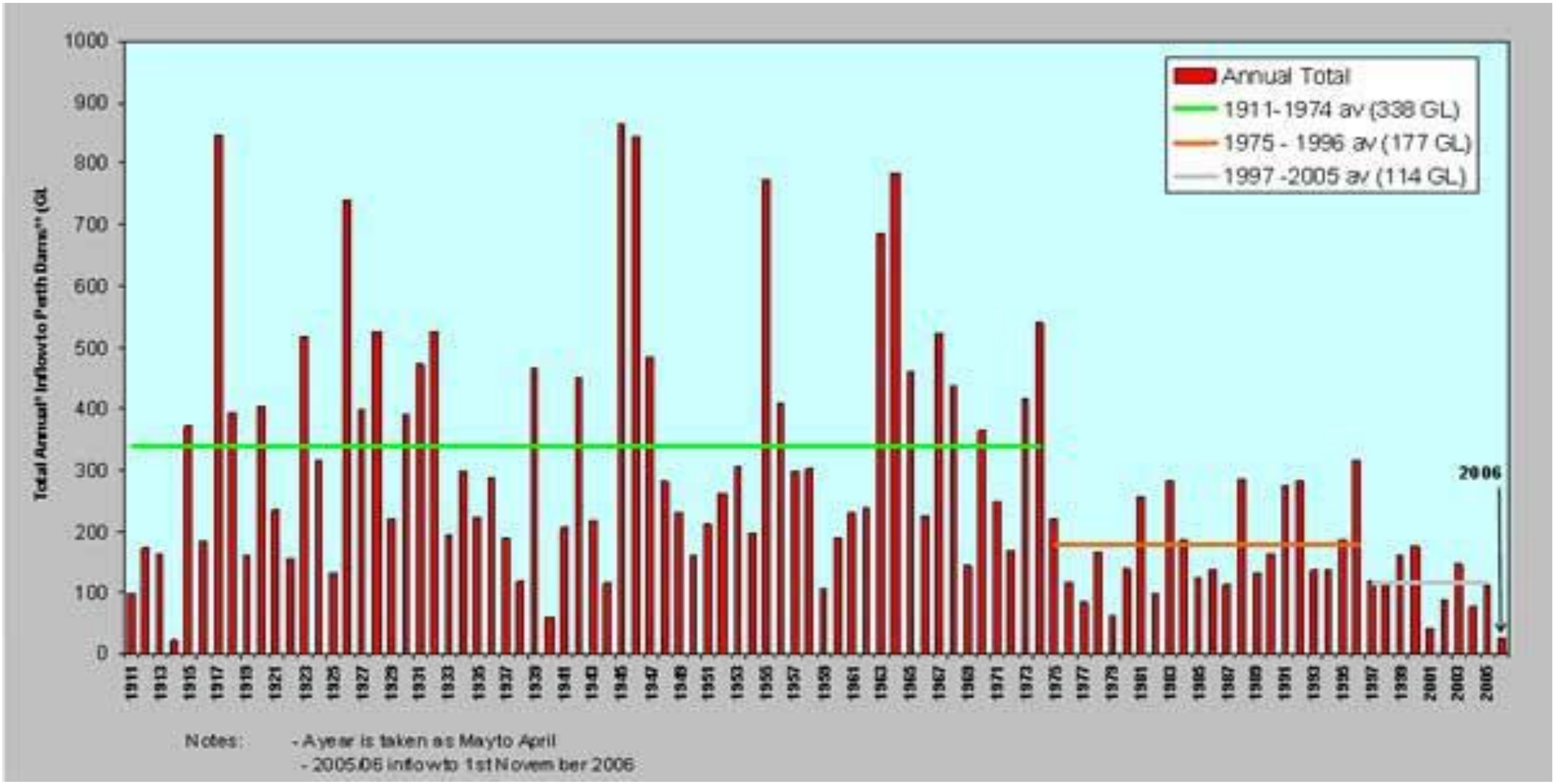
National Snow and Ice Data Centre



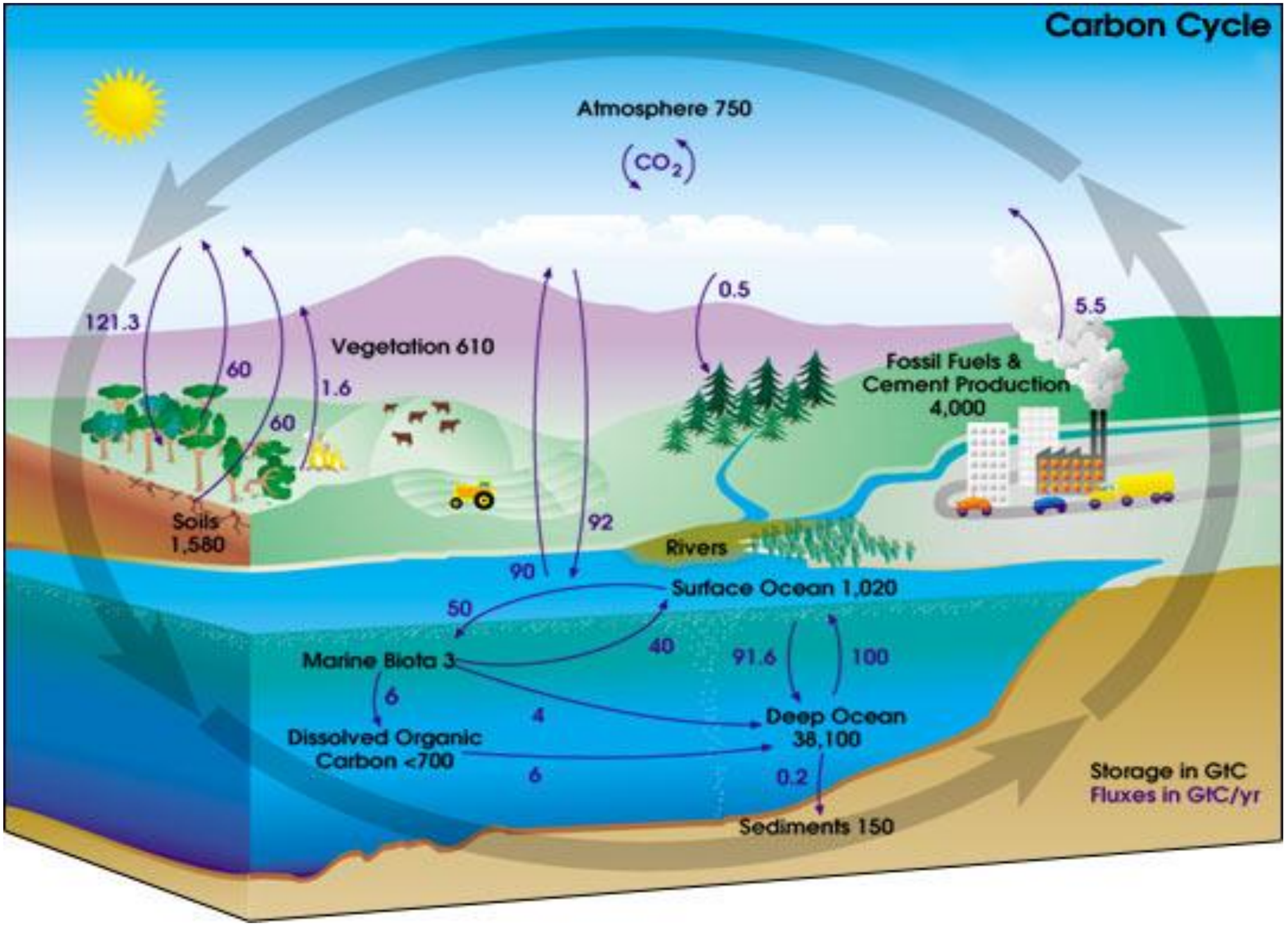


Reduced Run Off

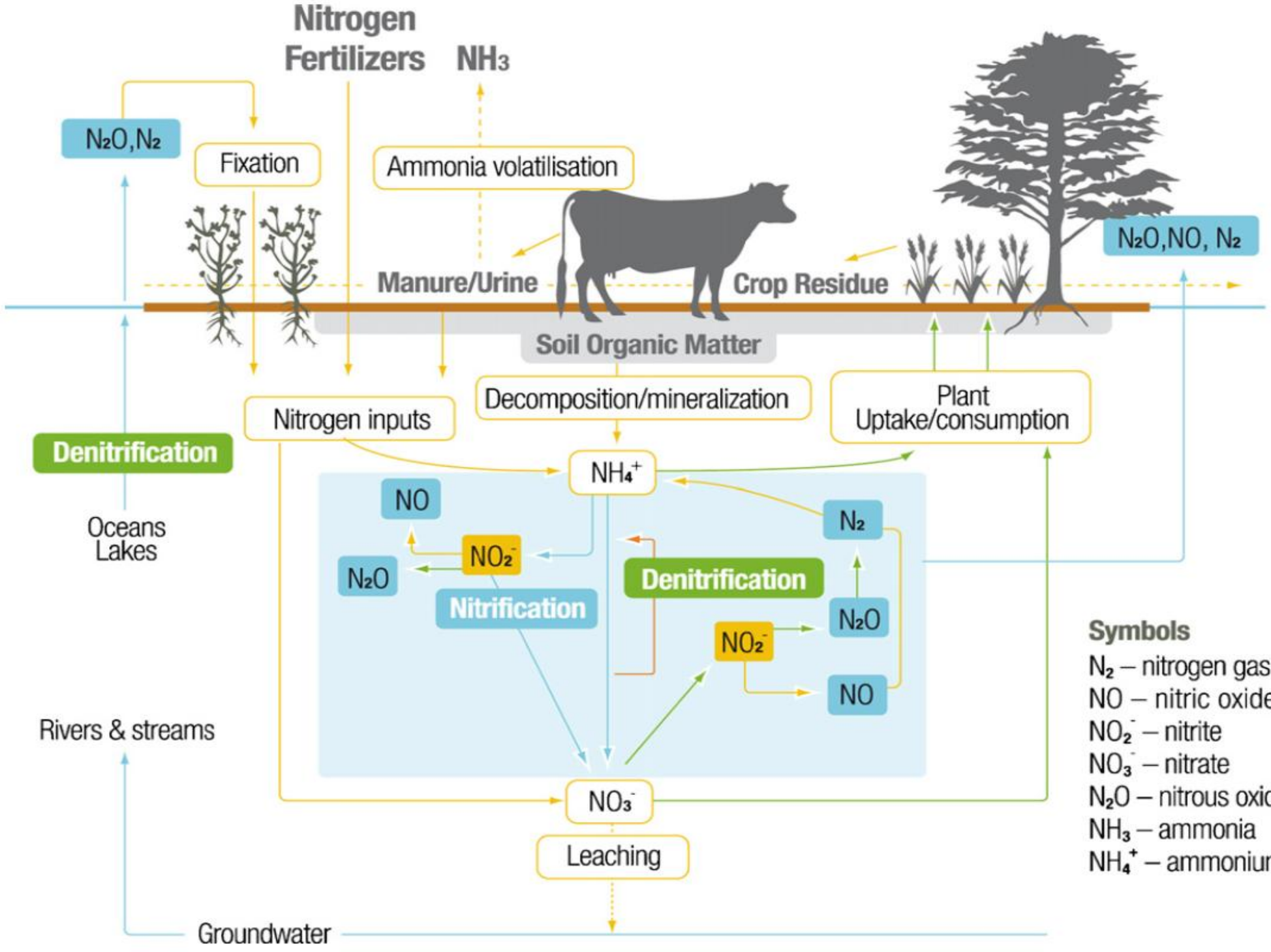
Flow into Perth Water Storages



The Carbon Cycle



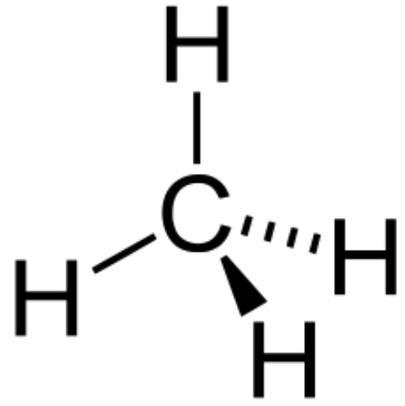
The nitrogen cycle



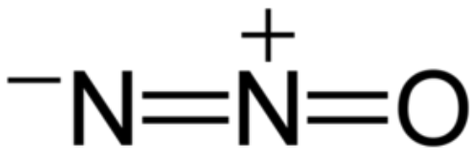
Global Warming Potential

- Used to compare different gases
- Reporting regulations in Australia use:

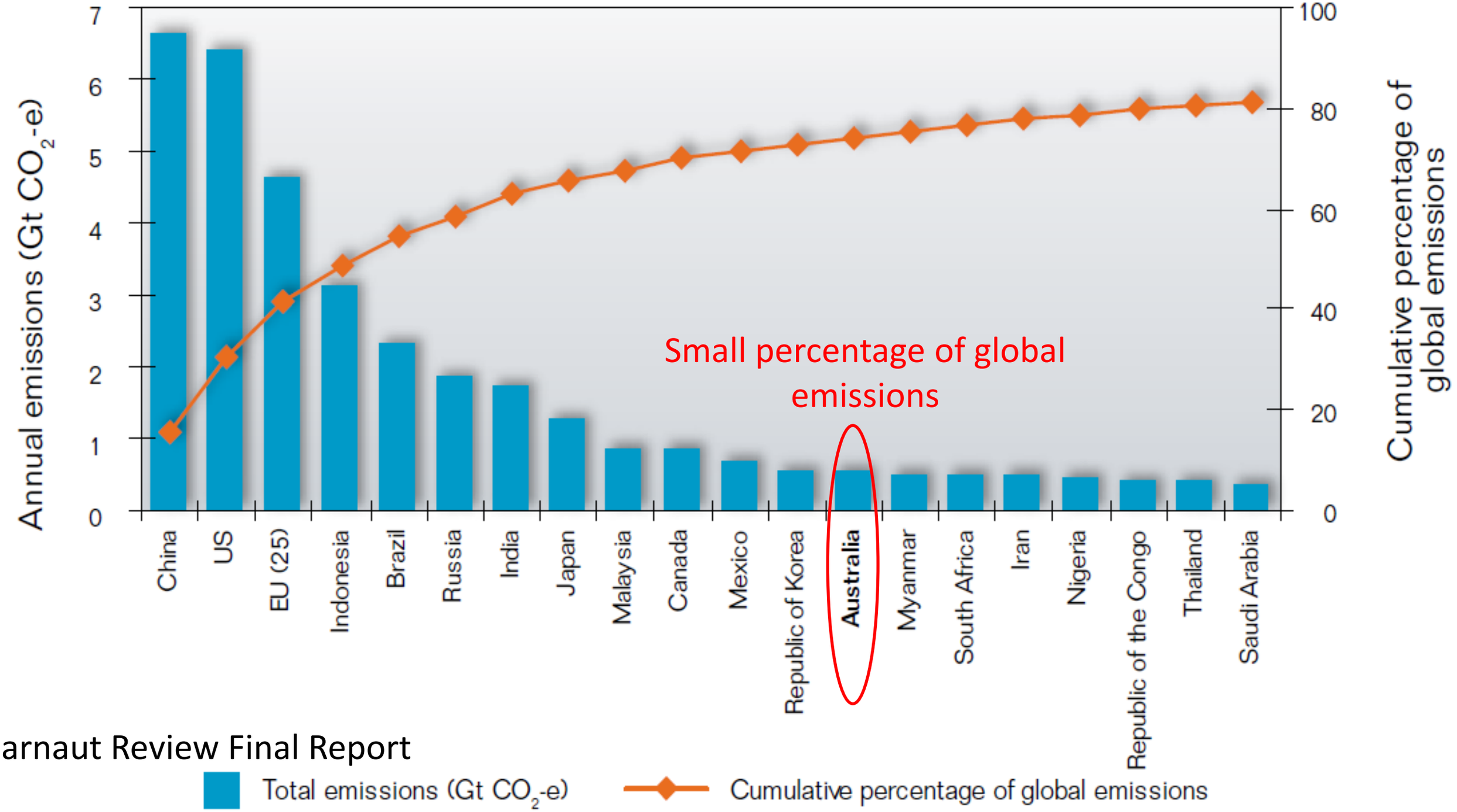
methane = 21 x carbon dioxide



nitrous oxide = 310 x carbon dioxide

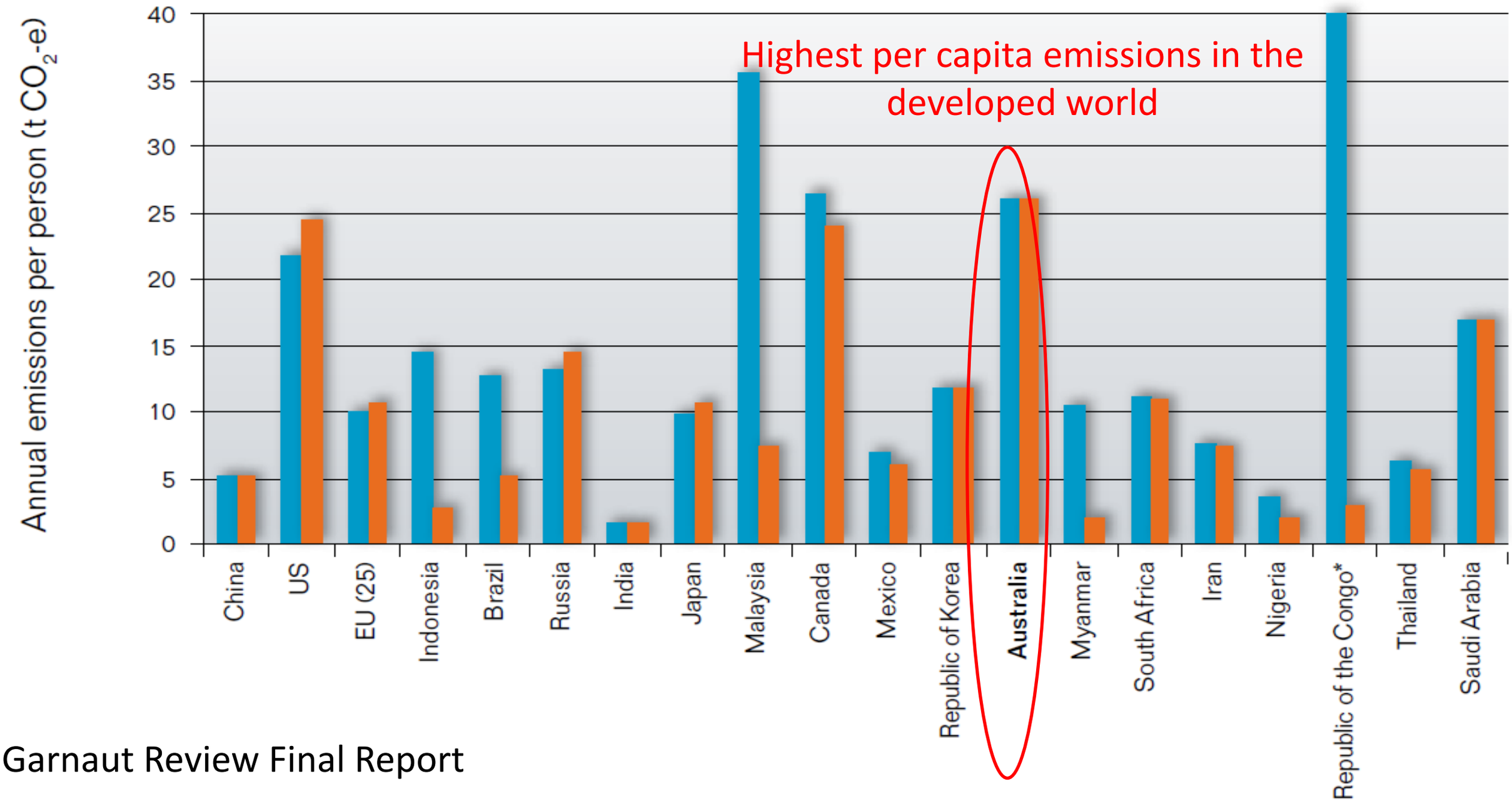


The 20 largest Emitters, c. 2004 data

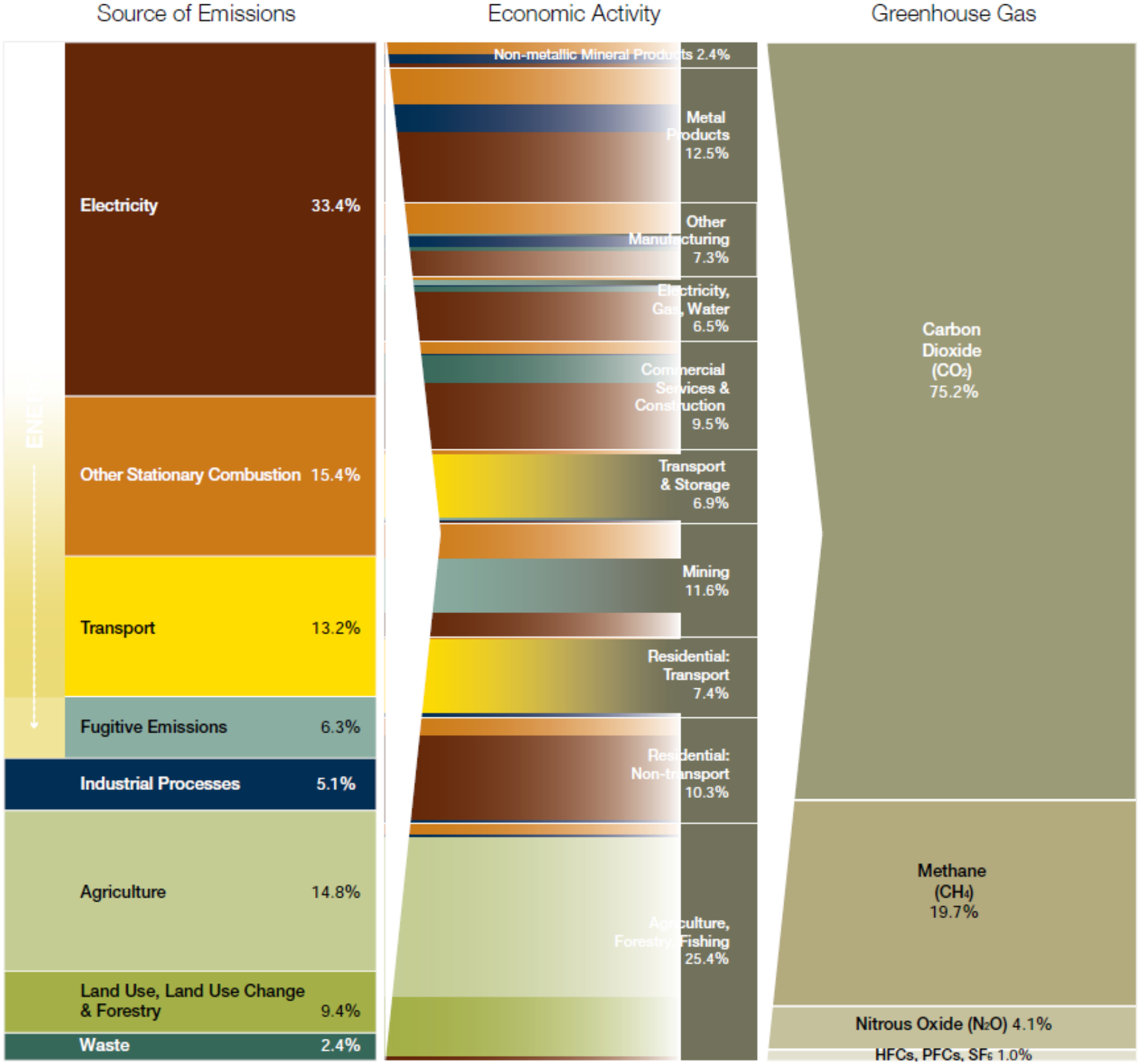


Garnaut Review Final Report

The 20 largest Emitters, c. 2004 data



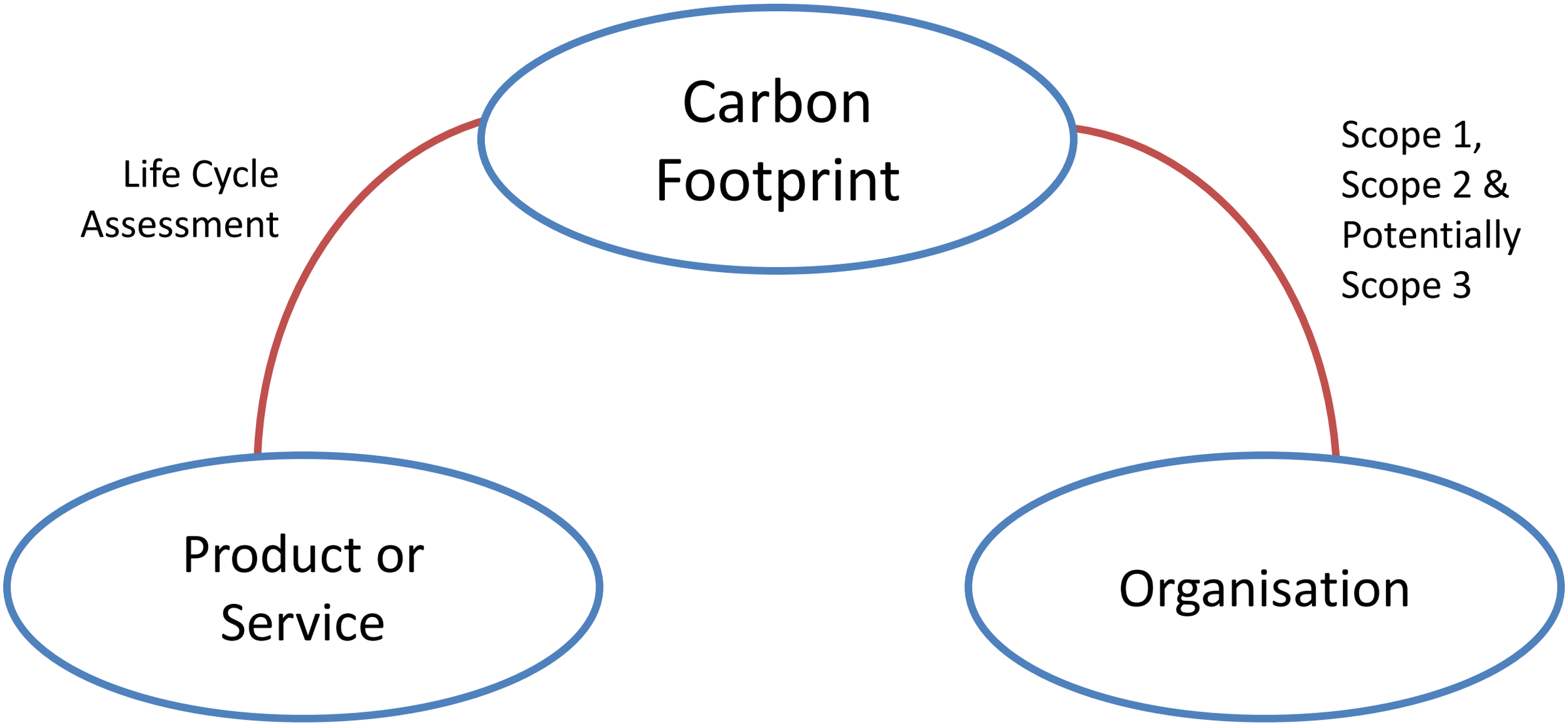
Garnaut Review Final Report


Source of Emissions
Economic Activity
Greenhouse Gas
ENERGY
Electricity 33.4%
Other Stationary Combustion 15.4%
Transport 13.2%
Fugitive Emissions 6.3%
Industrial Processes 5.1%
Agriculture 14.8%
Land Use, Land Use Change & Forestry 9.4%
Waste 2.4%
Non-metallic Mineral Products 2.4%
Metal Products 12.5%
Other Manufacturing 7.3%
Electricity, Gas, Water 6.5%
Commercial Services & Construction 9.5%
Transport & Storage 6.9%
Mining 11.6%
Residential: Transport 7.4%
Residential: Non-transport 10.3%
Agriculture, Forestry, Fishing 25.4%
Carbon Dioxide (CO_2) 75.2%
Methane (CH_4) 19.7%
Nitrous Oxide (N_2O) 4.1%
HFCs, PFCs, SF_6 1.0%

Carbon Accounting Methods

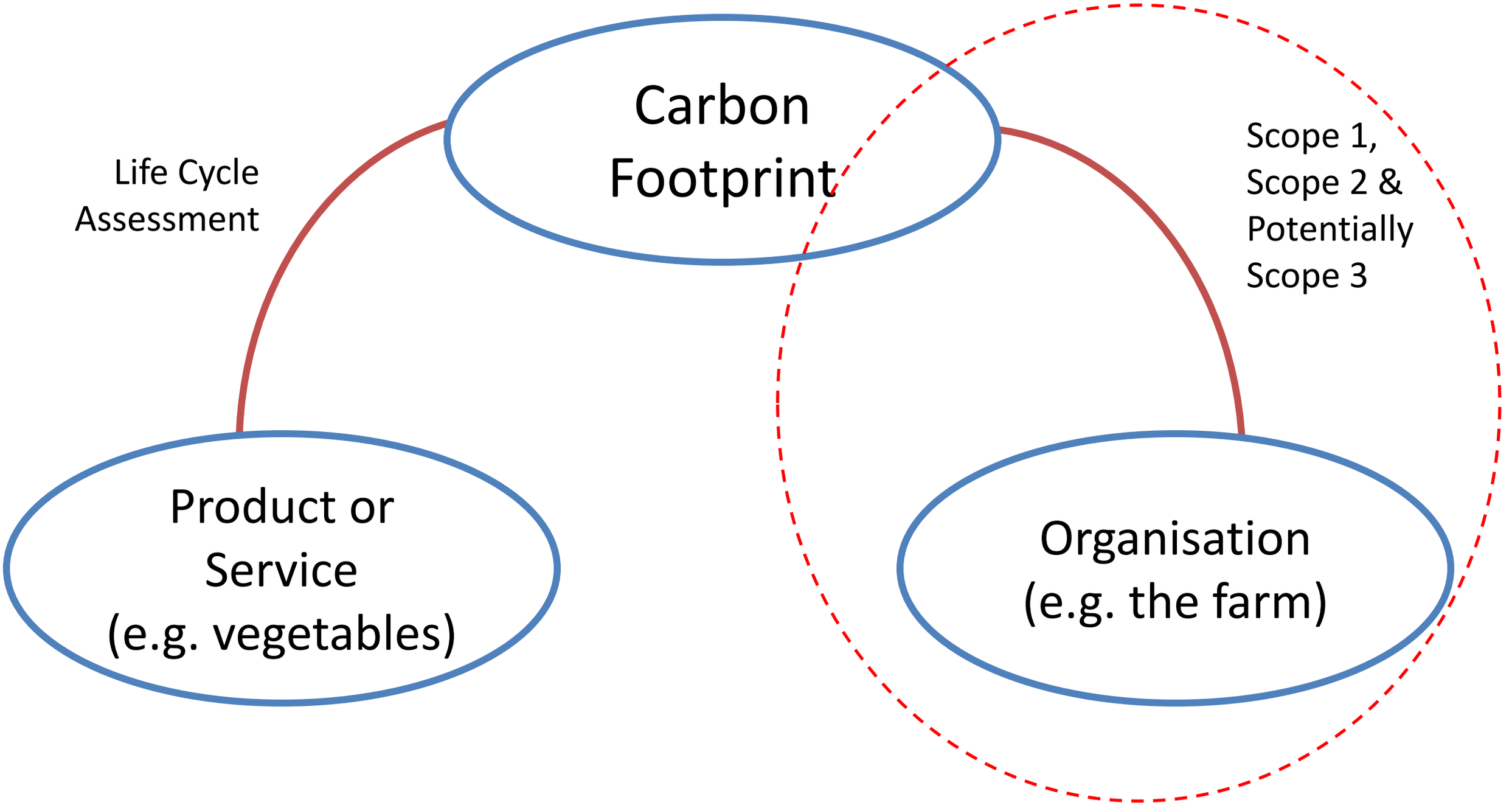
What is a carbon footprint?

The National Carbon Offset Standard



Carbon Footprint: The Farm

The National Carbon Offset Standard



Carbon Footprint - Organisation

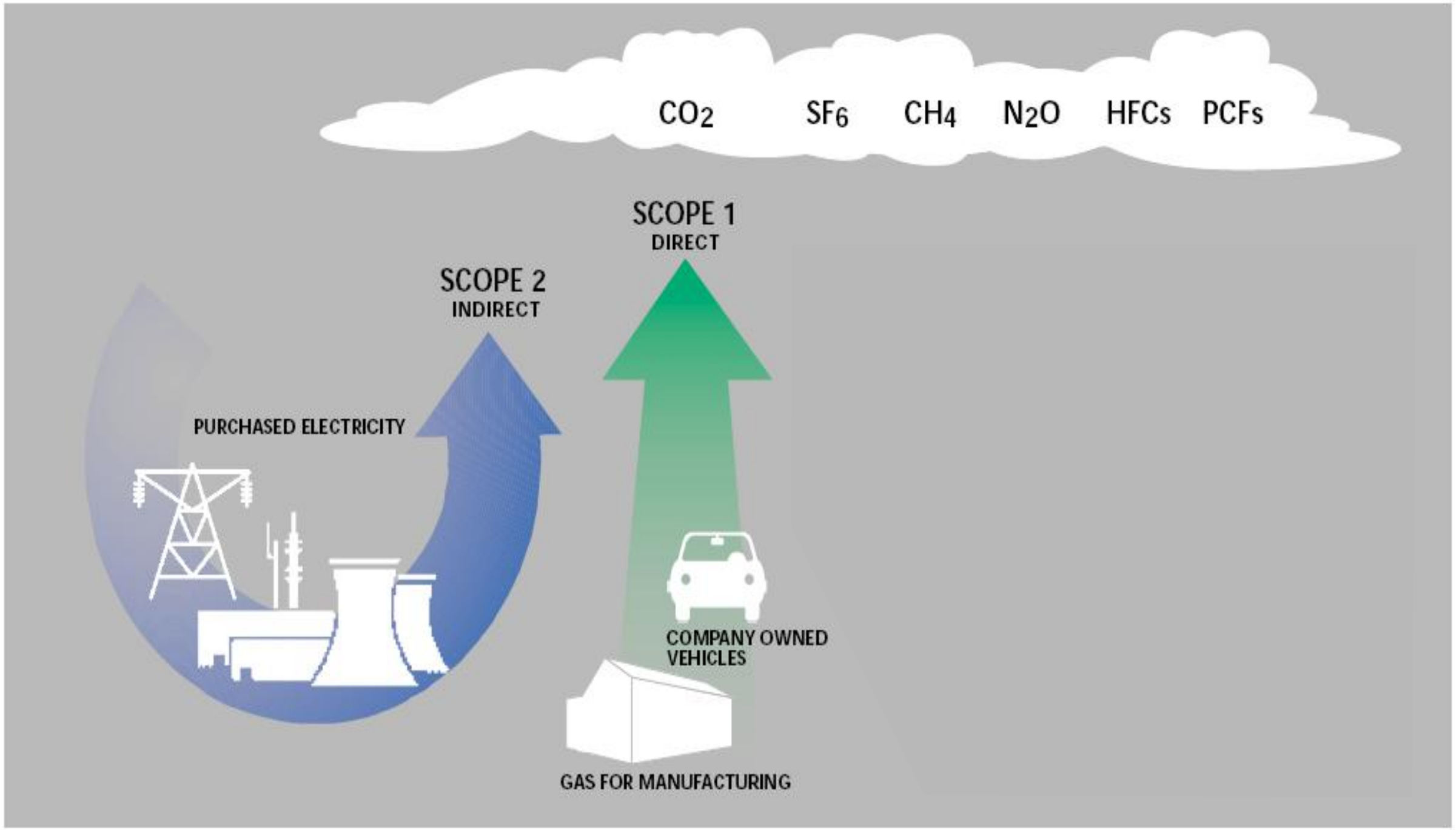
- Used by **corporations** and **governing** bodies
- Australian Government Methodologies
- Used internationally
- Identifies emission reduction opportunities
- Not sufficient for comparative purposes

The Organisation

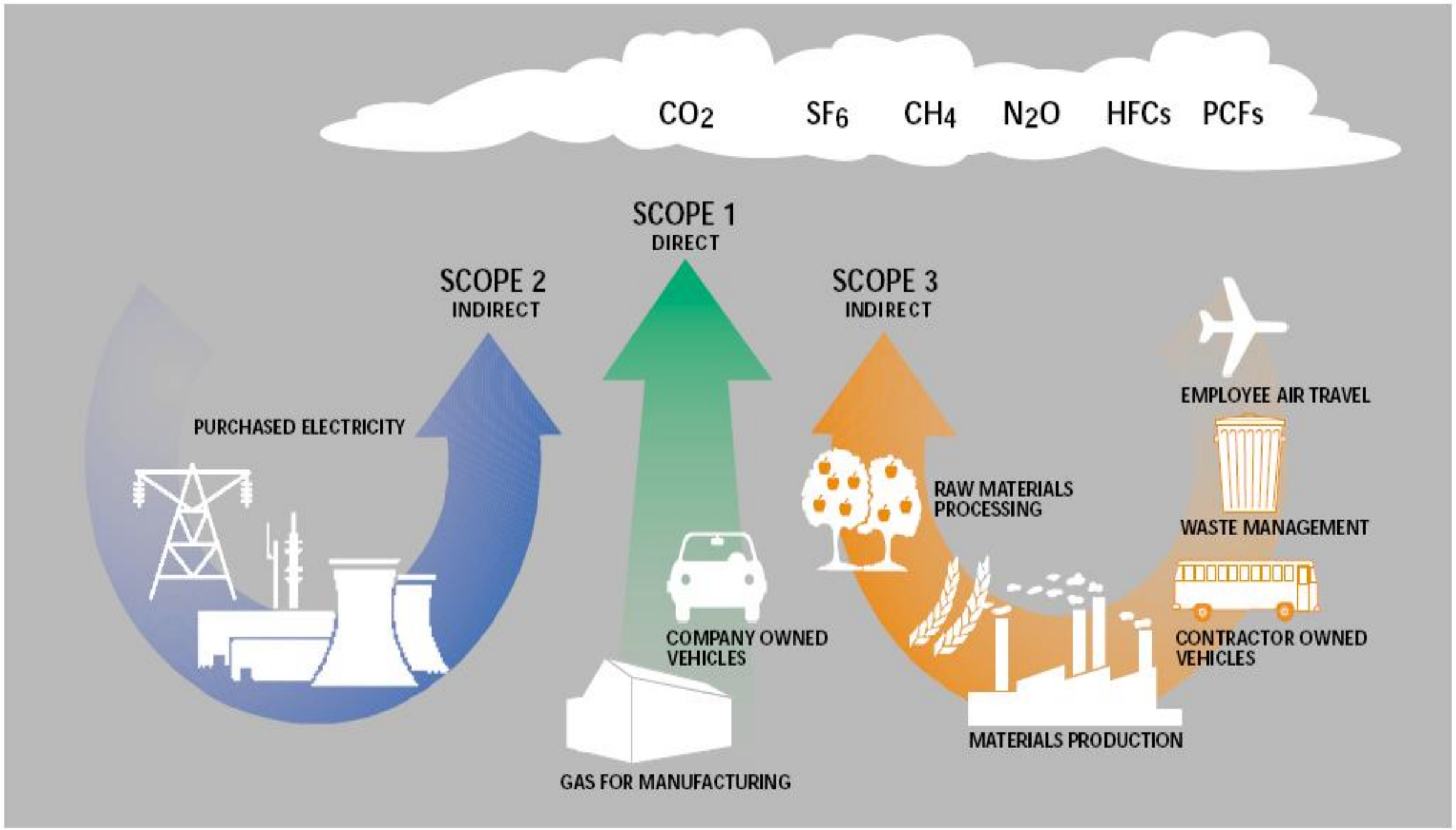
International Standard ISO14064

- The **GHG Protocol** was published in 2004
- The International Standards Organisation built on the method and formalised it **with ISO 14064, released in 2006**
- The two standards are **consistent** and can be used together in a **complimentary** manner

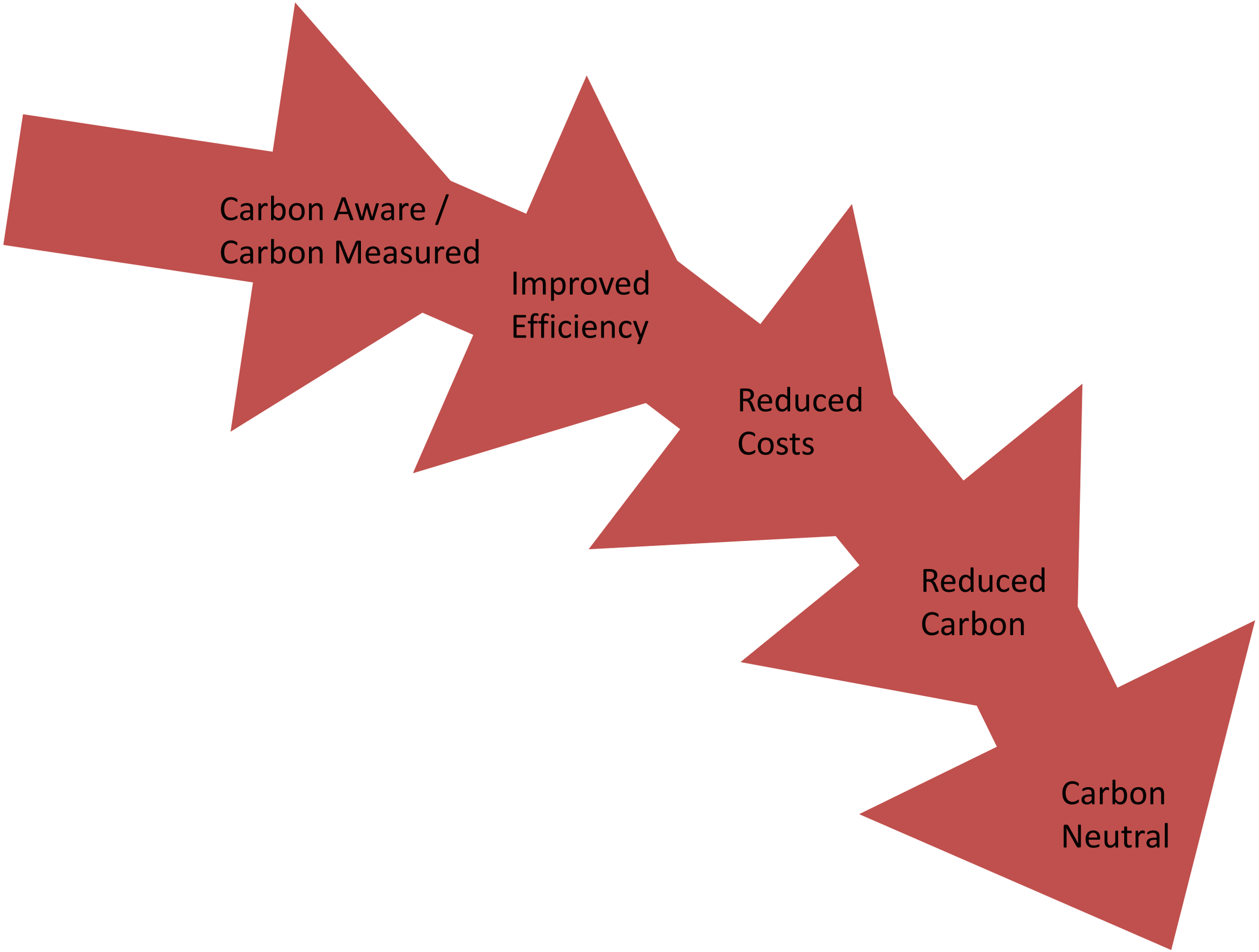
Greenhouse Gases by Scope



Greenhouse Gases by Scope



$$GHG_{Diesel} = E_f \times Q_{Diesel}$$


Carbon Aware /
Carbon Measured
Improved
Efficiency
Reduced
Costs
Reduced
Carbon
Carbon
Neutral

Australian Government
Department of Climate Change

National Greenhouse and Energy Reporting Guidelines

think change

National Greenhouse and Energy Reporting Scheme (NGER)

NGER Thresholds

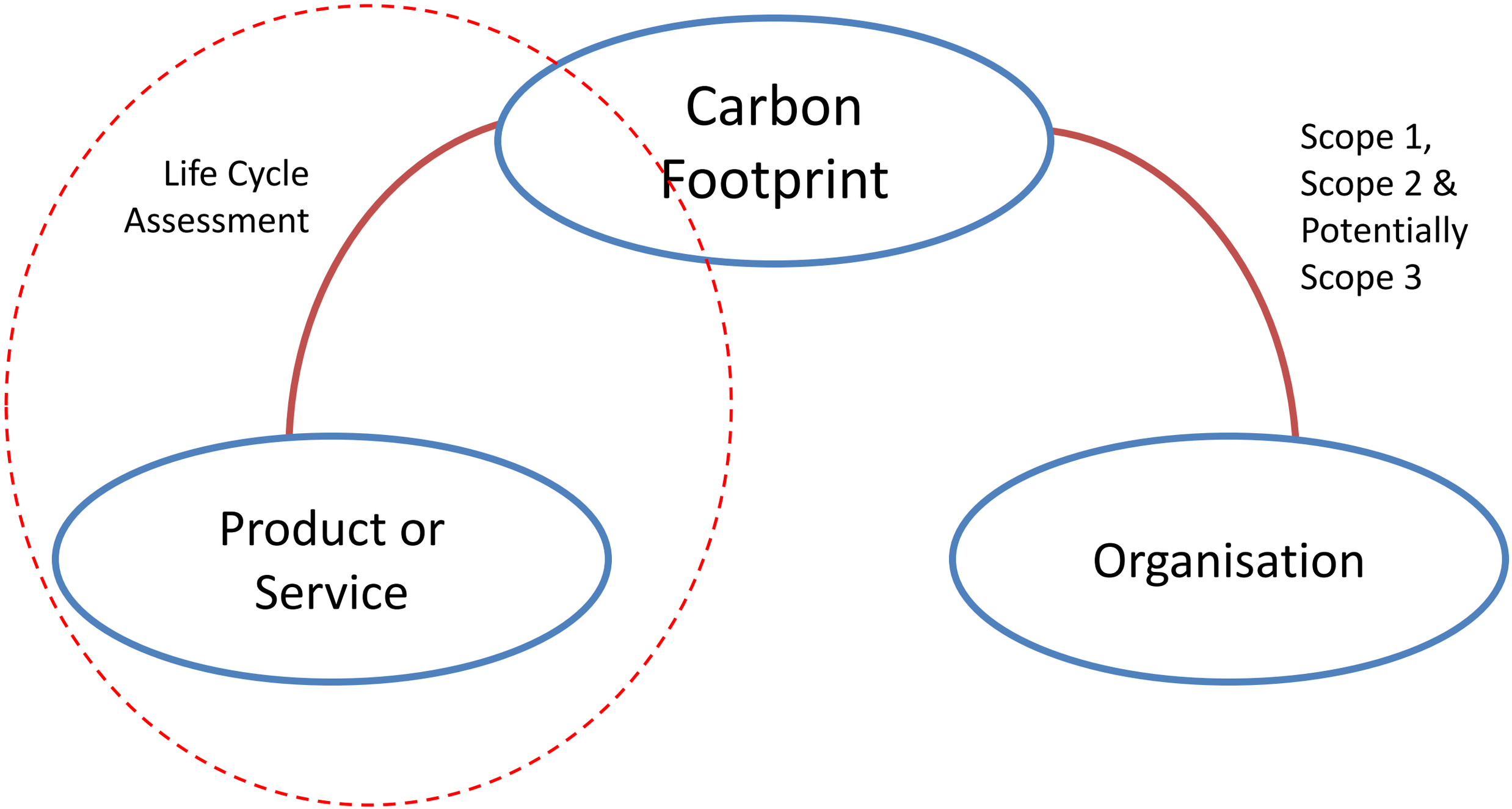
	2008 -2009 Reporting year 1	2009 -2010 Reporting year 2	2010 - onwards Reporting year 3 onwards
Facility thresholds	25 kt CO_2-e 100 TJ	→	
Corporate group thresholds	125 kt CO_2-e 500 TJ energy	87.5 kt CO_2-e 350 TJ energy	50 kt CO_2-e 200 TJ energy
Corporations to apply for registration by	31 August 2009	31 August 2010	31 August 2011
Corporations to report by	31 October 2009	31 October 2010	31 October 2011
Government to publish data by	28 February 2010	28 February 2011	28 February 2012

How much is 100 TJ energy or 25ktCO_2-e GHG emissions?

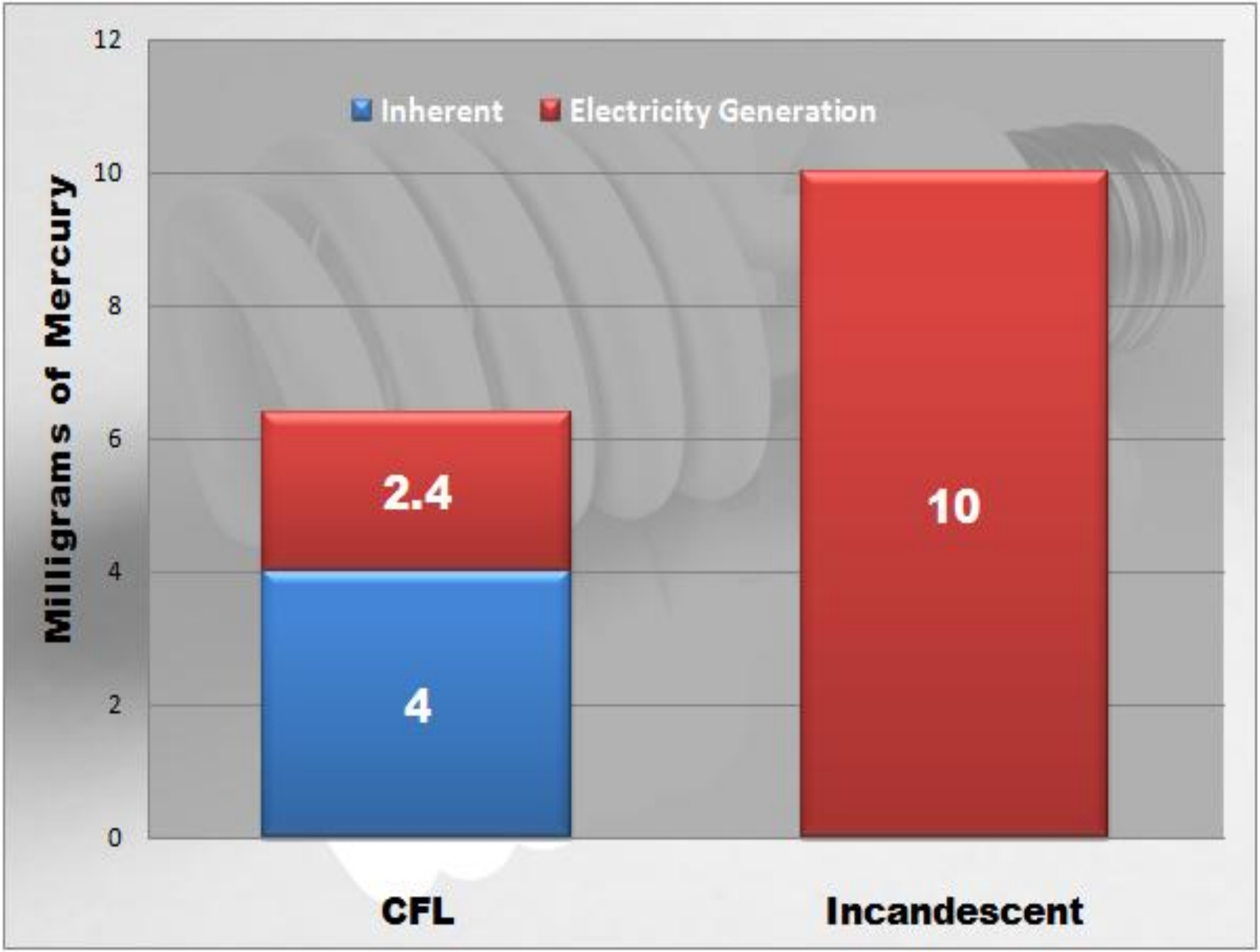
- **20,000-30,000 MWhr/yr** of electricity consumption, depending on state
- **2,600 kL** of Diesel is 100TJ (but only 7 kt CO_2-e)
- **3,000 kL** of Petrol is 100TJ (but only 6.9 kt CO_2-e)

Carbon Footprint: Product

The National Carbon Offset Standard

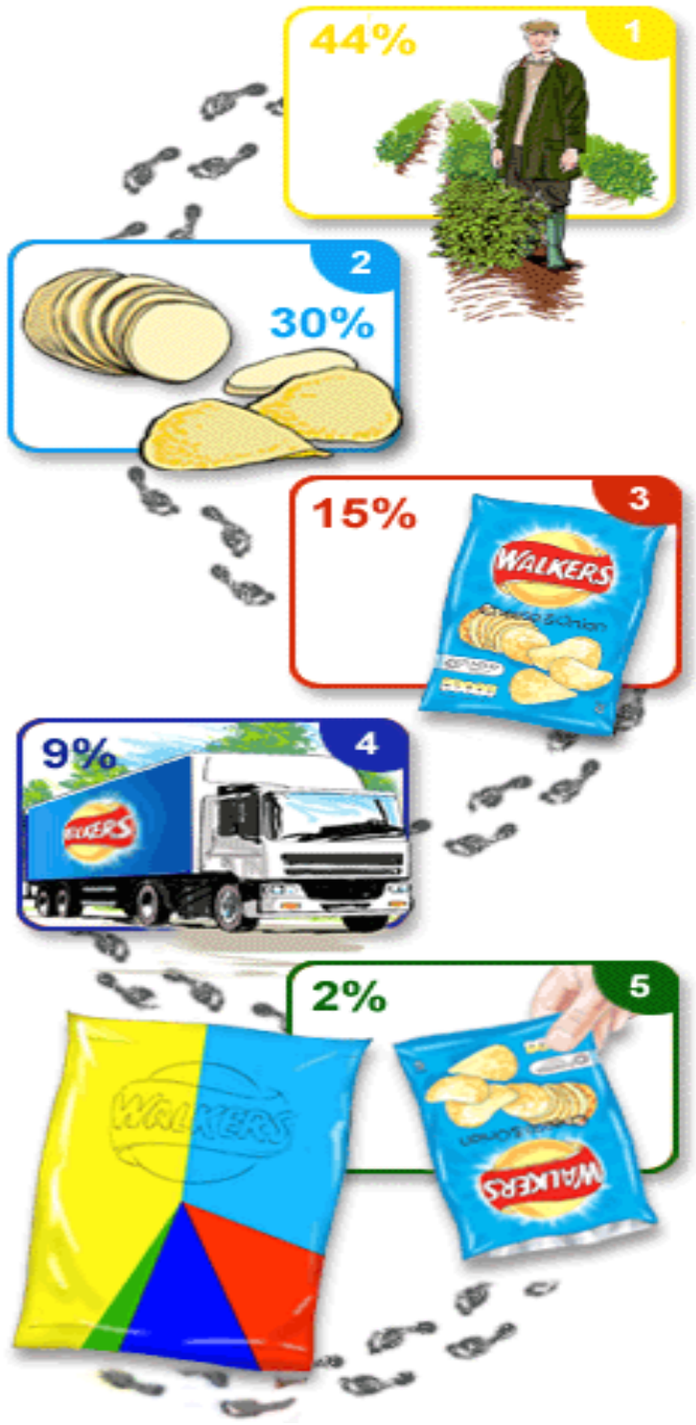


VIDEO



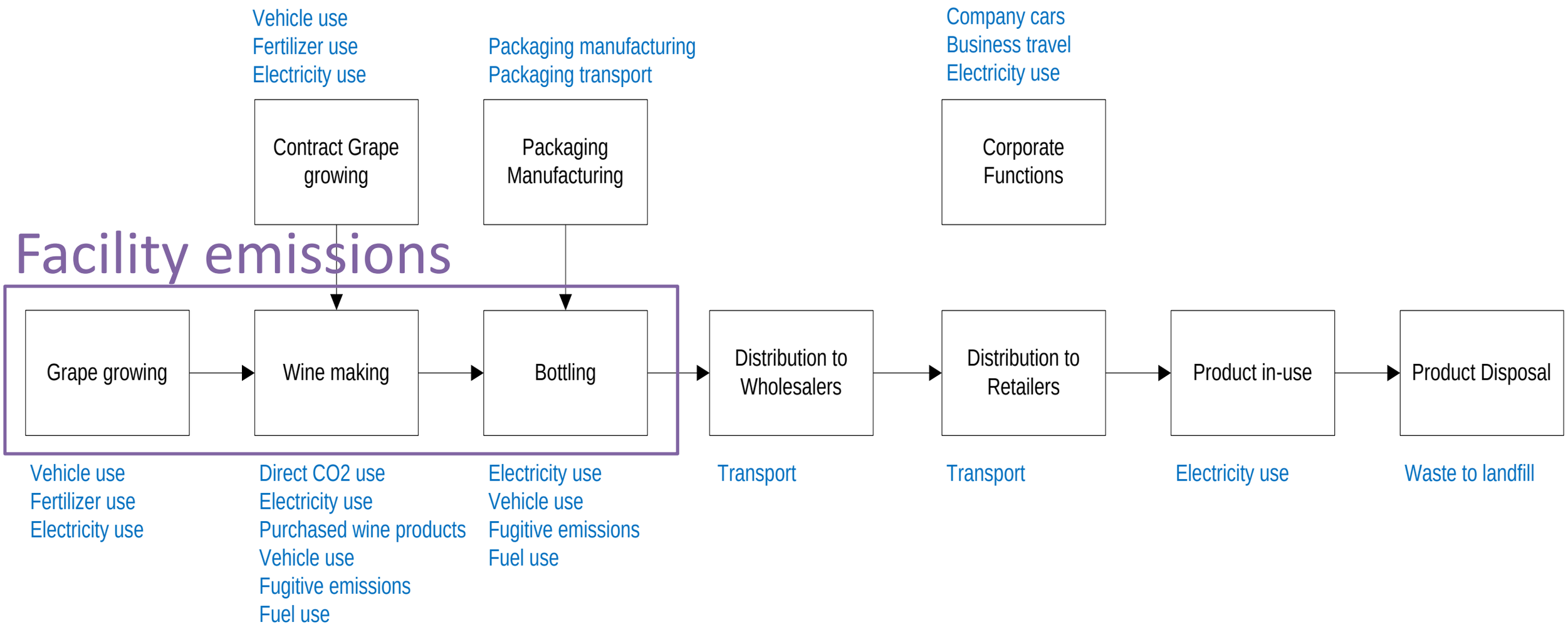
Source: US EPA, 2002

Product Example

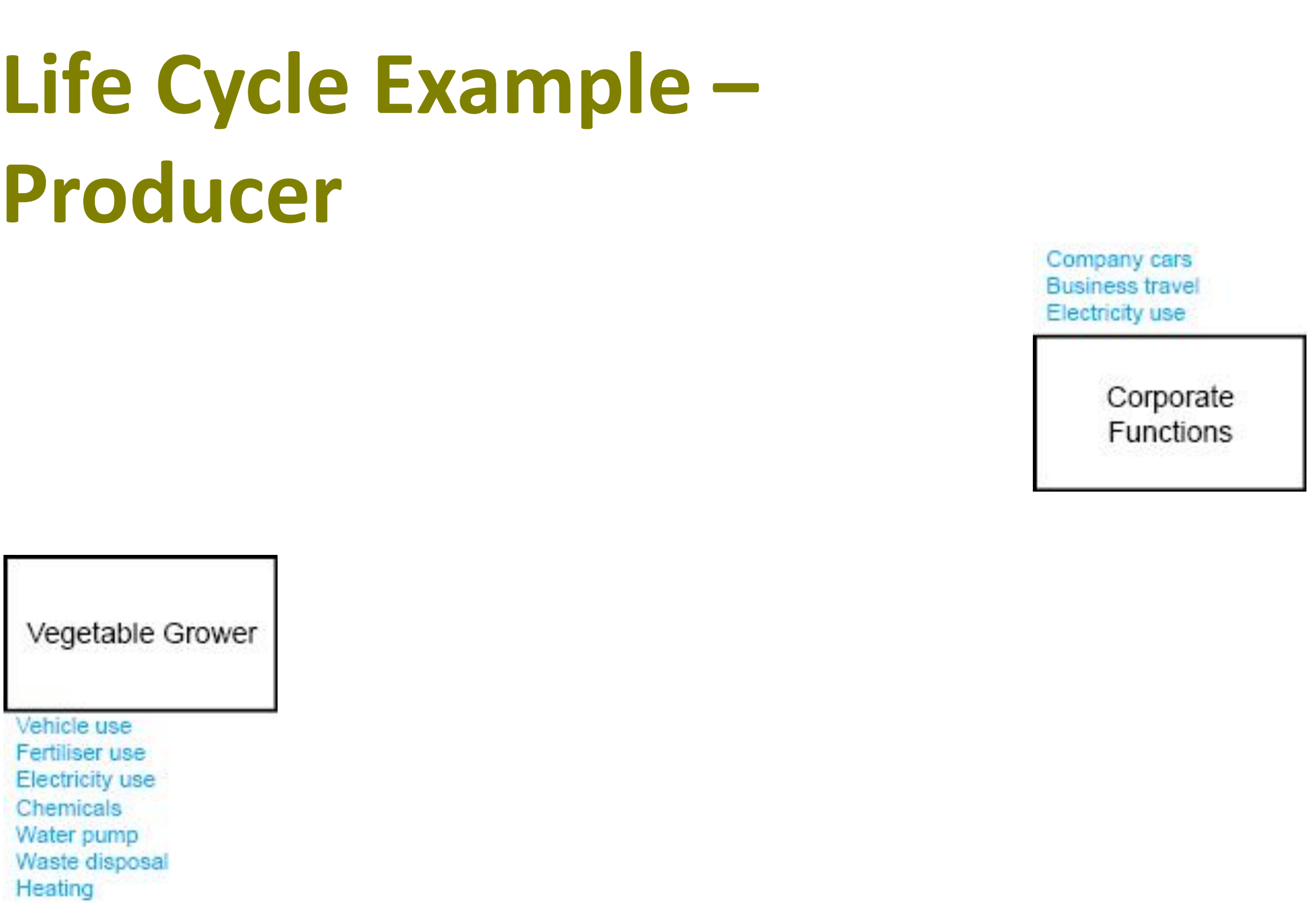


- This example looks at carbon dioxide and chip production
- A breakdown of the carbon in a life cycle assessment from the farm to landfill
- The percentage figures are the greenhouse gas contributions for each component of the value chain

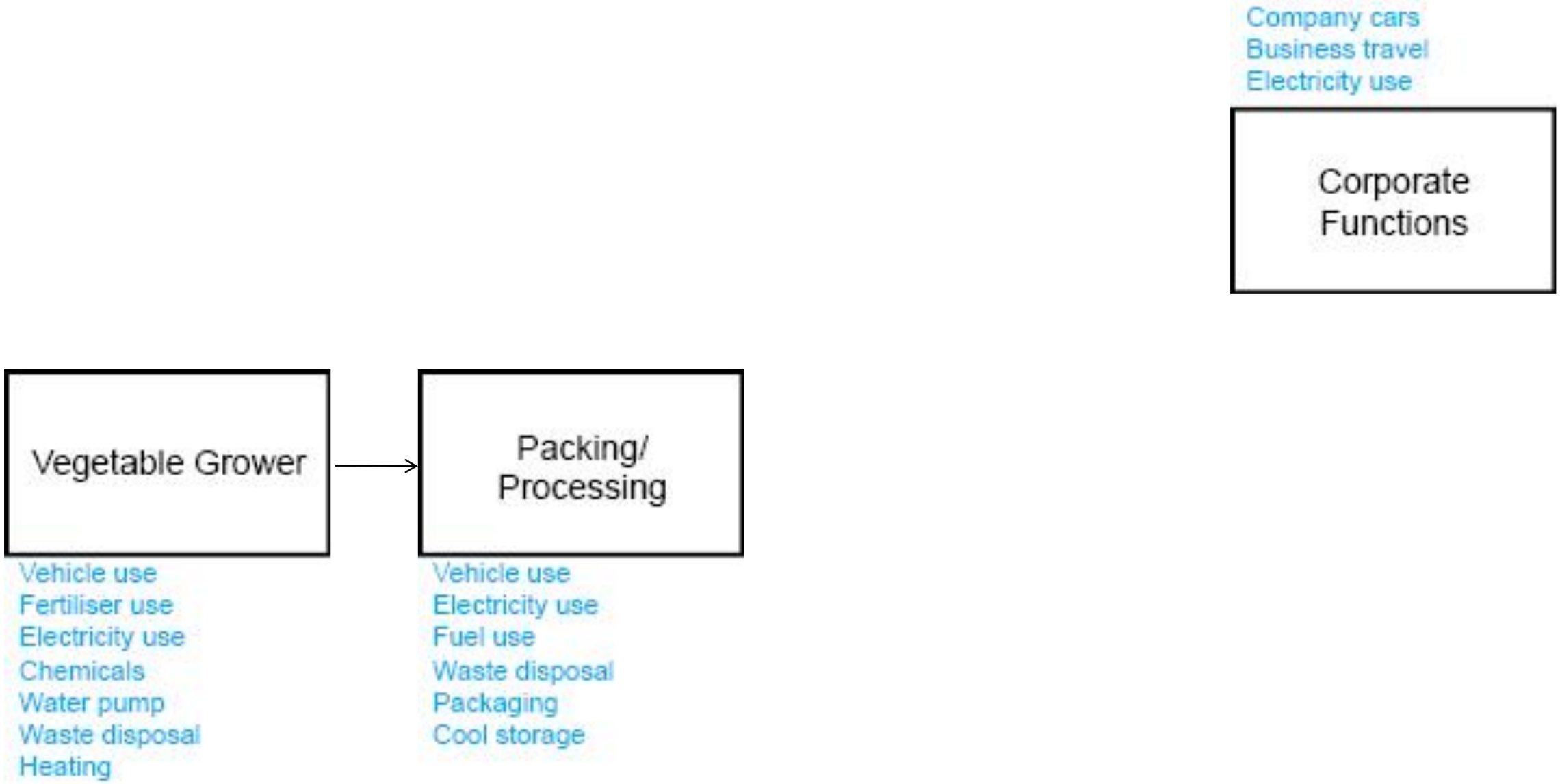
Life Cycle Example – Winery



Life Cycle Example – Producer



Life Cycle Example – Producer/Packer



Life Cycle Example – Producer/Packer/Wholesaler

Company cars
Business travel
Electricity use

Corporate Functions

Vegetable Grower	→	Packing/ Processing	→	Wholesaler
Vehicle use Fertiliser use Electricity use Chemicals Water pump Waste disposal Heating		Vehicle use Electricity use Fuel use Waste disposal Packaging Cool storage		Vehicle use Fuel use Freight Packaging Waste disposal

Carbon Labelling

International Examples

Carbon Labelling

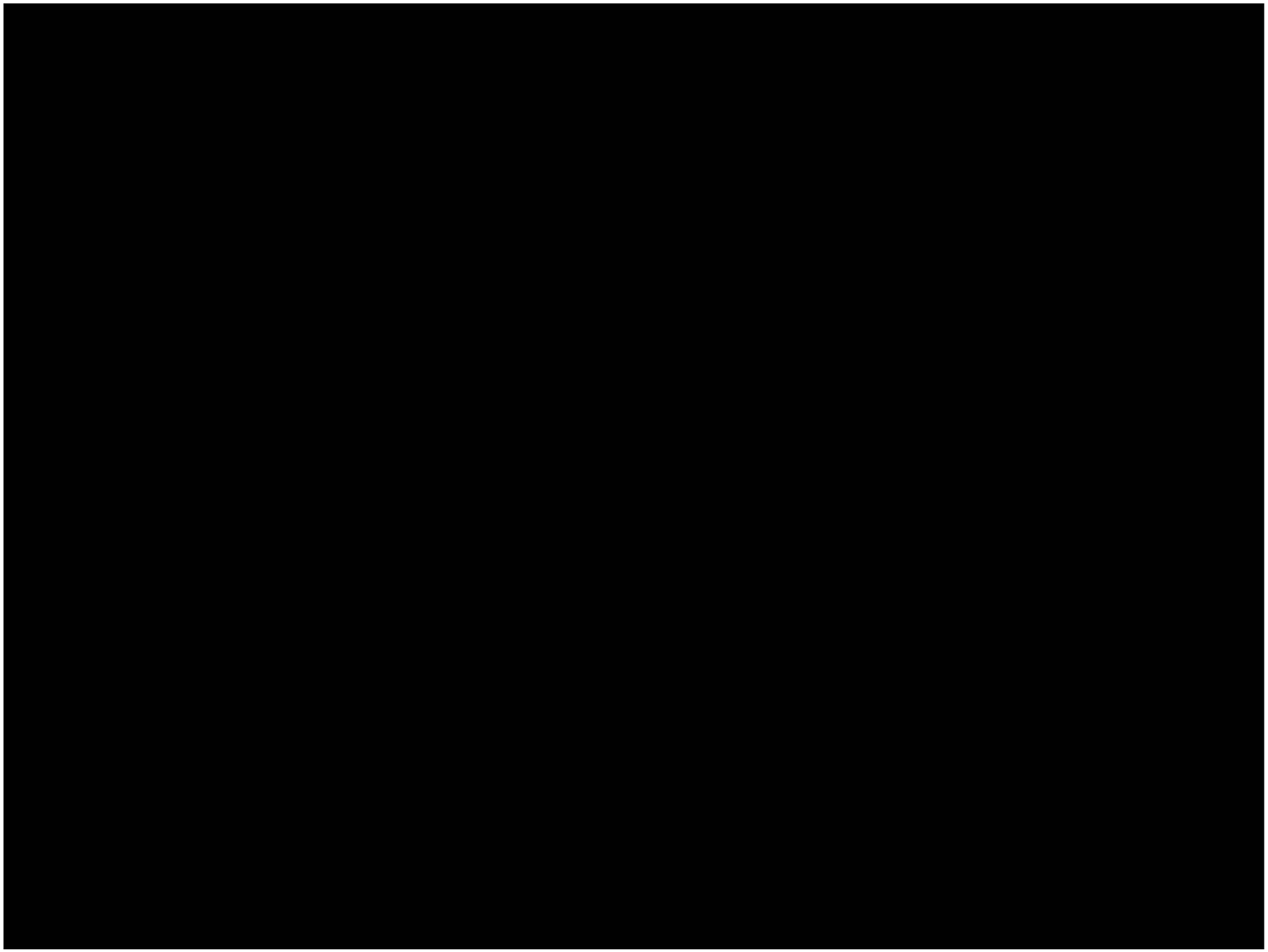
- The **purpose** is to communicate the **carbon impact** of a product

- The **objective** is to provide an opportunity for consumers to make **informed decisions** on the items they purchase

- Carbon labelling internationally, has been driven by **consumers** not **retailers**

Carbon Labelling and Retailers

VIDEO



Just-food
AUTHORITATIVE & TIMELY GLOBAL BUSINESS INFORMATION

UK: Tesco adds carbon footprint to milk

18 August 2009| Source: just-food.com

Tesco yesterday (17 August) began including carbon footprint information on milk as part of the UK retailer's aim for all its products to carry carbon labels.

Tesco has set the target of having "footprinted" 500 products by the end of the year.

The move comes in response to increasing awareness among consumers of the impact of the food supply chain on climate change. According to Tesco, 50% of shoppers now understand the meaning of the term "carbon footprint", up from 32% last year.

Tesco also said that consumers increasingly "want to be green", with over half of shoppers included in its survey stating that they would actively seek out products that had lower carbon footprints.

Tesco community and government director David North said that Tesco had decided to introduce carbon labels to milk because it is a "prominent", "iconic" product that will enable the company to help consumers "understand climate change".

Carbon Labelling Internationally

NHK

原料栽培から

CO_2 161g

リサイクルまで

CO2 LABELS

BERECHNET
CO2 Fußabdruck
www.pcf-projekt.de

100g
CO2
working with
the Carbon Trust

Tesco

reducing with
the Carbon Trust
CO2
We have committed to
reduce the carbon footprint
of this product
carbon-label.com

approved
CO2
by climatop

Migros

INDICE
CARBONE
450g
de CO2
voir au dos

Casino

ISO
International
Organization for
Standardization

E. Leclerc

An Australian Government Initiative
GREENHOUSE
FRIENDLY
www.greenhouse.gov.au · Telephone: 1300 130 606

*HARICOT VERT EXTRA FIN 440GR

2.84 €/KG

0.440 KG
0.97 KCO2 / KG
0.778 KCO2
3017800048221

1 € 25

*HARICOT VERT EXTRA FIN 440GR

2.84 €/KG

0.440 KG

0.97 KCO2 / KG

0.778 KCO2

3017800048221

1 € 25

BENNIFRICE 1.10

Total 9 articles 24.12
Soit en francs : 158.22
(1 euro = 6,55957 francs)

Espèces 24.13
Rendu 0

MERCI
DE VOTRE CONFIANCE
A BIENTOT !

Le bilan CO_2 de mes courses est de :

13,38 kg eq CO_2 (1)

Plus le chiffre est faible, mieux c'est pour ma planète !!

Pour en savoir plus, RDV sur le stand à l'entrée du magasin ou sur le site

www.jeconomisemaplanete.fr

Carbon Labelling in Australia

Carbon labels on food to be introduced in 2010

Lara Sinclair | *June 30, 2009*

Font Size: Print Page:

Article from: THE AUSTRALIAN

GROCERY shoppers bewildered by nutritional information disclosing a product's fat content and sugar levels may soon be confronted with a new label revealing its greenhouse gas emissions.

Consumers will be able to compare, buy and reject products based on their greenhouse emissions as early as next year after the launch of a carbon footprint labelling scheme today. Australia will be the third country, after Britain and the US, to get the foot-shaped Carbon Reduction Label, which is being billed as the greenhouse equivalent of a nutritional panel.

Environmental group Planet Ark will run the voluntary scheme in conjunction with Britain's Carbon Trust.

Becoming Carbon Neutral

The Jewel in the Crown…..

Carbon Offsets and Carbon Neutrality

- The National Carbon Offset Standard

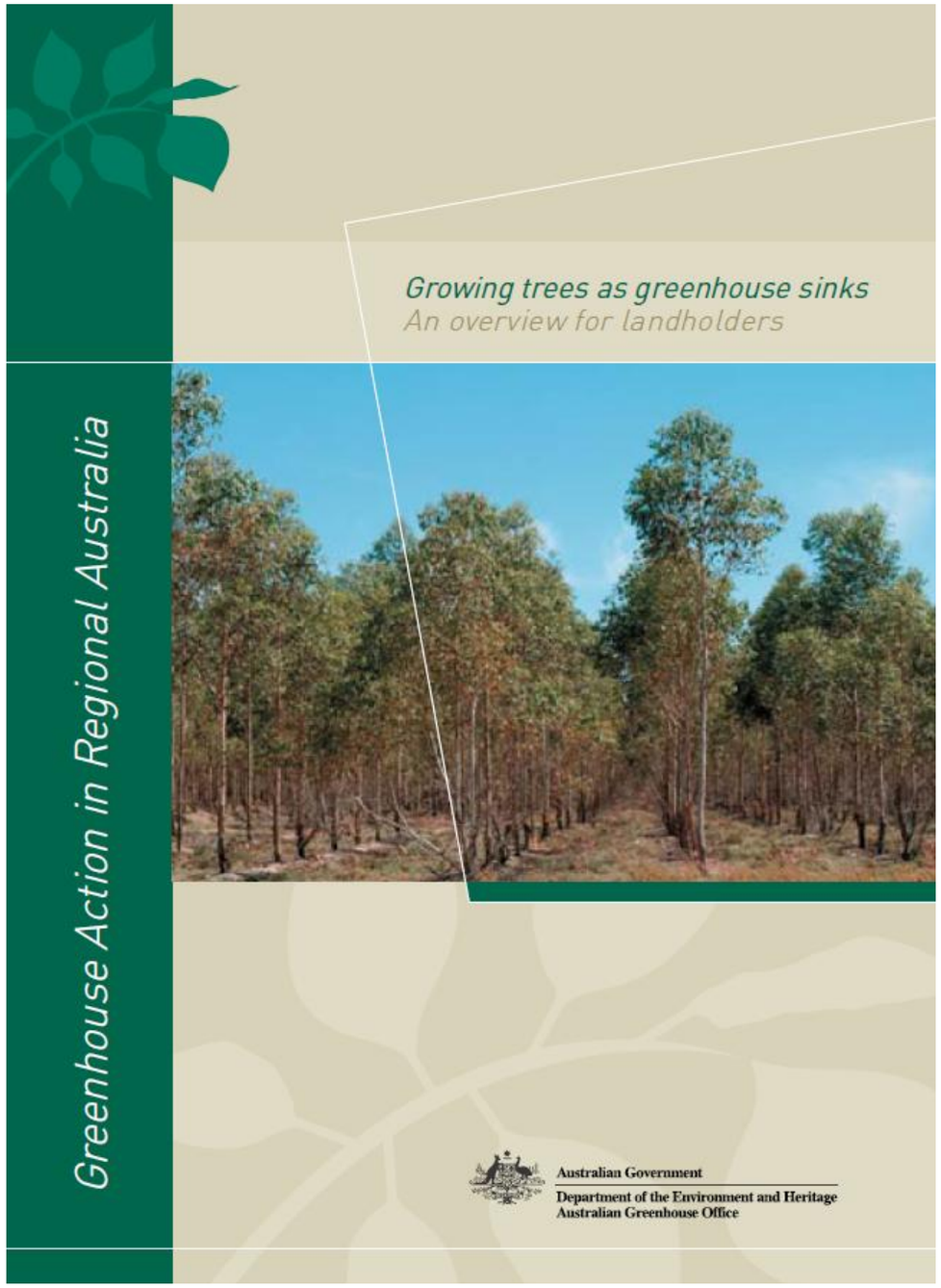
- Carbon offset program with real credibility

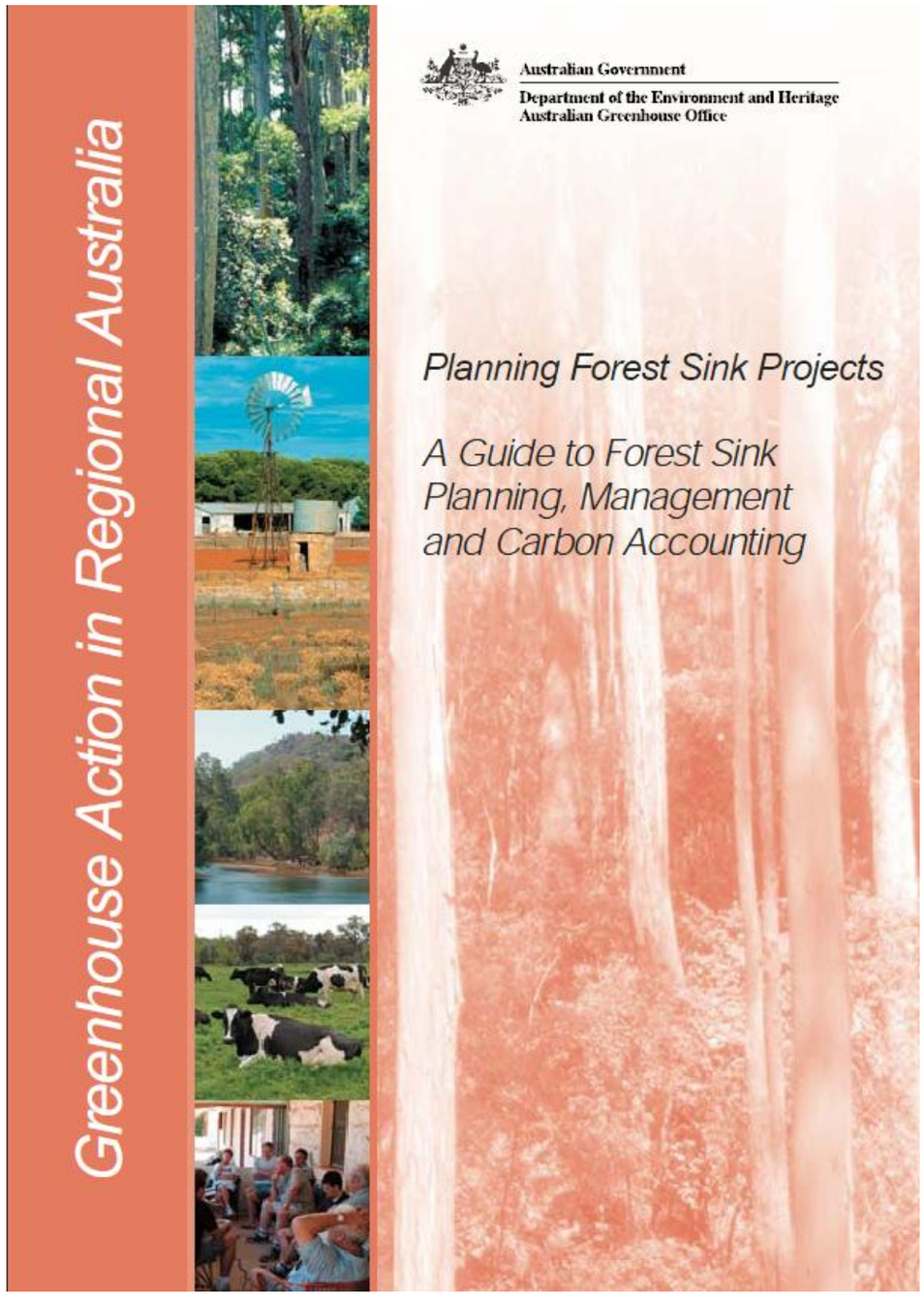
- Can be used in product marketing

- ISO 14044 – Life Cycle Assessment

Carbon Neutral Products

Creating Forest Sinks





Creating Forest Sinks

To create a forest sink, you must:

- Have a minimum area of 0.2ha
- Have a minimum width of 10m
- Have a potential height of at least 2m
- Have a minimum of 20% potential crown cover
- Be established on land that was not forested on 31 December 1989

Greenwashing

Greenwash – *verb:* the act of misleading consumers regarding the environmental practices of a company or the environmental benefits of a product or service.

TerraChoice 2007

Saab 'Grrrrrrreen' claims declared misleading by Federal Court

www.accc.gov.au

September 18

2008

ACCC to probe green beer claims

www.theage.com.au

August 25, 2008

The ACCC and carbon claims

- Think about the **message** that will be taken away by your target audience
- Provide accurate and complete information to consumers
- Misleading conduct can include **silence**
- **Clarify** your carbon claims
- When making claims of **carbon neutrality**, spell out exactly what is included in your claim to avoid misleading consumers
- If you are making statements as to the future, ensure you have a **reasonable basis**

Summary

- The purpose of this presentation is to inform and update growers about greenhouse gases and its impact on growers.
- There is NO requirement for carbon accounting and labelling at the moment.
- The Australian Vegetable Industry supports the development of the on-farm footprinting tool (VG09187).