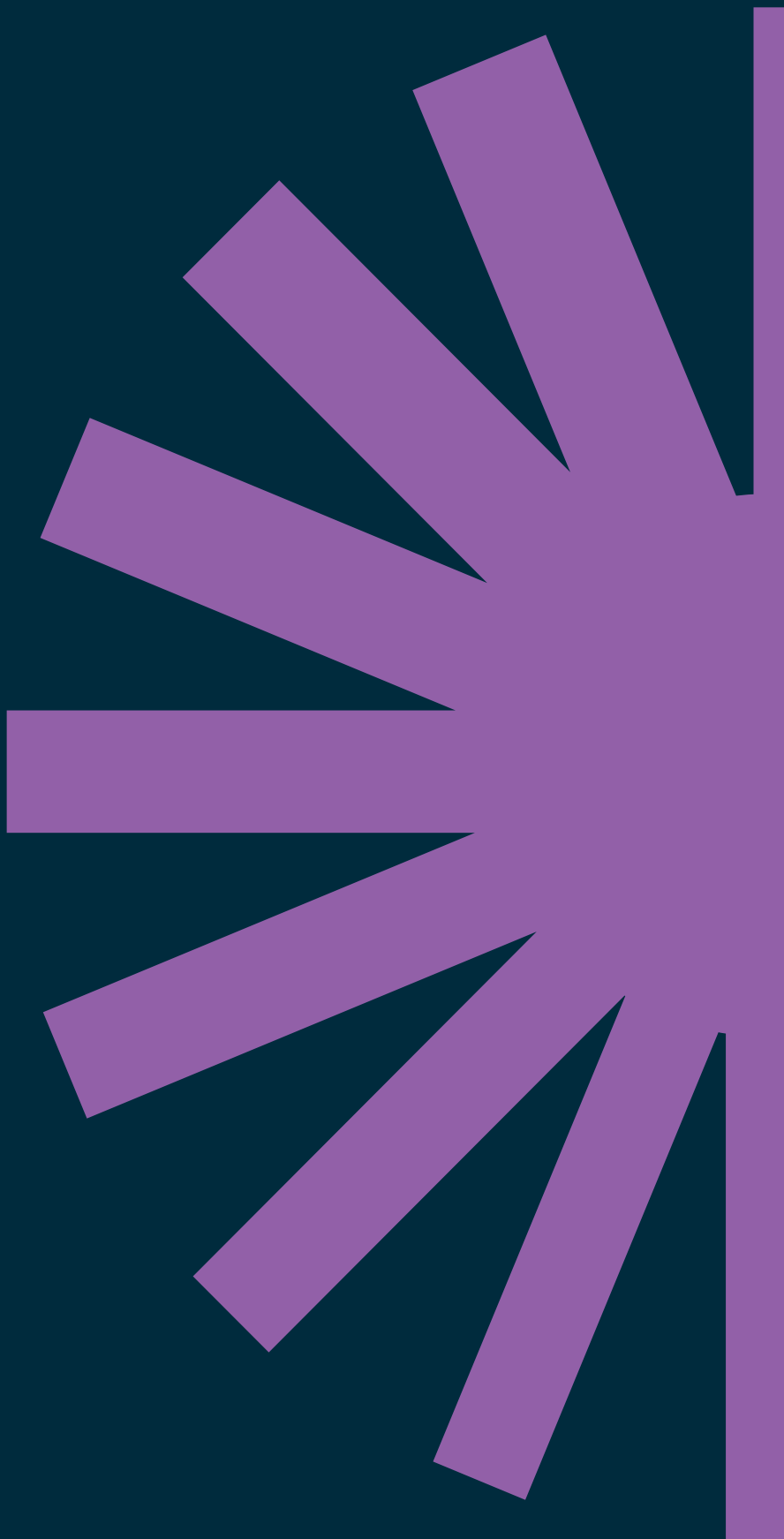
Boyce™

Understanding your carbon footprint: Establishing Your Emissions Baseline for a Sustainable Future



Carbon Emissions Baseline

With the introduction of mandatory climate-related disclosure reporting in Australia, many businesses are now required to report on climate and sustainability related risks, opportunities and impacts that may have previously been overlooked.

A crucial component of this requirement is the production of an annual greenhouse gas (GHG) emissions inventory for your business. This GHG emissions inventory is a significant aspect of Australia's decarbonisation journey and is not limited to entities mandated by law to report. The fundamental principle of GHG emissions calculations is that the value chain can impact emissions, where the GHG emissions of one supplier may affect the GHG emissions of a buyer. Therefore, even if you are not legally obligated to report, entities within your value chain may require your data to fulfill their own reporting obligations.

The purpose of this paper is to clarify the terminology and demystify GHG emissions, providing guidance on how to navigate the legislation and report effectively.

What are GHG emissions?

Greenhouse gas (GHG) emissions are gases that trap heat in the Earth's atmosphere, contributing to the greenhouse effect and global temperature increase.

These gases absorb heat energy emitted from the Earth's surface and instead of releasing it, re-radiate it back, effectively trapping heat in the atmosphere. This process is similar to how a greenhouse works, hence the name "greenhouse gases".

The main greenhouse gases that we generally focus on are:

- **Carbon dioxide (CO_2):** Released primarily through the burning of fossil fuels for energy (coal, oil, and natural gas), deforestation, and various industrial processes.
- **Methane (CH_4):** Emitted during the production and transport of coal, oil, natural gas, landfills, as well as from livestock and other agricultural practices.
- **Nitrous oxide (N_2O):** Produced by agricultural (fertiliser) and industrial activities, as well as during the combustion of fossil fuels and solid waste.
- **Fluorinated gases:** Synthetic gases used in various industrial applications such as refrigerators and air conditioners, which are potent but typically emitted in smaller quantities[1].

[1] *Overview of Greenhouse Gases | US EPA*

Each of these gases has a varying impact on their contribution to global warming. For example, methane is approximately 80 times more effective at trapping heat than carbon dioxide over a 20-year period, but it remains in the atmosphere for only about 12 years, compared to carbon dioxide, which can persist for centuries (see Figure 1). To ensure consistent measurement, emissions are expressed in terms of carbon dioxide equivalent (CO_2e).

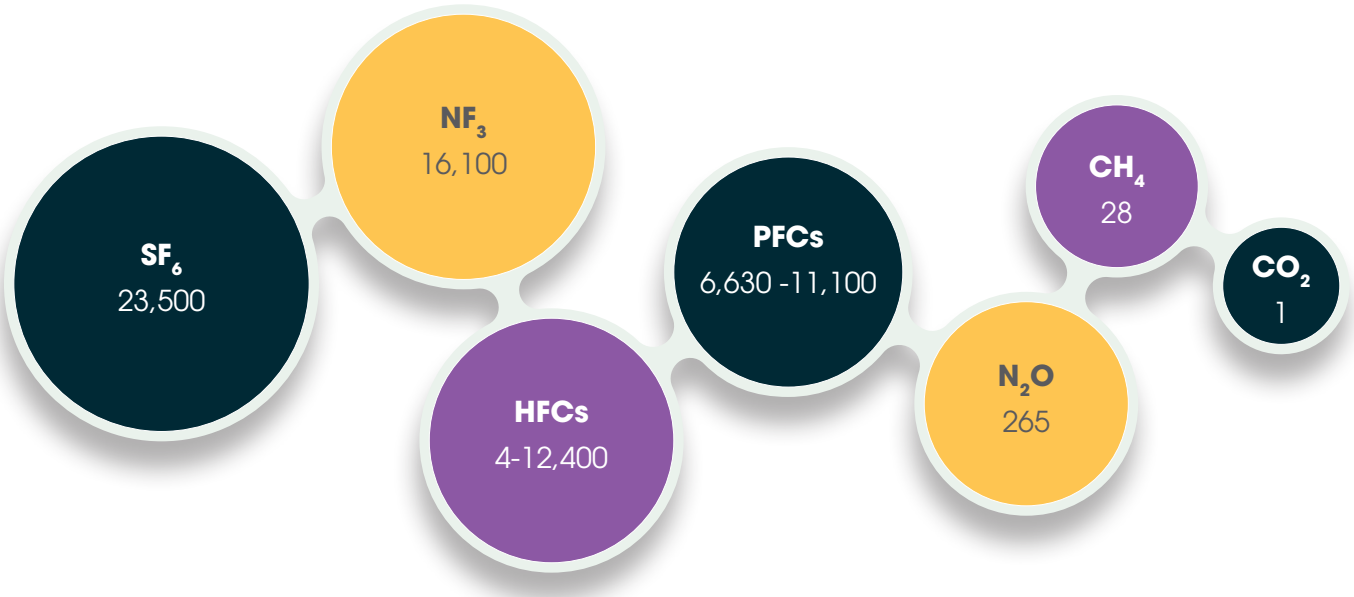


Figure 1: The global warming potential of the Intergovernmental Panel on Climate Change (IPCC) recognised GHGs.[2]

The following figure illustrates the mix of greenhouse gas emissions at the end of Q2, 2024 (in million tonnes - Mt CO_2e).

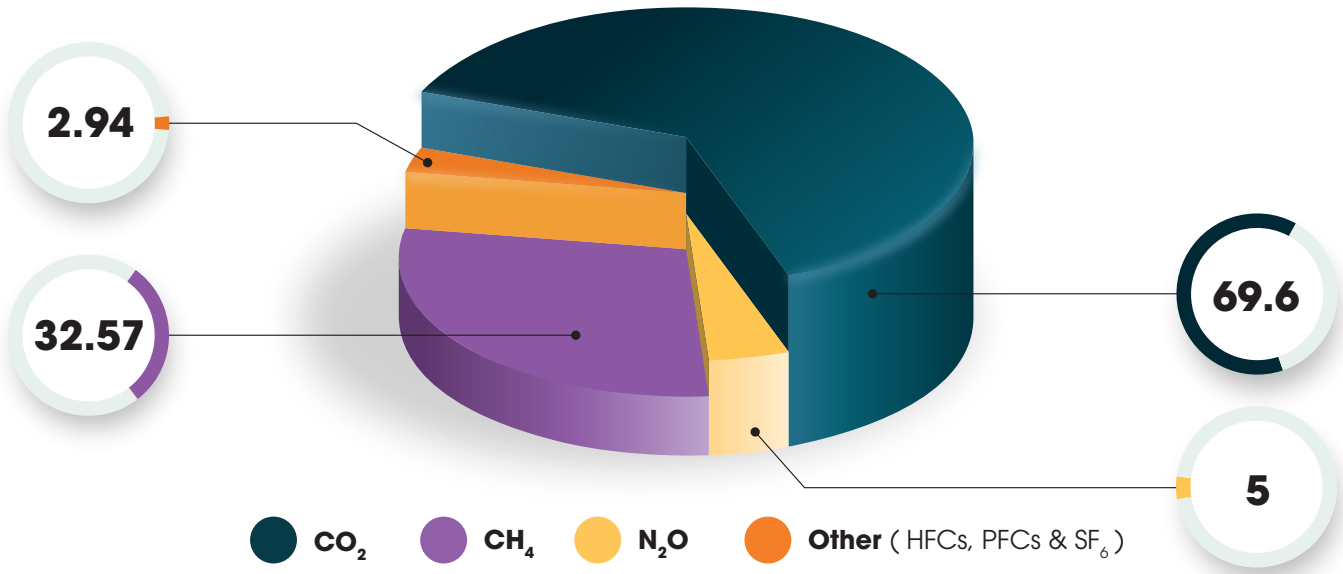


Figure 2: Total Australian emissions for Q2 2024.[3]

[2] *GHG Protocol Guidance 2019.pdf*

[3] *National Greenhouse Gas Inventory Quarterly Update: June 2024 - DCCEEW*

What is a GHG emissions baseline?

A GHG emissions baseline is a reference point that represents the amount of greenhouse gas emissions produced by a business the first time they are measured, or rather, before any strategic actions are implemented to mitigate or reduce those emissions. The progress of a strategy is impossible to evaluate unless there is a starting point. Therefore, the calculation of a businesses GHG emissions baseline is crucial for benchmarking the effectiveness of emission reduction efforts over time (see Figure 3).

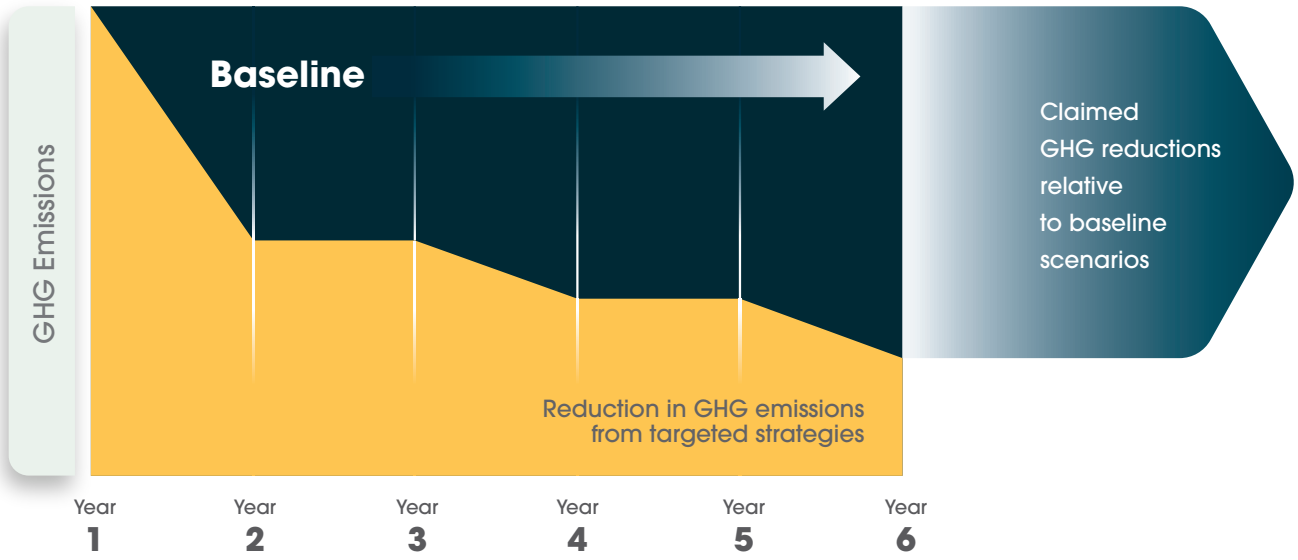


Figure 3: Quantifying GHG reductions from targeted strategies

Here are some key aspects of a GHG emissions baseline that are important to understand in the context of a GHG emissions inventory[4]:

- **Reference Point:** Serves as a benchmark against which future emissions reductions are measured over a specific period of time. This can be a specific year or an average over several years.
- **Business as Usual (BAU) Scenario:** Often, the baseline (or reference point as above) represents what emissions would look like if no additional actions were taken to reduce them.
- **Equivalent Quantification:** Baseline emissions are typically quantified in terms of CO_2-equivalent (CO_2e) emissions, which allows for the comparison of different greenhouse gases based on their global warming potential (see Figure 1).
- **Policy and Project Evaluation:** Establishing a baseline is essential for evaluating the impact of policies, projects, or interventions aimed at reducing GHG emissions.

By establishing a baseline, businesses can identify major sources of emissions which informs the development of reduction strategies. Once reduction strategies are in place, businesses compare their current emissions to the baseline, to track progress towards their climate goals and adjust strategies as needed.

[4] *What is a baseline? - GHG and Carbon Accounting, Auditing, Management & Training | Greenhouse Gas Management Institute*

What factors make up my emissions baseline?

There are several key pieces of information that are required to establish a GHG emissions baseline. These include:

1. **Activity Data:** This includes information on activities that generate emissions, such as fuel consumption, electricity use, industrial processes, and transportation.
2. **Emission Factors:** These are coefficients that describe and quantifies the rate at which an activity releases greenhouse gasses into the atmosphere. For example, the amount of CO_2 emitted per litre of diesel burned.
3. **Scope of Emissions:** Emissions are categorised into different scopes:
   - **Scope 1:** Direct emissions from owned or controlled sources (e.g. fuel).
   - **Scope 2:** Indirect emissions from the consumption of purchased electricity.
   - **Scope 3:** Other indirect emissions, such as those from the supply chain and business travel.
4. **Business as Usual (BAU) Scenario:** This scenario estimates what emissions would look like if no additional actions were taken to reduce them, and serves as the baseline year, used as the reference point.

These factors together help in creating a comprehensive and accurate emissions baseline, which is essential for tracking progress and setting realistic reduction targets (see Figure 4).

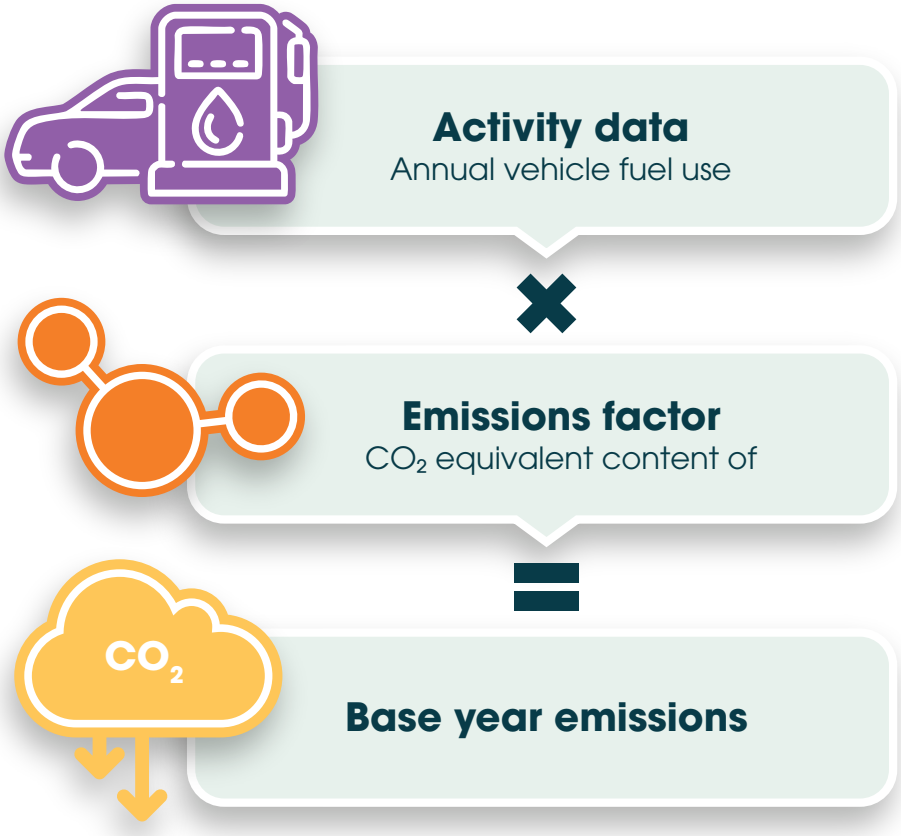


Figure 4: CO_2 emissions calculation utilising activity data and emissions factors[5]

[5] *Estimating the baseline scenario emissions - ICAT*

Scope 1, 2 & 3 emissions in detail

Scope 1, 2, and 3 emissions are categories used to classify the different sources of greenhouse gas (GHG) emissions within an organisation. These categories can help a business understand the emissions impact of different elements of their operations, and help manage reduction efforts more efficiently[6].

1. **Scope 1 Emissions:** These are direct emissions from sources that are owned or controlled by the business. Examples include emissions from company-owned vehicles, on-site fuel use, and industrial processes.

2. **Scope 2 Emissions:** These are indirect emissions from the generation of purchased electricity and other energy products, consumed by the business. Although these emissions occur at the facility where the energy is produced, they are accounted for in the organisation's carbon footprint because the organisation uses the energy.

3. **Scope 3 Emissions:** These are all other indirect emissions that occur in the value chain of the organisation, both upstream and downstream. This includes emissions from purchased goods and services, logistics and business travel employee commuting, and even the use of sold products. Scope 3 emissions often represent the largest portion of an organisation's total GHG emissions.

By understanding where these gases come from, businesses can take targeted actions, like using renewable energy, reducing food waste, and improving farming practices, to lower their impact (see Figure 5).

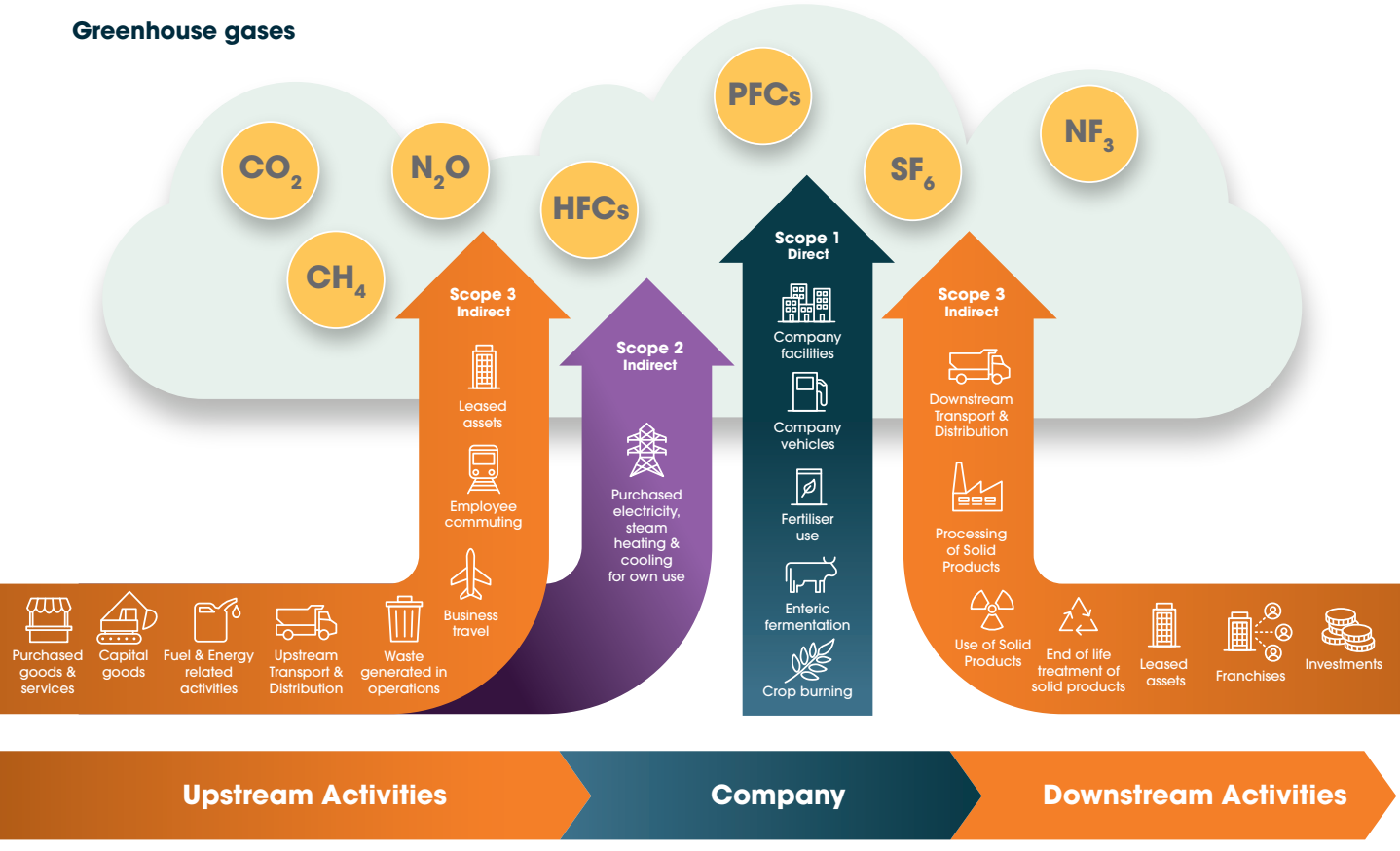


Figure 5: Scope 1,2 & 3 emissions lifecycle[7]

[6] *What are Scope 1, 2, and 3 emissions? | McKinsey*
[7] *Scopes and emissions across the value chain.pdf*

How will emissions tracking benefit my business?

Tracking GHG emissions and establishing baselines can have significant and positive impacts on a business, such as:

1. **Regulatory Compliance:** the Australian government has introduced strict regulations requiring certain businesses to report their GHG emissions. Tracking emissions ensures compliance with these laws and helps avoid potentially significant fines and legal issues.
2. **Long Term Cost Savings:** Identifying and reducing emissions often leads to increased operational efficiency and lower energy costs. For example, improving energy efficiency or switching to renewable energy sources, whilst having an upfront cost, can have a short return on investment (ROI) and can reduce electricity bills in the longer term.
3. **Risk Management:** Understanding your emissions profile helps anticipate and mitigate physical and transitional risks associated with climate change, such as regulatory changes, resource scarcity, major climate events and shifting market sentiment.
4. **Enhanced Reputation:** Demonstrating a commitment to sustainability can dramatically improve the reputation of your business with customers, investors, and other stakeholders. This can lead to increased customer loyalty and attract a greater range of investors. The increased transparency that results from emissions tracking can even increase your attractiveness to lenders who now have specific debt packages coupled with lower interest rates for energy efficient clients.
5. **Competitive Advantage:** Businesses that actively manage and reduce their emissions differentiate themselves in the market. This can be particularly important as consumers and businesses increasingly prioritise sustainability and low emission products.
6. **Innovation and Growth:** Tracking emissions can drive innovation by highlighting areas for improvement and encouraging the development of new sustainable products and services.
7. **Employee Engagement:** Sustainability initiatives can boost employee morale and engagement, as many employees prefer to work for environmentally responsible companies.

Ultimately, establishing and continually tracking your GHG emissions baseline, provides a framework for businesses to improve their environmental impact, operational efficiency, and market position. The result is a net benefit to your business. Tracking your emissions is a proactive step towards sustainability, helping you make informed decisions that benefit both your organisation and the environment, and in turn create a competitive advantage and value for you long-term (see Figure 6).

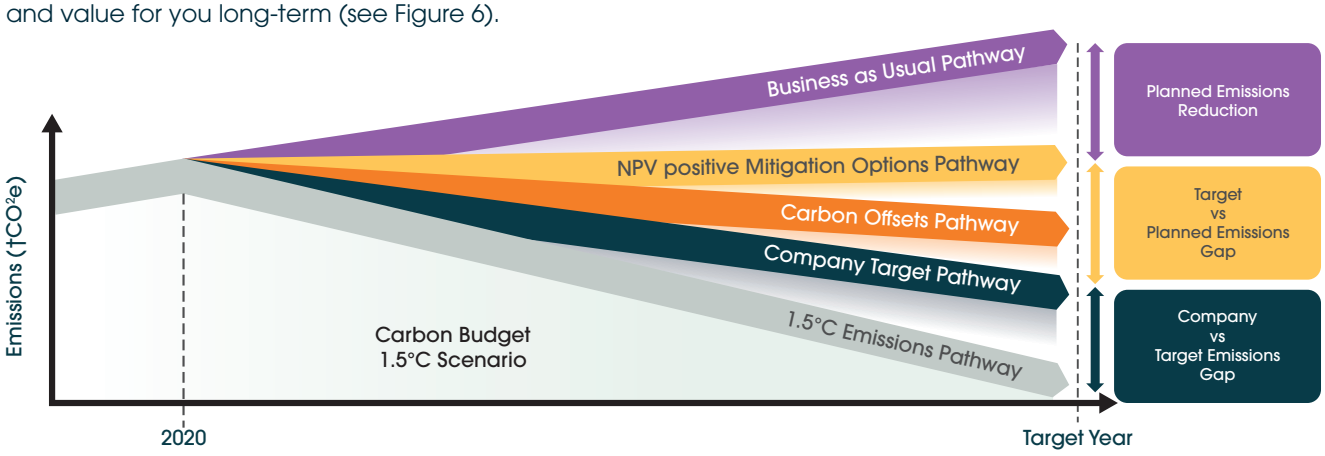


Figure 6: Project planning and decarbonisation pathways[8]

[8] *Building Organisational Emissions Baselines for GHG Management*

How Boyce can help you calculate your GHG emissions?

The process for calculating your GHG emissions doesn't need to be intimidating! Given our extensive knowledge of your business, we likely already possess much of the necessary documentation through MYOB or Xero. This minimises the time and effort required from you to gather data and respond to numerous enquiries. Our goal is to save you time, allowing you to focus on managing your business.

We have established partnerships with industry-leading platforms to ensure our calculations comply with all current and future frameworks and best practices. Our methodology utilises ISO 14064 and the Farm Greenhouse Accounting Framework (GAF) tools, developed by the University of Melbourne and the Primary Industries Climate Challenges Centre (PICCC). These tools are recognised as the premier frameworks for calculating agricultural emissions in Australia.

Our team is ISO 14064 certified, making us one of the few firms capable of verifying and validating your emissions calculations. This means we can audit any report from any provider, ensuring you and your financial stakeholders have confidence that your reports are accurate and conducted correctly.

Our comprehensive reports offer verifiable and traceable calculations, designed to add value to your business. They include as standard:

- A detailed analysis and discussion of results from our team of experts
- A decarbonisation strategy
- Identify future emissions projections to assist with pipeline planning
- A cost-benefit analysis to support the implementation of your decarbonisation goals.

ISO 14064

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Get in touch

Our experienced team is prepared to support you on your sustainability journey. Contact us today to discuss how we can help you stay ahead of the market and enhance the value of your assets, both now and in the future.

Our team

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