



# Quantifying net zero

Scopes 1 to 3

Megan Born | 13 October 2021

energetics

# About Energetics

Our trusted advisor status is underpinned by more than 35 years of experience advising all levels of government and ASX200 businesses.

We support our clients to identify and develop opportunities, mitigate climate change risks and improve market positioning through enhanced brand and reputation.



Modelling economy wide net zero investment opportunities



Financial modelling and net zero scenario analysis



Modelling of capital allocation and annual net financial position



End to end net zero strategy development



Abatement opportunity development



Corporate PPA transaction support



# Purpose of this masterclass

## Points of discussion



**Baselining**



**Target setting**



**Forecasting**



**Tracking**

## What you'll learn

How to  
construct a  
baseline

How to set  
a net zero  
target

How to  
forecast  
emissions

How to track  
and assess  
progress



## Question

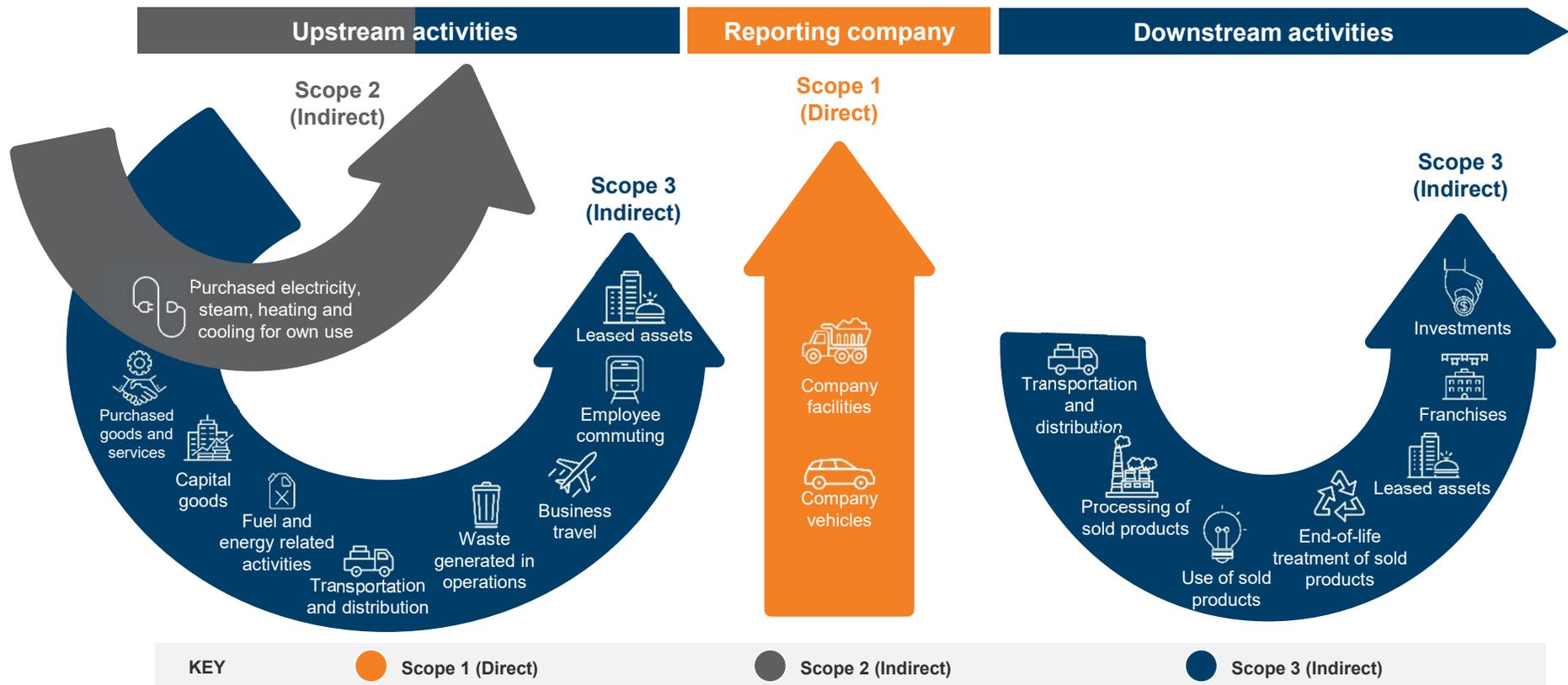
What is a net zero target?



# Baselining

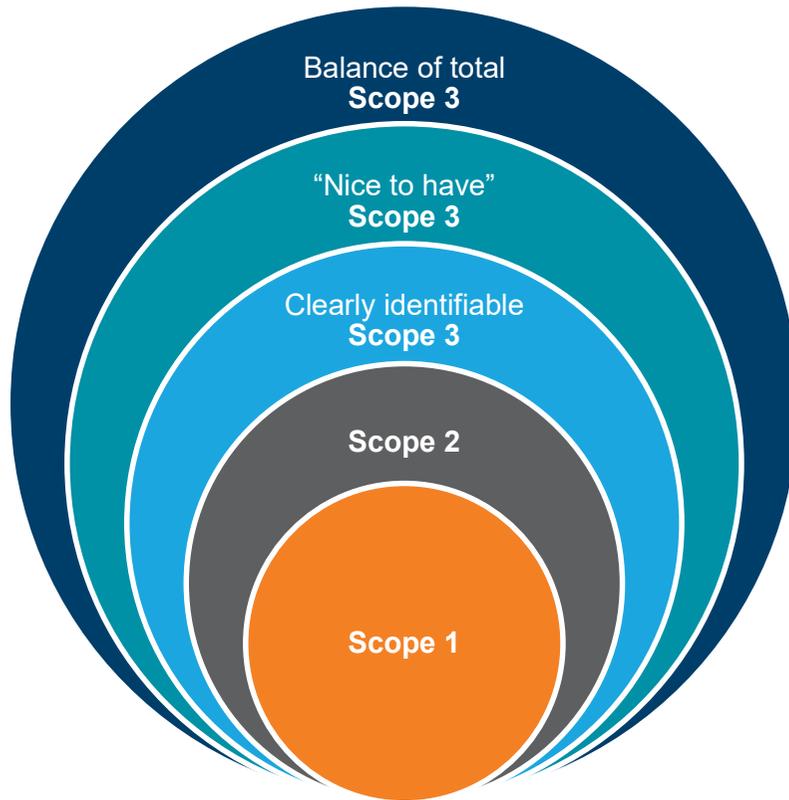
*Understanding your emissions inventory*

# Emissions scopes and sources



Adapted from GHG Protocol Corporate Standard

# Emissions scopes and sources



<b>Scope 3</b> <i>Balance of total</i>	Employee commuting	Leased assets	Franchises	Capital goods	Investments
<b>Scope 3</b> <i>Nice-to-have</i>	Purchased goods and services	Transportation and distribution	End-of-life treatment of sold products		
<b>Scope 3</b> <i>Clearly identifiable</i>	Waste generated in operations	Business travel	Fuel and energy related activities	Processing of sold products	Use of sold products
<b>Scope 2</b>	Purchased electricity, steam, heating and cooling for own use				
<b>Scope 1</b>	Company facilities		Company vehicles		

Sources and their allocation within these scope 3 categories will differ between corporations

# Which scope 3 categories are required?



## Size

Significant contribution to inventory

## Influence

Reductions can be undertaken or influenced

## Risk

Emissions contribute to risk exposure

## Stakeholders

Deemed critical by key stakeholders

## Outsourcing

Previously performed in-house, or in-house at other similar organisations

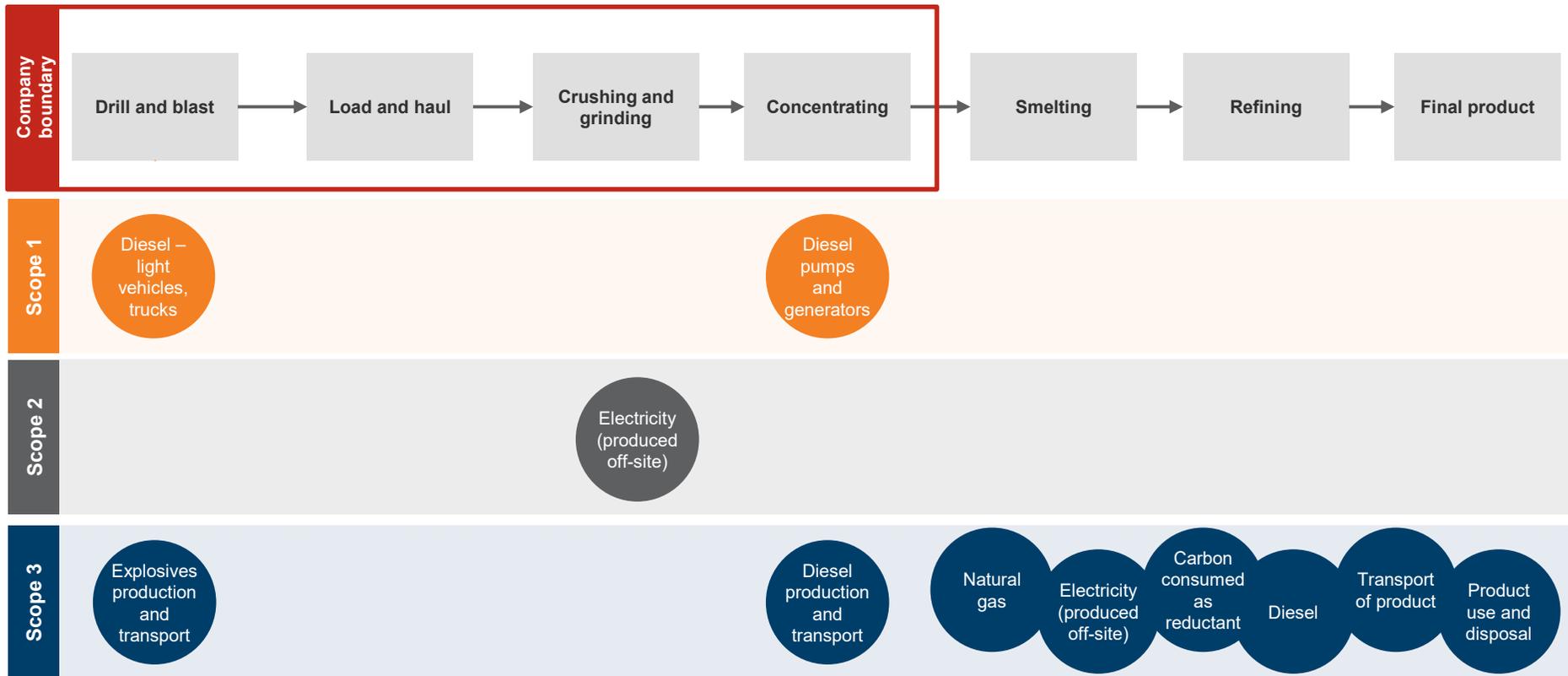
## Other

Any other criteria or guidance specific to the company or sector

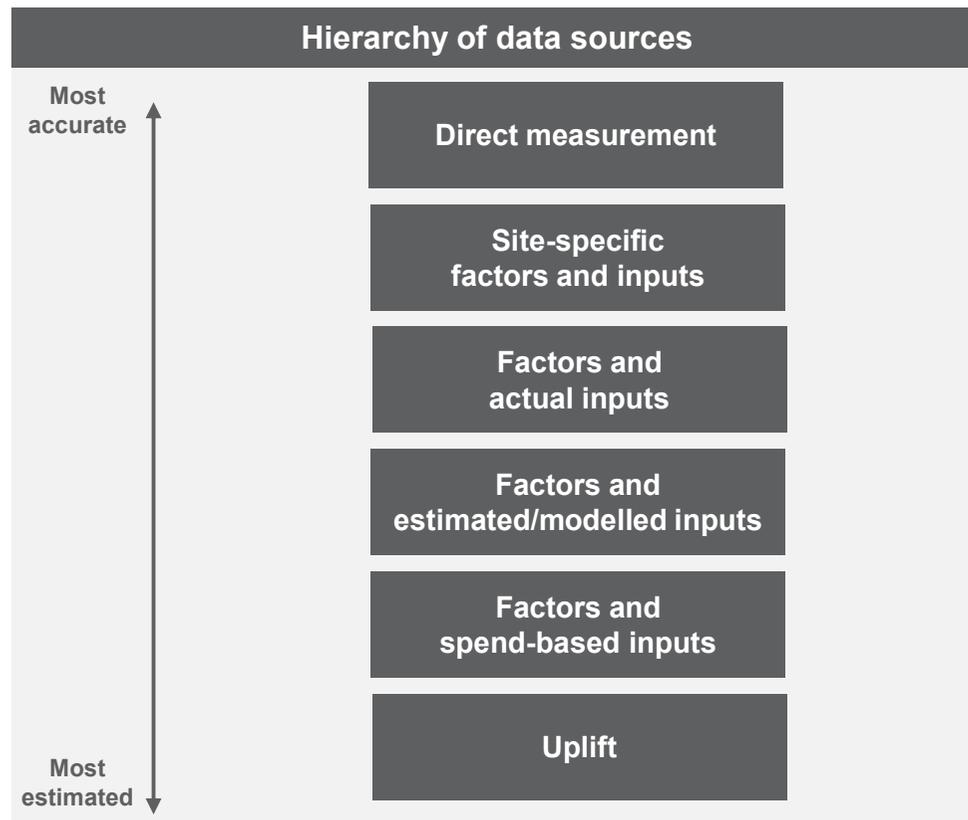
Adapted from GHG Protocol Scope 3 standard

# Identify supply chain emission sources

*Examples only – not complete*



# Approaches to estimating emissions



“We measured our emissions which resulted in a value of X tCO<sub>2</sub>-e”

“We consumed X litres of fuel, and tested our fuel to get specific information on its energy and emissions content”

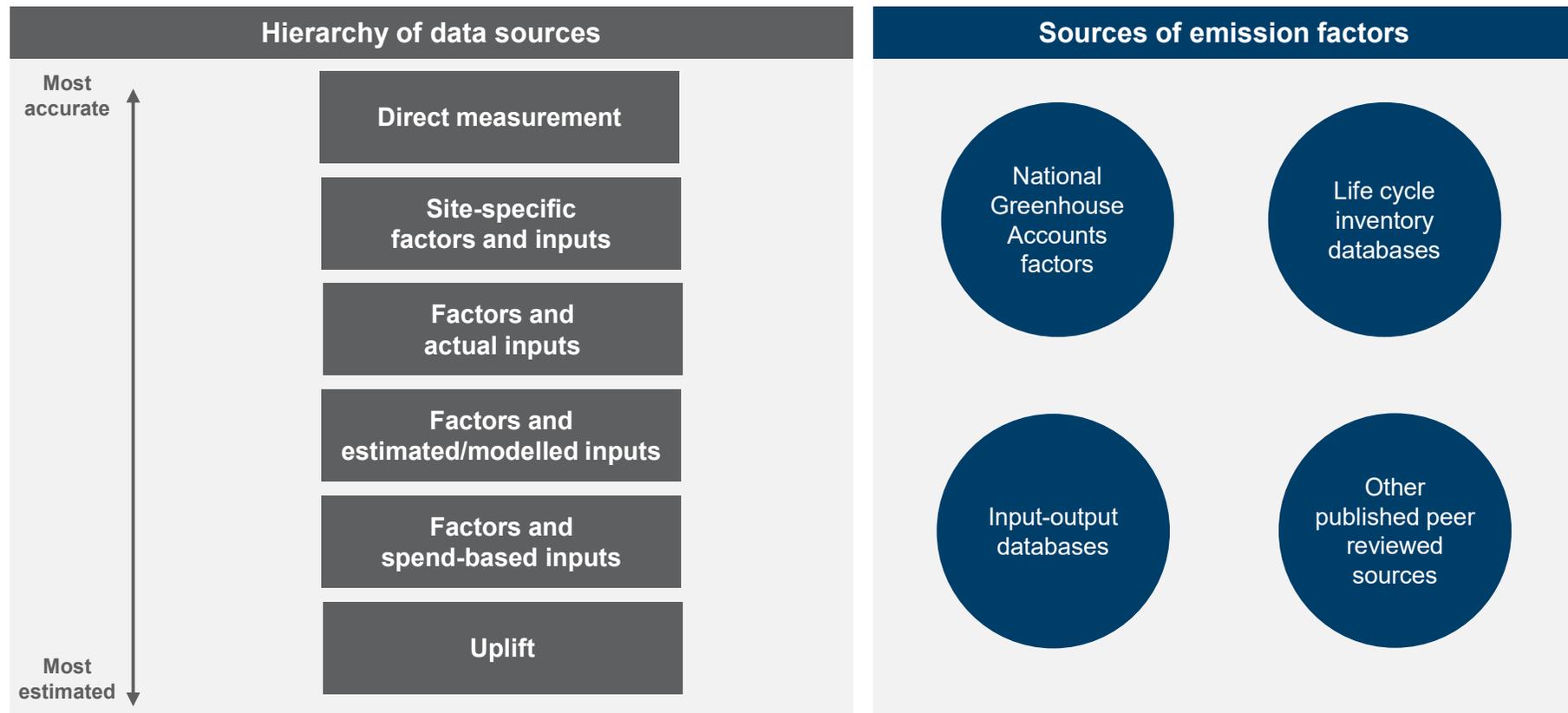
“As shown on our invoices, we consumed X litres of fuel”

“Our vehicles consume an average of X litres per hour and ran for Y hours, which equates to Z litres”

“We spend \$X on fuel, which at an average price of \$Y per litre equates to Z litres”

“This source is estimated to be an additional X% of the inventory”

# Approaches to estimating emissions



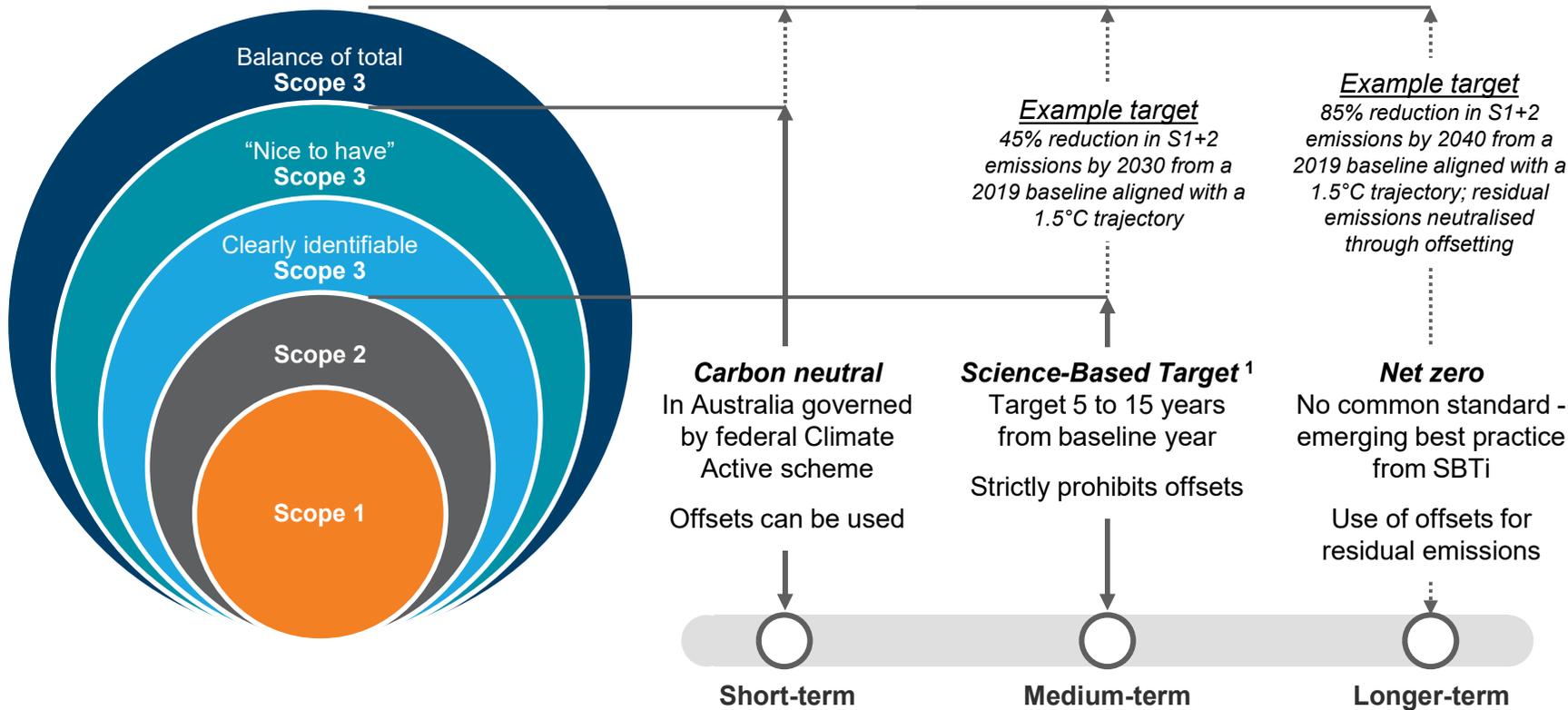


## Target setting

*Which target is the 'right' target?*



# What is a net zero target?



1. Scope 3 target needs to be developed if scope 3 emissions exceed 40% of scope 1+2

# What makes a target 'Paris aligned'?

## Sectoral decarbonisation approach

- Developed by Science Based Targets Initiative
- Considers differences between sectors – such as mitigation potential and ability for each sector to grow
- Translates climate science into sector and then company-specific benchmarks
- Used by other initiatives – such as the Transition Pathway Initiative and Climate Action 100+

nature  
climate change

LETTERS

PUBLISHED ONLINE: 24 AUGUST 2015 | DOI: 10.1038/NCLIMATE2770

## Aligning corporate greenhouse-gas emissions targets with climate goals

Oskar Krabbe<sup>1,2</sup>, Giel Linthorst<sup>1\*</sup>, Kornelis Blok<sup>1,3</sup>, Wina Crijns-Graus<sup>2</sup>, Detlef P. van Vuuren<sup>2,4</sup>, Niklas Höhne<sup>5,6†</sup>, Pedro Faria<sup>7</sup>, Nate Aden<sup>8,9</sup> and Alberto Carrillo Pineda<sup>10</sup>

**Corporate climate action is increasingly considered important in driving the transition towards a low-carbon economy<sup>1</sup>. For this, it is critical to ensure translation of global goals to greenhouse-gas (GHG) emissions reduction targets at company level<sup>2,3</sup>. At the moment, however, there is a lack of clear methods to derive consistent corporate target setting that keeps cumulative corporate GHG emissions within a specific carbon budget (for example, 550–1,300 GtCO<sub>2</sub> between 2011 and 2050 for the 2°C target<sup>4</sup>). Here we propose a method for corporate emissions target setting that derives carbon intensity pathways for companies based on sectoral pathways from existing mitigation scenarios: the Sectoral Decarbonization Approach (SDA). These company targets take activity growth and initial performance into account. Next to target setting on company level, the SDA can be used by companies, policymakers, investors or other stakeholders as a benchmark for tracking corporate climate performance and actions, providing a mechanism for corporate accountability.**

Both climate negotiations and scientific literature focus primarily on global or country-level abatement efforts. Reaching climate agreements between countries, however, has proved to be a complex and slow process. There is a growing recognition that more actively involving other actors (for example, at the city or company level) in defining climate action may be key in effectively tackling climate change<sup>5,6</sup>. This would, however, require simple, transparent methods that link the potential efforts of these actors to global climate projections. A large body of literature is available on setting country targets<sup>7</sup>, some of them even applying sectoral approaches to derive national targets<sup>8–10</sup>.

In contrast, methods that set targets for actors other than countries are much less common. Most of the literature is specific to particular case studies<sup>11</sup>, or calculate only sectoral level targets

(ref. 16). Globally, the rate of decline of GHG emissions per unit of global GDP (that is, monetary emissions intensity) would need to be around 5% per year to achieve a 50% emission goal in 2050. In the GEVA approach this decarbonization rate is subsequently applied to sectors and companies. Applying the same rate to all sectors does, however, not account for differences between sectors (for example, different mitigation potentials and costs) and may not always result in feasible targets. The GEVA method also does not account for current performance, by applying a uniform decarbonization trajectory that is applied to all companies. Finally, this method does not necessarily limit emissions within the carbon budget.

Any method for deriving sectoral targets needs to comply to a number of criteria: it should be applicable to different global targets; be transparent so that all actors can follow the calculations; allow for heterogeneity; and be acceptable to different actors. On the basis of these criteria, we propose an alternative method, the Sectoral Decarbonization Approach (SDA). We illustrate the SDA here by relating it to the global carbon budget associated with an at least 50% chance of keeping global warming below 2°C from pre-industrial levels (550–1,300 Gt anthropogenic CO<sub>2</sub> emissions from 2011 to 2050), as stated by the IPCC (ref. 4). For reasons of data availability, we use one specific global scenario to allocate this global carbon budget to sectors—namely, the 2DS scenario from the International Energy Agency (IEA; ref. 17). Cumulative emissions in this scenario are 1,054 GtCO<sub>2</sub> in the 2011–2050 time frame from fossil fuel combustion and industrial processes. Taking into account an average estimate for land-use CO<sub>2</sub> emissions (104 GtCO<sub>2</sub> from 2011 to 2050 (ref. 18)) this is in line with the 2°C carbon budget as determined by the IPCC. A comparison of the emission pathways in the 2DS scenario with the 2°C scenarios in the IPCC scenario database can be found in the Supplementary Information.

Translating the sectoral emission pathways into sectoral

# Fit for purpose targets are not static

## Targets need regular review



Business requirements change  
(e.g. 2050 becomes 2040)



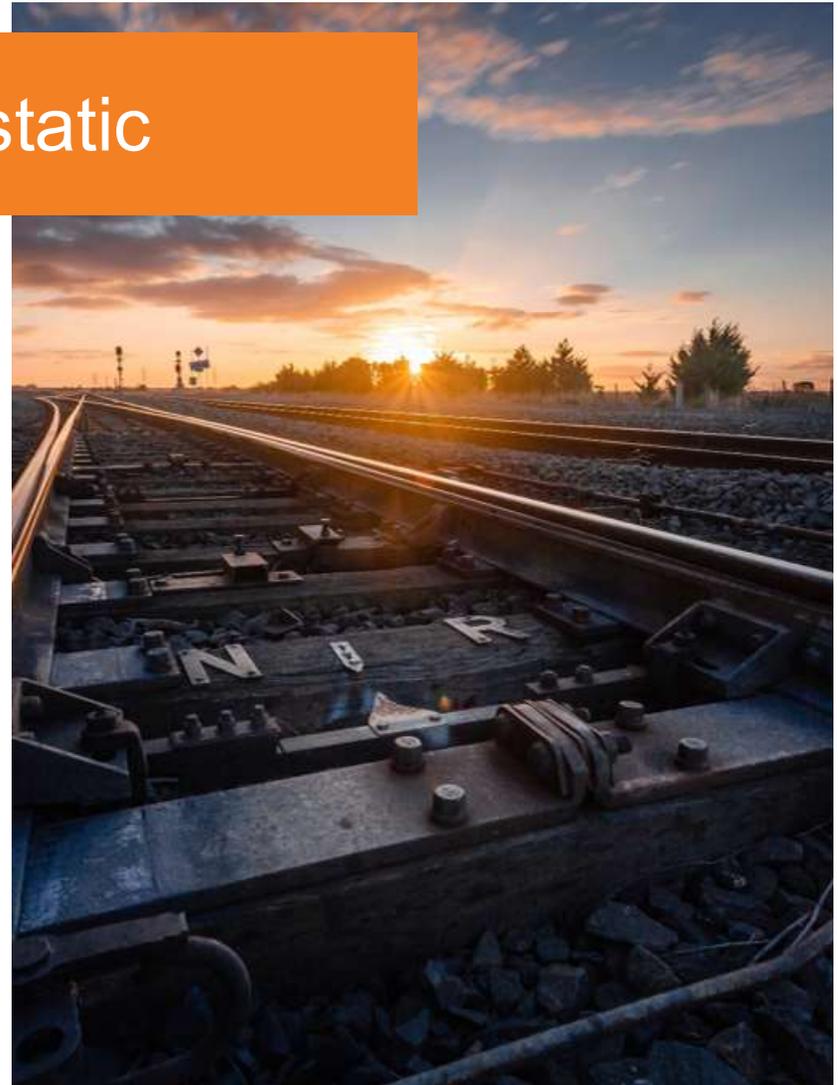
Target-setting is an iterative process  
that must be revised periodically



Regulatory requirements change

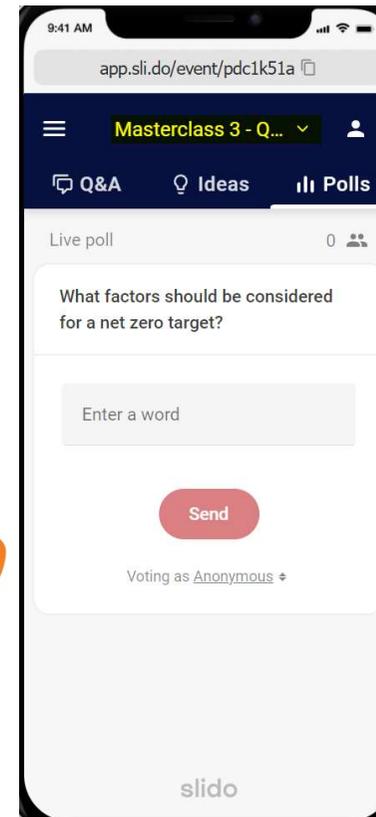


New and cheaper technologies  
might change the plan and  
accelerate progress to target



# Slido poll

“  
What factors should  
be considered for  
a net zero target?  
”



# Considerations for target setting



Time horizon

Ambition

Peers

Stakeholder expectations

Offsets: yes or no?

Absolute or intensity?

Reputational benefits

Formal reporting framework?

Adjusting for adding / removing sites



# Forecasting

*Understanding the emissions reduction task ahead*

# Constructing emissions forecasts



## Existing forecasts

Which emissions parameters are already forecast (e.g. diesel use)?

## Multiple scenarios

Over long time horizons (2050), multiple scenarios can test levers and sensitivities

## Small sources

Which sources can be estimated using historical averages?

## Legislative requirements

Are forecasts required elsewhere (e.g. Safeguard Mechanism)?

## Align with production

Which sources can be directly correlated with production?

## Operational changes

Are there any upcoming changes that will affect these relationships?



# Optioneering

*Which abatement opportunities should be implemented?*

An aerial photograph of a dense, lush green forest covering a rugged, rocky terrain. The forest is composed of various shades of green, indicating different types of trees and vegetation. The rocky outcrops are light brown and tan, providing a stark contrast to the green canopy. A large, white, circular graphic is superimposed over the center of the image, containing the text "A target without a plan is only half the story" in a clean, white, sans-serif font.

A target without  
a plan is only  
half the story

# Investigating identified opportunities

## Filtering opportunities

### Using conventional metrics

**Cost and benefit:** The total cost of the project (capital and ongoing operational expenses) must be investigated. Other cost calculations such as the Net Present Value (NPV) and Payback Period of the identified opportunities must also be undertaken.

**Scale of abatement:** The volume of GHG saved over the project's lifetime is also an important metric when investigating identified opportunities.

**Confidence factor:** Opportunities with high confidence in the abatement achievement and cost of the opportunity should be prioritised.

### Additional considerations

Does the opportunity align with your organisation's **values**?

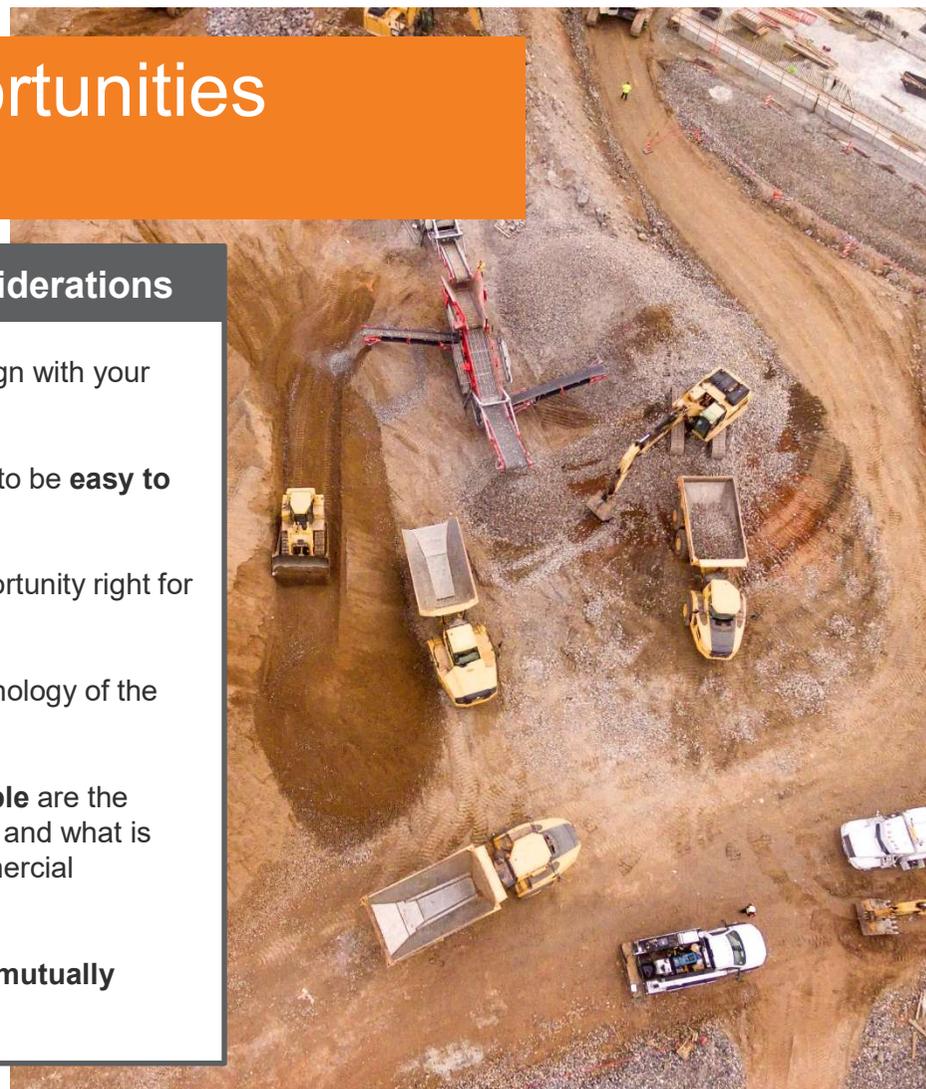
Is the opportunity going to be **easy to implement**?

Is the **timing** of the opportunity right for your organisation?

How **mature** is the technology of the abatement solutions?

How **commercially viable** are the abatement technologies and what is their timescale for commercial readiness?

Are some opportunities **mutually exclusive**?



# Investigating identified opportunities

## What you need to do



### **Review abatement opportunities**

Identify and review abatement opportunities and identify other options, including:

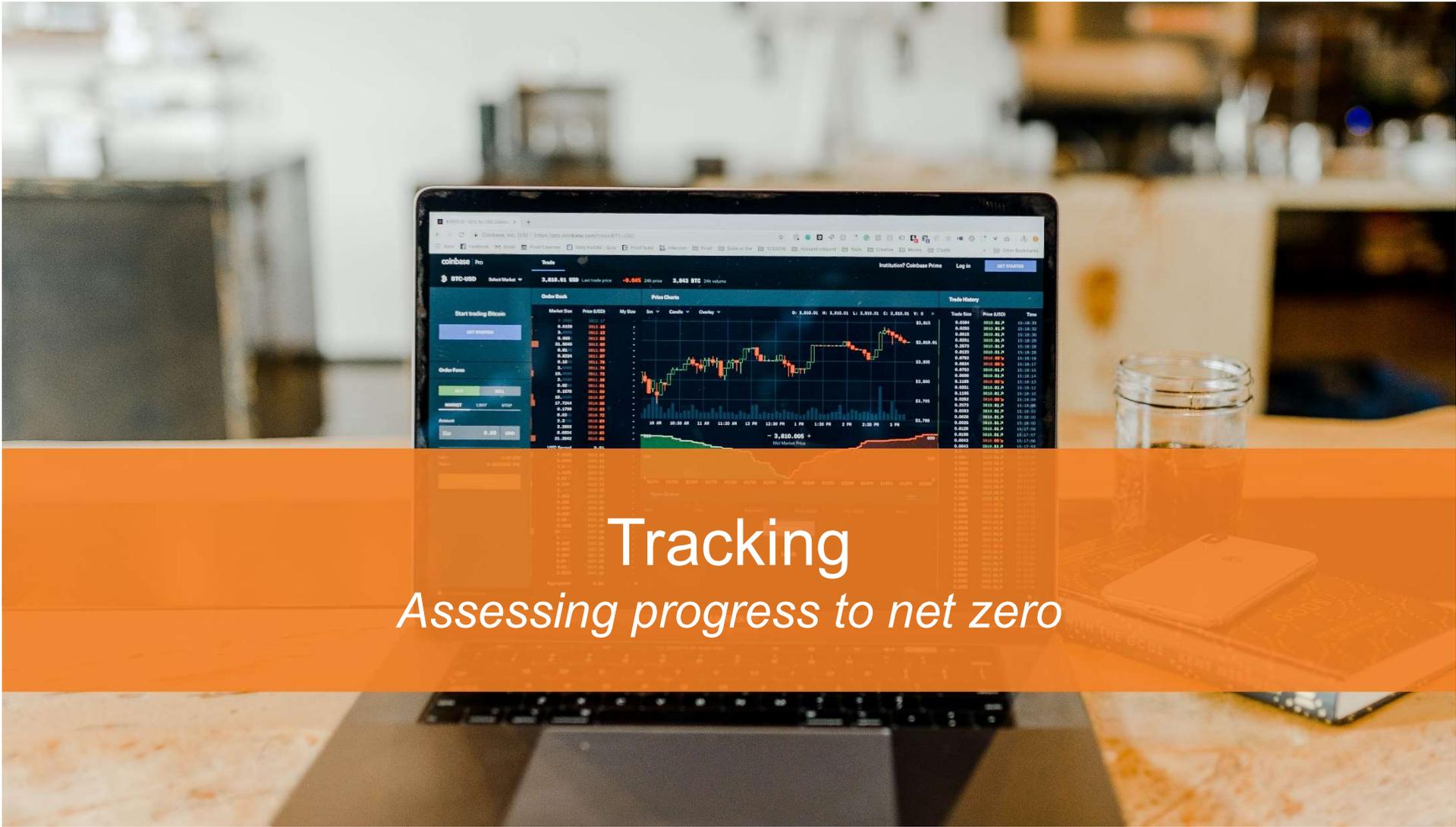
- Collate information (existing and potential emissions abatement measures)
- Review abatement measures to validate feasibility
- Conduct research for additional ideas / emerging trends / technologies
- Size opportunities

### **Assess risk**

- Project risk assessment and screening
- Confidence factor

### **Assess financial impact**

- Cost opportunities and evaluate (e.g. NPV)
- Assess financial implications of opportunities different abatement scenarios (e.g. different carbon prices)



Tracking  
*Assessing progress to net zero*

## Uses for metrics and charts



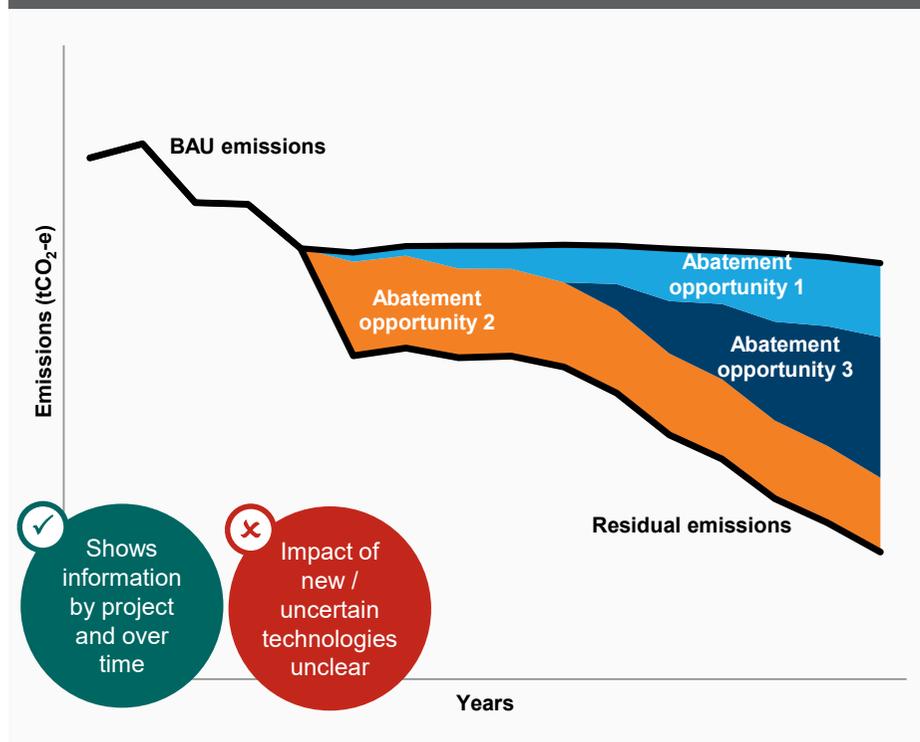
**Exploratory**  
Identifying and  
comparing potential  
pathways to  
net zero



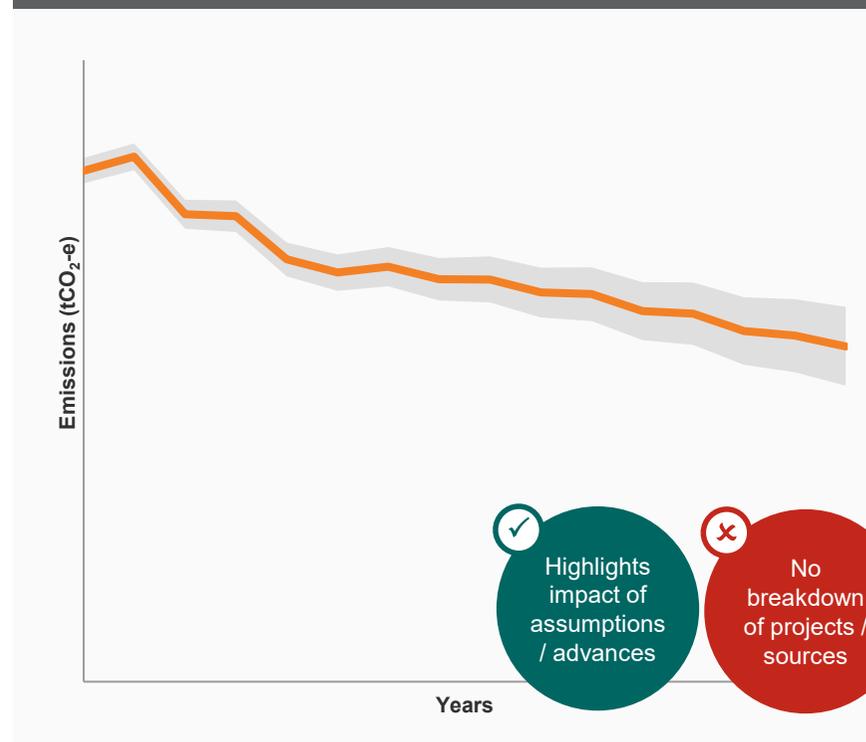
**Explanatory**  
Communicating  
progress to date or  
recommendations /  
decisions

# Exploratory charts

## Area chart

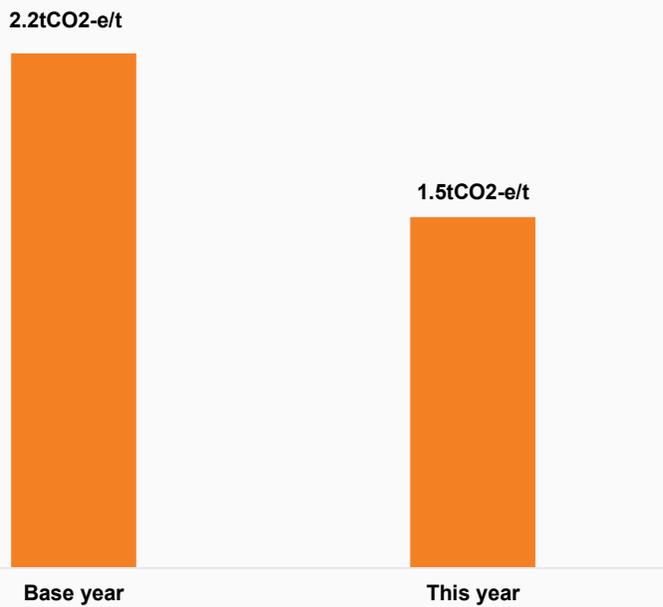


## Line chart and uncertainty



# Explanatory charts

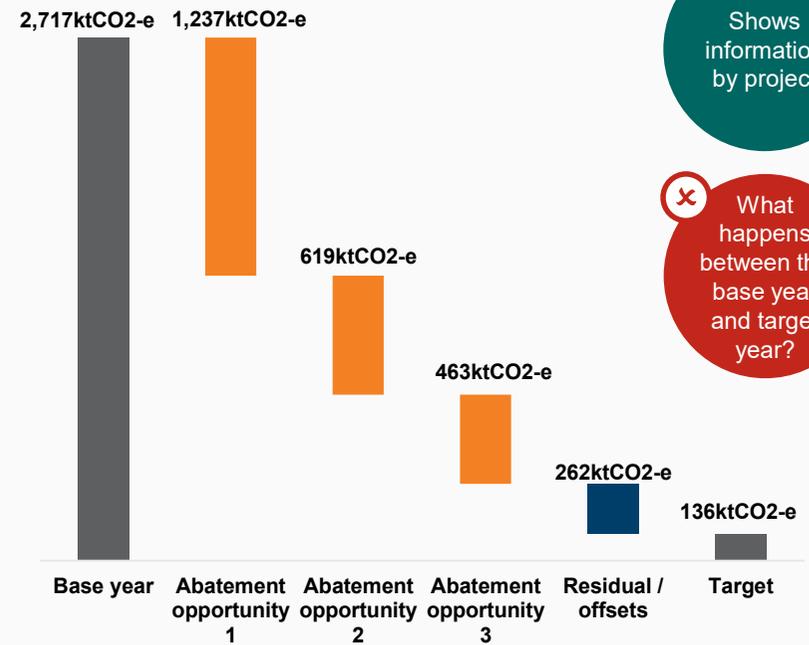
## Intensity comparison



✓ Easy to understand and compare

✗ Have overall emissions decreased?

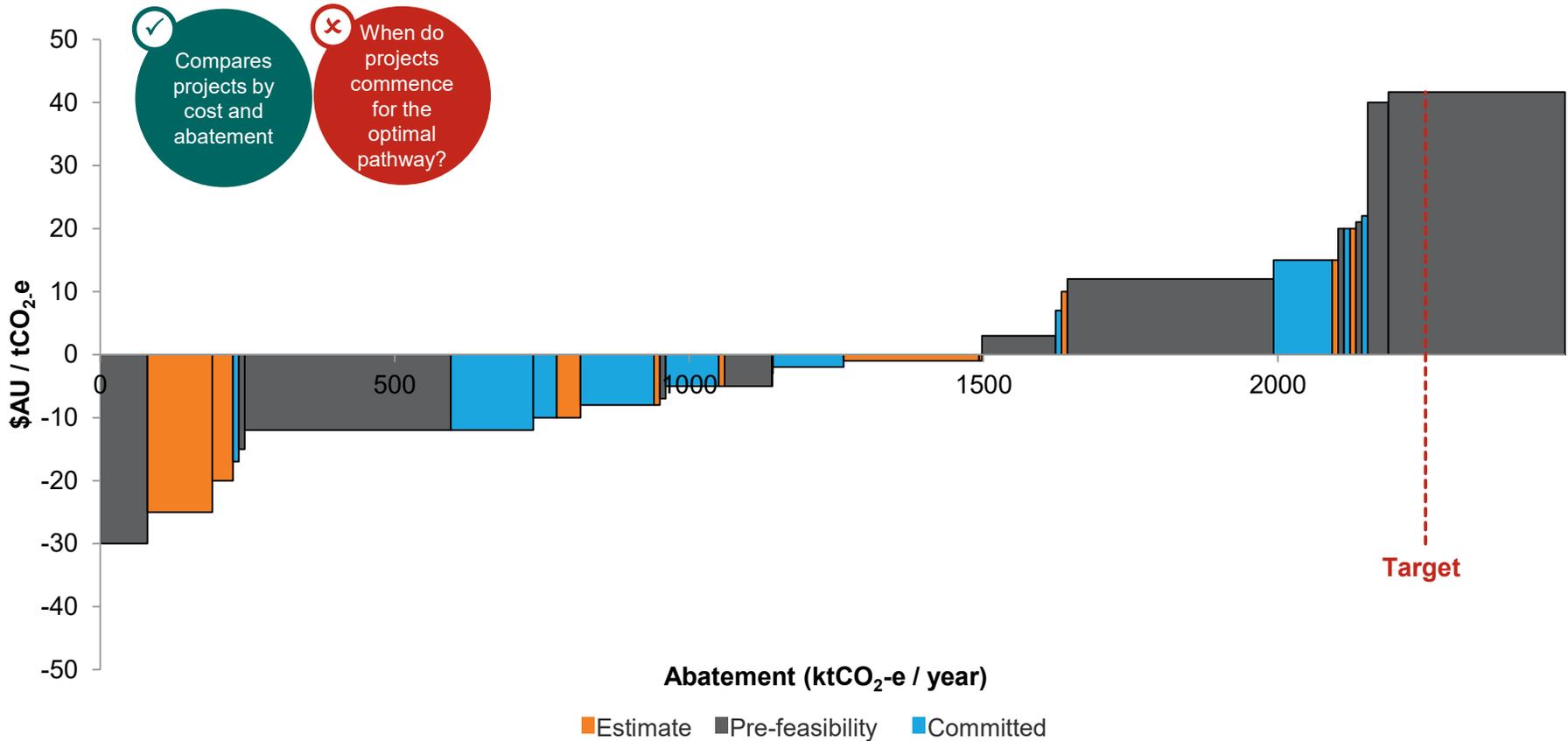
## Waterfall chart



✓ Shows information by project

✗ What happens between the base year and target year?

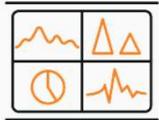
# Marginal abatement cost curve



# Uses for metrics and charts



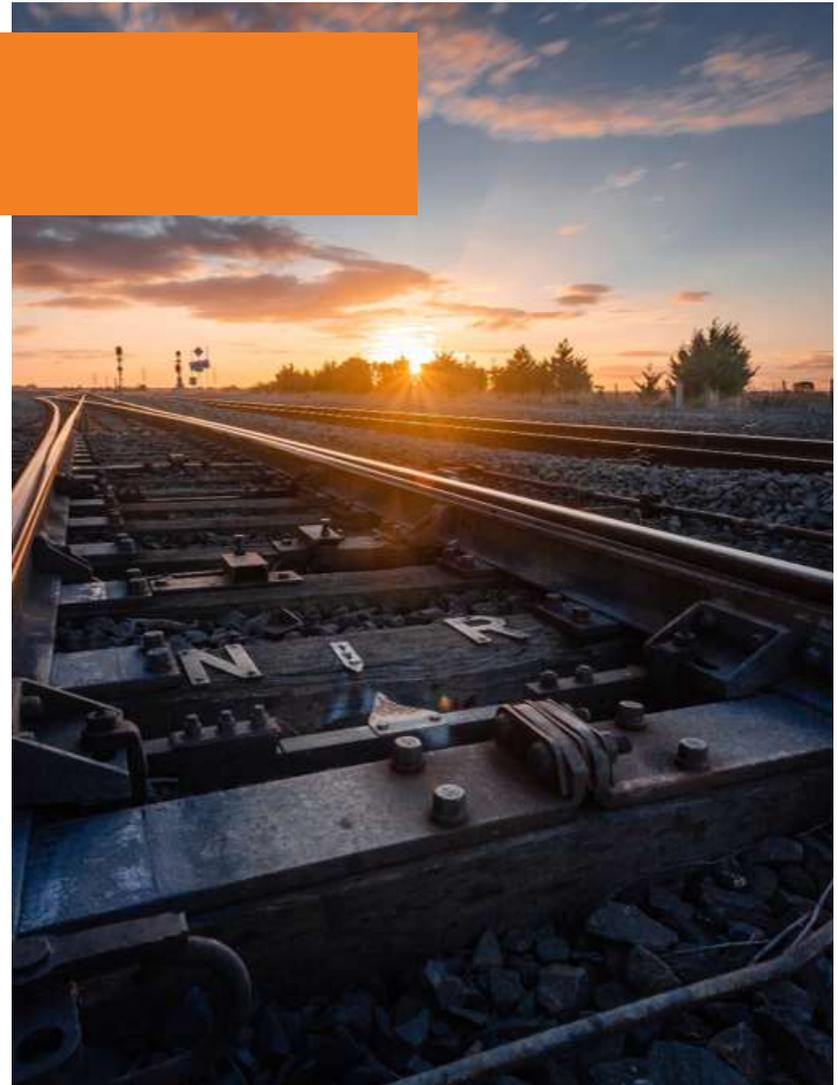
Consider what questions are answered – or raised – by the metrics



No 'one size fits all' – more than one is likely to be necessary



Compare achieved to projected abatement by project

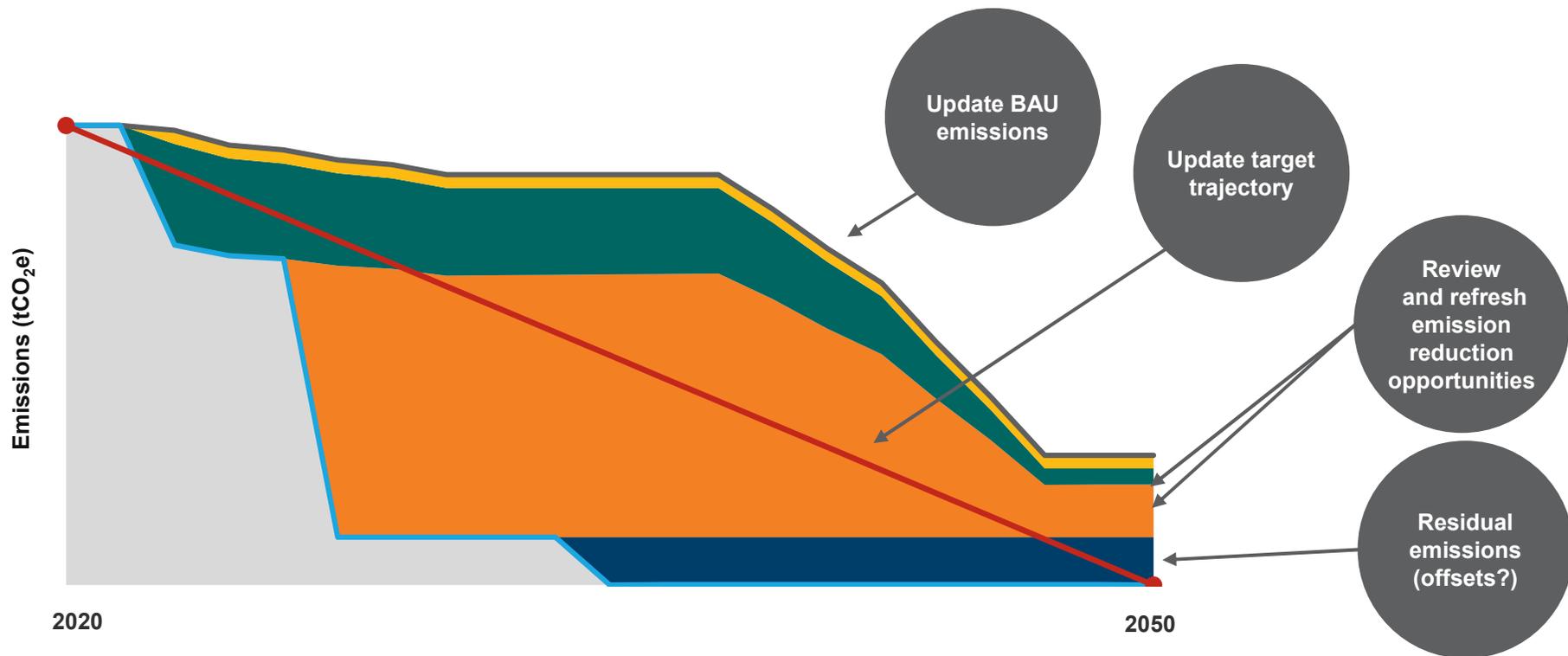


A close-up photograph of a hand holding a glowing incandescent lightbulb. The lightbulb is the central focus, emitting a warm, bright yellow light. The background is blurred, showing a person in a blue shirt and another person's hands writing on a piece of paper. An orange horizontal band is overlaid across the middle of the image, containing the text "In conclusion".

In conclusion

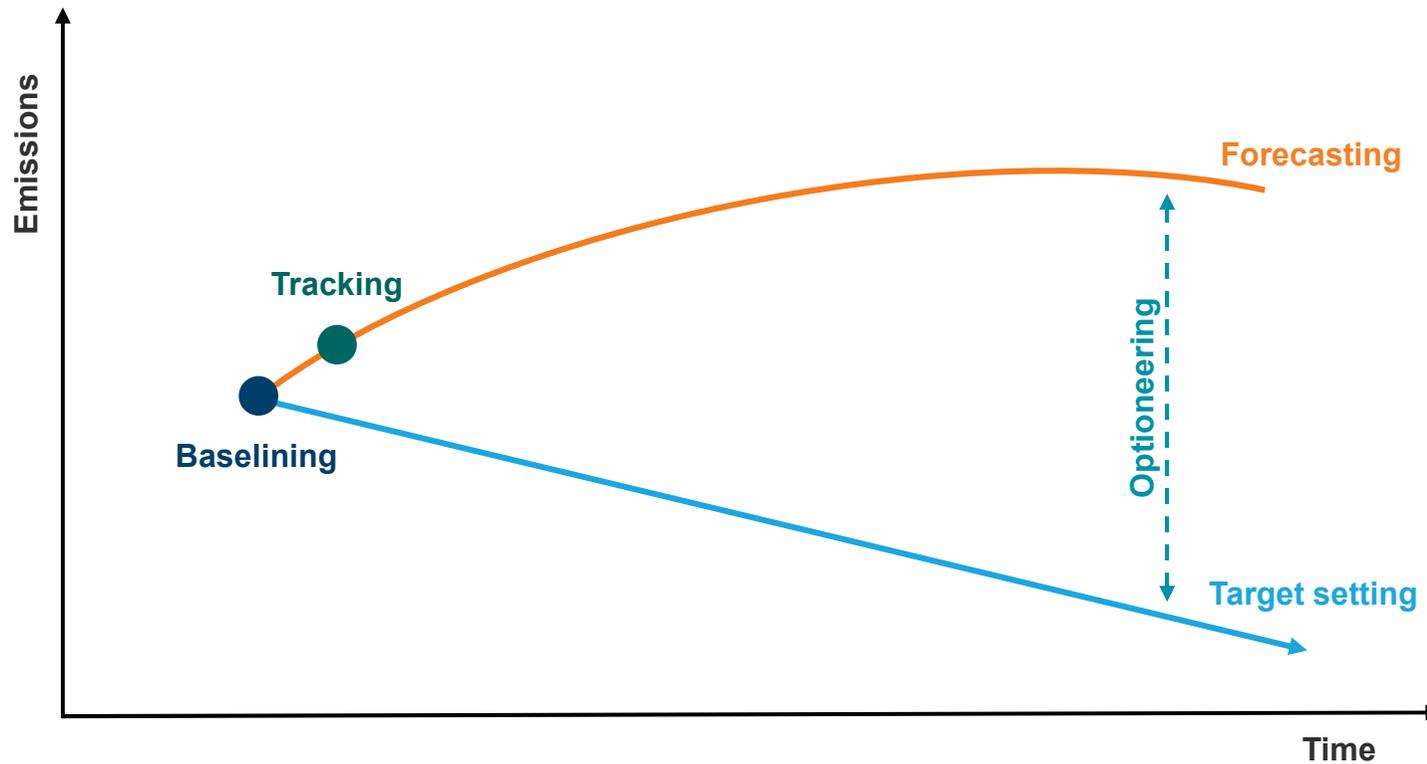
# Key elements in setting a net zero target

Tied together in a net zero business plan



# Key elements in setting a net zero target

Tied together in a net zero business plan





Questions

# Sustainability at Energetics

## Our contribution to a carbon neutral society

We're more than carbon neutral. Sustainability is core to Energetics' business.

In June 2008, Energetics became one of Australia's first consulting firms to achieve carbon neutrality through the Australian Government's Greenhouse Friendly Program.

In 2019 we became a 'Climate Active' certified organisation and in 2020 we added our services to our Climate Active certification. In 2021 we achieved a significant milestone when our science based target (SBT) was verified by the global Science Based Targets initiative (SBTi).



## Our values

A team of passionate, committed climate change and energy management professionals, we advise some of Australia's largest companies on their role in a sustainable and prosperous future.

We believe in:

- Delivering excellence
- Acting as an environmental role model
- Providing our clients with innovative and sustainable solutions
- Holding ourselves accountable for our actions
- Respecting the experience and opinions of our clients and colleagues.

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