
16 February 2024

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CEO, Climateworks Centre



Accelerating the energy transition

*Accelerating implementation of
net zero-aligned infrastructure
through policies and precincts*

About Climateworks Centre

We are climate transition specialists, working with decision-makers in Australia, Southeast Asia and the Pacific who have the power to reduce emissions at scale.

We focus on net zero emissions pathways, policies and practice.

- Operating from Australia and Indonesia
- Working in partnership

Climateworks Centre is an independent not-for-profit operating within Monash University



MONASH University

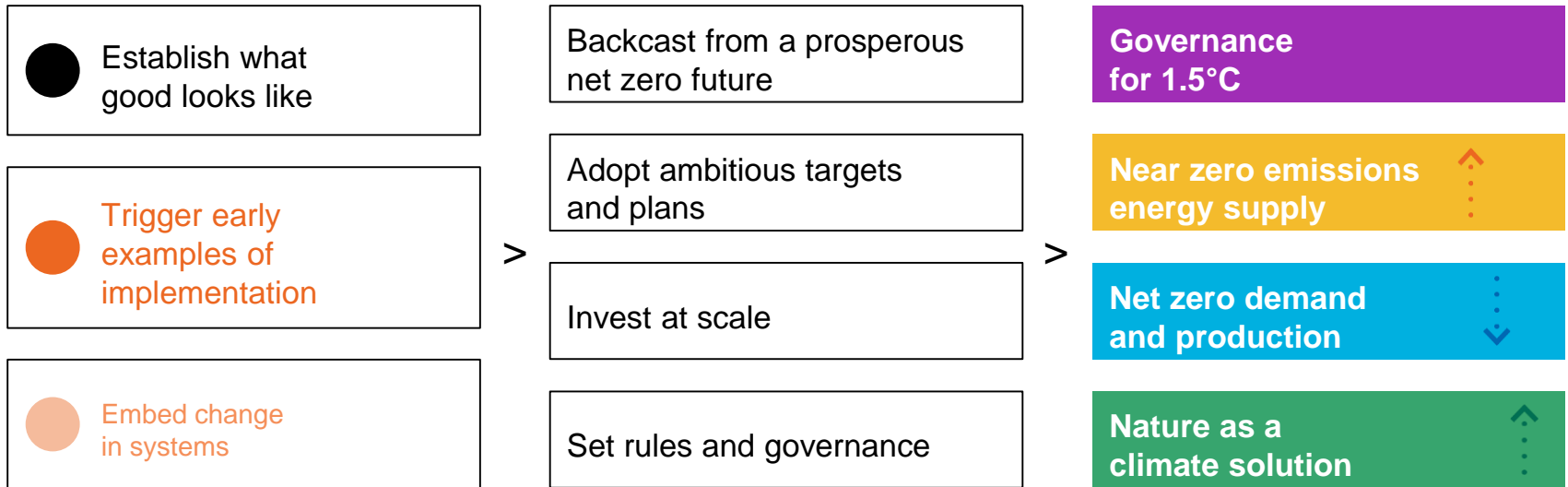
MONASH SUSTAINABLE DEVELOPMENT INSTITUTE



Climateworks CENTRE

Accelerating the transition requires systems thinking

Our approach:



AusTIMES was developed by Climateworks and CSIRO based on the TIMES model from the International Energy Agency.

Our model shows how the Australian economy can decarbonise at the lowest cost.

Each update has lower residual emissions in 2050. The 1.5°C-aligned path achieves net zero emissions before 2040

- + In 2014, Australia's first *Pathways to Deep Decarbonisation in 2050* was published by Climateworks & ANU with CSIRO, solving for net zero 2050
- + In 2020, *Decarbonisation Futures*, updated this and produced the first explicitly Paris-aligned emissions trajectories and pathways for Australia, solving for 2°C and 1.5°C
- + In 2023, *Decarbonisation scenarios* are our third major public release on economy-wide decarbonisation pathways for Australia, with two possible scenarios, 1.5°C and well-below-2°C (1.8°C).

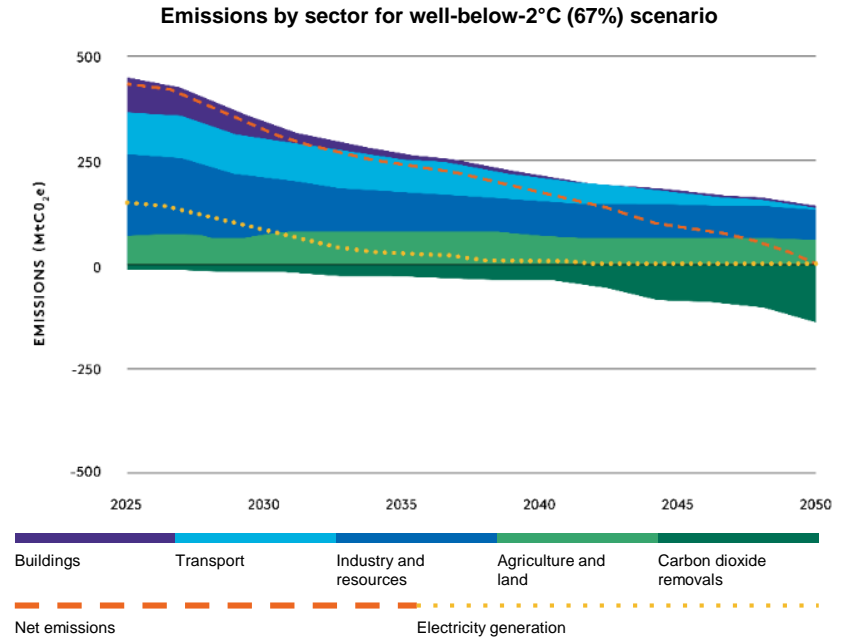
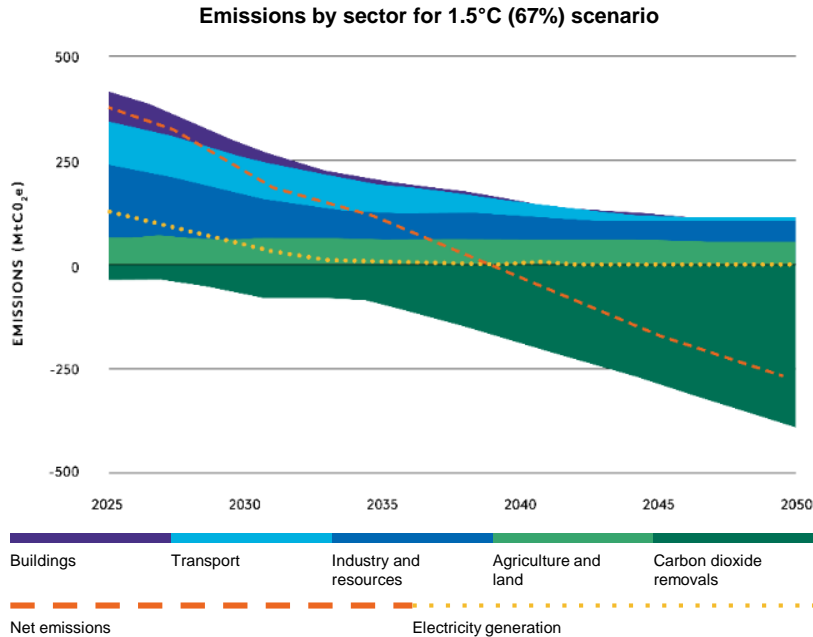
There have been some major developments since our 2020 scenarios

Hydrogen is better understood and more accepted as a potential solution for hard to abate sectors.

The policy context has shifted. Australia has committed to net zero emissions by 2050, and there is more action and commitment globally.

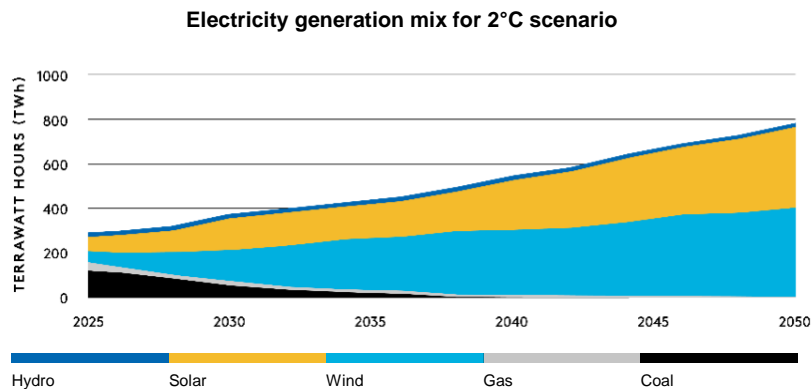
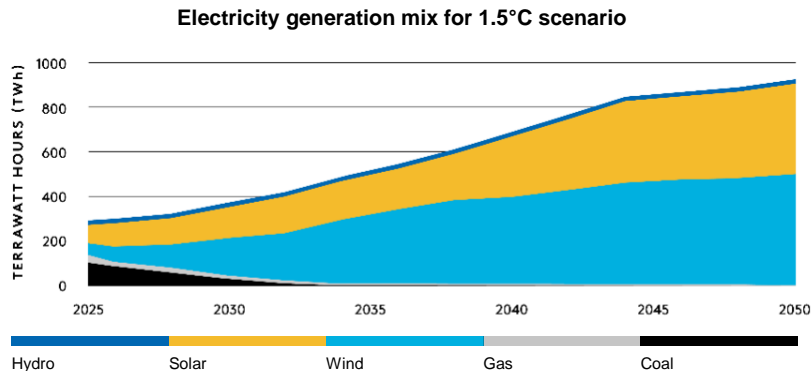
There is a growing consensus on the need to aim for **1.5°C rather than 2°C** to avoid the worst effects of climate change.

Cost-effective decarbonisation needs action across all sectors, and ~60-85% by 2035



Rapid decarbonisation of the electricity system is central to both scenarios

- + In both scenarios, renewable electricity generation grows to 83–90 per cent share of generation by 2030. This increases to nearly 100 per cent by 2050.
- + Renewable electricity generation capacity, currently around 55 GW, increases in both scenarios to 137–151 GW by 2030 and 363–398 GW by 2050.



Insights for transport



Transport benchmarks

Emissions benchmark for Paris-alignment

Year	Well- below-2°C (67%) scenario	1.5°C (67%) scenario
2030	1% below current levels	5% below current levels
2050	90% below current levels	90% below current levels

EV uptake benchmark

Year	Well- below-2°C (67%) scenario	1.5°C (67%) scenario
2030	56% of new car sales in 2030	73% of new car sales in 2030
2050	100% of new car sales in 2050	100% of new car sales in 2050

Insights for buildings



Buildings benchmarks

Emissions benchmark for Paris-alignment

Year	Well- below-2°C (67%) scenario	1.5°C (67%) scenario
2030	33% below current levels	36% below current levels
2050	94% below current levels	98% below current levels

- Gas use phases out of buildings in the 2030s
- Housing energy efficiency improves by 41 per cent by 2050 compared to today's levels

Insights for industry



Industry benchmarks

Emissions benchmark for Paris-alignment

Year	Well-below-2°C (67%) scenario	1.5°C (67%) scenario
2030	32% below current levels	46% below current levels
2050	54% below current levels	67% below current levels

Australian Industry Energy Transitions Initiative findings show more is possible

	Iron and steel	Aluminium	Other metals	Chemicals	LNG
Emissions reduction*	99%	98%	90%	96%	91%**
Technology Investment	A\$19.5b	A\$36.0b	A\$9.2b	A\$28.3b***	A\$39.6b
Renewable electricity required	29 TWh/yr	44 TWh/yr	26 TWh/yr	10 TWh/yr	6 TWh/yr
Hydrogen required	480,000 t/yr	12,000 t/yr	26,000 t/yr	205,000 t/yr	
<small>*Emissions reductions are findings of the Collaborative Action Scenario and based on 2020 levels</small>				<small>**Including a 75% reduction in LNG exports between 2020-50</small>	
				<small>***Including expenditure on hydrogen</small>	

Major policy processes are happening now

NDC with 2035 target due 2025

Climate-related financial disclosure

Sectoral pathways

Credible transition plans

Sectoral plans

Applying these goals in net zero industrial precincts (NZIPs / REIPs) can get it done



Clusters of industrial businesses



Powered by 100% renewable energy



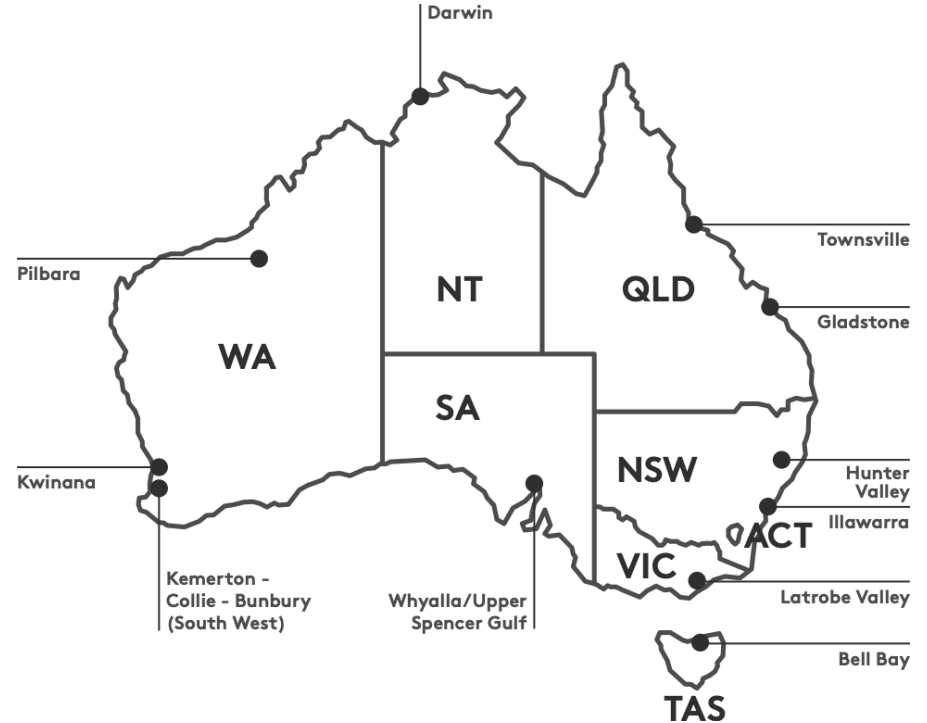
Sharing enabling infrastructure



Access to green hydrogen production



Coordinating govt investment funds with net zero pathway criteria in all precincts



Net zero targets for industrial regions was a call of the Australian Industry Energy Transition Initiative



Collaborators:



Industry & Business Participants:



Supported by:



Australian Industry ETI supply chains

17.3%

Contributed to Australia's GDP

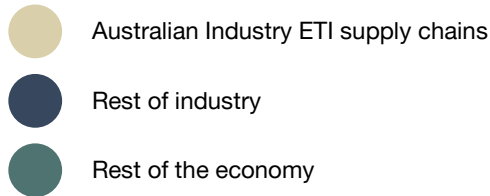
~A\$236bn

Generated in exports

~414,000

People employed

25%

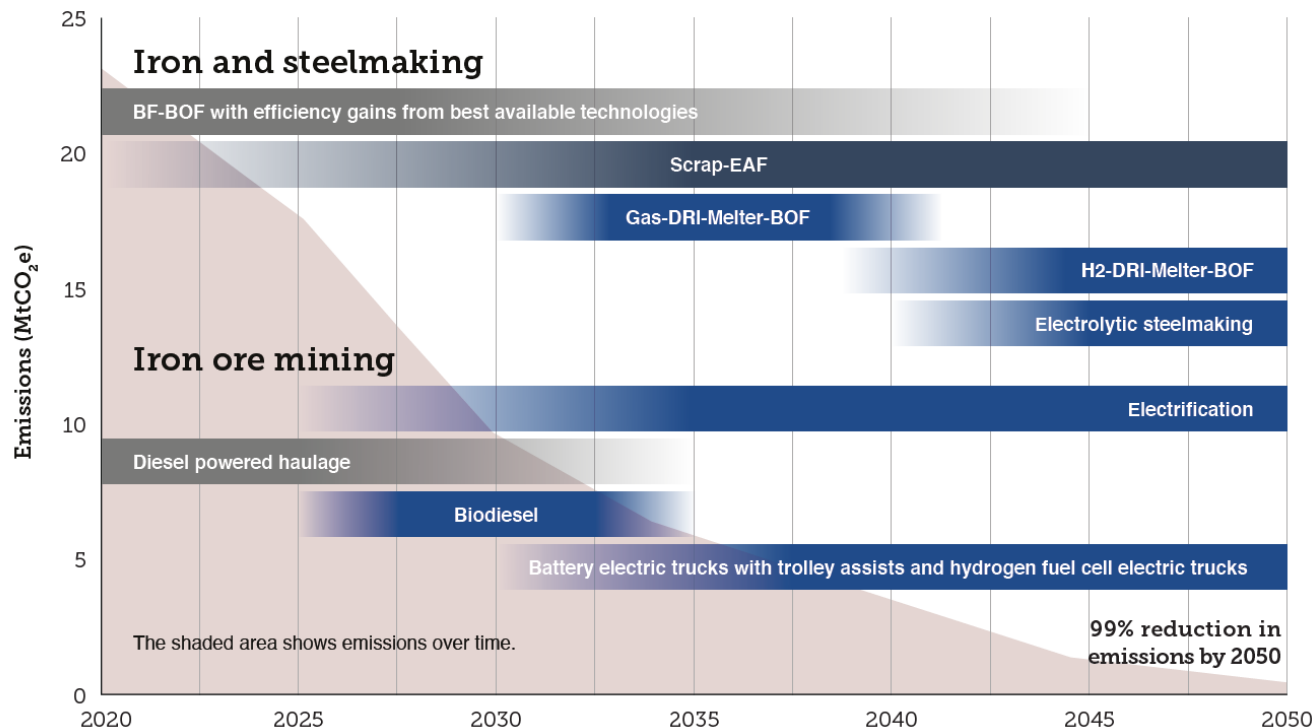


Emissions based on 2020 levels.
Industry emissions include scope 1 and 2.

Iron and steel

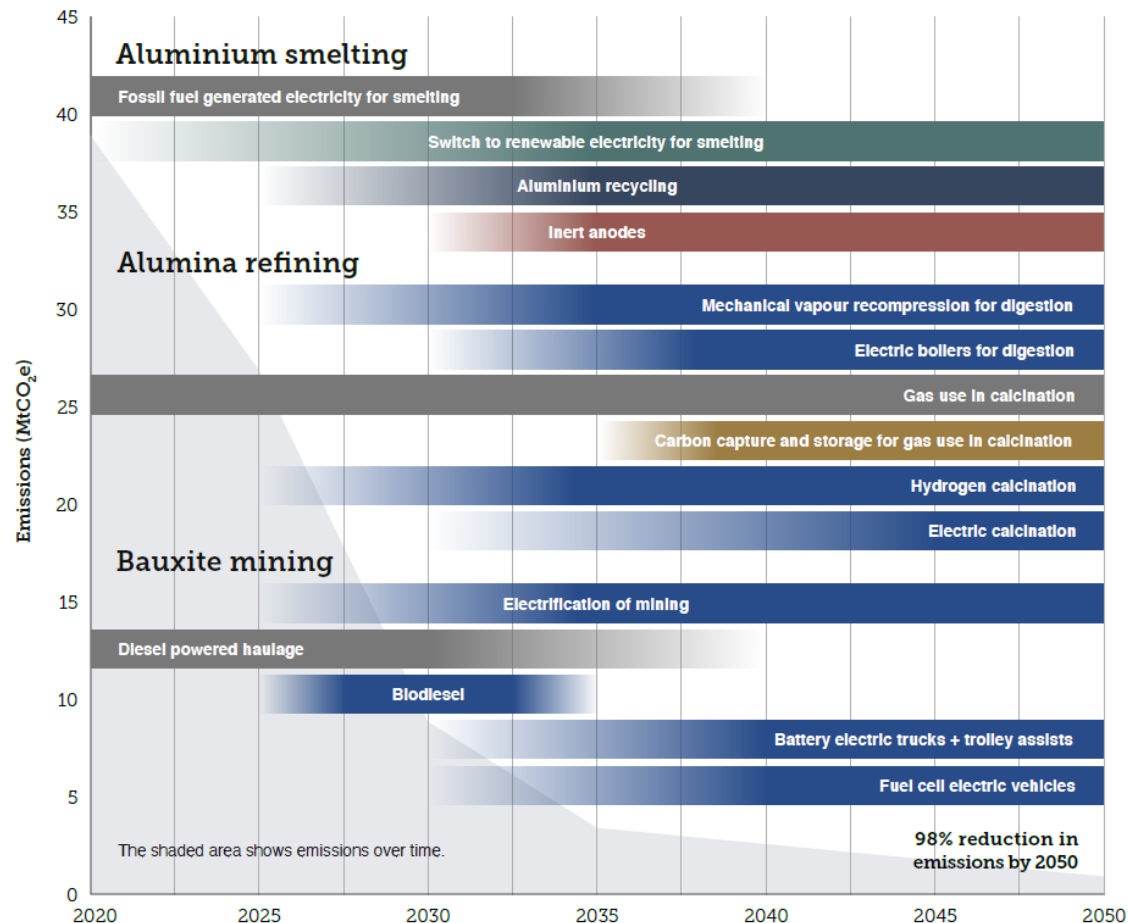
Technology deployment timeline

This chart shows the timeline of implementation that the model finds to be the least cost pathway, based on technology assumptions and other changes across the Australian economy. Note: There are other technologies that may be considered, for example, H2-DRI-EAF is an alternative steelmaking option using magnetite ores being investigated for deployment in Australia.



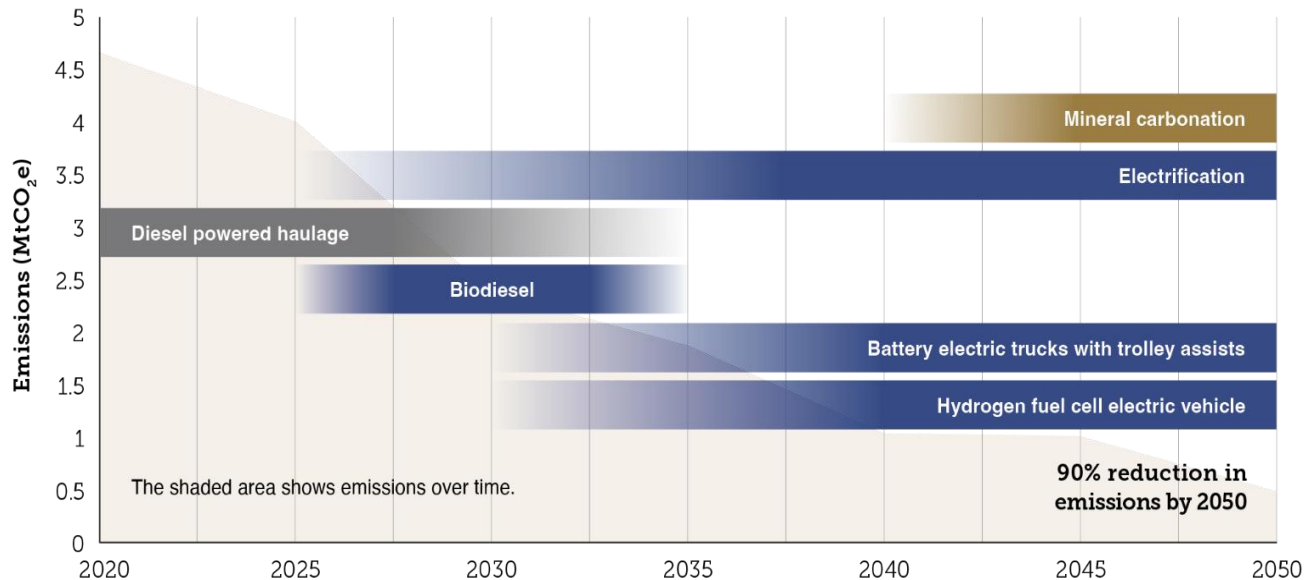
Aluminium Technology deployment timeline

This chart shows the timeline of implementation that the model finds to be the least cost pathway, based on technology assumptions and other changes across the Australian economy.



Other metals

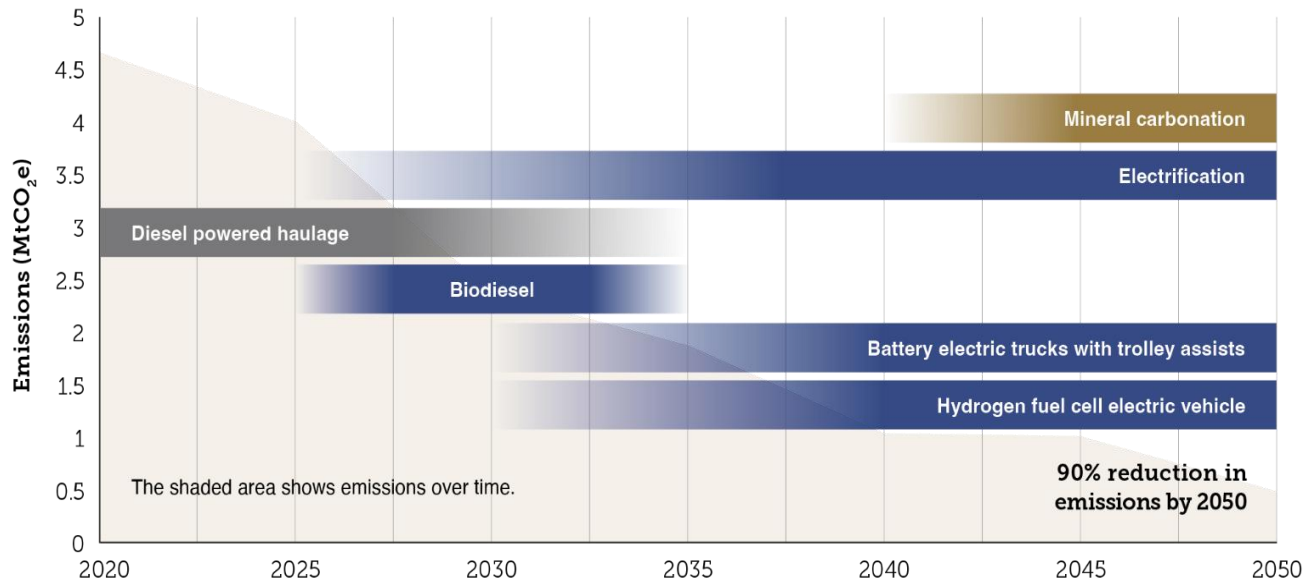
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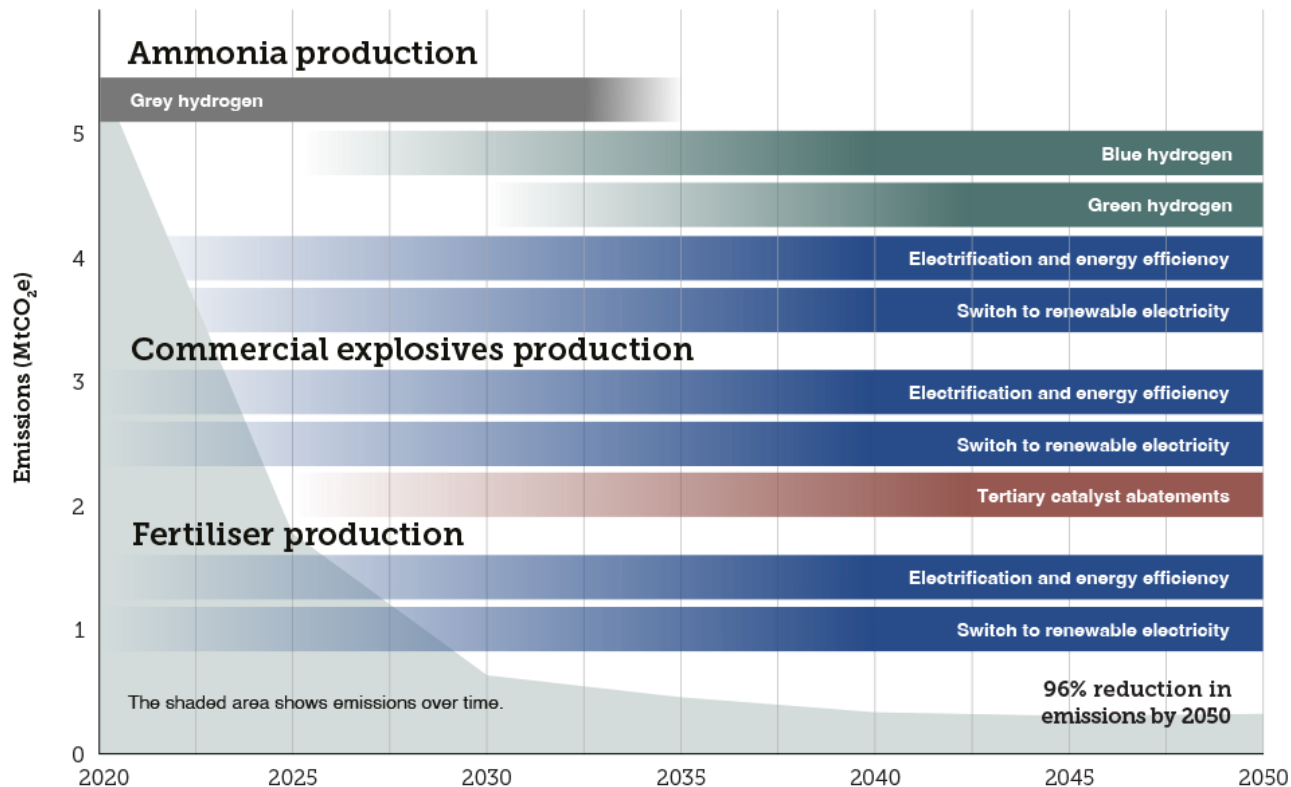
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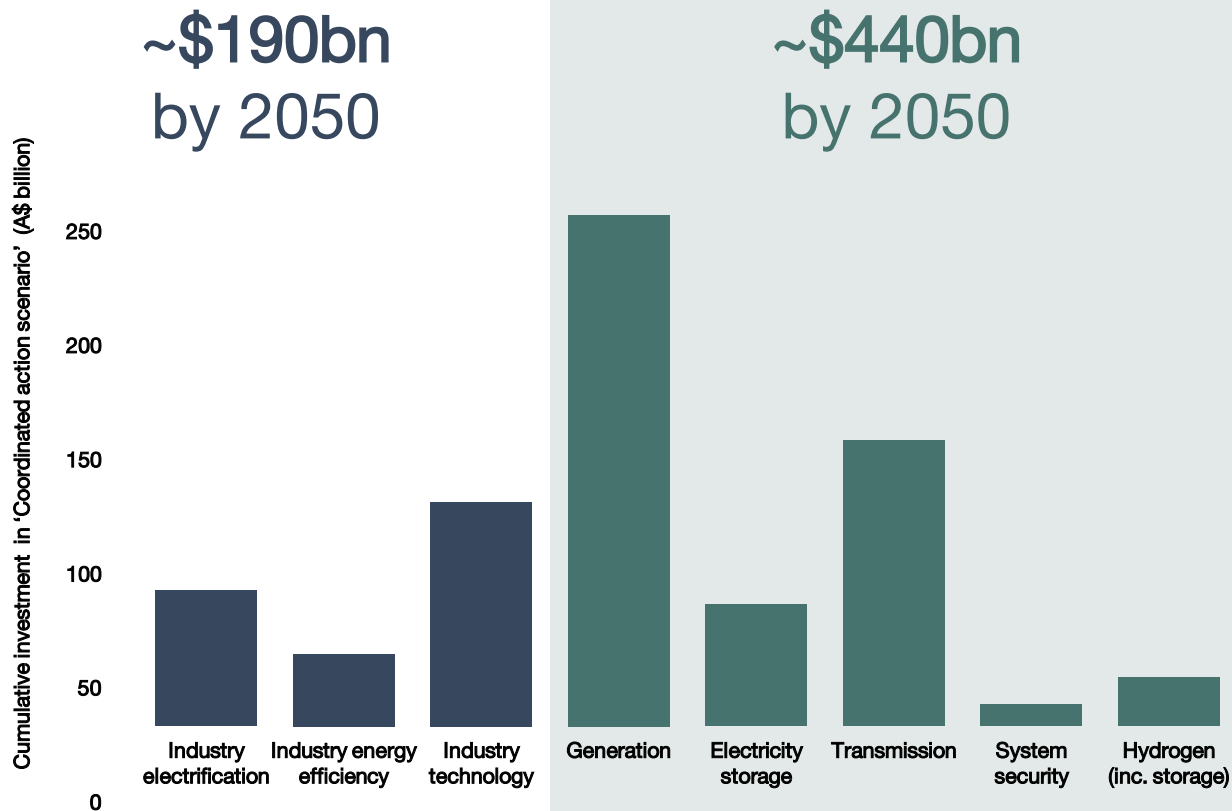
Chemicals

Technology deployment timeline



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More than twice as much investment goes into the energy system than the industrial facilities



Five enablers of 1.5°C-aligned net zero energy & industry

Set a strong, clear, enduring framework with a net zero emissions goal to align industry, finance and government

Transition to the large-scale, cost-competitive, renewable energy system of the future

Accelerate development and demonstration of the emerging technologies needed

Drive deployment of low-carbon solutions across the economy, reduce barriers and support investment towards the transition

Develop integrated net zero emissions industrial regions, supply chains and energy network solutions

Thank you for your interest, and action.

Anna Skarbek, CEO
Climateworks Centre

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Climateworks Centre was co-founded by Monash University and The Myer Foundation and works within the Monash Sustainable Development Institute



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