AMPC

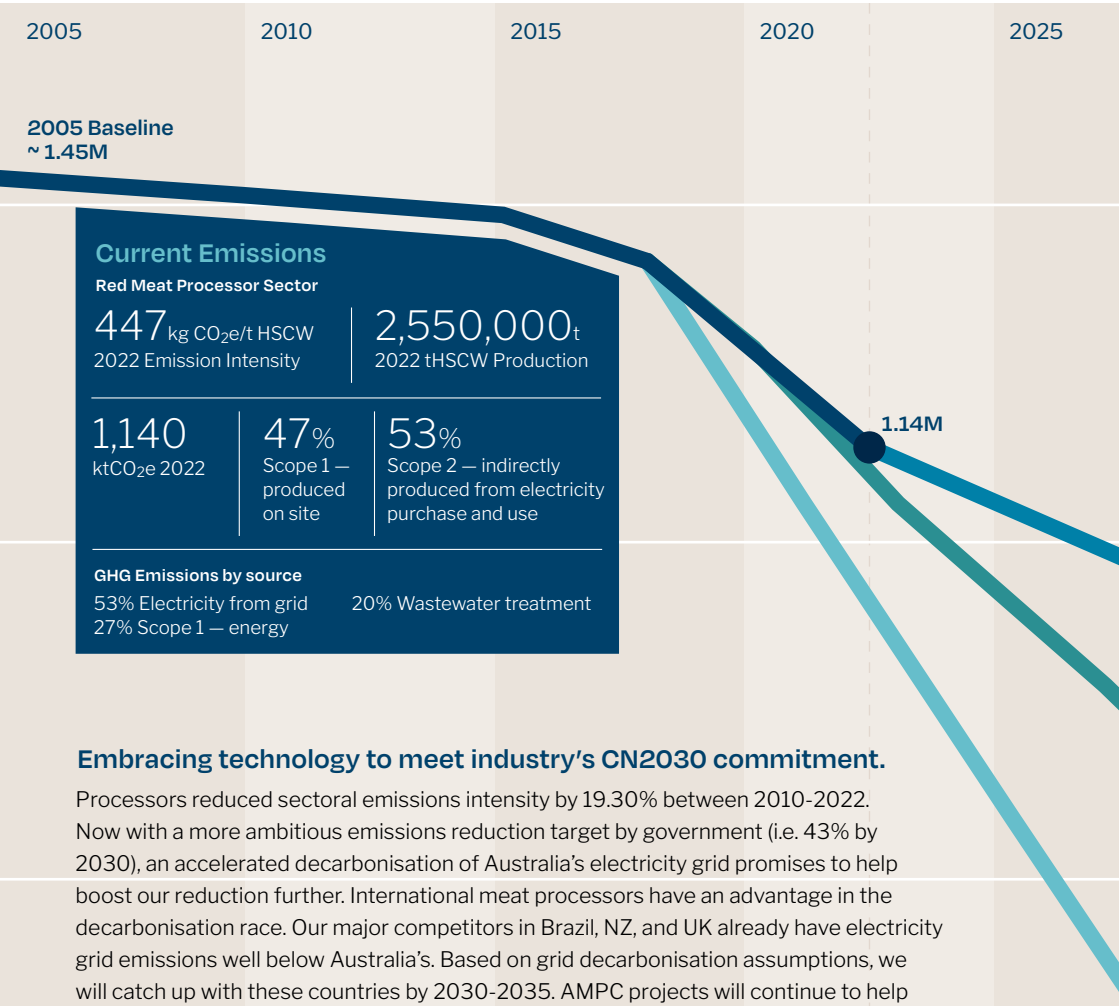
AUSTRALIAN MEAT PROCESSOR CORPORATION

Report

# AMPC Decarbonisation pathways update

# A decarbonisation pathway helps minimise the risk of high-cost solutions in the future.

The capital and NPV values calculated assume that the grid will decarbonise at the rate predicted in Table 38 of the DCCEEW *Australia's Emissions Projections 2022* report.




## Current Emissions

**Red Meat Processor Sector**

447 kg $CO_2e$/t HSCW
2022 Emission Intensity

2,550,000 t
2022 tHSCW Production

1,140
$ktCO_2e$ 2022

47%
Scope 1 — produced on site

53%
Scope 2 — indirectly produced from electricity purchase and use

**GHG Emissions by source**

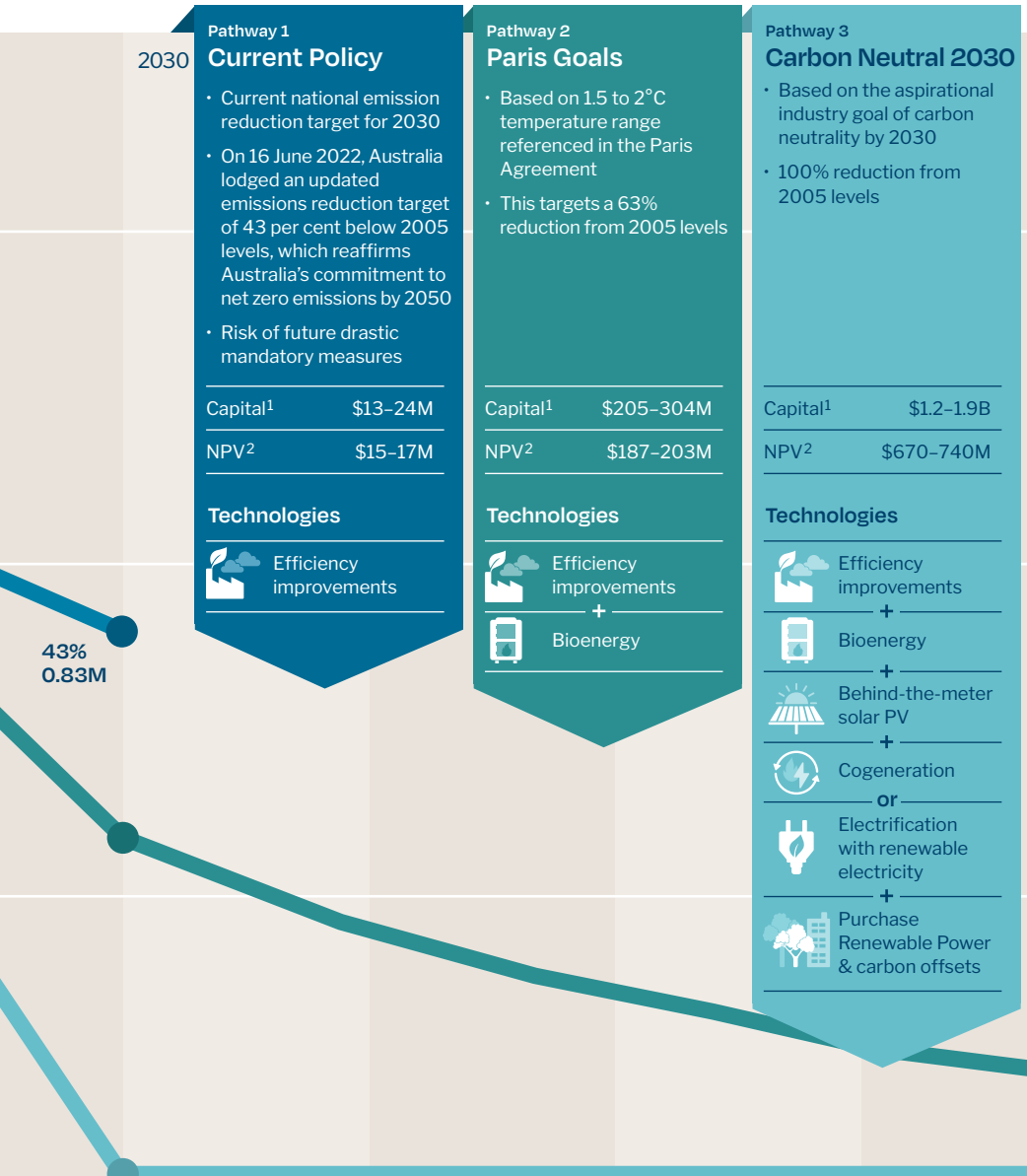
53% Electricity from grid
27% Scope 1 — energy
20% Wastewater treatment

## Embracing technology to meet industry's CN2030 commitment.

Processors reduced sectoral emissions intensity by 19.30% between 2010-2022. Now with a more ambitious emissions reduction target by government (i.e. 43% by 2030), an accelerated decarbonisation of Australia's electricity grid promises to help boost our reduction further. International meat processors have an advantage in the decarbonisation race. Our major competitors in Brazil, NZ, and UK already have electricity grid emissions well below Australia's. Based on grid decarbonisation assumptions, we will catch up with these countries by 2030-2035. AMPC projects will continue to help members transition to clean energy and better manage variable energy costs.

**Full report is available online**

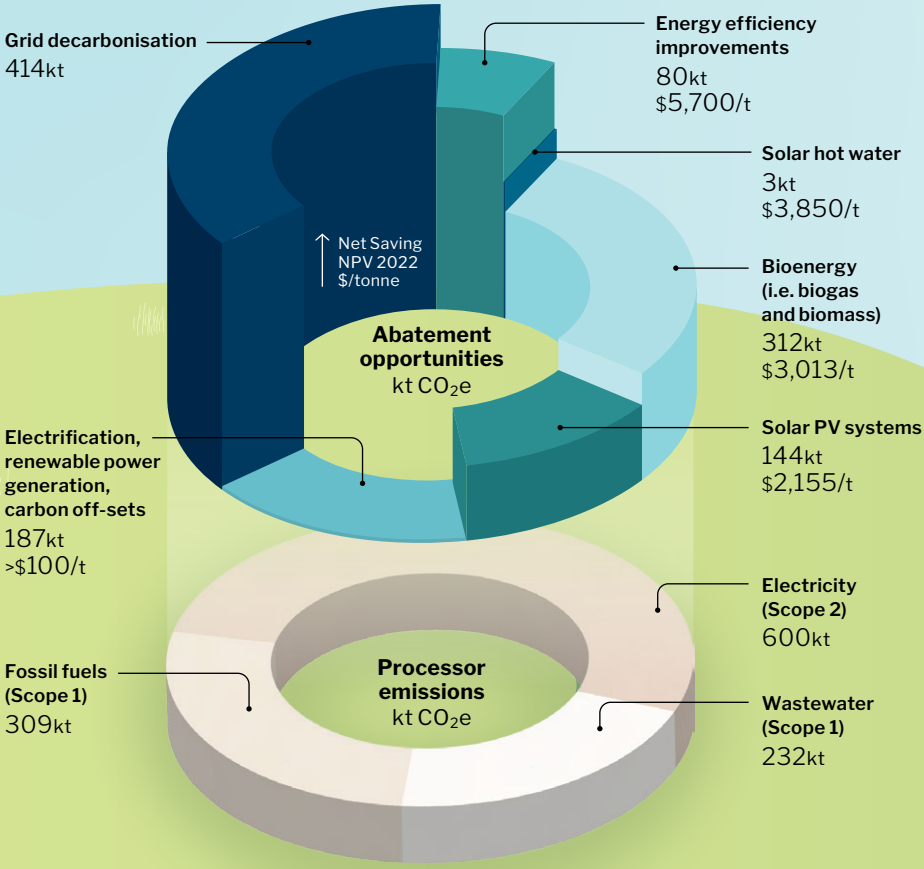
1 Estimated minimum capital required for on-site projects
2 Estimated NPV of all on-site projects with shadow carbon price of $30/tonne


2030
Pathway 1
Current Policy
• Current national emission reduction target for 2030
• On 16 June 2022, Australia lodged an updated emissions reduction target of 43 per cent below 2005 levels, which reaffirms Australia's commitment to net zero emissions by 2050
• Risk of future drastic mandatory measures
Capital[1] $13–24M
NPV[2] $15–17M
Technologies
Efficiency improvements
Pathway 2
Paris Goals
• Based on 1.5 to 2°C temperature range referenced in the Paris Agreement
• This targets a 63% reduction from 2005 levels
Capital[1] $205–304M
NPV[2] $187–203M
Technologies
Efficiency improvements
+
Bioenergy
Pathway 3
Carbon Neutral 2030
• Based on the aspirational industry goal of carbon neutrality by 2030
• 100% reduction from 2005 levels
Capital[1] $1.2–1.9B
NPV[2] $670–740M
Technologies
Efficiency improvements
+
Bioenergy
+
Behind-the-meter solar PV
+
Cogeneration
or
Electrification with renewable electricity
+
Purchase Renewable Power & carbon offsets
43%
0.83M
1.5M
1M
0.5M
0
Tonnes of CO2e

# Decarbonising our sector

Increased electricity grid decarbonisation is greatly helping the transition to clean energy. Energy efficiency is the next most economical way to decarbonise, followed by solar PV and bioenergy systems — these are large scale opportunities. As the grid decarbonises, electrification (e.g. heat pumps) become more competitive with bioenergy and cogeneration. The selection of the next step in decarbonisation will vary for each plant due to electricity grid carbon intensity, availability of renewable fuel sources, and space for renewable energy generation plant.

## Achieving Carbon Neutral 2030[3]




3 Decarbonisation based on Table 38 in DCCEEW Australia's emissions projections-2022
4 Metrics based on typical small and large plan

## Recommendations to Australian red meat processors

The recommendations remain the same, with possibly some focus moving away from PPAs because the grid is predicted to decarbonise at a rate that will allow most plants to achieve the 43% target with the implementation of energy efficiency only.

### Know your emissions

Develop systems to measure, monitor, and actively manage your emissions so you can track changes to your emissions profile.

### Prioritise

Identify key first actions using AMPC tools and guides to determine which emissions you should address first.

### Prepare for policy changes

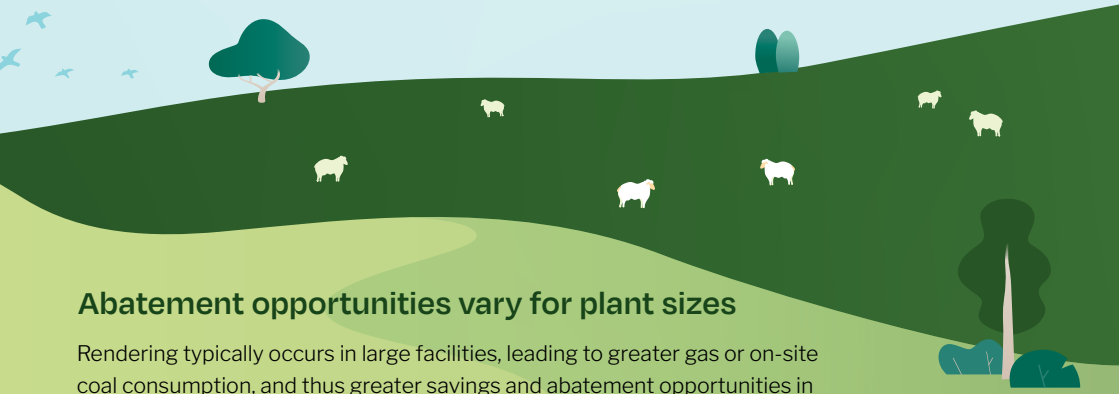
Use a shadow carbon price to help weight projects with the greatest potential. Monitor changes in grid electricity emissions and renewable energy approaches.

### Plan ahead

Develop a long-term plan to progressively reduce your emissions and prepare for policy changes, particularly when funding assistance becomes available.

### Collaborate

Leverage the AMPC as a central coordinator for knowledge sharing, project development, funding and buying aggregation (eg. Power Purchase Agreements).



## Abatement opportunities vary for plant sizes

Rendering typically occurs in large facilities, leading to greater gas or on-site coal consumption, and thus greater savings and abatement opportunities in fuel combustion and thermal efficiency.

**Large Plant Gas**[4]

24.7%

of total emissions are from thermal energy

**Small Plant Gas**[4]

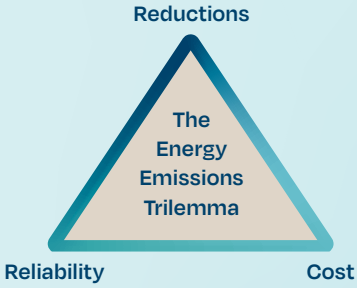
17%

of total emissions are from thermal energy

Wastewater is also a source of emissions for most plants, which can be reduced through anerobic digestion for biogas use in boilers/cogeneration. Plants that do not capture and use biogas will need to find other decarbonisation approaches such as biomass boilers. All sites will have some residual emissions and will require some carbon offsets to achieve CN30.

# Working towards our decarbonisation goals

AMPC understands the Energy Emissions **trilemma** and has projects underway to help our members.



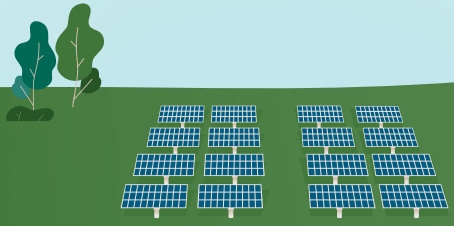

## Renewable electricity and electrification work program

1 Low cost solar PV assessment
2 Heat Pump and MVR assessment and design tools

Between 2021-2023, the sector's Solar PV development pipeline increased by 150% and this is enabling electrification opportunities.

Solar PV opportunities →

AMPC's heat pump selection tool →



## Bioenergy work program

1 Multifuel biomass boiler pilot
2 Anaerobic Co-digestion pilot
3 Emissions Reduction Funding guide

Since 2020, on-site coal use has been replaced by bioenergy as our sectors third largest source of energy.

Biogas productivity approach could deliver huge benefits →

Biomass boiler proves viable fuel option for processors →

AMPC launches emissions reduction handbook →

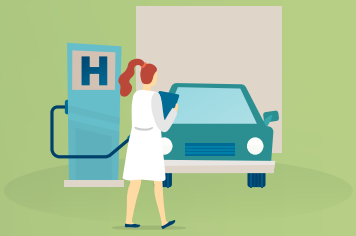
## Hydrogen and clean fuels work program

1 Working with Hydrogen
2 Fuel efficiency in heavy transport

Trialing smart and new technologies to assess opportunities for $H_2$ fuel cells as an energy store and an efficient fuel.

Renewable hydrogen cost-benefit analysis for Australian red meat processors →

AMPC investment in digital technologies helping to reduce heavy vehicle transport emissions →

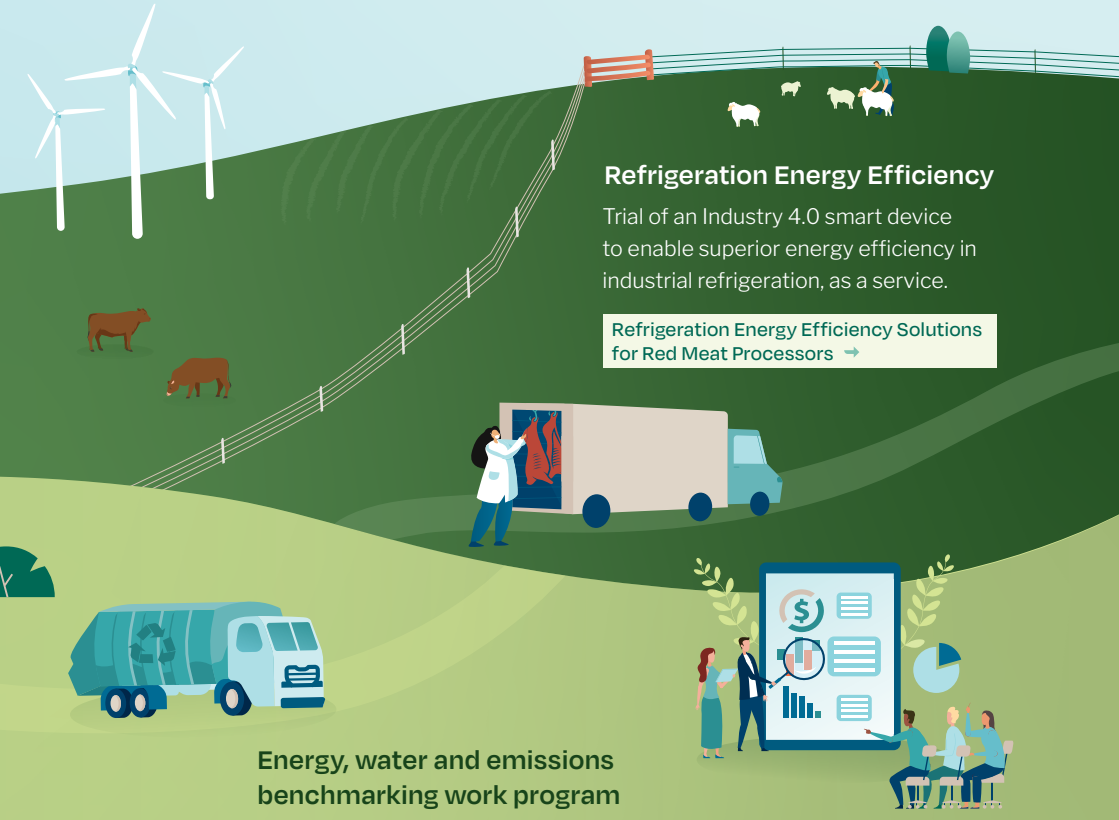


## Market imposed environmental disclosures

This work helps members understand how they should be preparing for increased environmental disclosure and collecting scope 3 emissions.

Market-imposed environmental disclosures →

Sustainability grant — a win for industry →



## Refrigeration Energy Efficiency

Trial of an Industry 4.0 smart device to enable superior energy efficiency in industrial refrigeration, as a service.

Refrigeration Energy Efficiency Solutions for Red Meat Processors →



## Energy, water and emissions benchmarking work program

Member participation represents 60% of total sector throughput. Available to all members who complete the Environmental Performance Review. It provides facility benchmarking and recommendations workshops.

Energy and water benchmarking and efficiency culture change →

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AUSTRALIAN MEAT PROCESSOR CORPORATION

## Start measuring and managing your energy, water and waste today.

Red meat processors can contact AMPC for help and advice.

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ampc.com.au