

# Case study for minimising carbon footprint in poultry production



Release of greenhouse gases (GHG), (measured in tonnes of carbon dioxide equivalent; CO<sub>2</sub>-e), into the atmosphere by human activities, is causing changes to the earth's climate and weather patterns. The chicken meat industry is changing practices and investigating pathways to continue to reduce emissions and potentially achieve carbon neutrality.

This fact sheet provides a case study example of how industry can reduce its GHG emissions.

The key contributors to GHG emissions from meat chicken production in Australia relate to imported soybean meal for feed and the production of feed grains, and electricity use on farm (heating, shed ventilation etc) and during processing. The feasibility of changes to these key contributors were evaluated in the context of one typical vertically integrated chicken meat farm and processing plant (Table 1). For this case study, it was assumed that ongoing emission reductions related to the electricity grid and genetic improvements (both of which are outside of the Australian industry's control) would continue, and that production volume would remain stable.

Parameter	Value
Location	NSW
FCR	1.6
Imported soybean meal (% of broiler ration)	19%
Grid electricity consumption, farm	7,306,488 kWh
Liveweight to processing plant	69,160,000 kg/year
Grid electricity consumption, processing plant	10,109,156 kWh
LPG consumption, processing plant	240,031 MJ
Natural gas consumption, processing plant	24,031 GJ
Grid electricity consumption, feed mill	28.7 kWh/t feed
Grid electricity consumption, breeding and hatchery	1,884,980 kWh
Soil carbon retention rate	20%
GHG emissions	142,315 t CO <sub>2</sub> -e
LU and dLUC impacts	122,562 t CO <sub>2</sub> -e
Carbon storage	-5,298 t CO <sub>2</sub> -e *

\*Reported as a negative because carbon storage from application of used litter offsets emissions

Land use (LU) emissions relate to soil carbon losses from cultivation for crop production.

Direct land use change (dLUC) emissions refer to vegetation and soil carbon losses that occur when land is converted from one use (e.g. forest or pasture) to another (such as cropland).

## Feasible pathway to reduce emissions from chicken meat production

### Low-GHG diet

This strategy considered a 4-year phased reduction in the percentage of imported soybean meal included in chicken feed and resulted in emissions 41% lower than 2021. The greatest reductions were seen in LU and dLUC emissions.

### Low-GHG diet and on-site solar power

This strategy considered adoption of solar power technologies to offset 60% of the electricity demand for the farming, hatchery and feed milling operations, in addition to the low-GHG diet pathway. This resulted in an estimated additional 7% reduction in total emissions.

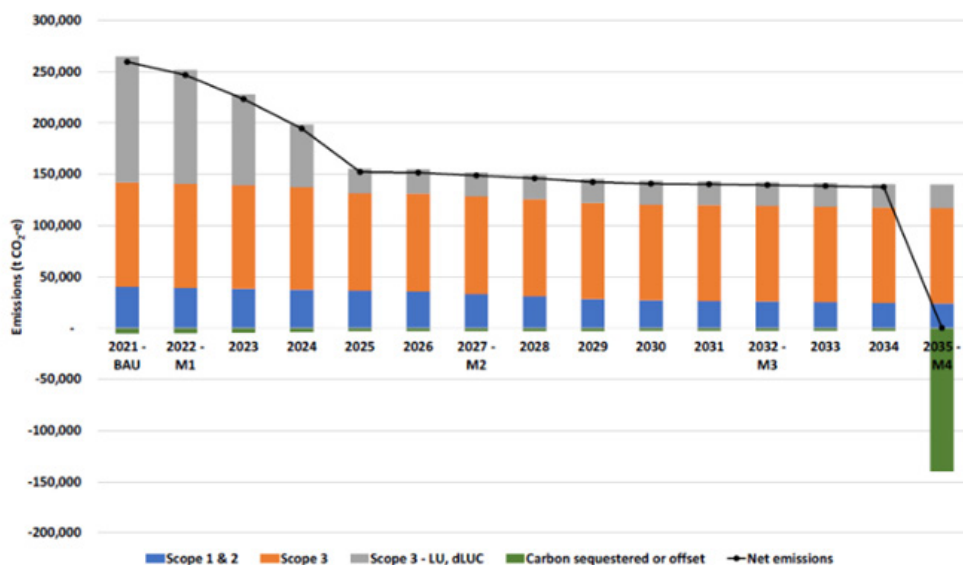
### Low-GHG diet, on-site solar power and energy efficiency

This strategy considered adoption of more energy efficient technologies in the processing plant, in addition to the low-GHG diet and adoption of solar power technologies for the farming, hatchery and feed milling operations. This resulted in an estimated additional 2% reduction in total emissions.

This fact sheet was developed as part of the *Training and extension for the Australian chicken meat industry* project (PRJ-011920). This project supports the adoption of innovation and research and development outcomes for the Australian chicken meat industry.



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**Chicken Meat**



**Module 1** – low-GHG diet  
**Module 2** – low-GHG diet, on-site solar  
**Module 3 (low carbon)** – low-GHG diet, on-site solar, energy efficiency  
**Module 4 (carbon-neutral)** – low-GHG diet, on-site solar, energy efficiency, purchased offsets

Figure 1. An example of a low-carbon and carbon-neutral pathway.

### Carbon offsets pathway

The three strategies considered were not adequate to achieve reductions to the point that chicken meat farming operations were carbon neutral. This would be achieved with the purchase of 137,047 carbon offset credits (where one credit is equivalent to one tonne of CO<sub>2</sub>-e), which allows the business to offset their remaining, hard-to-abate emissions via purchase of carbon credits produced by approved schemes which store or remove GHG emissions.

### Achieving carbon neutrality for chicken meat production may be difficult

Overall, this case study demonstrated that it would be feasible for the Australian chicken meat industry to reduce GHG emissions by implementing a range of viable technical options. However, emission reduction will come at a cost and could present a significant limitation. Industry should investigate the willingness of the market to pay for low emission chicken meat.

Continuing trends in consumer demand for production characteristics that decrease efficiency (for example, slower-growing breeds, reduced stocking rates) would also limit the chicken meat industry’s ability to further reduce emissions. While reduction in emissions was considered feasible, achieving carbon neutrality would currently not be feasible without the production of feed ingredients that are carbon-neutral and/or the purchase carbon offsets.

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