



Australian Government

Department of Climate Change, Energy,
the Environment and Water

Methodology for Australia's emissions projections

November 2025



Australia's emissions projections 2025

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Acknowledgement of Country

We acknowledge the Traditional Owners of Country throughout Australia and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past and present.

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Methodology summary

Australia's emissions projections incorporate a variety of data inputs, assumptions and methods. This methodology document outlines how the Department of Climate Change, Energy, the Environment and Water (DCCEEW) has developed the 2025 projections of greenhouse gas (GHG) emissions (DCCEEW 2025a). The projections are published on the DCCEEW and Australia's National Greenhouse Accounts (DCCEEW 2025b) websites. This methodology document does not include all the data and processes involved in producing Australia's emissions projections due to constraints and sensitivities relating to specific inputs. For example, facility level activity data has not been included due to commercial-in-confidence company data considerations. Key policies and measures included in the emissions projections are listed in Appendix B of Australia's emissions projections 2025.

Accounting approach

The emissions projections are estimated using Paris agreement accounting approaches consistent with Australia's accounting towards its 2030, 2035 and 2050 targets. Reporting years for all sectors correspond to Australian financial years as key data sources are published on this basis. For example, '2030' refers to the financial year 2029–30.

Australia's 2030 target, 2035 target, and the emissions projections cover all greenhouse gases that must be reported in Australia's annual national greenhouse gas inventory submitted under the Paris agreement (carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃). Consistent with Paris Agreement rules, anthropogenic sources and sinks of these gases that occur within Australia's jurisdiction are covered by Australia's annual national greenhouse gas inventory, and by extension, its targets and the emissions projections. This approach ensures Australia's accounting is complete.

Emissions from the energy, industrial processes and product use (IPPU), agriculture, and waste sectors are included. The land use, land-use change and forestry (LULUCF) sector has both emission sources and sinks that remove or sequester carbon dioxide from the atmosphere.

Emissions estimates are prepared in accordance with rules and guidelines agreed under the Paris Agreement, including the Intergovernmental Panel on Climate Change (IPCC) 2006 Guidelines for the Preparation of National Greenhouse Gas Inventories (IPCC 2006) and, where applicable, the 2019 IPCC Refinement to the 2006 IPCC Guidelines (IPCC 2019).

The department applies the 100-year global warming potential values from the IPCC Fifth Assessment Report (AR5) to estimate emissions, consistent with rules adopted under the Paris Agreement (Decision 18/CMA.1 Annex 2.D Paragraph 37, Decision 5/CMA.3 Paragraph 25).

Institutional arrangements and quality assurance

The projections are prepared by DCCEEW using the best available data and independent expertise to analyse Australia's future emissions reduction task. The department engages with a technical working group comprising of representatives from Australian Government agencies to test the methodologies, assumptions, and projections results. Australia makes formal submissions on its emissions projections to the UNFCCC, and these are subject to review from an expert review team coordinated by the UNFCCC secretariat. The last review was undertaken in 2025.

Electricity

Modelling approach

The electricity sector emissions projections have been prepared by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) using PLEXOS energy modelling software for the National Electricity Market (NEM), Western Australia's Wholesale Electricity Market (WEM) and Darwin Katherine Interconnected System (DKIS), and Microsoft Excel modelling for off-grid electricity generation, Mt Isa and the North West Interconnected System (NWIS).

The electricity sector is modelled in carbon dioxide equivalent (CO₂-e) where the share of each GHG is derived from historical inventory data at the most disaggregated level possible.

NEM, WEM and DKIS

DCCEEW used PLEXOS to project emissions from Australia's NEM, WEM and DKIS electricity grids to 2040. PLEXOS is used for simulating energy market outcomes, including long-term investment planning and short-term half-hourly market dispatch behaviour. DCCEEW's PLEXOS modelling framework includes both an investment model and a dispatch model. For the NEM, this modelling framework has been adapted from the 2024 Integrated System Plan model published by the Australian Energy Market Operator (AEMO). The investment model determines the required capacity mix to meet demand at the lowest system cost, subject to constraints. The dispatch model uses the capacity outputs from the investment model and performs a detailed short-term dispatch of both generation and storage assets to meet demand in each half-hourly interval. New large interconnector projects in the NEM are exogenous inputs into the model, in line with the step change pathway under AEMO's 2025 Draft Stage 2 Inputs, Assumptions and Scenarios Report (IASR) (AEMO 2025a), and advice from DCCEEW.

The emissions projections are developed on the basis of adopted policies and measures. The projections assume that state renewable energy targets will be met in Victoria, South Australia, and Tasmania and include the New South Wales Electricity Infrastructure Road Map. The emissions projections include the government's expanded Capacity Investment Scheme (CIS) and assume the Australian Government's 82% renewable electricity generation target for on-grid electricity is met by 2030. The CIS, along with Renewable Energy Transformation Agreements, Rewiring the Nation, Cheaper Home Batteries Program, and state renewable targets and plans, will support delivering the Australian Government's 82% renewable electricity generation target for on-grid electricity (NEM (including Mt Isa), WEM, NWIS and DKIS) by 2030.

Table 1 – Renewable energy targets included and assumed to be met in the projections, % ¹

	2027	2030	2035	2040
South Australia ²	100%			
Victoria (VRET)		65%	95%	
Tasmania (TRET) ³		150%		200%
Australia, on-grid		82%		

The projections include public closure announcements of power stations⁴, transmission upgrades, and new or expanding projects as publicly announced.

Assumptions regarding build costs are informed by the 2025 Draft GenCost current policies scenario (Commonwealth Scientific and Industrial Research Organisation (CSIRO) 2025).

Off-grid

DCCEEW modelled emissions from Australia's off-grid electricity networks. Off-grid refers to all locations where small electricity networks operate, and includes 'microgrids' not connected to the NEM, WEM, DKIS and NWIS. Off-grid electricity demand is predominantly from industrial users for mining and liquefied natural gas (LNG) production.

Off-grid electricity emissions are calculated using 2 models. The first is a bottom-up model that is driven by the production of LNG at individual facilities, with production assumptions in line with estimates in the fugitive emissions sector modelling and electricity use assumptions based on information reported by facilities under the National Greenhouse and Energy Reporting (NGER) scheme. The second is a top-down model that is driven by demand for off-grid electricity excluding LNG and assumptions of changes in the fuel mix, in particular the uptake of solar and wind technology.

It is assumed that some non-electricity facilities covered by the Safeguard Mechanism will choose to reduce emissions through fuel switching and electrification, and this contributes to additional electricity demand. In the off-grid modelling, additional demand from Safeguard facilities is assumed to be met by renewable generation.

For off-grid generation, emissions are calculated by the following equations for LNG and non-LNG off-grid electricity, respectively:

¹ State and territory renewable energy targets are not included where the underpinning policy to reach the target is undergoing detailed design. Renewable share is defined in this table as renewable generation (as generated) over total generation (excluding discharge from pumped hydro and batteries). The projections assume renewable build, including to meet state targets and plans, occur as announced.

² South Australia's net renewable energy target for 2027 calendar year accounts for exports. The target is formulated such that total exports must be greater than fossil-fuel generation from 2027 onwards.

³ Tasmania's renewable energy target accounts for exports. The TRET is based on Tasmania's 2020 demand i.e. 15,750 GWh for the interim target of 150% by 2030, and 21,000 GWh for the 200% target by 2040.

⁴ The 2025 emissions projections reflect Queensland energy policy as understood at July 2025. That is the projections do not include the previous policy of Renewable Energy Targets for 2030, 2032 and 2035, and include coal closures in Queensland based on technical life.

$$E_t = \sum_i (EF_{it} \cdot EC_{it} \cdot P_{it})$$

Where:

E_t = LNG off-grid electricity emissions in year t (Mt CO₂-e)

EF_{it} = facility-specific electricity emissions intensity factor in year t (Mt/MWh)

EC_{it} = facility-specific electricity consumption factor for unit of production in year t (MWh/Mt)

P_{it} = production at facility i in year t (Mt).

$$E_t = \sum_i (Ef_i \cdot Fc_i \cdot G_{it})$$

Where:

E_t = annual non-LNG off-grid electricity emissions in year t (Mt CO₂-e)

Ef_i = emissions factor for consumption by fuel i (Mt CO₂-e /PJ)

Fc_i = fuel consumption factor per unit of electricity generation (PJ/GWh)

G_{it} = electricity generation by fuel i in year t (GWh).

Activity data

NEM, WEM and DKIS

Forecasts of electricity demand are a key input into the electricity sector emissions projections. DCCEEW has sourced data from the AEMO's 2024 Electricity Statement of Opportunities (ESOO) (AEMO 2024a) to inform electricity demand projections for the NEM, and from the 2025 WEM Electricity Statement of Opportunities to inform projections for the WEM (AEMO 2025b).

The ESOO 2024 step change scenario for the NEM, and the ESOO 2025 expected growth scenario for the WEM were used as the basis for the projections demand series, however, some adjustments were made as outlined below.

AEMO's electricity demand series is adjusted to account for differences in the consumption of electricity from electric vehicles (EV), grid connected electrolyser demand, energy efficiency measures and electrification that are reflected in other sectors in the projections. The electricity emissions projections include consumption of electricity from electric vehicles consistent with estimates in the transport sector and electrification assumptions consistent with estimates in the stationary energy sector. Demand from data centres was also included in anticipation of an update in AEMO's 2025 NEM ESOO, which was published after the electricity emissions projections modelling assumptions were finalised.

Data and information from the Utilities Commission of the Northern Territory (Utilities Commission of the Northern Territory 2025), which include demand forecasts by AEMO for the Commission, and trends from PLEXOS analysis are used in modelling the DKIS.

Small grids and off-grids

In the NWIS, iron ore production from the Resources and Energy Quarterly (DISR 2025a, DISR 2025b) is used as a proxy for demand as one of the key commodities in the Pilbara.

Off-grid demand is derived using production estimates of LNG in line with assumptions in the fugitive emissions sector, and estimates under the report commissioned by DCCEEW from Advisian on electrification opportunities in Australian mining (Advisian 2022). Electrification and fuel switching expected from some facilities covered by the Safeguard Mechanism also influence off-grid demand.

Renewable capacity

The Clean Energy Regulator's (CER's) pipeline of large-scale renewable projects at July 2025 was used in the 2025 projections (CER 2025). A delay is applied from the projected accreditation date to account for the time required to finalise construction, connect, energise and ramp up the project. The pipeline provides renewable uptake to around 2027, after which new renewable capacity reflects outcomes of the PLEXOS modelling.

The CER's modelling of rooftop solar and small-scale battery storage was used in the projections to 2035. The CER modelling included forecast installations from the Cheaper Home Battery Program.⁵ After 2035, the projections adopt growth rates from AEMO's 2025 Draft Stage 2 IASR workbook (step-change) (AEMO 2025a). Future large battery projects reflect public announcements and AEMO's existing, committed and anticipated new developments in the 2025 Generation Information list (AEMO 2025c).

Wind and utility solar are projected to meet a growing share of the underlying demand. A level of curtailment is calculated by the PLEXOS model and applies to some renewable to ensure an operable and secure system. This curtailment was found to be equivalent to 9% of renewable generation in the NEM in the baseline scenario in 2030, and 6% in 2040.

Data sources

Table 2 – Data sources for electricity demand projections

Grid	Data source for electricity demand
National Electricity Market	AEMO 2024 Electricity Statement of Opportunities for the NEM
Wholesale Electricity Market	AEMO 2025 Electricity Statement of Opportunities for the WEM
Darwin Katherine Interconnected System	Northern Territory Electricity Outlook Report (Utilities Commission of the Northern Territory 2025)
North West Interconnected System	Iron ore production used as a proxy for demand
Off-grid	LNG production consistent with production assumptions in the fugitive emissions sector Non-LNG demand is informed by forecast mining demand, hydrogen electrolyzers, and Safeguard facilities, consistent with assumptions in other sectors in the projections

⁵ Forecasts for the Cheaper Home Battery Program included in the emissions projections reflect draft results, finalised prior to the program start date and associated installation data. Therefore, the input used in the emissions projections may not align with the CER published forecast for small-scale battery storage. The Cheaper Home Batteries program commenced on 1 July 2025 and uptake to date has exceeded expectations.

Transmission

Transmission networks transport electricity from generators to distribution networks and then to customers, or in some cases directly to large customers. In Australia, there are transmission networks in each state, and both territories are serviced by distribution networks. The NEM is an interconnected transmission network on the east coast of Australia connecting Queensland, New South Wales, the Australian Capital Territory, Victoria and Tasmania.

When a data model is constrained with certain parameters, it can lead to the model making supplementary assumptions to meet a set requirement. In constraining the electricity model to meet state targets, the electricity emissions projections modelling assumes that the necessary transmission will be available to achieve the renewable targets, supported by Rewiring the Nation.

Interconnector capability and transmission projects are informed by AEMO's 2025 Draft Stage 2 IASR (AEMO 2025a), the New South Wales Network Infrastructure Strategy (Government of New South Wales 2023) and Departmental advice. The timing and assumptions for major projects are outlined in Table 3.

Table 3 – Major project assumptions

Project	Assumption and timing
Marinus Link	Completion of cable 1 by December 2030 (750 MW)
	Completion of cable 2 by December 2032 (750 MW)
Copperstring 2032	Completion by 2031 (500 kV transmission line)
Snowy 2.0	Commercial operation by December 2028 (2,200 MW)

Stationary Energy

Emissions from the stationary energy sector are projected using modelling processes developed by DCCEEW. Projections are aggregated from 6 sub-sectors: energy; mining; manufacturing; buildings; agriculture, forestry and fishing; and other, which is solely emissions from fuel used by military vehicles within Australia.

Modelling approach

The stationary energy models are a combination of facility-specific and top-down models depending on the emission source and the availability of data. The structure of these models is provided in Table 4.

Emissions for the LNG sector are projected at the facility-level as each facility has a different emissions intensity. Emissions intensities are calculated based on emissions reported through the NGER scheme. The emissions intensity is updated yearly for each facility.

Activity data

Activity data used in the stationary energy sub-sectors are presented in Table 4.

Stationary energy emissions projections are estimated using activity data from various sources including Office of the Chief Economist commodity forecasts (DISR 2025a, DISR 2025b), Australian Energy Update (DCCEEW 2025e), Wood Mackenzie long-term outlook reports (2025b), IBISWorld industry reports (IBISWorld 2024, 2025), AEMO's Gas Statement of Opportunities (AEMO 2024b, AEMO 2025d), Australian Construction and Industry forum reports (2025), and Company Reports. Where forecast activity data is unavailable, activity is kept constant at the base year level. The emissions from these sub-sectors are relatively small.

The projections also consider any company announcements regarding the closure or change in production capacity and potential new facilities. The emissions reductions from the Safeguard Mechanism and other policies and measures are also included.

All stationary energy sub-sectors, except the energy sub-sector, are modelled in CO₂-e where the share of each GHG is derived from historical inventory data at the most disaggregated level possible. The gases modelled in the Energy sub-sector are CO₂, CH₄, and N₂O.

Table 4 – Summary of activity data and calculation methods for each stationary energy sub-sector

Emissions sub-sector	Activity data	Calculation method
Energy		
LNG (facility-level model)	Production data from the gas fugitives sector and emissions intensity from the NGER scheme and various environmental impact studies; on-site abatement estimates from the Safeguard Mechanism model	$E_t = \sum_i (EF_{it} \cdot P_{it}) - SG_t$ <p>Where:</p> <p>E_t = emissions in year t (Mt CO₂-e)</p> <p>EF_{it} = facility-specific emissions factor in year t</p> <p>P_{it} = production at facility I in year t</p>

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Emissions sub-sector	Activity data	Calculation method
		SG_t = emissions reduction from Safeguard Mechanism in year t
Oil and other gas extraction (top-down model)	Western Australia gas demand from AEMO (AEMO 2024b); East Coast gas demand from AEMO (2025d); crude and condensate oil demand from OCE (DISR 2025a, DISR 2025b); on-site abatement estimates from the Safeguard Mechanism model	$E_t = (E_{t-1} \cdot \Delta\text{Production}) - SG_t$ Where: E_t = emissions in year t (Mt CO ₂ -e) E_{t-1} = emissions in the previous year $\Delta\text{Production}$ = change in production between year t and year t – 1 SG_t = emissions reduction from Safeguard Mechanism in year t
Manufacture of solid fuels (top-down model)	Iron and steel growth rates from OCE (DISR 2025a, DISR 2025b) and Wood Mackenzie long-term outlook report (2025b)	SG_t = emissions reduction from Safeguard Mechanism in year t
Gas production and distribution (top-down model)	Western Australia gas demand from AEMO (2024b); east coast gas demand from AEMO (2025d), on-site abatement estimates from the Safeguard Mechanism model	
Fuel refining (top-down model)	Total petroleum refinery output from OCE (DISR 2025a, DISR 2025b). For renewable fuels, emissions are sourced from environmental impact statements, on-site abatement estimates from the Safeguard Mechanism model	
Mining		
Coal mining (top-down model)	Production data from the coal fugitives sector; on-site abatement estimates from the Safeguard Mechanism model	$E_t = (Fc_{t-1} \cdot Ec \cdot Ef \cdot \Delta P) - SG_t$ Where: E_t = emissions in year t (Mt CO ₂ -e)
Other mining (iron ore, gold, copper, nickel, zinc, bauxite, lithium, mineral sand, and manganese) (top-down model)	Production data from OCE (DISR 2025a, DISR 2025b), Wood Mackenzie long-term outlook report (2025b), base year proportion of the type and amount of fuel used in each commodity derived from NGER scheme energy data, on-site abatement estimates from the Safeguard Mechanism model as well as the emissions reduction from technological improvement in non-safeguard mines (Advisian 2022)	Fc_{t-1} = fuel consumption in the previous year Ec = energy contents of the fuel Ef = emissions factors of the fuel ΔP = change in production between year t and year t – 1 SG_t = emissions reduction from Safeguard Mechanism in year t
Manufacturing (top-down model)		
Non-ferrous metals (alumina; aluminium; refined nickel, copper, zinc, lithium, lead/ acid battery, battery recycling, recycled metal, and e-waste)	Production data from OCE (DISR 2025a, DISR 2025b) and Wood Mackenzie long-term outlook report (2025b); base year proportion of the type and amount of fuel used in each commodity derived from NGER scheme energy data; on-site abatement estimates from the Safeguard Mechanism model	$E_t = (Fc_{t-1} \cdot Ec \cdot Ef \cdot \Delta P) - SG_t$ Where: E_t = emissions in year t (Mt CO ₂ -e) Fc_{t-1} = fuel consumption in the previous year Ec = energy content of the fuel Ef = emissions factor of the fuel ΔP = change in production between year t and year t – 1 SG_t = emissions reduction from Safeguard Mechanism in year t
Non-metallic minerals (cement, lime, plaster and concrete; ceramics; glass and glass products and other)	IBISWorld industry reports analysis (IBISWorld 2024, 2025) and Cement Industry Federation (CIF 2023); Decarbonisation Pathways for the Australian Cement and Concrete Sector	

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Emissions sub-sector	Activity data	Calculation method
	(VDZ 2021); base year proportion of the type and amount of fuel used in the process derived from NGER energy scheme data; on-site abatement estimates from the Safeguard Mechanism model	
Iron and steel	Production data from OCE (DISR 2025a, DISR 2025b) and Wood Mackenzie long-term outlook report (2025b); on-site abatement estimates from the Safeguard Mechanism model	
Pulp, paper and print	Data from DCCEEW (2025c, 2025d); final data point (2025) held constant, on-site abatement estimates from the Safeguard Mechanism model	
Chemicals (other petroleum and coal product and basic chemical, chemical and plastic)	Ammonia: Wood Mackenzie long-term outlook report (2025a) and company reports, derived proportion of the base year from NGER scheme data; on-site abatement estimates from the Safeguard Mechanism model. Other petroleum and coal product and plastic held constant at 2025 level, on-site abatement estimates from the Safeguard Mechanism model	
Food processing, beverages and tobacco	n/a	10-year historical average emissions growth, on-site abatement estimates from the Safeguard Mechanism model
Other manufacturing	n/a	
Buildings (top-down model)		
Residential and commercial	Annual gas consumption data from AEMO (2024b, 2025d), Step Change demand series adjusted with electrification values from the progressive change scenario, and energy efficiency from step change – low energy efficiency sensitivity to reflect current policy settings; wood and wood waste fuel use from Energy Consult (2022); derived proportion of emissions from wood biomass and others from DCCEEW (2025e)	$E_t = E_{wt} + E_{gt}$ $E_{wt} = E_{wt-1} \cdot \Delta\text{Consumption}$ $E_{gt} = E_{gt-1} \cdot \Delta\text{Demand}$ <p>Where:</p> E_t = emissions in year t (Mt CO ₂ -e) E_{wt} = emissions in year t (Mt CO ₂ -e) from burning wood biomass at residential buildings E_{gt} = emissions in year t (Mt CO ₂ -e) from natural gas consumption at residential and commercial buildings E_{wt-1} = emissions in the previous year from consumption of wood or other fuels E_{gt-1} = emissions in the previous year from natural gas consumption ΔDemand = change in gas consumption in commercial/residential buildings between year t and year $t - 1$ $\Delta\text{Consumption}$ = change in wood consumption between year t and year $t - 1$
Construction	Activity data from Australian Construction Industry Forum (ACIF 2025)	$E_t = E_{t-1} \cdot \Delta\text{Activity}$ <p>Where:</p> E_t = emissions in year t (Mt CO ₂ -e) E_{t-1} = emissions in the previous year $\Delta\text{Activity}$ = change in activity between year t and year $t - 1$

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Emissions sub-sector	Activity data	Calculation method
Agriculture, forestry and fishing (top-down model)		
	Farm production data from the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES 2025a, ABARES 2025b); average rate of change in diesel consumption derived from NGER data	$E_t = (E_{t-1} \cdot \Delta\text{Production}) \times (1 - Dcr)$ <p>Where: E_t = emissions in year t (Mt CO₂-e) E_{t-1} = emissions in the previous year $\Delta\text{Production}$ = change in production between year t and year $t - 1$ Dcr = average rate of change in diesel consumption per unit of production</p> <p>Emissions held constant at 2030 level.</p>
Other (military) (top-down model)		
	Data from DCCEEW (2025c, 2025d)	10-year average of historical emissions

Transport

Emissions from the transport sector are projected using an emission estimation model maintained and updated by DCCEEW. Transport sub-sectors are modelled based on projected activity and changes in emissions intensity. In addition, retirement rates and activity by vintage are also considered for the light duty vehicle sub-sector. The exception to this modelling approach is for pipeline transport. Projected pipeline emissions are based on projections of state-level natural gas consumption and production.

The DCCEEW transport model uses inputs from various sources, which are detailed in the following sections.

Modelling approach

The transport sector emissions projections are modelled using several sub-models outlined in Figure 1. Results from sectoral models are rescaled to the latest National Greenhouse Gas Inventory quarterly update (DCCEEW 2025d). Projected on-site abatement from the Safeguard Mechanism are estimated separately and included in the transport emissions projections by state & territory and by gas.

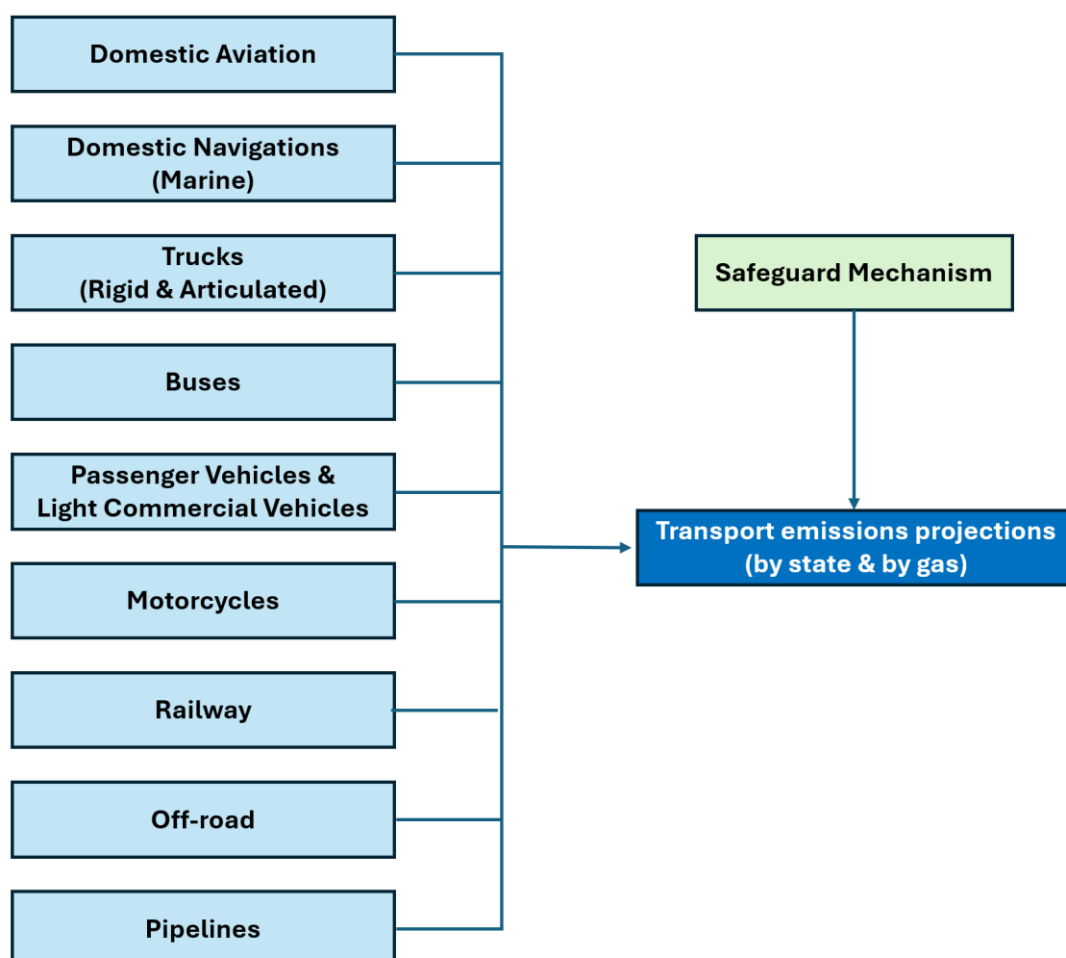


Figure 1 – Simplified flowsheet of the transport sector emissions model

The transport model takes a top-down approach where only average emission intensity is considered, regardless of the underlying technology. This reflects the [New Vehicle Efficiency Standards](#), that prescribes emission intensity outcomes rather than specific technologies.

Projected emissions for transport models are the product of projected activity and average emissions intensity of each transport sector segment. Emissions are projected as CO₂-e and then the share of each greenhouse gas is estimated by using the shares published in the latest historical inventory data at the most disaggregated level possible.

Activity projections

Freight activity projections are based on analysis from the Bureau of Infrastructure and Transport Research Economics' freight forecasts (BITRE 2022) on projected tonne-kilometre for freight.

Aviation passenger activity is measured in passenger kilometres travelled (PKT), derived from the Australian aviation forecasts (BITRE 2024a). Vehicle kilometres travelled (VKT) estimates for passenger vehicle, motorcycle and bus passenger activity (BITRE 2024b) are scaled to population forecasts. Light commercial vehicles (LCV) have a hybrid freight and passenger function, but projected activity is calculated in VKTs and is assumed to be driven only by population change. Table 5 contains the VKT estimates for light vehicles in billions of kilometres per year.

Passenger railways are now almost entirely electrified, with emissions from the electricity generation used to power electric rail reported in the electricity sector. Emissions from the remaining passenger rail activity is small and is grouped with freight activity. For marine passenger activity, including recreational craft, and off-road transport, activity is assumed to be a function of population and is scaled to population forecasts. Pipeline activity is scaled to department projections of natural gas (excluding LNG) consumption or production by state.

Emission intensity projections

The New Vehicle Efficiency Standard (NVES) introduces mandatory CO₂ emissions targets for all new passenger and light commercial vehicles sold in Australia from 1 January 2025, requiring manufacturers to meet or beat the targets expressed in grams of CO₂/km which are tightening annually through to 2029. The NVES adopts a technology-neutral approach, requiring reductions in average tailpipe emission intensity across new vehicles irrespective of whether they utilise petrol, diesel, hybrid, plug-in hybrid or battery EV technology. To reflect the policy, the transport emissions model takes a top-down approach by considering only activity levels and the average emissions intensity of vehicles. No assumptions are made about individual technologies such as electric or hybrid vehicle adoption or efficiency improvements in internal combustion vehicles.

The headline limits for new vehicles under the NVES are set under in the New Vehicle Efficiency Standard Act 2024 and are measured based on the New European Driving Cycle (NEDC) test procedure. 'Real world' emission intensities are typically higher than the NEDC laboratory tests reported by manufacturers.⁶ Real-world conversion factors are an area of significant uncertainty and may change over time. An NEDC-to-real world conversion factor of 1.31 is used in the emissions projections, based on the best available estimate from the Department of Infrastructure, Transport, Regional Development, Communications, Sports and the Arts (DITRDCA) which considered current fleet composition, historical fuel consumption and third-party analysis. Table 5 contains the real-

⁶ Research & Data - Australian Automobile Association: <https://www.aaa.asn.au/research-data/>

world new light vehicle emission intensities (average for new vehicles) in grams CO₂ per kilometre used in the emissions projections.

The NVES currently specifies emission limits until 2029, after which these projections assume annual improvements will revert to the historical trend, from a 2029 base. A statutory review of the NVES is required to commence in 2026 to consider future NVES policy settings, including emissions limits after 2029.

The light vehicle model projects vehicle stock and average emissions by vintage. Average fleet emissions are updated as more efficient vehicles enter the fleet and older vehicles are retired. Late model vehicles are on average driven more kilometres per year than older models. The proportion of total vehicle kilometres driven by new vehicles is adjusted upwards, while the proportion of total kilometres driven by older models is reduced.

The emission intensity of pipeline transport efficiency is assumed to remain flat over the projections period.

Emission intensity calculations for other sectors are based on the analysis of multiple data sources including BloombergNEF (BNEF 2025) and historical trends.

Table 5 – Projected light duty vehicle activity and assumed real world emissions intensity of new light vehicles, 2026–2040

Financial year	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
New vehicles – real world emission intensities in grams CO₂ per kilometre⁷															
Passenger vehicles	172	140	107	84	77	77	77	76	76	75	75	74	74	73	73
LCV	255	215	178	151	143	142	141	141	140	139	138	137	136	136	135
Activity (billion km travelled)															
Passenger vehicles	182	184	186	188	191	193	196	198	200	203	205	207	210	212	214
LCV	60	61	62	63	63	64	65	66	67	67	68	69	70	70	71

The Safeguard Mechanism and the transport sector

It is assumed that some transport emissions covered by the Safeguard Mechanism will be abated through fuel switching, efficiency gains and electrification. To prevent double counting, modelled on-site abatement from Safeguard facilities is updated to exclude emissions intensity improvements already included in the projections. Safeguard Mechanism abatement is then deducted at the end of modelling process to estimate the final transport emissions projections.

⁷ The headline limits for new vehicles under the NVES are measured based on the NEDC test procedure. The NEDC emission intensities are lower than the projected real-world emission intensities listed in this table.

Fugitive emissions from fuels

Emissions from the fugitive emissions sector are projected using emission estimation models maintained and updated by DCCEEW using external inputs. The models are a combination of facility-specific and top-down models, depending on the nature of the emission source and the availability of data.

Coal fugitives

Operating coal mines

Modelling approach

DCCEEW maintains a mine-by-mine model of fugitive emissions from operating coal mines that projects emissions by greenhouse gas. A mine-by-mine model takes account of the emissions intensity of each mine. These depend on the operational and geological characteristics of the mine.

$$E_{gt} = \sum_{gi} (P_{it} \cdot El_{gi}) - SG_{gt}$$

Where:

E_{gt} = annual emissions from operating coal mines of greenhouse gas g in year t (Mt CO₂-e)

P_{it} = coal production at mine i in year t (kt)

El_{gi} = the emissions intensity of greenhouse gas g of production at mine i , (Mt CO₂-e/kt coal)

SG_{gt} = abatement incentivised by the Safeguard Mechanism of greenhouse gas g in year t (Mt CO₂-e).

Activity data

The emissions intensity of coal mines includes all sources of fugitive emissions from vented CH₄ and CO₂, flaring and post mining. For operating mines, the emissions intensity is sourced from the most recent 8 years of National Greenhouse Gas Inventory data, which are based on company data reported under the NGER scheme. For some mines, expert judgment is applied to exclude years impacted by operational outages and to take into account trends in the emissions intensity of the mine that could be due to mining different parts of the coal resource or updated gas management practices. For prospective coal mines, the emissions intensity is sourced from environmental impact statements or is the average for currently operating mines in the same coal basin.

Mine-by-mine production estimates for existing and new mines are informed by the Department of Industry, Science and Resources (DISR 2025a, 2025b) for 2025–2030 and Wood Mackenzie (2025b) for 2031 to 2040. Coal production is separately estimated for thermal and metallurgical coal production at each mine.

An estimate of total demand for Australian coal is made for thermal coal and metallurgical coal based on DISR for 2025–2030 and growth rates from the Wood Mackenzie Energy Transition Scenario from 2031, with adjustments to domestic demand to account for the emissions projections modelling of the electricity sector.

For each year, the sum of production from coal mines is calibrated to total demand for Australian thermal and metallurgical coal. If forecast production from existing mines is greater than estimated demand for Australian coal, then all thermal or metallurgical coal mines' production is scaled down at an equal rate to balance demand and production. If there is a shortfall, production from prospective new unspecified mines are added to meet this demand. Production from prospective new unspecified mines are not estimated on a mine-by-mine basis but are estimated in total for metallurgical and thermal coal and are allocated to New South Wales and Queensland underground and open cut coal mines based on the production profiles of potential new thermal and metallurgical mines. The emission factors applied are equal to the current average for each mine type in each state.

Production from brown coal mines is sourced from the electricity sector modelling.

Abandoned coal mines

Modelling approach

CH₄ emissions occur under certain conditions following the closure of underground coal mines. Emissions are estimated using a mine-by-mine model developed for the National Greenhouse Gas Inventory. The model is extended to include projected closures of underground coal mines to 2040.

$$E_t = \sum_i (ED_i \cdot EF_i \cdot (1 - F_{it})) - ER_{it}$$

Where:

E_t = emissions from abandoned coal mines in year t (Mt CO₂-e)

ED_i = annual emissions of mine i in the year before decommissioning (Mt CO₂-e)

EF_i = emission factor for mine i at a point in time since decommissioning. It is derived from the Emissions Decay Curves (DCCEEW 2025c)

F_{it} = fraction of mine i flooded at a point in time since decommissioning

ER_{it} = quantity of CH₄ emissions avoided by recovery at mine i in year t (Mt CO₂-e).

The model requires the CH₄ emissions at the time of closure, the mine type, mine void size and mine water inflow rates. Emissions at the time of closure and mine void volume are sourced from the operating coal mines model. Emission decay curves are calculated from the formulas published in the *National Inventory Report* (DCCEEW 2025c). Mine flooding rates are estimated based on the mine's water production region consistent with the National Greenhouse Gas Inventory.

Activity data

Closure dates are sourced from mine-by-mine forecasts provided by the DISR (2025a, 2025b) and Wood Mackenzie (2025b) and are consistent with the operating coal mines model.

Oil and gas fugitives

Oil

Oil fugitive emissions are separated into 6 sub-sectors:

- crude oil production
- crude oil transport
- exploration
- other – abandoned wells
- refining/storage
- flaring.

Modelling approach

The gases modelled in the oil fugitives sub-sector are CO₂, CH₄, and N₂O.

Oil fugitive emissions projections for crude oil production, crude oil transport, refining/storage and flaring are calculated using the following equation:

$$E_t = \sum_i \left(Pr_t \cdot (El_{cp} + El_{ct} + El_{rs} + El_f) \right) - SG_t$$

Where:

E_t = oil fugitive emissions in the year t (Mt CO₂-e)

Pr_t = proxy indicator in year t

El_{cp} = average emissions intensity for crude oil production (Mt CO₂-e / ML of crude oil and condensate production)

El_{ct} = average emissions intensity for crude oil transport (Mt CO₂-e / ML of crude oil and condensate production)

El_{rs} = average emissions intensity for refining/storage (Mt CO₂-e / ML of refinery output)

El_f = average emissions intensity for oil flaring (Mt CO₂-e / ML of crude oil and condensate production).

SG_t = emissions reductions from Safeguard Mechanism in year t (Mt CO₂-e).

Projected emissions for oil exploration are calculated as a 10-year average of historical fugitive emissions from oil exploration.

Projected emissions from abandoned wells is calculated based on historical rates of fugitive emissions growth from abandoned wells. For the 2025 projections, the assumed annual growth rate is 3%.

$$E_t = 1.03E_{t-1}$$

Where:

E_t = emissions in year t

E_{t-1} = emissions in the year $t - 1$.

Activity data

Activity data used to estimate emissions from oil fugitives is provided in Table 6.

Table 6 – Summary of data sources for preparing oil fugitive emissions

Fugitive emissions source	Proxy indicator	Source
Oil - production	Crude oil and condensate production	DISR (2025a, 2025b)
Oil - transport	Crude oil and condensate production	DISR (2025a, 2025b)
Oil - exploration	Historical 10-year average of emissions from oil exploration	DCCEEW (2025c, 2025d)
Oil - abandoned wells	3% growth in emissions derived from historical growth in emissions	DCCEEW (2025c, 2025d)
Oil refinery	Refinery output	DISR (2025a, 2025b)
Oil - flaring	Crude oil and condensate production	DISR (2025a, 2025b)

LNG facilities

Modelling approach

DCCEEW maintains a facility-by-facility model of fugitive emissions from LNG. The gases modelled in the LNG fugitives sub-sector are CO₂, CH₄, and N₂O. Factors influencing the emissions from an LNG facility are the operation of the plant, the reservoir CO₂ concentration and source of the feed gas, abatement actions and annual production.

$$E_t = \sum_i (P_{ti} \cdot (El_{vi} + El_{fi} + El_{oi}) - CCS_t - SG_{it})$$

Where:

E_t = LNG fugitive emissions in year t (Mt CO₂-e)

P_{ti} = production at facility i in year t (Mt LNG)

El_{vi} = venting emissions intensity at facility i (Mt CO₂-e/Mt LNG)

El_{fi} = flaring emissions intensity at facility i (Mt CO₂-e/Mt LNG)

El_{oi} = other leaks emissions intensity at facility i (Mt CO₂-e/Mt LNG)

CCS_t = CO₂ captured and stored at the Gorgon LNG facility in year t (Mt CO₂).

SG_{it} = emissions reductions at facility i in year t from the Safeguard Mechanism (Mt CO₂-e) (excluding carbon capture and storage (CCS) at the Gorgon LNG facility).

Emissions intensities for venting, flaring and other fugitive leaks at operating facilities are based on NGER scheme data. For newer facilities or new feed gas sources, emissions intensities are sourced from environmental impact statements or other sources if available.

Activity data

LNG production projections for each facility are informed by estimates from the DISR (2025a, 2025b) and Wood Mackenzie (2025a). The projections consider committed and prospective additions and removals in capacity, given the global outlook for LNG.

Domestic natural gas

Modelling approach

Domestic natural gas is natural gas consumed in Australia. It is distinguished from LNG, which is predominantly produced for export. The small amount of LNG produced for domestic consumption is treated as domestic gas in the projections. The gases modelled in the domestic gas fugitives sub-sector are CO₂, CH₄, and N₂O.

The sources of fugitive emissions from domestic natural gas in the projections are gas exploration, other post-meter emissions, other abandoned wells, production, processing, transmission, distribution, venting and flaring. Proxy indicators are used to project the growth in emissions at the state level from the sub-sectors as listed below.

$$E_t = \sum_i (P_{it} \cdot El_i) - CCS_{it} - SG_{it}$$

Where:

E_t = annual emissions in year t (Mt CO₂-e)

P_{it} = gas production at basin i in year t (PJ)

El_i = the emissions intensity of processing/processing/flaring/venting at basin i (Mt CO₂-e/PJ gas produced)

CCS_{it} = CO₂ captured and stored at facility i in year t (Mt CO₂-e)

SG_{it} = emissions reductions at basin i in year t from the Safeguard Mechanism (Mt CO₂-e) (excluding CCS).

The emissions intensities of processing, production, flaring and venting at basins across Australia were calculated from emissions estimates in the National Greenhouse Gas Inventory and historical gas production.

Activity data

Estimates of gas production for domestic consumption (including new gas developments) are informed by estimates from the DISR (2025a, 2025b), AEMO (2024b, 2025d) and Rystad Energy (2025). Domestic gas demand over the projections period is estimated using the following process:

- initial demand forecasts are derived separately for the eastern and western markets using the AEMO step change scenarios (AEMO 2024b, 2025d)
- adjustments are made to the AEMO forecasts to account for gas-powered-generation demand from the electricity emissions projections modelling and energy efficiency improvements (as outlined in the stationary energy sector)

- adjustments are made to reflect the change in demand for natural gas as a result of Safeguard Mechanism on-site abatement (excluding gas at LNG facilities which is assumed to be processed into LNG and exported).

If forecast production is greater or less than the adjusted estimated domestic demand, production is decreased or increased as required to balance demand and production in each market. Where adjustments are required to meet demand, that production is assumed to have the weighted average of emissions intensities from all basins supplying the western domestic gas market and the weighted average of emissions intensities from the Bowen-Surat, Cooper-Eromanga and Gippsland basins in the eastern gas market.

Emissions intensities for new gas developments are derived from environmental impact statements if available, and state average emission intensities from the National Greenhouse Gas Inventory (DCCEEW 2025c).

Fugitive emissions associated with gas extracted from the Beetaloo sub-basin are calculated from emissions intensities from Surat Bowen coal seam gas (CSG) for production sub-sectors. For processing, flaring and venting emissions, Beetaloo emissions intensities are derived using the CSIRO study of whole-of-life GHG emissions from the Surat Basin for the Gas Industry Social and Environmental Research Alliance (GISERA) project (Schandl et al. 2019).

Activity data used to estimate emissions from natural gas fugitives is provided in Table 7.

Table 7 – Summary of data sources for preparing gas fugitive emissions

Fugitive emissions source	Proxy indicator	Source
Distribution	Unaccounted for gas losses	AEMO (2025d)
Exploration – flared	Total gas production	DISR (2025a, 2025b); AEMO (2024b, 2025d)
Exploration – leakage – conventional	Conventional gas production	DISR (2025a, 2025b); AEMO (2024b, 2025d)
Exploration – leakage – unconventional	Unconventional gas production	DISR (2025a, 2025b); AEMO (2024b, 2025d)
Exploration – venting – completions - conventional	Conventional gas production	DISR (2025a, 2025b); AEMO (2024b, 2025d)
Exploration – venting – completions – unconventional	Unconventional gas production	DISR (2025a, 2025b); AEMO (2024b, 2025d)
Exploration – venting – workovers	Unconventional gas production	DISR (2025a, 2025b); AEMO (2024b, 2025d)
Other – abandoned wells	Historical growth rate of emissions abandoned gas wells	DCCEEW (2025c)
Other – Post meter emissions	Derived total appliance in the commercial and residential sector, Vehicle stock projections, Industrial natural gas consumption	AEMO (2024b, 2025d); Energy Consult (2015, 2022)
Processing	Domestic gas production (conventional and unconventional)	DISR (2025a, 2025b); AEMO (2024b, 2025d); emission projections models for LNG
Production – offshore platforms	Number of shallow and deep offshore platforms	DCCEEW (2025c); AME Group; Company Reports

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Fugitive emissions source	Proxy indicator	Source
Production – onshore gathering and boosting – conventional gas	Conventional gas production	DISR (2025a, 2025b); AEMO (2024b, 2025d); emission projections models for LNG
Production – onshore gathering and boosting – unconventional gas	Unconventional gas production	DISR (2025a, 2025b); AEMO (2024b, 2025d); emission projections models for LNG
Production – onshore wells – conventional gas	Conventional gas production	DISR (2025a, 2025b); AEMO (2024b, 2025d); emission projections models for LNG
Production – onshore wells – unconventional gas	Unconventional gas production	DISR (2025a, 2025b); AEMO (2024b, 2025d); emission projections models for LNG
Production – onshore wells – water production	Unconventional gas production	DISR (2025a, 2025b); AEMO (2024b, 2025d); emission projections models for LNG
Transmission and storage – LNG terminals	Number of LNG terminals operating	AEMO (2025d); AME Group; company reports
Transmission and storage – storage – LNG	Number of LNG storage stations operating	AME Group; company reports
Transmission and storage – storage – natural gas	Number of gas storage stations operating	AEMO (2025d); AME Group; company reports
Transmission and storage – transmission	Total pipeline length	APGA (2023); company reports
Venting and flaring – flaring – gas	Domestic gas production (conventional and unconventional)	DISR (2025a, 2025b); AEMO (2024b, 2025d)
Venting and flaring – venting – gas	Domestic gas production (conventional and unconventional)	DISR (2025a, 2025b); AEMO (2024b, 2025d)

Industrial processes and product use

Emissions from the IPPU sector are projected using bottom-up models developed within DCCEEW. Where possible, emissions are projected by estimating fuel use at the facility level, to account for different fuel types, and the emissions intensity of production across facilities.

Modelling approach

A summary of data sources and model frameworks applied is provided in Table 8.

Unless otherwise specified, the emissions intensity of production is assumed to be constant across the entire projections period and is based on the emissions reported in Australia's *National Inventory Report 2023* (DCCEEW 2025c).

The gases modelled in the IPPU sector are CO₂, CH₄, N₂O, CF₄, C₂F₆, SF₆ and 12 species of HFCs. The chemical industry sub-sector is modelled in CO₂ and N₂O. The gases modelled in the metal industry are CO₂, CH₄, N₂O, CF₄, and C₂F₆. Other product manufacturing and use are modelled in SF₆ and HFCs. All other remaining sub-sectors are modelled in CO₂.

Activity data

Emissions projections in the IPPU sector are estimated using activity data from various sources including OCE commodity forecasts (DISR 2025a, DISR 2025b), Wood Mackenzie long-term outlook reports (2025b), company reports, IBISWorld industry reports (2024, 2025), and the Organisation for Economic Co-operation and Development (OECD 2025).

Emissions from the 'product uses as substitutes for ozone depleting substances' and 'other product manufacture and use' sub-sectors are estimated by extrapolating models used in the preparation of the National Inventory Report. A detailed methodology for these sub-sectors is available in the *National Inventory Report 2023* (DCCEEW 2025c).

Table 8 – Summary of sources and formulae used for each IPPU sub-sector

Emissions sub-sector	Data source	Formula
Chemical industry		
Ammonia	Wood Mackenzie long-term outlook report (2025b) and company reports	$E_t = \sum_i (U_{it} \cdot EC_j \cdot EF_j) - SG_{it}$ <p>Where: E_t = emissions in year t (Mt CO₂-e) U_{it} = natural gas consumption at facility i in year t EC_j = the energy content of natural gas EF_j = the emissions factor of natural gas SG_{it} = emissions reductions at facility i in year t from the Safeguard Mechanism (Mt CO₂-e)</p>
Nitric acid	DCCEEW estimates based on projected iron ore and coal production	$E_t = \sum_i (EF_{it} \cdot P_{it}) - SG_{it}$ <p>Where: E_t = emissions in year t (Mt CO₂-e)</p>

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Emissions sub-sector	Data source	Formula
		<p>$E_{F_{it}}$ = facility-specific emissions factor in year t</p> <p>P_{it} = nitric acid production at facility i in year t</p> <p>SG_{it} = emissions reductions at facility i in year t from the Safeguard Mechanism (Mt CO₂-e)</p>
Titanium dioxide	World Gross Domestic Product (GDP) growth from the Organisation for Economic Co-operation and Development (OECD 2025)	$E_t = \sum_{i,j} (U_{jit} \cdot EC_j \cdot EF_j) - SG_{it}$ <p>Where:</p> <p>E_t = emissions in year t (Mt CO₂-e)</p> <p>U_{jit} = the use of fuel j at facility i in year t</p> <p>EC_j = the energy content of fuel j</p> <p>EF_j = the emissions factor of fuel j</p> <p>SG_{it} = emissions reductions at facility i in year t from the Safeguard Mechanism (Mt CO₂-e)</p>
Synthetic rutile	World GDP growth from the Organisation for Economic Co-operation and Development (OECD 2025)	$E_t = \sum_{i,j} (U_{jit} \cdot EC_j \cdot EF_j) - SG_{it}$ <p>Where:</p> <p>E_t = emissions in year t (Mt CO₂-e)</p> <p>U_{jit} = the use of fuel j at facility i in year t</p> <p>EC_j = the energy content of fuel j</p> <p>EF_j = the emissions factor of fuel j</p> <p>SG_{it} = emissions reductions at facility i in year t from the Safeguard Mechanism (Mt CO₂-e)</p>
Acetylene	Population forecasts from ABS (2025a) and Department of the Treasury (2023)	$E_t = E_{t-1} \cdot \Delta\text{Population}$ <p>Where:</p> <p>E_t = emissions in year t (Mt CO₂-e)</p> <p>E_{t-1} = emissions in the previous year</p> <p>$\Delta\text{Population}$ = change in population between year t and year $t - 1$</p>
Petrochemical and carbon black	n/a	$E_t = E_{t-1}$ <p>Where:</p> <p>E_t = emissions in year t (Mt CO₂-e)</p> <p>E_{t-1} = emissions in the previous year</p>
Metal industry		
Aluminium production	Production data from DISR (2025a, 2025b) and Wood Mackenzie long-term outlook report (2025b).	$E_t = \sum_{i,j} (U_{jit} \cdot EC_j \cdot EF_j) + (PFC_{t-1} \cdot \Delta\text{Production}) - SG_{it}$ <p>Where:</p> <p>E_t = emissions in year t (Mt CO₂-e)</p> <p>U_{jit} = the use of fuel j as a reductant at facility i in year t</p> <p>EC_j = the energy content of fuel j</p> <p>EF_j = the emissions factor of fuel j</p> <p>PFC_{t-1} = perfluorocarbon emissions in the previous year</p> <p>$\Delta\text{Production}$ = change in production between year t and year $t - 1$</p> <p>SG_{it} = emissions reductions at facility i in year t from the Safeguard Mechanism (Mt CO₂-e)</p>
Iron and steel production	Production data from DISR (2025a, 2025b) and Wood Mackenzie long-term outlook report (2025b)	$E_t = \sum_i (EF_i \cdot P_{it} - cs_{it}) - SG_{it}$

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Emissions sub-sector	Data source	Formula
		<p>Where:</p> <p>E_t = emissions in year t (Mt CO₂-e) EF_i = facility-specific emissions factor P_{it} = production at facility i in year t CS_{it} = carbon content in steel at facility i in year t</p> <p>SG_{it} = emissions reductions at facility i in year t from the Safeguard Mechanism (Mt CO₂-e)</p>
Ferroalloys production	Company statements	$E_t = \sum_{i,j} (U_{jit} \cdot EC_j \cdot EF_j) - SG_{it}$ <p>Where:</p> <p>E_t = emissions in year t (Mt CO₂-e) U_{jit} = the use of fuel j as a reductant at facility i in year t EC_j = the energy content of fuel j EF_j = the emissions factor of fuel j SG_{it} = emissions reductions at facility i in year t from the Safeguard Mechanism (Mt CO₂-e)</p>
Other metal production (copper, nickel, silicon and lead)	Production data from DISR (2025a, 2025b) and Wood Mackenzie long-term outlook report (2025b)	$E_t = \sum_{i,j} (U_{jit} \cdot EC_j \cdot EF_j) - SG_{it}$ <p>Where:</p> <p>E_t = emissions in year t (Mt CO₂-e) U_{jit} = the use of fuel j as a reductant at facility i in year t EC_j = the energy content of fuel j EF_j = the emissions factor of fuel j SG_{it} = emissions reductions at facility i in year t from the Safeguard Mechanism (Mt CO₂-e)</p>
Cement	Production forecast from Cement Industry Federation and IBISWorld industry report (2025).	$E_t = \sum_i (EF_i \cdot P_{it}) - SG_{it}$ <p>Where:</p> <p>E_t = emissions in year t (Mt CO₂-e) EF_i = facility-specific emissions factor P_{it} = production at facility i in year t SG_{it} = emissions reductions at facility i in year t from the Safeguard Mechanism (Mt CO₂-e)</p>
Lime	Production forecast from Cement Industry Federation and IBISWorld industry report (2025).	$E_t = \sum_i (EF_i \cdot P_{it}) - SG_{it}$ <p>Where:</p> <p>E_t = emissions in year t (Mt CO₂-e) EF_i = facility-specific emissions factor P_{it} = production at facility i in year t SG_{it} = emissions reductions at facility i in year t from the Safeguard Mechanism (Mt CO₂-e)</p>
Limestone and dolomite and other carbonates	DCCEEW estimates based on projected ceramics, ferroalloy production, glass production, and iron and steel production. Zinc production data from DISR (2025a, 2025b) and Wood Mackenzie long-term outlook report (2025b).	$E_t = E_{t-1} \cdot \Delta\text{Production}$ <p>Where:</p> <p>E_t = emissions in year t (Mt CO₂-e) E_{t-1} = emissions in the previous year $\Delta\text{Production}$ = change in production between year t and year $t - 1$</p>
Non-energy products from fuel and solvent use		

Australia's emissions projections 2025

Emissions sub-sector	Data source	Formula
Lubricant use	n/a	$E_t = E_{t-1}$ Where: E_t = annual emissions in year t E_{t-1} = emissions in the previous year
Product uses as a substitute for ozone depleting substances	DCCEEW (2025c)	Based on National Inventory Report methodology
Other product manufacture and use		
Electrical equipment	DCCEEW (2025c)	Based on National Inventory Report methodology
SF ₆ and PFCs from other product uses	Population forecasts from ABS (2025a) and Department of the Treasury (2023)	$E_t = E_{t-1} \cdot \Delta\text{Population}$ Where: E_t = emissions in year t (Mt CO ₂ -e) E_{t-1} = emissions in the previous year $\Delta\text{Population}$ = change in population between year t and year $t - 1$
N ₂ O from product uses	Population forecasts from ABS (2025a) and Department of the Treasury (2023)	$E_t = E_{t-1} \cdot \Delta\text{Population}$ Where: E_t = emissions in year t (Mt CO ₂ -e) E_{t-1} = emissions in the previous year $\Delta\text{Population}$ = change in population between year t and year $t - 1$
Other production	DCCEEW estimates based on projected ammonia production and food, beverages and tobacco production	$E_t = E_{t-1} \cdot \Delta\text{Production} - SG_t$ Where: E_t = emissions in year t (Mt CO ₂ -e) E_{t-1} = emissions in the previous year $\Delta\text{Production}$ = change in production between year t and year $t - 1$ SG_t = emissions reductions in year t from the Safeguard Mechanism (Mt CO ₂ -e)

Agriculture

Emissions from the agriculture sector are projected using bottom-up modelling developed by DCCEEW. The model is maintained and updated within DCCEEW using external inputs.

Modelling approach

Emissions from agricultural activity are calculated as

$$E(t) = \sum_i \sum_j \sum_k N_{jk}(t) \cdot \frac{E_{ijk}(0)}{N_{jk}(0)}$$

Where:

$E(t)$ = Emissions in year t (Mt CO₂-e), with $E(0)$ denoting emissions in the latest inventory year

i = IPCC sub-sector, such as enteric fermentation, manure management etc

j = commodity, in the relevant units (head, kt, etc), such as grazing beef cattle, grain-fed beef cattle, sheep, wheat, rice etc

k = state or territory

N_{jk} = Quantity of activity type by commodity, by state or territory, in relevant unit quantity (number of head, kilotonnes, hectares etc.)

The gases modelled in the agriculture sector are modelled in CO₂-e, where the share of each GHG is derived from historical inventory data at the most disaggregated level possible.

Activity data

Emissions are projected by calculating the amount of agricultural activity in Australia each year. This is done by drawing on external data sources that contain activity numbers and activity growth rates (Table 9).

The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) is a key data source informing the agricultural emissions projections. These projections are informed by ABARES' short-term forecasts for 2026, and ABARES medium-term outlook under their baseline scenario for 2027 to 2030. The scenario uses statistical analysis of climate drivers such as the El Niño Southern Oscillation and Indian Ocean Dipole to project a plausible assumed climate oscillation pattern to 2030, as well as making assumptions on the global economy.

Where activity data are not available for particular commodities, an appropriate proxy such as production (quantity of end product), or a relevant driver, such as growth in another connected commodity (as informed by historical comparisons), is used. For example, poultry and pig activity are grown using poultry meat production and pig meat production as proxies. Similarly, nitrogen fertiliser, lime, and urea use are grown in line with crop area as a driver to 2030, and crop production from 2031 onwards.

Australia's emissions projections 2025

Table 9 – Summary of principle data sources for agriculture

Commodity	Emissions sub-sectors	Data sources	Unit of activity
Grazing (grass-fed) beef	Enteric fermentation	ABARES (2025a, 2025b)	Head of animal
	Manure management	DCCEEW estimate based on historical trends	
	Agricultural soils		
Grain-fed (feed-lot) beef	Enteric fermentation	ABARES (2025a, 2025b)	Head of animal
	Manure management	DCCEEW estimate based on historical trends	
	Agricultural soils		
Dairy	Enteric fermentation	ABARES (2025a, 2025b)	Head of animal
	Manure management	OECD-FAO (2025)	
	Agricultural soils	DCCEEW estimate based on historical trends	
Sheep	Enteric fermentation	ABARES (2025a, 2025b)	Head of animal
	Manure management	DCCEEW estimate based on historical trends	
	Agricultural soils		
Crops	Agricultural soils	ABARES (2025a, 2025b)	Non-rice crops: kilotonnes of crop Rice: kilotonnes of rice Hectares of area under cultivation
	Field burning of agricultural residues	DCCEEW estimate based on historical trends	
	Rice cultivation	OECD-FAO (2025)	
Pigs	Enteric fermentation	ABARES (2025a)	Head of animal
	Manure management	OECD-FAO (2025)	
	Agricultural soils	DCCEEW estimate based on historical trends	
Poultry	Manure management	ABARES (2025a, 2025b)	Head of animal
	Agricultural soils	OECD-FAO (2025)	
		DCCEEW estimate based on historical trends	
Other animals	Enteric fermentation	Activity held constant at final year of inventory	Head of animal
	Manure management		
	Agricultural soils		
Fertilisers	Agricultural soils	ABARES (2025b) DCCEEW estimate based on historical trends	Kilotonnes
Lime and urea	Liming and urea application	ABARES (2025b) DCCEEW estimate based on historical trends	Kilotonnes

Additional medium-term outlook data is used from the Organisation for Economic Co-operation and Development (OECD) and the Food and Agriculture Organization (FAO) for some commodities. Emissions in later years are modelled to follow average seasonal conditions using a continuation of historical activity trends or recent averages. Historical trends are also used to inform growth if projected activity data are unavailable.

The projections include a trend towards grain-fed beef cattle, following the historical trend towards a greater proportion of beef cattle transferred to feedlots. Further, the projections make minor adjustments to pig and poultry growth rates to account for increasing historical production per animal slaughtered.

As emissions within agriculture relate to biological processes, as well as manure and residue management, individual commodities can contribute several types of gases to multiple IPCC sub-sectors. The alignment between agricultural commodity and IPCC sub-sectors is shown in Figure 2.

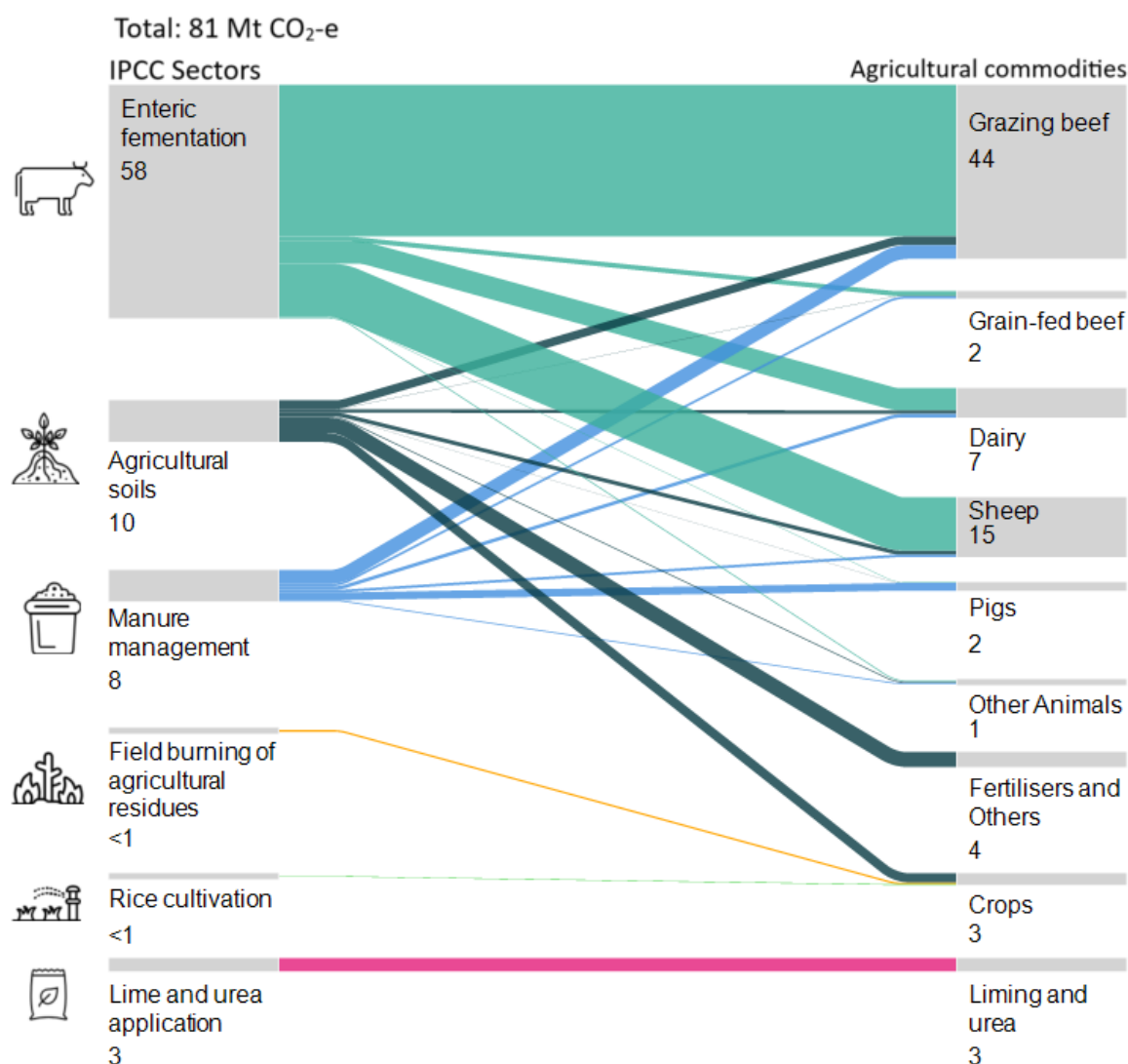


Figure 2 – Agriculture emissions by commodity and IPCC sub-sector, 2030, Mt CO₂-e

Waste

The waste sector emissions projections are prepared by DCCEEW, and include 5 waste sub-sectors:

- solid waste to landfill
- biological treatment of solid waste (composting)
- incineration
- domestic and commercial wastewater
- industrial wastewater.

Modelling approach

The waste sector models largely replicate the methods used to calculate historical waste emissions, described in the National Inventory Report 2023 (DCCEEW 2025c). The solid waste sector modelling is completed on a site-specific basis to take account of the emission characteristics of individual landfills. The gases modelled in the waste sector are CO₂, CH₄, and N₂O.

Solid waste deposited at landfills

Waste deposited in landfills is classified according to three waste streams: municipal solid waste (MSW), commercial and industrial waste (C&I), and construction and demolition waste (C&D). Each of these streams is further disaggregated into a mix of individual waste categories: food, paper and cardboard, garden and park, wood, textiles, sludge (including biosolids), nappies, rubber and leather, and inert (concrete, metal, plastics, glass, soil etc.). With the exception of inert waste, all these waste categories produce emissions when in landfill and are modelled in the projections.

The projections model the amount of each category of non-inert waste deposited in landfills. The amount of waste generated is projected to grow with population, except for nappies. The quantity of nappy waste is projected to grow proportional to projected changes in the population under 2 years old and over 85 years old.

The proportion of each waste category sent to landfill is adjusted to account for policies and trends within the sector. Modelled policies and measures include the planned rollout of food organics and garden organics (FOGO) bins to households, projects funded through the Recycling Modernisation Fund (RMF), approved Energy from Waste (EfW) projects, the Safeguard Mechanism, and Australian Carbon Credit Unit Scheme (ACCU) projects.

Progress towards the following targets is incorporated in the model through an assumed gradual reduction per capita based on separate annual deposition estimates for relevant materials (e.g., textiles, rubber and leather, wood etc) and based on advice from Blue Environment (Blue Environment 2023):

- National Food Waste Strategy: halve food waste generation by 2030
- National Waste Policy Action Plan: 80% average resource recovery rate by 2030, reduce total waste generated by 10% per capita by 2030, halve the amount of organic waste sent to landfill for disposal by 2030
- state and territory resource recovery targets
- state and territory waste generation reduction targets.

Projects funded through the RMF are included where they are considered to contribute additional capacity; meaning that the project is expected to primarily receive material streams that previously went to landfill. For non-inert waste, this includes some projects targeted at paper and cardboard waste, and tyres.

EfW facilities will divert some combustible waste from landfill and convert it to energy. Under the IPCC guidelines, the combustion emissions from these facilities are counted in the electricity sector, and do not contribute to the incineration sub-sector of the waste sector. The EfW facilities included in the model are:

- Kwinana facility in Western Australia, which incinerates approximately 460 kt of MSW and C&I waste annually starting from 2026.
- East Rockingham facility in Western Australia, which is expected to process 300 kt of MSW and 30 kt of C&I waste annually from 2027.
- Laverton North waste gasification project in Victoria, which is expected to process 200 kt of MSW annually from 2026.
- Maryvale facility in Victoria, which is expected to process 325 kt of MSW and C&I waste annually from 2026.

On-site abatement from the Safeguard Mechanism, as well as abatement from ACCU projects, is modelled separately and subtracted at the end of the modelling process.

Historical waste is modelled on a facility-by-facility basis to reflect the characteristics of each landfill, including weather conditions. Future waste deposited is estimated at the state and territory level, reflecting the average conditions of landfills in each jurisdiction.

Biological treatment of solid waste

The biological treatment of solid waste sub-sector includes emissions from the composting and anaerobic digestion of organic waste. The quantity of waste processed in this way is projected to grow as policies and programs are implemented to divert organic waste from landfills. In particular, the rollout of FOGO bins to households is projected to contribute significantly to this diversion. The commitments from state and territory governments included in these projections are outlined in Table 10.

Table 10 – FOGO commitments included in the solid waste to landfill emissions projections

Jurisdiction	Commitment	Modelled rollout	Source
ACT ⁸	FOGO for all households in ACT metro area	100% by 2030	Aligned with the NWPAP target
NSW	FOGO collection for all households by 2030	100% by 2030	NSW Government (2021)
QLD ⁸	Councils to identify best fit-for-purpose option for household organic waste and begin rollout	50% by 2030	Aligned with the NWPAP target

⁸ Assumptions of the percentage availability of FOGO bins in ACT and Queensland used in waste emissions model are aligned with the National Waste Policy Action Plan (NWPAP) target which is to roll out FOGO collections services to metropolitan areas by 2030.

Jurisdiction	Commitment	Modelled rollout	Source
SA ⁹	FOGO for all households in Adelaide metro area	77% by 2030	GISA (2020)
TAS	Introduce weekly FOGO collections	100% by 2030	DNRET (2022)
VIC	Every Victorian household to have access to a FOGO bin or local composting by 2030	100% by 2030	RV (2020)
WA	FOGO for all households in Perth and Peel regions by 2025	80% by 2025	Waste Authority (2019)

Incineration

In Australia, incineration emissions are generated from thermal oxidation of clinical waste and solvents. The model assumes that clinical waste increases proportionately to population and the volume of solvents incinerated remains constant over the projections period.

Domestic and commercial wastewater

Emissions are estimated separately for unsewered and sewer populations, which have different assumed chemical oxygen demands (CODs).

The unsewered COD per capita ratio is applied to a projection of the unsewered population in each state and territory. Emissions are calculated based on the inventory CH₄ emissions factor and the percentage of wastewater anaerobically treated (50%).

The sewer COD per capita is applied to a projection of the sewer population in each state and territory. COD flows are used to estimate emissions from domestic and commercial wastewater facilities. COD influent refers to COD entering the wastewater facility in wastewater. COD outflow refers to:

- COD removed as sludge within the facility
- COD discharged from a facility as effluent, such as into rivers or the ocean
- COD in sludge removed to landfill or other land-based sites.

COD outflows are projected using ratios to COD influent. The ratios are a national average based on the latest inventory data. COD outflows are projected for each state and territory using the calculated ratio and the COD influent for the relevant year. This approach assumes that the proportion of COD outflow to COD influent remains constant over the projection timeframe. The proportion of CH₄ recovered is held fixed from the latest inventory year.

N₂O emissions are calculated by replicating the same assumptions and calculations used to project CH₄ from the sewer population. However, N₂O emissions do not include any GHG recovery and are applied to the entire Australian population rather than only the sewer population.

⁹ The current roll-out of FOGO bins in South Australia already meets the target set in *Supporting the Circular Economy* (GISA 2020; Blue Environment 2024). The proportion of households projected to have FOGO bins is therefore held constant over the projections period.

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Table 11 – Summary of calculation methods for each domestic and commercial wastewater sub-sector

Emissions sub-sector	Calculation method
Sewered population, methane	
Total	$CH_4(t) = CH_4(ww) + CH_4(sl) - CH_4(cap)$ <p>Where</p> <p>$CH_4(t)$ is the total estimated CH₄ emissions from the treatment of wastewater at municipal wastewater treatment plants</p> <p>$CH_4(ww)$ is the estimated CH₄ emissions from the treatment of sewage at wastewater plants</p> <p>$CH_4(sl)$ is the estimated CH₄ emissions from treatment of sludge at wastewater plants</p> <p>$CH_4(cap)$ is the estimated captured CH₄ emissions</p>
Wastewater	$CH_4(ww) = (COD_{in} - COD_{sl} - COD_{out}) \times EF_{ww}$ <p>Where</p> <p>$CH_4(ww)$ is the estimated CH₄ emissions from the treatment of wastewater</p> <p>COD_{in} is the amount of COD input entering into wastewater treatment plants</p> <p>COD_{sl} is the amount of COD treated separately as sludge</p> <p>COD_{out} is the amount of COD effluent discharged from wastewater treatment plants into aquatic environments</p> <p>EF_{ww} is the emission factor for wastewater treated at wastewater treatment plants</p>
Sludge	$CH_4(sl) = (COD_{sl} - COD_{trl} - COD_{tro}) \times EF_{sl}$ <p>Where</p> <p>$CH_4(sl)$ is the estimated CH₄ emissions from the treatment of sludge</p> <p>COD_{sl} is the amount of COD treated separately as sludge</p> <p>COD_{trl} is the amount of COD as sludge removed and sent to landfill</p> <p>COD_{tro} is the amount of COD as sludge removed and sent to a site other than landfill</p> <p>EF_{sl} is the emission factor for sludge treated at wastewater treatment plants</p>
Sewered population, nitrous oxide	
Total	$N_2O(t) = N_2O_{on} + N_2O_{eff} + N_2O_{sl}$ <p>Where</p> <p>$N_2O(t)$ is the total estimated N₂O emissions from domestic and commercial wastewater treatment</p> <p>N_2O_{on} is the estimated N₂O emissions from sewage treatment at a wastewater plant</p> <p>N_2O_{eff} is the estimated N₂O emissions from the discharge of effluent</p> <p>N_2O_{sl} is the estimated N₂O emissions from the application of treated sludge to land</p>
Unsewered population	
Total	$CH_4(t) = COD_t \times EF_t$ <p>Where</p> <p>$CH_4(t)$ is the estimated CH₄ emissions from the unsewered wastewater</p> <p>COD_t is the amount of COD produced by the unsewered population</p> <p>EF_t is the emission factor for unsewered wastewater</p>

Industrial wastewater

Industrial wastewater emissions are projected for the following sub-sectors: dairy production, pulp and paper production, meat and poultry processing, organic chemicals production, sugar production, beer production, wine production, fruit processing, and vegetable processing.

The emissions projections are based on changes to commodity production levels. Growth rates are based on long-term forecasts using sector-specific metrics (Table 12).

Table 12 – Data sources for industrial wastewater commodity trends

Commodity	Activity data source
Dairy production	Agriculture activity projection
Pulp and paper production	Historical trends (ABS 2025b)
Meat and poultry processing	Agriculture activity projection
Organic chemical production	Historical trends (ABS 2025b)
Sugar production	Agriculture activity projection
Beer production	Historical trends (ABS 2025b)
Wine production	Historical trends (ABARES 2025b)
Fruit processing	Historical trend (ABARES 2025b)
Vegetable processing	Historical trend (ABARES 2025b)

Table 13 – Summary of calculation method for the industrial wastewater sub-sector

Emissions sub-sector	Calculation method
Total	$CH_4(t) = CH_4(ww) + CH_4(sl)$ <p>Where</p> <p>$CH_4(t)$ is the total estimated CH_4 emissions from the treatment of wastewater at municipal wastewater treatment plants</p> <p>$CH_4(ww)$ is the estimated CH_4 emissions from the treatment of sewage at wastewater plants</p> <p>$CH_4(sl)$ is the estimated CH_4 emissions from treatment of sludge at wastewater plants</p>
Wastewater	$CH_4(ww) = (COD_{in} - COD_{sl} - COD_{eff}) \times EF_{ww} - CH_4(ww,cap)$ <p>Where</p> <p>$CH_4(ww)$ is the estimated CH_4 emissions from the treatment of wastewater</p> <p>COD_{in} is the amount of COD input entering into wastewater treatment plants</p> <p>COD_{sl} is the amount of COD treated separately as sludge</p> <p>COD_{eff} is the amount of COD effluent discharged from wastewater treatment plants into aquatic environments</p> <p>EF_{ww} is the emission factor for wastewater treated by wastewater treatment plants</p> <p>$CH_4(ww,cap)$ is the estimated captured CH_4 emissions from wastewater treatment</p>
Sludge	$CH_4(sl) = (COD_{sl} - COD_{trl} - COD_{tro}) \times EF_{sl} - CH_4(sl,cap)$ <p>Where</p> <p>$CH_4(sl)$ is the estimated CH_4 emissions from the treatment of sludge</p> <p>COD_{sl} is the amount of COD treated separately as sludge</p> <p>COD_{trl} is the amount of COD as sludge removed and sent to landfill</p>

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Emissions sub-sector	Calculation method
	COD _{tro} is the amount of COD as sludge removed and sent to a site other than landfill
	EF _{sl} is the emission factor for sludge treated by wastewater treatment plants
	CH _{4(sl, cap)} is the estimated captured CH ₄ emissions

Land use, land-use change and forestry

The LULUCF sector includes emissions and removals from forests, agricultural lands, and changes in land use that arise from management practices (e.g. clearing) and impact the carbon stored in vegetation and soils.

Modelling approach

The Full Carbon Accounting Model (FullCAM) is used to project emissions where sufficient input data exists. FullCAM is an empirically constrained, mass balance, carbon cycling ecosystem model used to estimate carbon stock changes across the Australian landscape, including for Australia's National Greenhouse Accounts. FullCAM integrates data on climate, soil, management and land-use change observed from satellites. A detailed description of the model is outlined in the National Inventory Report (DCCEEW 2025c). The LULUCF sector emissions projections are prepared by DCCEEW and build on this approach using the UNFCCC sub-sectors grouped into the categories outlined in Table 14.

For categories where a clear trend is established in the historical data or is a likely function of ongoing management cycles (e.g. plantations) a continuation of the trend has been projected. For categories that have more variable emissions that oscillate around an average, for example carbon pools that are particularly sensitive to climate, a return to the average has been projected. For some other less material categories with no clear trend, the current short term net emission level using the 2022-2023 mean has been held constant. More detail is provided in Table 14.

Table 14 – Summary of emissions categories, modelling approaches and data sources for the LULUCF sector

Emissions Category	Approach/Assumptions	Data sources
Forests		
Forest land remaining forest land	Modelled at sub-sector level as below	
- Harvested native forests	FullCAM estate model with future harvesting areas assumed to remain constant based on current log volumes in all states except for Victoria and Western Australia which have announced cessation of native forest harvesting from 1 January 2024.	Australian Forestry and Wood products statistics (ABARES 2025c)
- Pre-1990 plantations	Net emissions and removals return to long-term mean by 2040 as replanting occurs following harvesting of the majority of the softwood estate (with a 35-year harvest cycle) in the short-term.	Historical trends (DCCEEW 2025c)
- Biomass burning	Includes prescribed burns and wildfire. Losses and subsequent recovery from non-anthropogenic fires assumed to average out over time. Net emissions and subsequent removals are assumed to return to long-term average by 2040.	Historical trends (DCCEEW 2025c)
- Fuelwood	Net emissions to continue at 2021, 2022, and 2023 historical average.	Historical trends (DCCEEW 2025c)

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Emissions Category	Approach/Assumptions	Data sources
Land converted to forest land	Modelled at sub-sector level as below. This incorporates the impacts of ACCU Scheme projects over the projection period.	ACCU projection
- Plantations (Hardwood, Softwood, Environmental)	Net emissions and removals reflect assumptions on the cyclic growth and current harvesting trends developed in collaboration with ABARES.	Historical trends (DCCEEW 2025c)
- Regeneration	The net sink is assumed to return to the long-term average by 2040, from current levels which reflect strong post-drought growth.	Historical trends (DCCEEW 2025c)
- Regrowth following observed land clearing	Often subject to re-clearing, the net sink from these areas are assumed to return to the long-term average by 2040.	Historical land clearing activity (DCCEEW 2025c)
- Biomass burning	Net emissions are assumed to return to long-term average by 2040.	Historical trends (DCCEEW 2025c)
- Mangroves	Net emissions to continue at current level.	Historical trends (DCCEEW 2025c)
Harvested wood products	Wood product use is assumed to continue at current level and the net sink is modelled as described in the National Inventory Report 2023.	Historical trends (DCCEEW 2025c)
Forests converted to Agricultural and other lands		
Land converted to grassland, converted to cropland, land converted to settlements, and land converted to wetlands	Primary land clearing is the key driver of emissions in these sectors. Primary clearing has been in decline since 1990, and the current average (2021, 2022, and 2023) lower levels of primary clearing are assumed to be sustained over the projection period leading to stabilisation of net emissions.	Historical land clearing activity (DCCEEW 2025c)
Agricultural and other lands		
Cropland remaining cropland	Emissions reflect both climate and management influences following an all-time low resulting from several years of above average rainfall in much of Australia; year-on-year variability reflects crop productions emission projections and overall, the net sink is assumed to trend towards net zero. Emissions from soil carbon ACCU projects are also included in this category, offsetting the emissions somewhat.	Historical trends (DCCEEW 2025c), ACCU projection, ABARES (2025a, 2025b)
Grassland remaining grassland	Emissions reflect both climate and management influences following an all-time low resulting from several years of above average rainfall in much of Australia; the net sink is assumed to stabilise at historical average emissions covering a range of historically wetter and drier climate conditions. Emissions from soil carbon ACCU projects are also	Historical trends (DCCEEW 2025c), ACCU projection.

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Emissions Category	Approach/Assumptions	Data sources
Wetland remaining wetland and settlements remaining settlements	<p>included in this category, offsetting the emissions somewhat.</p> <p>Current management practices are assumed to remain unchanged to 2040. Emissions to continue at current levels.</p>	Historical trends (DCCEEW 2025c)

The Safeguard Mechanism

The Department uses a facility-specific model to estimate the impact of the Safeguard Mechanism. The model estimates the:

- Safeguard emissions assuming constant emissions intensities,
- projected emissions reductions that occur on-site at facilities in response to the Safeguard Mechanism (not including reductions from technologies already implemented), and
- demand for ACCUs and Safeguard Mechanism Credits (SMCs) to meet Safeguard compliance obligations.

'Safeguard facility baselines' are legislated limits on the net emissions of covered Safeguard facilities. Safeguard facility baselines are estimated consistent with the production forecasts underpinning the 2025 emission projections, and the National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 as amended in August 2024. Safeguard baselines decline by the default rate of 4.9% each year to 2030. An indicative default decline rate of 3.285% from 2031 has been included in the Safeguard Rule and this is what is assumed in these emissions projections from 2031.

To estimate the projected impact of the Safeguard Mechanism, emissions are first projected assuming current emissions intensities continue, referred to as 'Reference Safeguard emissions', informed by production forecasts and emission intensities as outlined in this methodology report. In the model, the difference between projected Reference Safeguard emissions and baselines are met through on-site emissions reductions and/or through surrendering ACCUs or SMCs.

The Department commissioned RepuTex (2025) to provide on-site abatement estimates for Safeguard facilities, both at the individual facility level and by technology and IPCC sector. In this analysis, the uptake of abatement technology is informed by a Marginal Abatement Cost (MAC) model, covering over 100 decarbonisation activities for each year across projections outlook. Changes in MACs over time are informed by forecast changes in fuel prices as well as decreases in Capital Expenditure (CAPEX) for emerging technologies. The model also accounts for existing decarbonisation plans and technology deployment at each facility. The analysis also provided the estimated change in the type and/or quantity of fuel used in Safeguard facilities from abatement uptake. Based on this analysis, facilities prioritise low-cost process improvements first and then invest in large-scale projects, including some assumed to be funded under the Powering the Regions Fund, bringing forward activities that may not otherwise be cost-effective. These estimates were calibrated to the Department's facility-by-facility projections of production. These estimates are also used to estimate the creation of SMCs.

The emissions reductions from on-site improvements and projects are incorporated into the emission projections for the electricity, stationary energy, fugitives, transport, IPPU and waste sectors as outlined in the sectoral chapters of this methodology report. The emissions occurring at Safeguard facilities after taking account of these improvements and technology projects are called 'gross emissions.'

In some cases, these improvements and technology projects reduce emissions at facilities such that a facility is no longer a covered Safeguard facility (i.e. its gross emissions fall below the 100,000 t CO₂-e threshold). 'Gross emissions Safeguard covered facilities' refer to aggregate emissions from Safeguard facilities that remain covered (i.e. above 100,000 t CO₂-e).

Once Safeguard gross emissions are estimated, the Safeguard model estimates the number of units needed to meet facility baselines. This is called 'net demand for units', which also accounts for SMCs generated by existing facility and can be met using ACCUs and SMCs generated by former Safeguard facilities. Facilities generate SMCs when their gross emissions are below their Safeguard baseline. These SMCs can be sold or banked to meet their own future Safeguard compliance obligations. Facilities may also need to purchase ACCUs. The net demand for ACCUs is an input to the ACCU model which projects supply and demand in the ACCU market.

The Australian Carbon Credit Units Scheme

The Department maintains an ACCU supply model that projects ACCU supply by project type. The projections of ACCU supply are then incorporated into relevant sectoral models as emissions reductions or removals. The majority of ACCU supply is expected to be generated in the LULUCF sector.

The Department projects ACCU demand from:

- Safeguard facilities, based on outputs from the Department's Safeguard Mechanism model
 - The ACCU model applies a one-year lag to unit demand from the Safeguard Mechanism to more accurately project the year in which the units will be cancelled. For example, ACCU liabilities that Safeguard facilities accrue in the 2025 financial year will result in the cancellation of ACCUs or SMCs by February 2026, during the 2026 financial year.
- deliveries of ACCUs to Government, based on current fixed and optional carbon abatement contracts and estimated delivery rates
- other sources of voluntary (including Climate Active), state/territory and compliance demand, based on internal estimates.

The Department projects ACCU issuance by project type by sourcing forecasts from Reputex and using Department estimates based on the latest data of known projects likely to generate ACCUs, the current project pipeline, expert advice on the expected outlook for certain project types and the expected time required to commence projects and ramp-up abatement.

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