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# ACT GREENHOUSE GAS INVENTORY FOR 2021-22

**PREPARED FOR:**

ENVIRONMENT, PLANNING AND SUSTAINABLE DEVELOPMENT DIRECTORATE

ACT GOVERNMENT

18 NOVEMBER 2022

ACT Government

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# VERSION CONTROL

| Version | Date | Authors | Project Director |
|---|---|---|---|
| **Final** | 18/11/22 | Katy Horan, Naresh Rao | Ben Sichlau |

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# 1. ACT GREENHOUSE GAS EMISSIONS INVENTORY SUMMARY

**The ACT's total net greenhouse gas emissions in 2021-22 were 1,647 kilotonnes of carbon dioxide equivalent (kt $CO_2$-e).**

## 1.1 ACT emissions summary

The Australian Capital Territory (ACT) Government has adopted greenhouse gas (GHG) reduction targets established under the *Climate Change and Greenhouse Gas Reduction Act 2010* (the Act). This report provides estimates of the ACT's greenhouse gas emissions attributable to sectors within the Territory for the 2021-22 financial year. The estimates are based on the method established under the Act*, the Climate Change and Greenhouse Gas Reduction (Greenhouse Gas Emissions Measurement Method) Determination 2022* (the Determination).

The following ACT Greenhouse Gas Emissions Inventory Report 2021-22 has been prepared to satisfy Part 2, Section 12 of the Act.

It contains:

- the amount of GHG emissions in the ACT for the inventory year
- an analysis of the ACT's progress in meeting legislated GHG targets and the renewable energy targets including:
    - a comparison of annual emissions against legislated targets
    - identification of the main sources of GHG emissions in the ACT
    - an explanation of changes compared to 2020-21 and previous years
    - compliance with the renewable target and identification of the main sources of renewable energy generated for the ACT.

In summary, the ACT's total net greenhouse gas emissions in 2021-22 were 1,647 kilotonnes of carbon dioxide equivalent (kt $CO_2$-e). The major sources of emissions were transport (63.6%) and stationary energy (26.6%) consisting of natural gas combustion (22.5%), fugitive gas emissions (3.2%) and other stationary fuels (0.9%). Further emissions were generated from industrial processes and product use emissions (10.0%), waste processing and decomposition (9.3%), and agriculture (0.8%). Total emissions are partly offset by land use, land-use change and forestry (LULUCF) that provide net sequestration (removal) of 171 kt $CO_2$-e (-10.4% of total emissions) – that is, the sector absorbed more emissions than it generated. Table 1 shows the results for 2021-22.

***Table 1. ACT 2021-22 greenhouse gas emissions by source***

| Emission Source | Emissions 2021-22 (Kt CO2-e) | Share of total emissions (inc. LULUCF) | Share of total emissions (exc. LULUCF) |
|---|---|---|---|
| Waste including wastewater | 153 | 9.3% | 8.4% |
| Agriculture | 14 | 0.8% | 0.8% |
| Industrial processes/product use | 164 | 10.0% | 9.0% |
| Transport | 1,047 | 63.6% | 57.6% |
| Fugitive emissions | 53 | 3.2% | 2.9% |
| Natural gas combustion | 371 | 22.5% | 20.4% |
| Other stationary energy | 15 | 0.9% | 0.8% |
| Sub total (excl. LULUCF) | 1,818 | 110.4% | 100% |
| LULUCF | -171 | -10.4% | NA |
| Total (inc. LULUCF) | 1,647 | 100% | NA |

## 1.2 Changes in emissions

### The ACT's total emissions have reduced by 1,451 kt CO2-e (-47%) since 1989-90.

Since the ACT's baseline year (1989-90) the territory's population has grown 63% from 279,000 to 454,000 whilst total emissions have fallen 47% from 3,098 kt $CO_2$-e to 1,647 kt $CO_2$-e. The key driver of this outcome continues to be the emission reductions associated with electricity generation. Emissions from electricity began gradually declining in 2015-16 and then fell to zero 2019/20 in line with the territory's 100% renewable electricity supply target. Further contributors to emission reductions since 2012-13 were:

- carbon sequestration by the LULUCF sector, which changed from a net carbon emitter to a net carbon sink in 2015-16, representing an overall reduction of -279 kt $CO_2$-e
- a reduction in emissions associated with transport of -52 kt CO2-e
- a reduction in emissions associated with agriculture of -14 kt $CO_2$-e
- a reduction in emissions from natural gas combustion of -7 kt $CO_2$-e

The overall impact of these emission reductions has been slightly muted by increased emissions from:

- waste decomposition (53 kt $CO_2$-e)
- industrial processes and product use (29 kt $CO_2$-e)
- fugitive emissions from natural gas distribution (16 kt $CO_2$-e)

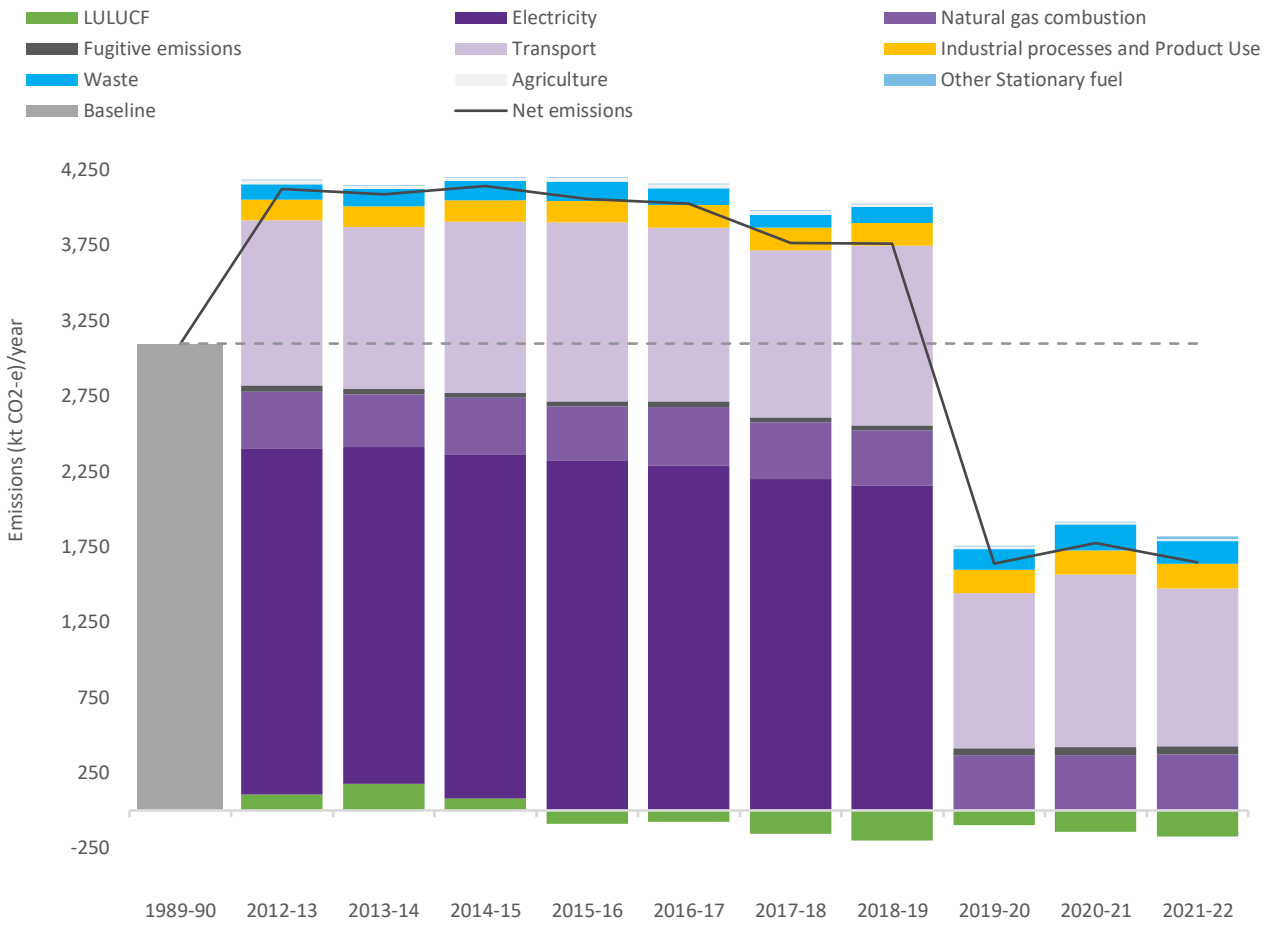


***Figure 1. Net emissions and emissions by sector – ACT, 2012-13 to 2021-22***

## 1.3 Per capita emissions

**At 3.6 tCO2-e in 2021-22, the ACT's per capita emissions are just 17% of the national average of 21.5 tCO2-e (for the year 2018-19) and lower than all the other states and the Northern Territory, but higher than Tasmania1.**

Part two, section 8 of the Act states that the per person target which is the average amount of GHG emissions produced per person in the ACT each year is to peak by 30 June 2013. ACT is in compliance with the target with per capita emissions falling consistently since 2012-13. Per capita emissions decreased by 67% between 1989-90 and 2021-22. The majority of this decline took place from 2016-17 to 2019-20 as the ACT delivered on its renewable energy targets and per capita emissions fell from 8.8 to 3.6 $tCO_2$-e (59% decrease).

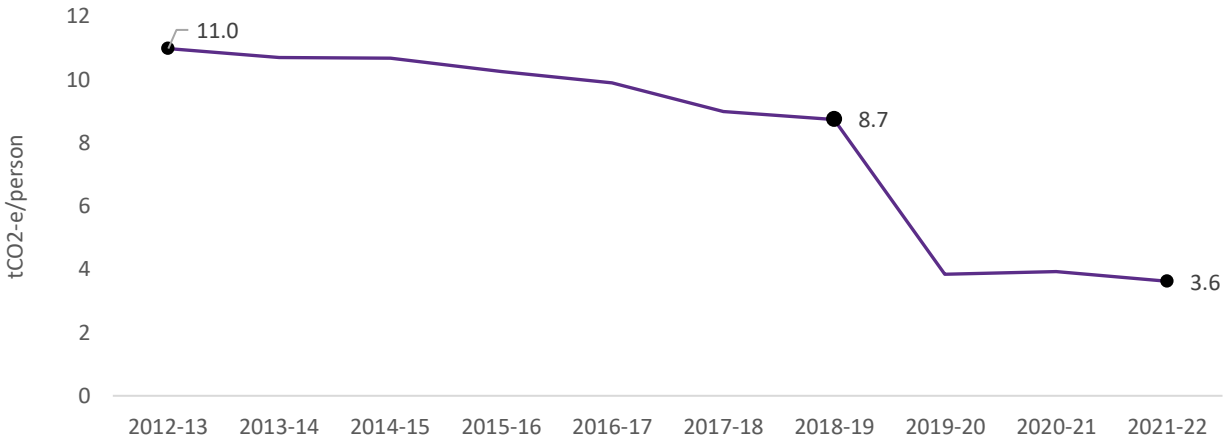


***Figure 2. Trend in per capita emissions ($tCO_2$-e) – ACT, 2012-13 to 2021-22***

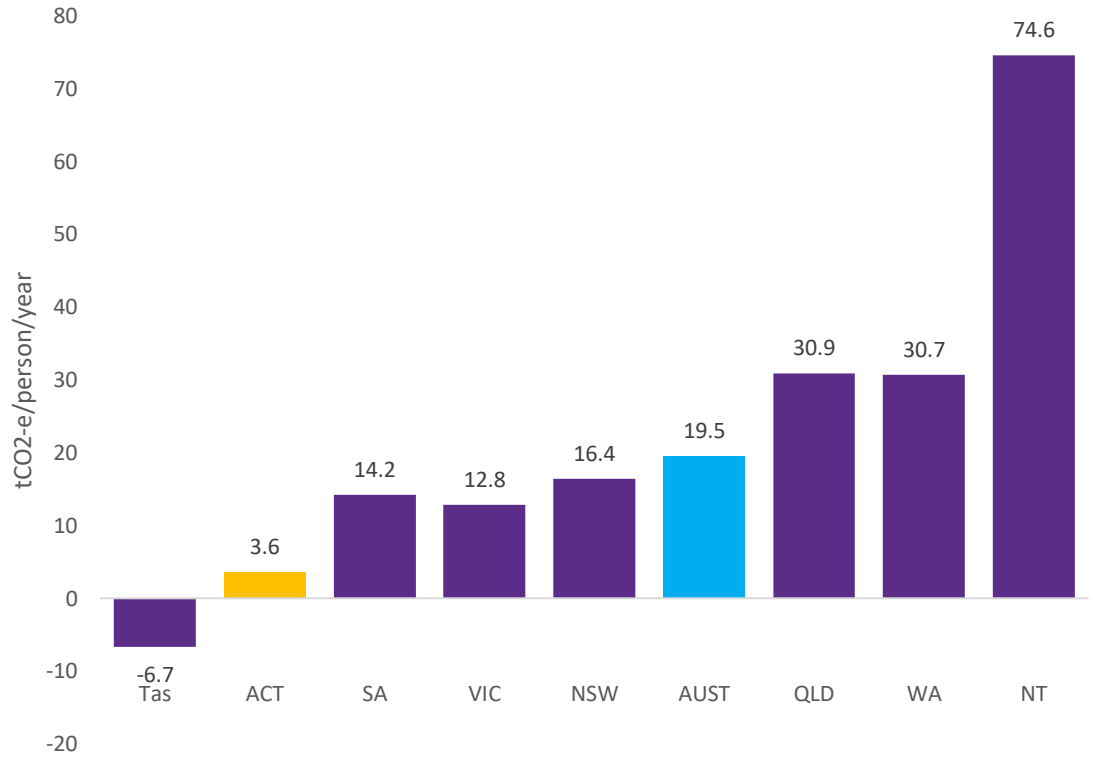


***Figure 3. 2021-22 Per capita emissions ($tCO_2$-e) by State, Territory and Nation***

[1]Sources: State and Territory Greenhouse Gas Inventories 2020 (AGEIS, 2022). National, state and territory population 2021 (ABS, 2022).

# 2. EMISSIONS BY SECTOR

## 2.1 Overview of emissions by sector

This section presents the ACT's greenhouse gas emissions by sector and describes the activities that drive these emissions and the reasons for changes over the past years.

Sector definitions are drawn from the five Intergovernmental Panel on Climate Change (IPCC) source categories:

- Energy
- Industrial processes and product Use
- Agriculture
- Land use, land-use change and forestry (LULUCF)
- Waste

## 2.2 Sector changes compared to previous years

### 2.2.1 Energy

***Electricity***

**Electricity-related emissions were zero in 2021-22 due to the ACT maintaining its 100% renewable electricity supply.**

The ACT differs from all other Australian states and territories in having no thermal fossil fuel electricity generators located within its borders. Most of the electricity consumed in the ACT is imported from the NSW grid, and most of the imported electricity is generated at power stations located either within NSW, or, by way of flows through inter-connectors between state grids, Queensland, or Victoria. Consequently, a conventional jurisdictional greenhouse gas inventory following IPCC Guidelines (i.e., reporting only emissions from sources located within the jurisdictional boundary) would greatly under-estimate historic emissions arising from consumption of electricity in the ACT. For this reason, the ACT emissions inventory has always reported Scope 2 emissions for electricity consumption.

Since 1 January 2020 the ACT has offset 100% of residual electricity emissions through renewable generation and retiring Large Generation Certificates (LGCs). The financial year 2021-22 was the third year in which the ACT achieved zero electricity-related emissions. Total electricity flow in the ACT was consistent with previous years at 3,001 GWh up 1% on 2020-21. Total electricity input from the National Electricity Market was 2,730 GWh and the renewable power percentage (RPP) associated with the federal Large-scale Renewable Energy Target was 18.59% for the financial year 2021-22. Therefore it was calculated that 508 GWh of the ACT's network sales was from LGC producing renewable sources. A further 177 GWh were generated from small-scale solar PV (<200 kW) within the ACT (up 25%) and 92 GWh of below baseline hydroelectricity from Snowy Hydro. These renewable sources do not generate LGCs and are therefore not captured in the RPP. The total quantity of renewable electricity supplied to the ACT in 2021-22 was 776 GWh up 4% on the previous year.

The ACT surrendered 2,224,000 LGCs in 2021-22 to maintain its 100% renewable electricity supply.

***Table 2. 2021-22 pathway to zero emissions electricity***

| | 2021-22 contribution to target (GWh) | YoY change (%) |
|---|---|---|
| **Total electricity supplied to customers** | 3001 | +1% |
| **LRET generation** | 508 | -0.5% |
| **Rooftop solar PV (<200 kW)** | 177 | +26% |
| **ACT share of Snowy Hydro output**[2] | 92 | -4% |
| **Required surrender of LGCs** | 2,224 | +0.1% |
| **Residual electricity** | 0 | |

[2] Below baseline (pre-RET) generation

*Stationary energy*

## Natural gas emissions represented 22.5% of total ACT emissions in 2021-22, with fugitive emissions from the natural gas network (e.g., leakage) accounting for a further 3.2% of emissions.

Total natural gas emissions (excluding transport) were flat compared to last year (slight 0.6% increase) at 371 kt CO2-e and per capita gas use remained at 17 GJ per person.

The trend in per capita gas use shows a long-term decline as shown in Table 3, as more gas heating, hot water, and cooking is converted to electricity, gas appliances become more efficient and gas connections are further limited in new dwellings. The downward trend appears to be slowing.

Since the accomplishment of 100% renewable electricity supply, natural gas has become the second largest emission source in the ACT with natural gas combustion and fugitive emissions comprising 25.7% of the inventory in 2021-22.

Remaining stationary energy emissions arise from LPG (0.9%), firewood (<0.1%) and fuel oil (<0.1%).

***Table 3. Natural gas emissions(combustion and fugitive) in the ACT (excluding transport)***

| Natural gas | Units | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Per capita use** | GJ/ capita | 21.4 | 19.6 | 20.9 | 19.5 | 20.5 | 19.1 | 18.2 | 17.5 | 17.4 | 17.4 |
| **Fugitive emissions** | $ktCO_2$-e | 38 | 33 | 33 | 30 | 35 | 34 | 33 | 46 | 50 | 53 |
| **Combustion emissions** | $ktCO_2$-e | 378 | 352 | 376 | 358 | 387 | 372 | 368 | 366 | 369 | 371 |

*Transport*

## Ground transport emissions were calculated to be 1,016 kt CO2-e in 2021-22, a 10% drop from 2020-21.

Sales of major transport fuels fell from between 4 to 12% with petrol falling 12%, diesel falling 7% and all other transport fuels falling a combined 4%. Historic data was revised this year due to the discovery of a small number of petrol stations that had not reported fuel sales in 2019/20 and 2020/21 see Table 5.

Per capita transport energy use fell 11% to 30.3 GJ per capita from 33.7 GJ, which is lower than during the height of the pandemic when per capita usage was 31.5 GJ (Table 5).

***Table 4. Transport fuel consumption***

| Transport fuels | Units | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Petrol (unleaded, E10, E85)** | kl | 330,838 | 317,559 | 315,243 | 320,310 | 321,073 | 321,300 | 312,014 | 282,816 | 295,277 | 263,472 |
| **Diesel** | kl | 85,096 | 91,401 | 117,193 | 128,265 | 137,070 | 146,269 | 151,247 | 144,012 | 161,827 | 149,885 |
| **CNG (ACTION)** | GJ | - | 109,791 | 108,614 | 100,089 | 87,283 | 85,297 | 80,585 | 74,480 | 90,583 | 82,058 |
| **LPG** | Kl | 21,760 | 15,275 | 11,404 | 11,528 | 9,348 | 7,211 | 5,986 | 4,508 | 3,647 | 2,913 |

***Table 5. Ground transport emissions in the ACT***

| Transport fuels | Units | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total emissions** | kt $CO_2$-e | 1,040 | 1,019 | 1,083 | 1,139 | 1,105 | 1,056 | 1,140 | **1,147** | **1,124** | 1,016 |
| **Previously stated** | kt $CO_2$-e | 1,040 | 1,019 | 1,083 | 1,139 | 1,105 | 1,056 | 1,140 | 1,019 | 1,070 | - |

### Aviation emissions were 31 kt CO2-e in 2021-22 or 1.9% of the total inventory.

Aviation emissions have not previously been reported in the ACT's GHG inventory. The methodology was updated in 2021-22 to include this emission source and historic values have been calculated back to the baseline year (Table 7). Emissions have been calculated in accordance with the GHG Protocol guidance for cities and account for emissions that occur within the jurisdiction. All emissions associated with the landing and take-off (LTO) cycle (including taxi-out, take-off, climb, descent, land and taxi-in) are taken as a proxy for aviation emissions that occur within the ACT boundary. It is assumed that all cruising altitude emissions occur outside of the ACT.

Activity data is sourced from the Bureau of Infrastructure and Transport Research Economics (BITRE) and provides the number of flight movements (departures and arrivals at Canberra airport; see Table 6). Fleet composition and LTO emissions have been estimated based on the top two aircraft used in Australia (Boing 737-800 and Airbus A-320). LTO cycle emissions have been calculated using the 1.A.3.a Aviation 2 LTO emissions calculator 2019 developed by the European Environment Agency to assist European Union member states in developing their national inventories.

Baseline emissions were calculated to be 21 kt $CO_2$-e, however it is noted that flight movements were unusually low in 1989-1990 due to a shortage of pilots. Emissions associated with commercial aviation were between 54 and 60 kt $CO_2$-e from 2012-13 to 2018-19 and fell to as low as 23 kt $CO_2$-e at the height of the pandemic. During the inventory year, commercial aviation emissions were 31 kt $CO_2$-e or 1.9% of the total inventory.

***Table 6. Aviation activity data Canberra Airport (Source: BITRE)***

| Aviation | Units | Baseline | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Arrivals** | # | 7,569 | 20,858 | 20,197 | 19,354 | 19,219 | 19,008 | 19,303 | 19,267 | 14,333 | 8,236 | 11,110 |
| **Departures** | # | 7,523 | 20,958 | 20,294 | 19,435 | 19,280 | 19,083 | 19,370 | 19,321 | 14,367 | 8,250 | 11,127 |

***Table 7. Aviation emissions (kt $CO_2$-e)***

| Aviation | Units | Baseline | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total emissions** | kt $CO_2$-e | 21 | 60 | 59 | 55 | 54 | 54 | 55 | 55 | 41 | 23 | 31 |

## 2.2.2 Industrial Processes and Product Use

### Emissions from industrial processes and product use (IPPU) increased slightly from 159 kt CO2-e in 2020-21 to 164 kt CO2-e in 2021-22, which is in line with the long-term trend.

These emissions represented 10% of the 2021-22 inventory or 164 kt CO2-e (see Table 8). IPPU emissions in the ACT arise primarily from hydrofluorocarbon (HFC) gases used in refrigeration and air-conditioning equipment. This category is termed 'product used as substitutes for ozone depleting substances' in the IPCC category system. The inventory includes emissions from the residential and commercial/industrial sectors. Residential emissions are calculated using household data from the Australian Bureau of Statistics (ABS) along with other inputs and assumptions to estimate residential HFC leakage. Commercial data is obtained from the Australian Government.

***Table 8. Industrial processes and product use emissions summary***

| Industrial processes and product Use (kt $CO_2$-e) | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total emissions** | 135 | 137 | 139 | 139 | 147 | 151 | 150 | 157 | 159 | 164 |

## 2.2.3 Agriculture

### Agricultural emissions were estimated to be 13.7 kt CO2-e in 2021-22

Enteric fermentation accounts for the majority (~85%) of agricultural emissions, followed by agricultural soils and manure management. Enteric fermentation is positively correlated with numbers of meat cattle and sheep and lambs in the ACT. Agricultural emissions have been in decline from 2016-17 in line with a reduction in livestock numbers, with drought and market conditions listed as two reasons why herd sizes have decreased over this time. Emissions for

this sector are calculated using the most recent data available from the ABS and are subject to a one year lag. Emissions for this sector are updated retrospectively when livestock numbers are published.

***Table 9. Agriculture emissions summary***

| Agriculture (kt $CO_2$-e) | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total emissions** | 28 | 21 | 22.9 | 27.6 | 27.5 | 23.6 | 17.7 | 14.7 | 13.7 | 13.7 |

### 2.2.4 Land Use, Land-Use Change and Forestry (LULUCF)

**Emissions from the LULUCF sector in 2021-22 were -171 kt CO2-e, compared to -144 kt CO2-e in 2020-21 indicating the LULUCF sector is continuing to act as a net sink for carbon emissions in the ACT.**

***Table 10. Historic LULUCF emissions (kt CO2-e)***

| LULUCF (kt $CO_2$-e) | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20* | 2020-21 | 2021-22 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Forest land** | 34 | 115 | 36 | -95 | -73 | -147 | -188 | -106 | -136 | -164 |
| **Cropland** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -0.01 |
| **Grassland** | 45 | 33 | 9 | -15 | -24 | -23 | -22 | -12 | -23 | -16.76 |
| **Wetland** | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 8 | 3 | 4.2 |
| **Settlements** | 7 | 8 | 7 | 1 | 5 | 2 | -3 | 1 | 1 | 0.29 |
| **Harvested wood** | 19 | 20 | 23 | 19 | 14 | 10 | 10 | 12 | 11 | 5.11 |
| **Total emissions** | **108** | **179** | **78** | **-87** | **-76** | **-156** | **-200** | **-97** | **-144** | **-171** |

The ACT Government's reporting on LULUCF emissions is based on estimates prepared and published by the Australian Government in annual State and Territory Greenhouse Gas Inventories (STGGI) reports. STGGI reports are usually published approximately 18-24 months after the end of each reporting year. The latest STGGI report, used to estimate the LULUCF emissions this year, was released in April 2022 and it presents data for the year ending 30 June 2020. This means there is currently a time lag in reporting on annual LULUCF emissions estimates, of up to two years. Nonetheless, the trends in the LULUCF emissions profile over time (e.g., over the past decade) are important for monitoring changes in the ACT's greenhouse gas inventory on an annual basis.

In recent years, the LULUCF emissions source category has been subject to regular method changes at the national level, resulting in material fluctuations in the LULUCF emissions data year-to-year for each state and territory. Furthermore, these method changes have resulted in retrospective changes that extend back to the ACT's baseline year of 1989-90, which has had implications for the entire time series of emissions data. Further changes are expected over the coming years, as the Australian Government continues to introduce and implement method changes to incorporate the use of new science and technologies and updated datasets – for example, further work in underway on new systems and datasets for soil carbon assessments that will be incorporated in future LULUCF reporting.

While the method changes are all focused on continually improving the estimates of LULUCF emission sources and removals, the material changes year-to-year have been difficult for the ACT Government, which is tracking its performance with emissions reduction initiatives against legislative commitments and other 'point in time' targets, e.g., emissions reduction targets relating to years including 2013, 2020 and 2045.

To reduce these year-to-year fluctuations that have impacted the ACT emissions inventory reporting, the Territory Government has adopted a rolling average based on the previous three years of national inventory data for the current year's inventory. This approach should tend to smooth the interannual variations to some extent and reduce the extent to which the following year may see a significant increase or decrease and unsettle current considerations about legislated commitments and targets. It also enables the Territory to report on its updated inventory without needing to wait the full 18-24 months for previous financial year reporting. However, it is important to note the ACT intends to continue using the Australian Government's authoritative datasets, and material changes in the LULUCF emissions source category would continue to be incorporated over time, although the impact would be expressed through changes that are averaged over several years.

In this context, the 2021-22 estimates for the LULUCF sector indicate that it has continued to increase its contribution as a net sink for the ACT, based on increased carbon stocks in growth and regeneration of forests and grasslands. This is reflected in the increase in net removals through the LULUCF sector since 2015-16 and the most recent data

published by the Australian Government for 2019-20. Note that emissions associated with the 2019-20 bushfires were excluded from Australia's national inventories under the natural disturbances provision[3]

### 2.2.5 Waste

**In 2021-22, emissions from landfill were 140 kt CO2-e, having fallen 12% year-on-year. Emissions from wastewater have risen slightly by 0.6% to 13 kt CO2-e in 2021-22.**

Waste-related emissions fall into two separate sub-categories – methane emissions from the breakdown of organic materials in solid waste sent to landfill, and emissions of methane and/or nitrous oxide from the treatment of wastewater.

*Emissions from landfill*

In the ACT, solid waste emissions arise from the active Mugga Lane landfill site and the closed West Belconnen site. Because the breakdown of organic solid wastes in landfill sites is very slow, most of the methane emissions arise from legacy waste, sent to landfill as long as thirty or forty years ago. ACT waste emissions are estimated using the Solid Waste Calculator workbook, built by the Clean Energy Regulator for use as a reporting tool by organisations required to report under the National Greenhouse and Energy Reporting Scheme.

Several years ago, the model was populated with annual disposal data provided by ACT NoWaste, extending back to 1975. Estimates for each successive year are made by adding, at the appropriate place in the model, the reported volume of waste sent to landfill during the year, and the volume of landfill gas captured and either used in engines to generate electricity or flared. Data on gas captured and burnt prior to 2019-20 has been supplied by LGI (Landfill Gas Industries) and previously by Energy Developments Ltd (EDL).

For a given waste stream composition, landfill gas emissions, the net amount of capture and flaring, are a complex function of several factors, which include the quantity of waste to landfill during the inventory year, the year-on-year profile of quantities sent in past years (extending back as much as two or more decades), the volume of gas captured and flared during the inventory year, and the year-on-year profile of capture and flaring in past years. Emissions from landfill have varied by as much as 75% over the inventory years 2012-13 to 2021-22 driven primarily by methane flaring volumes Table 11.

***Table 11. Historic emissions from waste to landfill***

| Emissions from waste to landfill | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|---|---|---|---|---|---|
| **(kt CO2-e)** | 90 | 103 | 116 | 119 | 102 | 73 | 93 | 126 | 159 | 140 |

*Emissions from wastewater*

Wastewater emissions were 13 kt CO2-e or ~1% of the total inventory in 2021-22. Wastewater emissions consist of methane and nitrous oxide released during the digestion treatment process used at Lower Molonglo Wastewater Quality Control Centre. Data on fugitive emissions are provided by Icon Water. Emissions from wastewater treatment are largely proportional to population and have shown a gradual increase over time.

***Table 12. Historic emissions from wastewater***

| Emissions from waste water | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|---|---|---|---|---|---|
| **(kt CO2-e)** | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 13 | 13 |

[3] DISER Technical Report. *Estimating greenhouse gas emissions from bushfires in Australia's temperate forests: focus on 2019-20*.

# 3. PROGRESS TOWARDS MEETING THE ACT TARGETS

## 3.1 The ACT greenhouse gas emissions targets

**Compared to 1989-90 levels, the ACT's total emissions have fallen by 47%. The ACT has an interim emissions reduction target in 2025 of a 50 to 60% reduction from 1989-90 levels.**

The ACT's emission reduction targets are legislated under the *Climate Change and Greenhouse Gas Reduction Act 2010.* Its principal target is to reduce greenhouse gas emissions to achieve zero net emissions in the ACT by 30 June 2045.

In the interim, the ACT's targets are to reduce greenhouse gas emissions from 1989-90 levels by:

- 50 to 60% by 2025
- 65 to 75% by 2030
- 90 to 95% by 2040

The ACT has made progress towards its next interim target in 2025. As shown by the table below, since 1989-90, emissions have decreased by 47%. This has been largely due to the ACT achieving its renewable energy target in recent years. The remaining 3% reduction required to meet the 2025 interim target requires changes to point-of-consumption technologies (e.g. zero emissions vehicles and/or a transition away from natural gas) and achieving this can take time. This assessment is made while noting that methodology changes and refinements at the national inventory level are ongoing and may result in further variations for key sectors such as LULUCF.

Another target relates to per capita emissions. The average amount of greenhouse gas emissions produced per person in the ACT each year was required to peak by 30 June 2013. Based on the table below, we note that per capita emissions peaked in 2012-13 and there has been a pronounced downward trend since.

***Table 13. Progress towards emissions reduction targets***

| Year | 1989-90 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total emissions (kt $CO_2$-e)** | 3,098 | 4,182 | 4,144 | 4,199 | 4,115 | 4,081 | 3,821 | 3,823 | 1,719 | 1,774 | 1,647 |
| **Change relative to 1989-90** | NA- | 35% | 34% | 36% | 33% | 32% | 23% | 23% | -45% | -43% | -47% |
| **Per capita emissions ($tCO_2$-e)** | 11.0 | 11.0 | 10.7 | 10.7 | 10.3 | 9.9 | 9.0 | 8.7 | 3.9 | 3.9 | 3.6 |

## 3.2 The ACT renewable energy target

**The ACT reached this milestone in 2019-20 and continues to maintain the target in 2021-22.**

The renewable energy target is legislated under the *Climate Change and Greenhouse Gas Reduction Act 2010.* The ACT has a target of a 100% renewable electricity supply on and from 1 January 2020. Refer to section 2.2.1 for further details.

# APPENDIX 1 DETAILED ACT EMISSIONS SOURCES 2021-22

| Emission source (IPCC Categories) | Subcategories | | 2021-22 emissions (kt $CO_2$-e) |
|---|---|---|---|
| **1 Energy** | | | **1,487** |
| **1.A Fuel Combustion** | | | |
| **Stationary energy** | | ***386*** | |
| | | *Electricity* | *0* |
| | | *Natural gas combustion* | *371* |
| | *Stationary LPG* | *15* | |
| | *Fuel oil* | *<1* | |
| | *Wood fuel* | *<1* | |
| | **Transport** | ***1,016*** | |
| | | *Petrol* | *517* |
| | | *Diesel* | *407* |
| | | *LPG* | *5* |
| | | *All other fuels* | *87* |
| **1.A.3.a Domestic aviation** | | ***31*** | |
| **1.B. Fugitive Emissions from Fuels** | Natural gas | | ***53*** |
| **2. Industrial processes** | | | **164** |
| **2.F Product uses as substitutes for Ozone Depleting Substances** | Refrigeration and air conditioning | | *164* |
| **3. Agriculture** | | | **14** |
| | Enteric fermentation | | *12* |
| | Manure management | | *<1* |
| | Agricultural soils | | *1* |
| **4. LULUCF** | | | **-171** |
| | Forest land | | *-164* |
| | Cropland | | *<1* |
| | Grassland | | *-17* |
| | Wetland | | *4* |
| | Settlements | | *<1* |
| | Harvested Wood Products | | *5* |
| **5. Waste** | | | **154** |
| | Landfill emissions | | 140 |

| | | | |
|---|---|---|---|
| | Wastewater | | 13 |
| **Total** | | | **1,647** |

*Note: Numbers may not sum due to rounding.*