



Tasmanian Greenhouse Gas Emissions Update

Annual progress report for the 2020 reporting year

August 2022

Prepared by the

Tasmanian Policy Exchange



A photograph of traditional Aboriginal objects. In the foreground, there is a dark wooden bowl with a braided cord around its rim. To its right is a large, shallow, reddish-brown clay bowl. In the background, there are several woven baskets made of natural fibers, some containing dark stones or seeds. The objects are arranged on a light-colored, textured surface, possibly a piece of animal skin or a woven mat. The background is softly blurred, showing more of the same objects and a hint of an outdoor setting with greenery.

Acknowledgement of Country

We acknowledge the palawa/pakana of lutruwita, the traditional owners of the land upon which we live and work.

We pay respects to Elders past and present as the knowledge holders and sharers. We honour their strong culture and knowledges as vital to the self-determination, wellbeing and resilience of their communities.

We stand for a future that profoundly respects and acknowledges Aboriginal perspectives, culture, language and history.

Acknowledgments

The TPE has been established at the University of Tasmania to make timely and informed contributions to key policy debates occurring in Tasmania and beyond thus making a positive contribution to the future of our state and its people.

We would like to thank the numerous colleagues from across the University who contributed to the update.

Primary Authors

Dr. Lachlan Johnson
Megan Langridge
Prof. Richard Eccleston



Key Findings

How are we tracking?

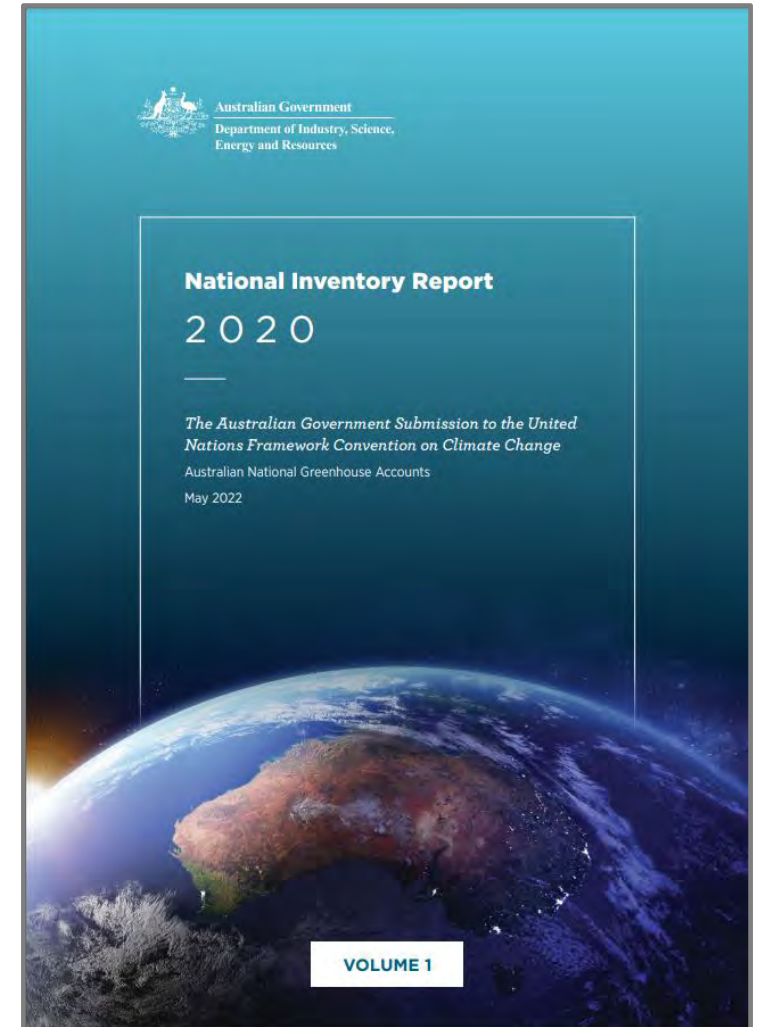
In late May, the Australian Government released the most recent *State and Territory Greenhouse Gas Inventories*. The reports estimate CO₂-e emissions from 2020, providing an important opportunity to provide an independent assessment of **progress towards emissions reduction** targets.

How does Tasmania compare?

Tasmania's net emissions in 2020 were **negative 3733 kt CO₂-e**, which means that the state currently absorbs more carbon from the atmosphere than it emits. While this is a **nationally and internationally significant** achievement, there is more to the story and work still to be done.

What are our priorities for future emissions reduction?

As Tasmania already has a **very low-emissions electricity** generation system, the most important near-term **abatement** opportunities are in the **transport and agriculture** sectors.



Introduction: Tasmania's climate-positive opportunity

We are facing a **climate emergency** that demands **urgent global and local action**. [With the warming of the planet projected to exceed 3°C on average](#), there is a pressing need to reduce emissions and prepare communities and industries for the impacts of unavoidable climate change.

While confronting, this is a challenge we must embrace with hope rather than despair. The **radical climate action** the world needs is possible, and there may be no better place it **can be demonstrated than here in Tasmania**.

This independent assessment of Tasmanian's GHG emissions in 2020 confirms that Tasmania remains one of the **few places on the planet** that has already **achieved a net-zero** emissions profile. However, detailed analysis suggests we cannot be complacent, as our net-negative status is driven by land use, land use change and forestry (LULUCF) offsets which are likely to decline over time.

Storing carbon in forests and soils is an important strategy for carbon dioxide removals, maintaining Tasmania's emissions profile over the longer term will also require a **stronger commitment to reducing gross emissions** in four major sectors: [agriculture, industrial processes, energy, and transport](#).

To maintain its world-leading net-negative emissions profile through 2030 and beyond, Tasmania must remain committed to leveraging our abundant renewable energy assets to reduce gross carbon emissions across all industry sectors. The development of low and zero carbon technologies will also **drive investment and employment and future proof the Tasmanian economy** in an increasingly carbon-conscious world.

The upcoming parliamentary debate on Tasmania's next *Climate Act* and associated *Climate Action Plan* provides an important opportunity to establish Tasmania as an innovator and leader in decarbonisation and climate-action.

The challenge of transitioning to low and zero carbon energy sources and processes must be embraced in an equitable and determined way. Addressing climate change will transform how we live as a society and how our economy operates. With an ambitious and pro-active approach drawing on Tasmania's assets, expertise, and growing community-wide commitment to change,

Tasmania can become an example to the world on climate action and sustainability.

The *State and Territory Greenhouse Gas Inventory* methodology



United Nations Framework
Convention on Climate Change

Australia's greenhouse gas emissions are estimated and reported according to guidelines developed by the **United Nations Framework Convention on Climate Change** (UNFCCC). The UNFCCC's method, while allowing flexibility to reflect local conditions, enables the production of comparable national and sub-national estimates of carbon pollution.

This system is enormously **valuable but it is not perfect**, and is subject to continuous and **ongoing evolution**. As a result, the production of the inventories each year incorporates updates and adjustments to the UNFCCC methodology and reassessment of assumptions or calculations underpinning tools like the Full Carbon Accounting Model (FullCAM). Such changes are applied retrospectively to previous years' emissions tallies. While the adjustments are often relatively minor, they can still be consequential. For instance, in previous years, Tasmania was reported as having achieved net-zero emissions in 2013. The most recent (2020) inventories, however, revise this milestone back by one year, to 2014.

In some cases, the revisions can involve major adjustments – particularly in the crucial land use sector. To give just one example, revision of land use emissions estimates between the 2019 and 2020 inventories altered the net figure for 2008 by more than 5000kt CO₂-e.

Given that these adjustments can mean the difference between meeting legislated emissions reduction targets or falling short of them, it is even more important that the **data are used cautiously** and interpreted primarily as a rationale for **deeper and ever more ambitious action** to address climate change.

Key national insights – Australia’s greenhouse accounts 2020

According to the [National Inventory Report 2020](#) Australia’s total emissions in **2020 were 19.9% lower** than 2005 levels. Under the Paris Agreement, the Australian Government committed to reduce national emissions by between 26-28% on 2005 levels by 2030 and to achieve net-zero emissions by 2050.

In May 2022, the incoming federal Labor Government set a new target to **reduce emissions by 43% on 2005 levels by 2030** with increased oversight from the Federal Parliament and a rejuvenated and independent Climate Change Authority.

Emissions and removals are grouped into five sectors in Australia’s system of greenhouse gas account, although energy emissions from transport and stationary energy (mostly power generation and domestic gas) are reported separately. The energy (non-transport) sector was the largest source of GHG emissions in 2020, comprising 65.5% of total net emissions. The next largest was transport (19.2%), followed by agriculture (13.9%), industrial processes and product use (6.7%), and waste (2.4%). Despite some sectors showing net growth since 1990, all decreased to some extent between 2019 and 2020, the most substantial being transport with a reduction of 6.8% (see Table).

Transport sector emissions in particular were **impacted by COVID-19** restrictions in 2020. The decline in emissions from the transport sector during this period was largely a result of the reduction in passenger vehicle use, while emissions from **domestic aviation declined by 21.6%** due to travel restrictions. Given these COVID-related disruptions, significant increases in transport emissions are expected in the 2021 reporting year.

The land use, land-use change, and forestry sector (LULUCF) was a net sink of 40.1 Mt CO₂-e in 2020, equivalent to 8.2% of the total net emissions. Between 1990 and 2020 LULUCF has changed from a net source to a net sink, driven by reductions in primary forest clearing and harvesting, reforestation and afforestation, establishing new plantations as well as improved cropping practices resulting in reduced soil carbon emissions.

Australia’s emissions per capita and per dollar of GDP have generally declined between 1990 and 2020, a product of sectoral emissions reductions, LULUCF, and structural changes in the economy. While Australia’s population grew by 50.5% between 1990 and 2020, the **emissions per capita declined by 48.4%** over this time period.

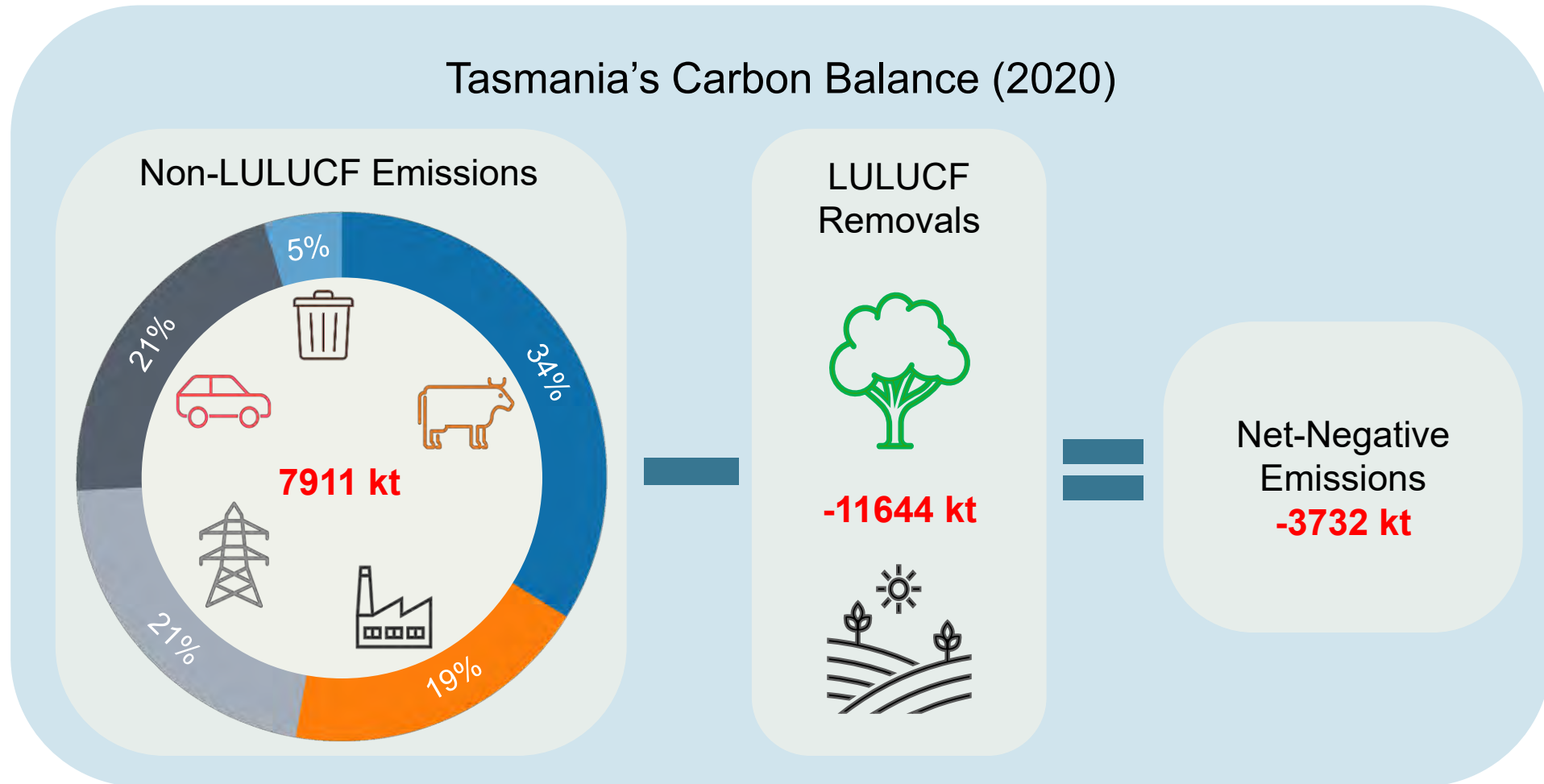
Drought conditions in mainland Australia (although not Tasmania) in recent years have **contributed to a contraction in livestock population**, crop production, and fertilizer consumption, leading to a decrease in agricultural emissions.

Finally, there were also **notable bushfire events in 2019-20**. Because the future recovery of the forest is expected to be complete, “the 2019-20 bushfires are expected to have a negligible impact on the long-run trend in carbon stock change in the affected forests” ([p. 34](#)). For this reason, direct emissions from these fires do not appear in the inventories, which is standard practice under Australia’s Full Carbon Accounting Model (FullCAM). While this approach is contentious and [disputed by some experts](#), for the sake of consistency the present document reports emissions as they have been reported in the national inventories.

Sector	Contribution to total net emissions in 2020	Increase or decrease between 1990 and 2020	Increase or decrease between 2019 and 2020
Energy	84.2%	41%	-3.6%
▪ Non-transport energy	▪ 65.5%	38.1%	-2.6%
▪ Transport	▪ 18.8%	52.2%	-6.8%
Industrial processes and product use	6.7%	26.4%	-2%
Agriculture	13.9%	-20.1%	-2.8%
Waste	2.4%	-44.5%	-1.2%
LULUCF	-8.2%	-120%	0.03%

Tasmania's Carbon Balance in 2020

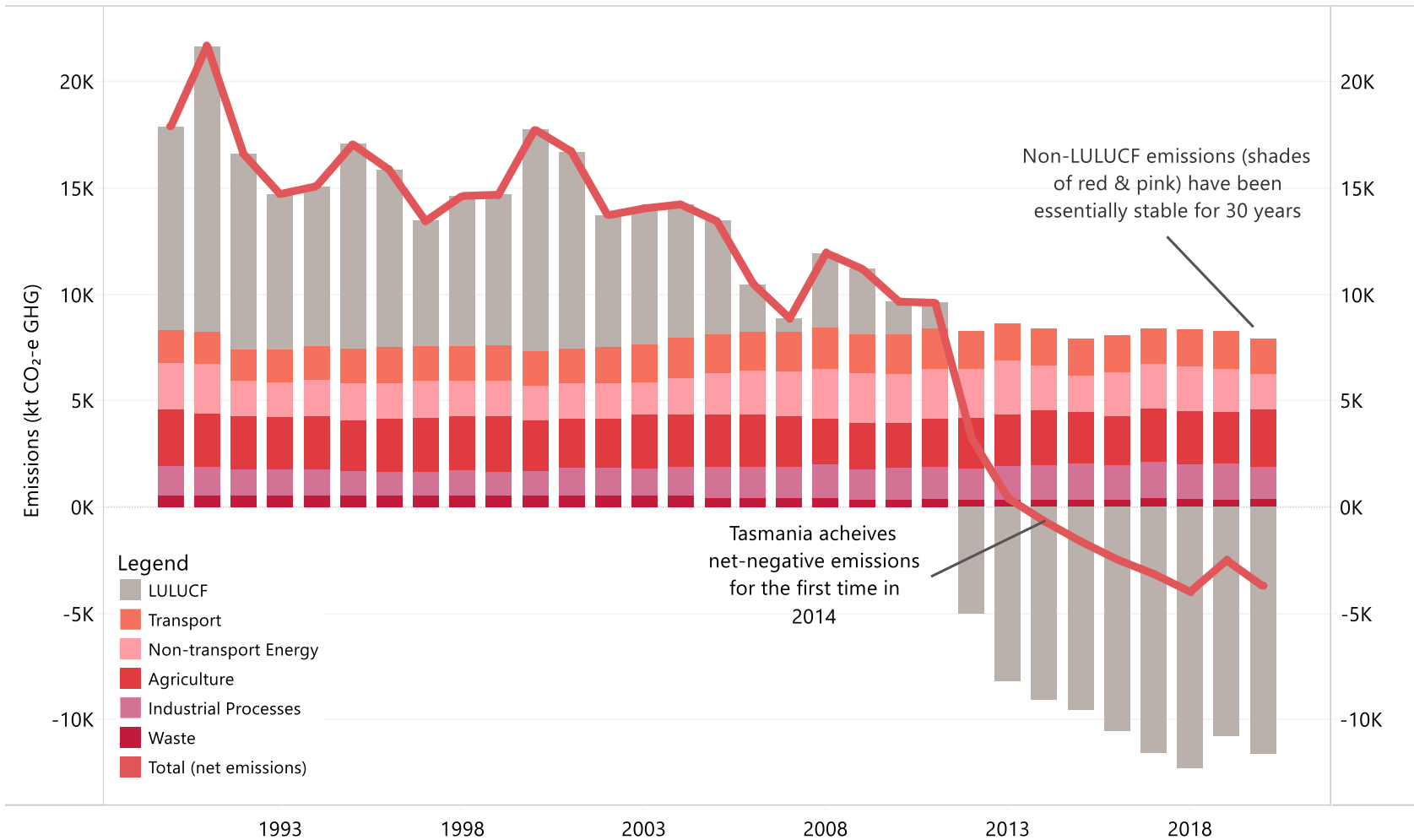
Land use & forest removals exceeded gross emissions resulting in net-negative emissions (3733 kt)



Tasmania's emissions have been net-negative since 2014

but this is almost entirely attributable to the land-use (LULUCF) sector

Tasmanian Net CO₂-e Emissions by Sector, 1990-2020



Tasmania's 'net' emissions are world-leading, but they only tell part of the story.

Our negative emissions profile can be explained by:

1. Renewable electricity generation; and
2. The significant increase in removal/storage of CO₂ in forests and soils (LULUCF) since 2012.

However, the rate at which forests sequester carbon declines as they mature and LULUCF removals are expected to decline over time.

Modelling conducted last year by Point Advisory suggests that without ambitious reductions in other sectors, Tasmania could be a net-carbon emitter again before 2030.

Tasmania's per capita emissions (excluding land use) are low by national standards due to our renewable electricity generation

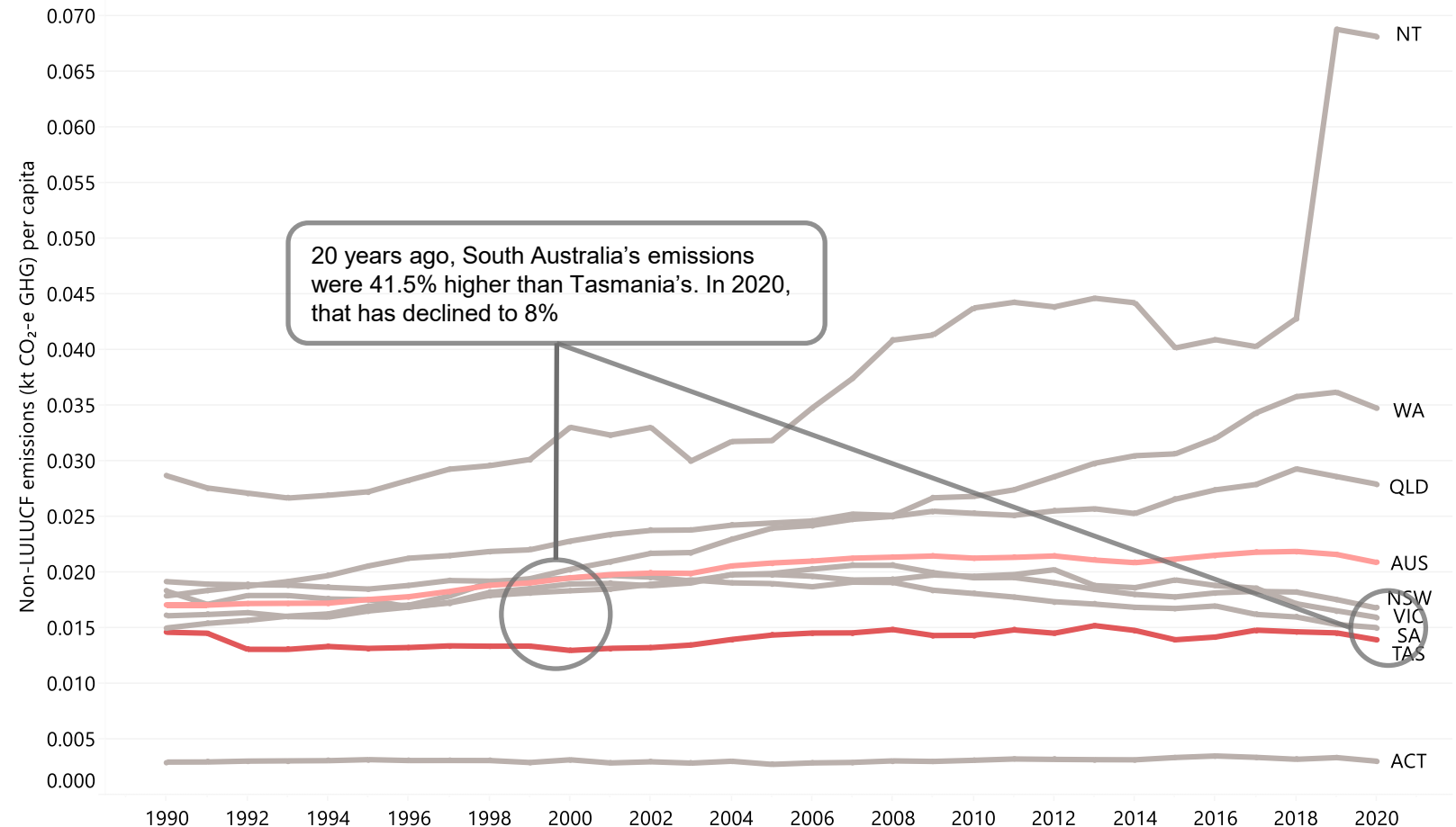
But without further action our nation-leading profile is under threat

Tasmania's non-LULUCF emissions are among the **lowest** in the country. However, other states, notably Victoria, New South Wales, and South Australia, have achieved considerable reductions in more recent years.

Tasmania's **'gross' emissions** have been **largely static** (if not very slowly rising).

If Tasmania does not pursue aggressive emissions abatement opportunities, more **ambitious mainland jurisdictions** may have lower gross emissions per capita in the near future.

Per Capita Emissions Excluding LULUCF by State, 1990-2020



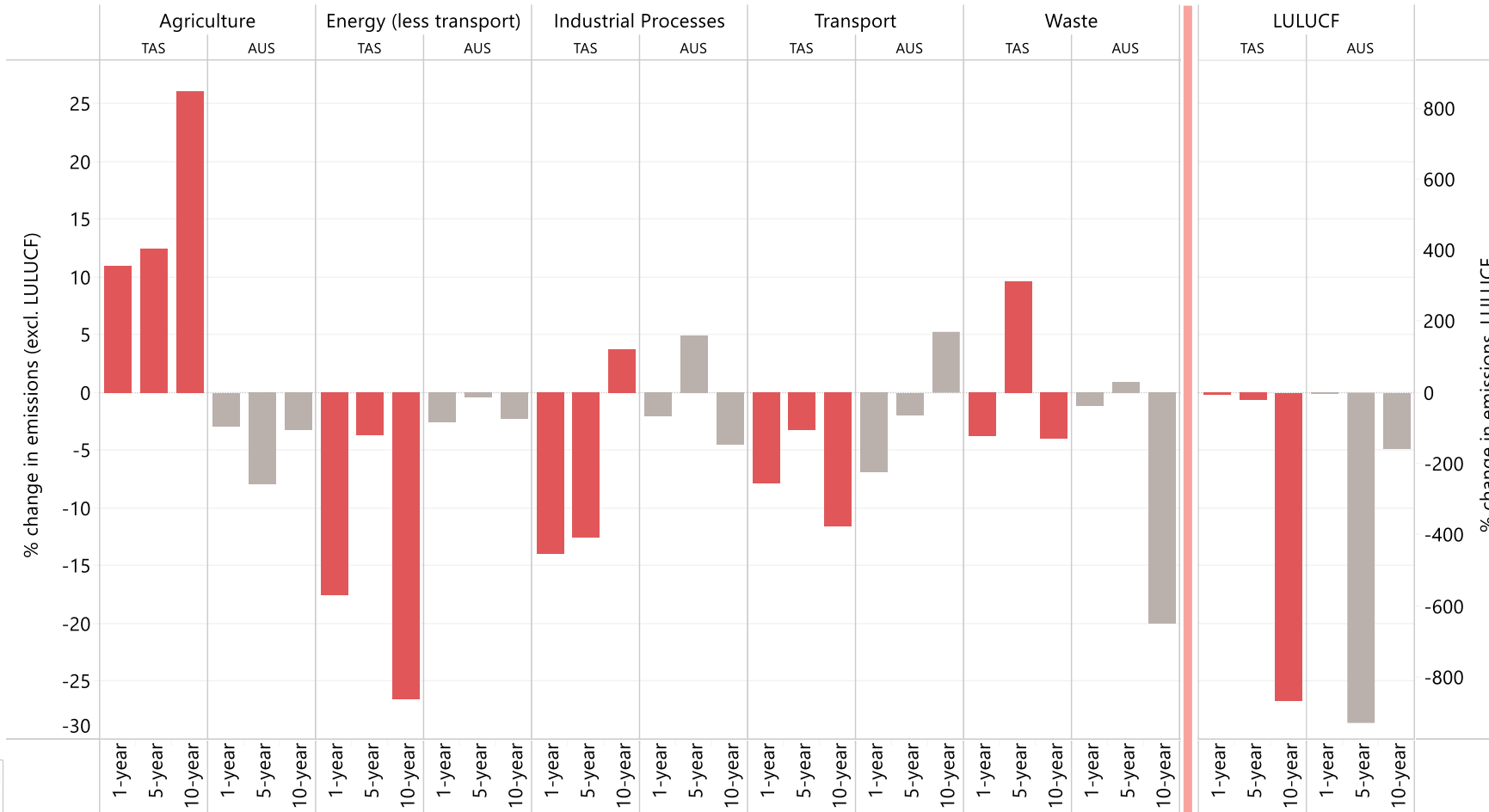
Tasmania's GHG emissions by Industry Sector



Tasmania has achieved reductions compared to the national average in most sectors

But we are falling behind in others – notably agriculture

Per Cent Change in Emissions by Sector, Tasmania and Australia



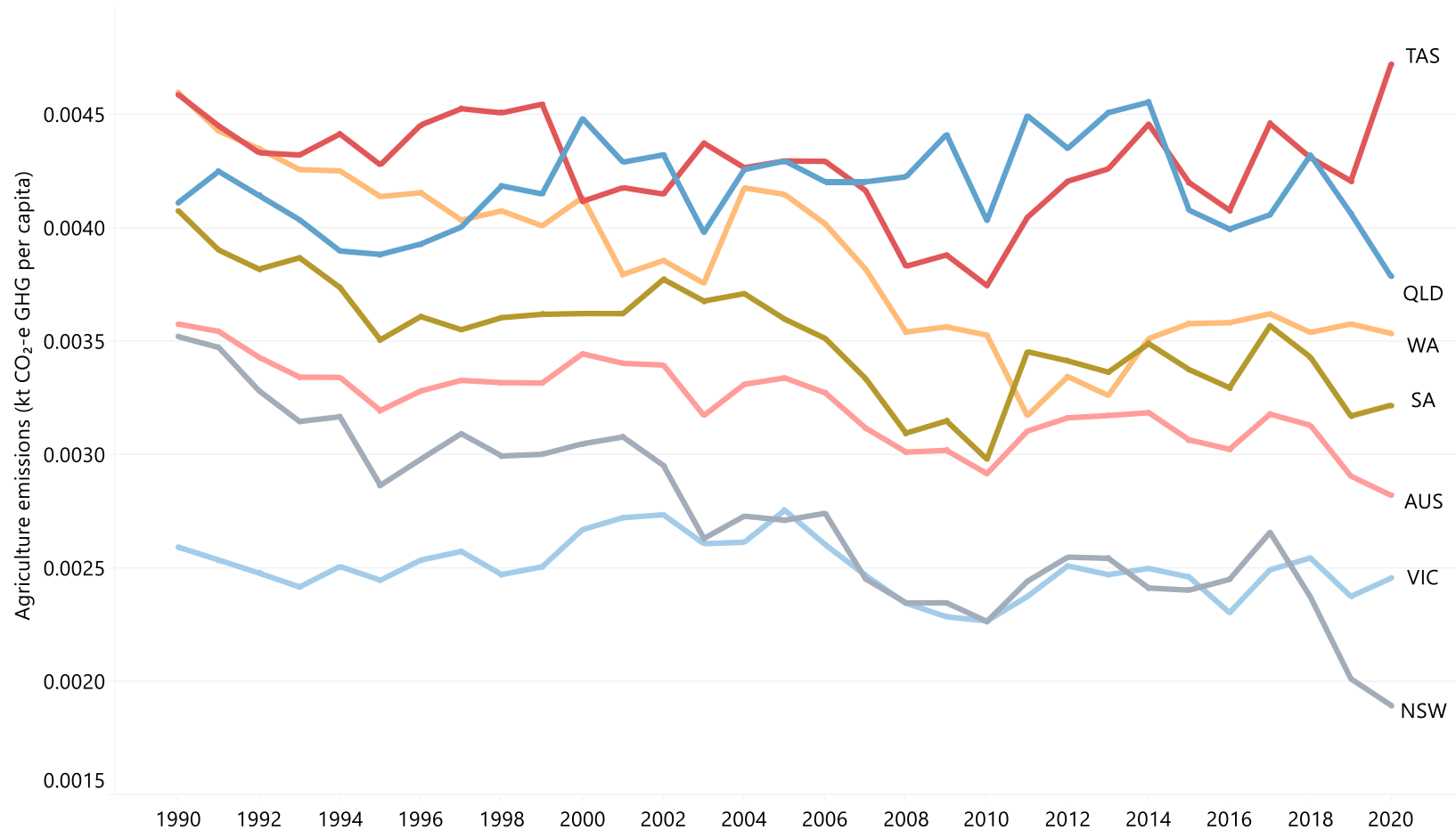
Agricultural emissions in Tasmania have increased significantly over the last decade, although this can be attributed to a 70% increase - to \$1.9 bn - in agricultural output over the period.

COVID-related restrictions did have an impact on 2020 emissions data. For example, the 6% year-on-year **reduction in transport emissions** can be attributed to **COVID** restrictions.

Tasmania's agricultural emissions continue to increase

But our per capita production is also high and growing

Per Capita Emissions from Agriculture by State and Territory, 1990-2020



Tasmanian per capita **emissions from agriculture are second** to the Northern Territory (not pictured given they are over 60% higher than Tasmania's). We are also, along with NT, the only jurisdiction whose agricultural emissions are trending higher.

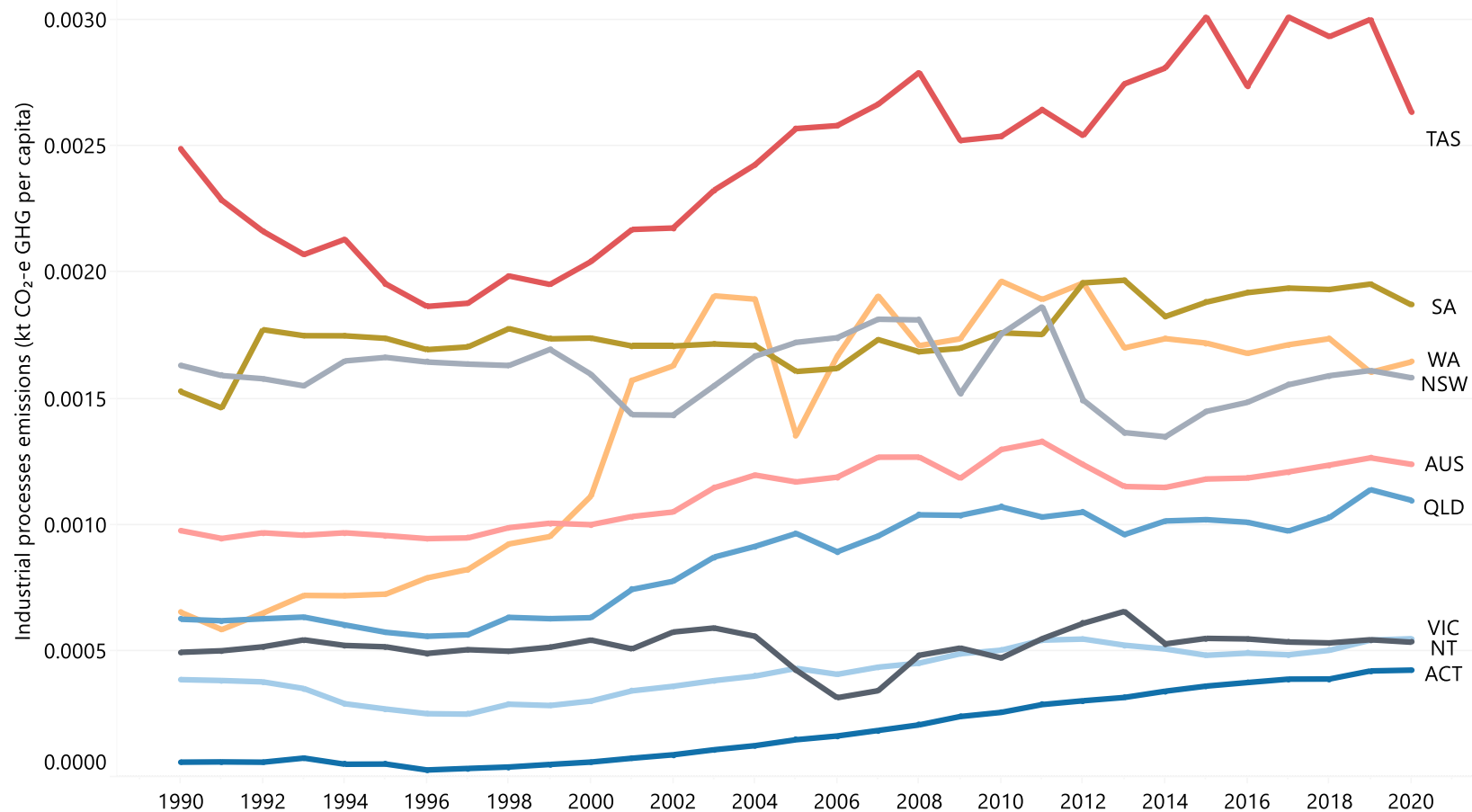
As noted on the previous slide, our rising Ag emissions can be attributed to a **significant increase** - 70% in real terms to \$1.9 bn - in **agricultural output** over the period.

Given the importance of agriculture to the state economy and our overall emissions profile, supporting **innovation** to reduce agricultural emissions – such as **Asparagopsis feed supplements** – should be a priority.

Our per capita industrial emissions are the highest in the nation

Modernising cement production and using green H₂ in industrial processes should be the priorities

Per Capita Emissions from Industrial Processes by State and Territory, 1990-2020



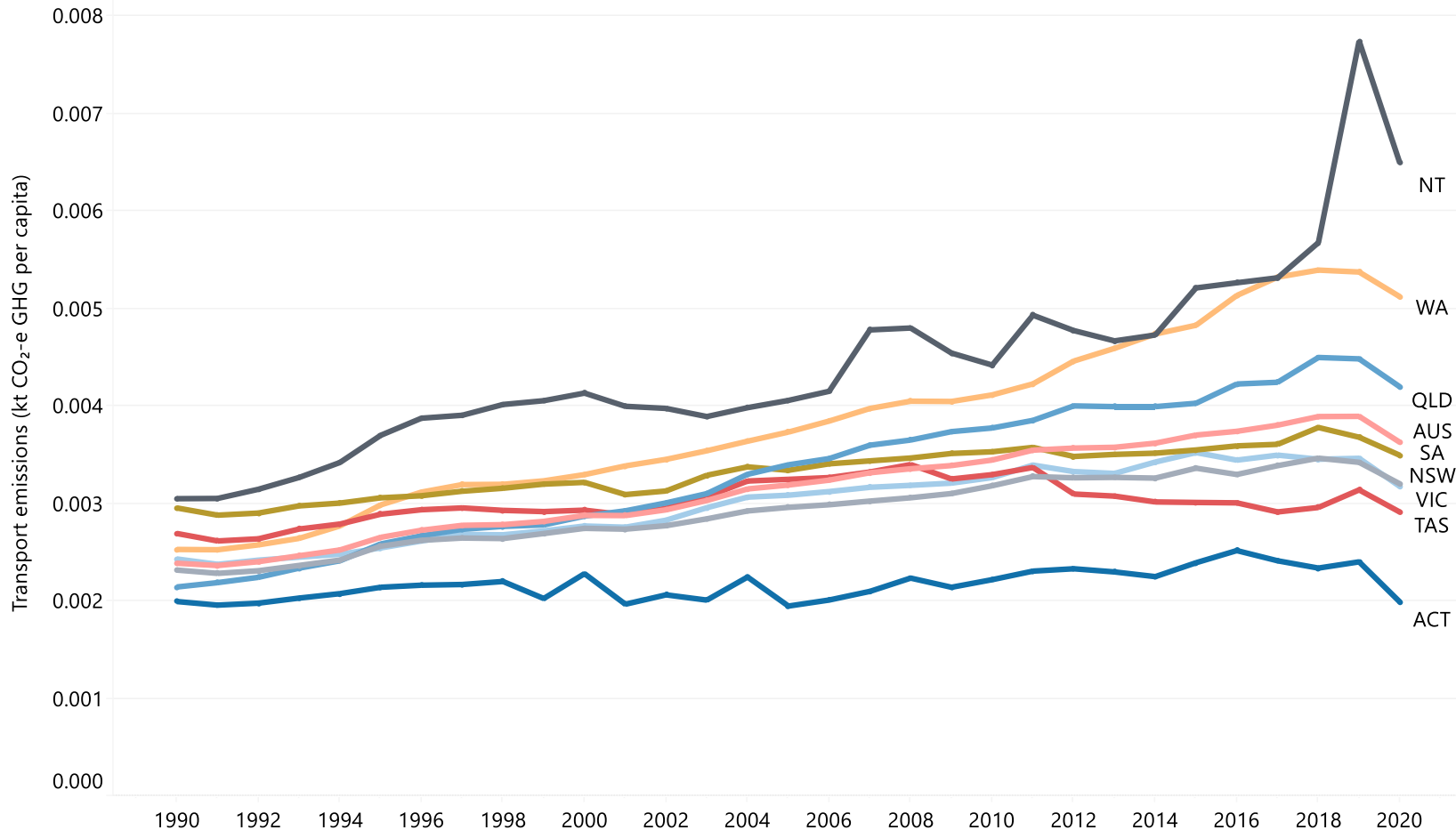
Tasmania's absolute **industrial processes emissions** may be quite low, but in per capita terms they are more than **double the national average**.

Reducing industrial emissions is a challenge because of the cost and availability of abatement solutions. Tasmania is not alone in this regard – national industrial processes emissions have increased by 27% since 1990.

Our most significant abatement opportunities in this sector are from **modernising cement production** and, over time, using **green hydrogen** in other industrial processes such as **smelting aluminium and ferromanganese**.

Tasmanian transport emissions may be relatively low, but they still represent a major and relatively low cost abatement opportunity

Per Capita Emissions from Transport by State and Territory, 1990-2020



Transport, predominantly road transport, is responsible for roughly **half of Tasmania's total energy emissions**.

Shorter commutes mean that transport emissions in Tasmania are low relative to some other jurisdictions. However, Tasmanians' older cars and very high levels of dependence on private vehicles make **transport** an important and **relatively low cost target for emissions reduction**.

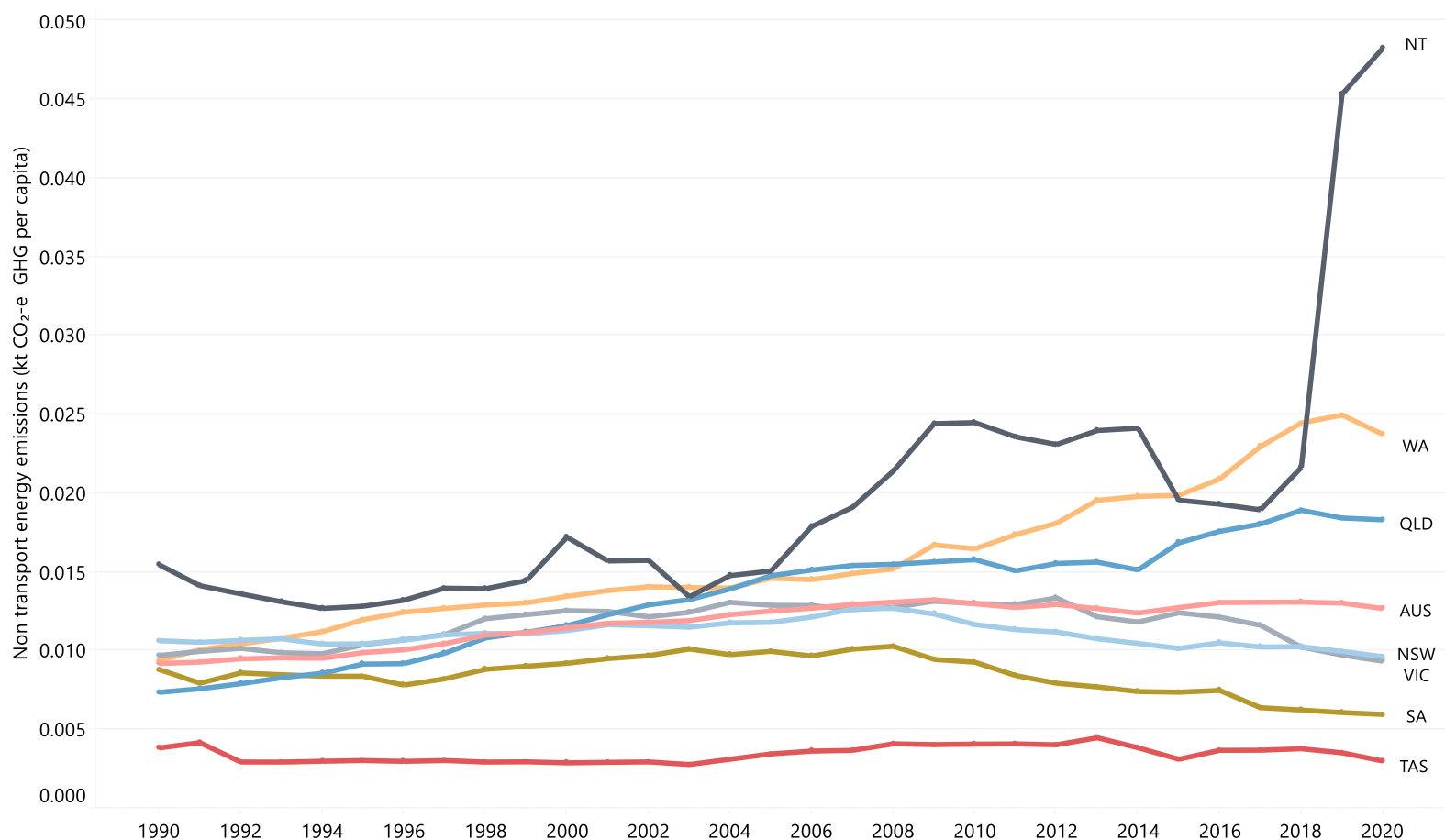
Increasing EV uptake and public and active transport use could achieve significant reductions but must be **accompanied by increased renewable energy generation** if it is to be truly carbon neutral.

The University of Tasmania will release a **options** paper on **reducing transport emissions** in Tasmania in October.

Renewable (mostly hydro) electricity keeps our energy emissions low

But generation will need to increase in line with growing energy demand

Per Capita Emissions from Energy (excl. Transport) by State and Territory, 1990-2020



Tasmania's **low non-transport energy** emissions are due mostly to the state's hydroelectricity assets.

While Tasmania can be 100% self-sufficient in renewable energy, the connection to the national energy market via **Basslink** complicates claims of being 100% renewable.

Tasmania also has a legislated target to produce 200% of current electricity demand from renewables by 2040.

Tasmania's claim to being 100% renewable depends upon **increasing generation** in line with increasing demand. As the state transitions away from fossil fuels, this will become even more important.



Can Tasmania continue to rely on LULUCF removals to remain net-negative?

Can Tasmania continue to rely on land use removals to sustain our net-negative profile?

Over the past 30 years, changes in **Tasmania's emissions profile** have been driven almost **exclusively by the land use**, land use change, and forestry (LULUCF) sector. While these changes have made a major contribution to achieving a net zero profile, the rate at which our forest estate has been sequestering carbon since the late-2000s is unlikely to be maintained indefinitely.

This is because the **rate at which CO₂-e can be removed** from the atmosphere and stored in forests and soil **is likely to decline** as managed [forests approach maturity](#).

Bushfires, rising temperatures, changing patterns of rainfall, and land clearing all have the potential to increase Tasmanian LULUCF emissions.

Analysis from the [Tasmanian Climate Change Office](#) and [Point Advisory](#) has found that if Tasmania maintains a business-as-usual scenario, emissions are likely to

remain below net-zero until at least around 2025. However, **from 2030 onwards, Tasmania's net emissions are likely to increase**, and in years with major bushfire events, Tasmania is likely to become a net emitter once again.

These estimates are based on the anticipated increasing impacts of climate change and bushfires over time on land use change and forest management.

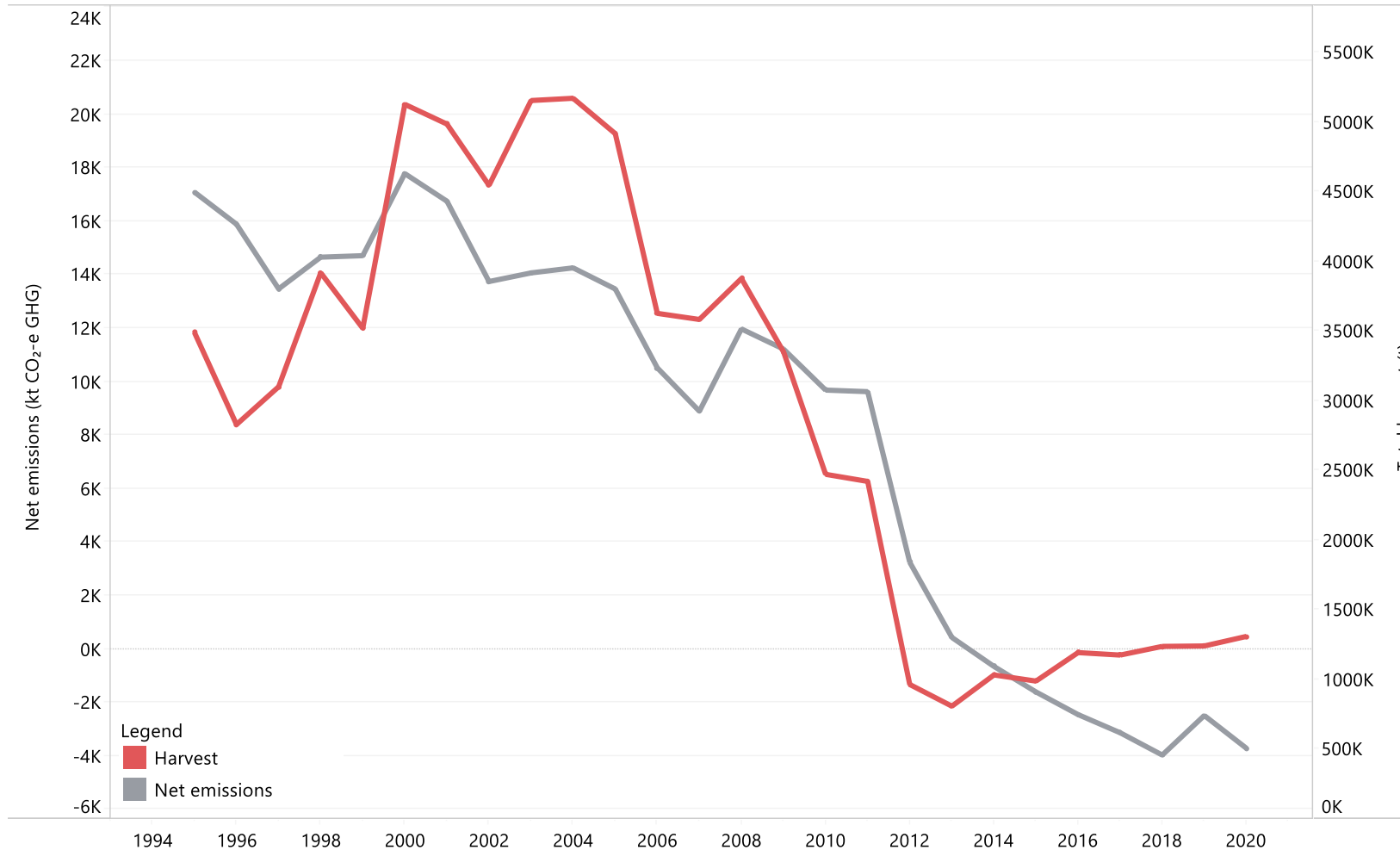
Even in the absence of other forms of disturbance (such as harvesting or bushfires), the capacity of Tasmania's forests and land to sequester carbon will decline over time due to the aging of managed forests.

Declining land use removals highlights the **need to decarbonise other sectors** in the Tasmanian economy to maintain our world-leading net zero profile, future-proof the Tasmanian economy and establish Tasmania as a leader in low and zero carbon technologies and processes.

A number of factors influence land use removals in the GHG inventory

But there is a clear relationship between LULUCF removals and declining timber harvesting in Tasmania

Tasmanian Net CO₂-e Emissions and Public and Private Native Forestry Harvest, 1995-2020



Tasmania's **negative net emissions** profile is a product of a dramatic increase in **LULUCF removals** (sequestration) through the late-2000s and early-2010s.

While the causes are complex – and often misrepresented in public debate – the main factors were a simultaneous **shift from native forest harvesting towards plantations**, an overall drop in harvest, and an **increase** in the size of the plantation estate. A further contributing factor is a shift in the age structure of harvested areas from older forests to younger regrowth forests.

While these **younger forests remove** significant amounts of atmospheric CO₂ as they grow, they will gradually become **carbon neutral** over time.

Native forests are significant stores of carbon, and increases in harvesting will in most cases also increase emissions.

Conclusion: Progress towards a Climate-positive Tasmania



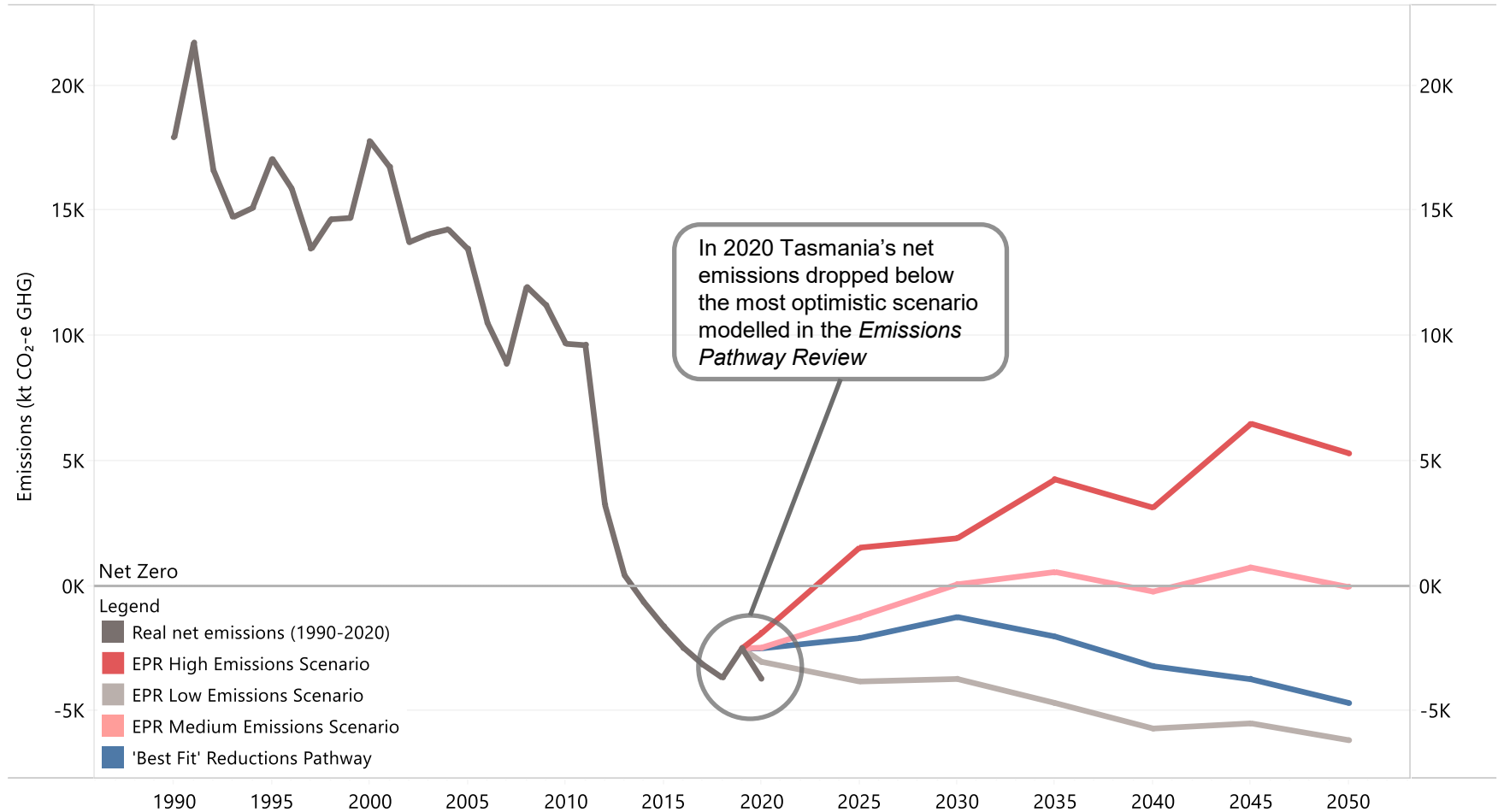
While it's very early days, Tasmanian emissions are currently tracking closest to the lowest *Emissions Pathway Review* scenario

In 2021, an independent review of Tasmania's climate change legislation **modelled likely future emissions** under a range of different scenarios.

Tasmania's reported 2020 emissions were **below** the lowest modelled emissions scenario, suggesting that at least for **now we remain on track to maintain net-zero to 2030**. The Point Advisory modelling did suggest, however, that Tasmania would return to net-positive emissions before 2030 without ambitious action.

We will **report** on Tasmania's **actual emissions** relative to the modelled scenarios on an annual basis to assess progress towards achieving net zero at 2030.

Tasmanian Net CO₂-e Emissions and Point Advisory Modelled Pathways, 1990-2050



SOURCE: Australian State and Territory Greenhouse Gas Inventories 2020, available at <https://www.industry.gov.au/data-and-publications/national-greenhouse-accounts-2020>; Point Advisory (2021), *Tasmanian Emissions Pathway Review: Technical Report*, https://www.dpac.tas.gov.au/_data/assets/pdf_file/0028/136828/Update_of_Tasmania_s_Emissions_Pathway_Review_-_technical_report.pdf. Note: the figures for year one of the Point Advisory scenario modelling have been adjusted to reflect an update in the inventory methodology.

Conclusions: Tasmania currently enjoys a world-leading emissions profile but can't be complacent

Tasmania's net-negative emissions status is a considerable achievement of which the community should be proud. The latest data show that not only did Tasmania **retain its net-negative carbon emissions** figure in 2020, but that emissions declined relative to the previous year.

This means that, at least so far, the state remains on track to meet its net-zero at 2030 target. While this is undoubtedly good news, it's **only part of the story**.

Tasmania's major non-LULUCF emissions sources (agriculture, energy, transport, and industrial processes) are **either static or, in some cases, rising**. If we could rely on continued sequestration in forests and soils forever, this might not be such a problem.

The unfortunate reality, however, is that the **sequestration** productivity of our **forest estate will decline** over time as young, formerly managed native production forests approach maturity.

Tasmania's immense volume of stored carbon in forests also presents risks. More frequent and **intense bushfires driven by climate change**, as well as land clearing for agriculture or development, could still turn some of Tasmania's precious carbon sinks into **carbon sources**.

Rather than a long term solution, therefore, Tasmania's forest carbon sequestration must be understood as **a brief window of opportunity** in which to decarbonise other parts of our economic and social systems.

Increasing soil-based carbon sequestration and driving uptake of emissions-reducing **feed supplements** for ruminant livestock both present major and imminently available abatement opportunities for the agriculture sector.

In the transport sector, considerable gains are on offer via **electrification** and **improving and promoting public and active transport** – both areas in which Tasmania lags compared with leading mainland jurisdictions. **Victoria, New South Wales, and South Australia** are all making significant progress in non-LULUCF emissions reduction and may **overtake Tasmania** on this critical metric in the coming years even despite our 100% renewable electricity generation. Tasmania cannot afford to be complacent if it wishes to maintain its status as a national or global leader.

Tasmania's emissions profile is laudable and remains, rightly, the envy of many of our peers, our **claim to global climate leadership** will increasingly rely on **far more ambitious action** to remain credible.

Given this opportunity and growing community expectations of aggressive climate action, it essential that Tasmania's next ***Climate Act*** and **Action Plan set clear targets to reduce emissions** across the Tasmanian economy and, following the lead of the recently elected federal government, commit to high levels of oversight from parliament and an independent climate change advisory body.

Recent UTAS publications on Tasmanian climate policy

- *Tasmania's Renewable Energy Future: Submission to the Draft Tasmanian Renewable Energy Action Plan*, September 2020, available at https://www.utas.edu.au/_data/assets/pdf_file/0009/1475577/Tasmanias-renewable-energy-future_TREAP-submission.pdf
- *University of Tasmania Submission to the Draft Renewable Energy Coordination Framework*, March 2021, available at https://www.utas.edu.au/_data/assets/pdf_file/0010/1475578/UTAS-Draft-Renewable-Energy-Coordination-Framework-Submission.pdf
- *A Blueprint for a Climate-Positive Tasmania: Submission to the Review of Tasmania's Climate Change Act and Climate Action Plan*, April 2021, available at https://www.utas.edu.au/_data/assets/pdf_file/0003/1475562/A-blueprint-for-a-climate-positive-Tasmania.pdf
- *Towards a Climate-Positive Tasmania: A Discussion Paper*, October 2021, available at https://www.utas.edu.au/_data/assets/pdf_file/0009/1545561/Towards-a-climate-positive-Tasmania-02112021.pdf
- *Submission to the Climate Change (State Action) Amendment Bill 2021*, November 2021, available at https://www.utas.edu.au/_data/assets/pdf_file/0004/1552279/TPE-Submission-to-draft-amendment-climate-change-bill.pdf
- In May 2022 The University of Tasmania was ranked as the leading university in the world for climate action in the [Times Higher Education Impact Rankings](#).



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Update prepared by the
**Tasmanian Policy
Exchange**

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