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Net zero emissions pathway options for Tasmania

Background paper

Prepared for:

Tasmanian Department of Premier and Cabinet

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THIS PAPER

The purpose of this paper is to provide background information and preliminary analysis on Tasmania's emission profile, pathways and opportunities to set a more ambitious net zero emissions target.

This paper provides an overview of the analysis undertaken to date for the Tasmanian Government to support the development of a new, more ambitious emissions reduction target for the state, and includes the following:

- a discussion of the net zero target pathway options available to Tasmania, including a comparison with other Australian states and territories, and with other countries;
- a discussion of Tasmania's current emissions profile, and an indication of how this profile could look in the future; and
- an overview of different emissions reduction opportunities available to Tasmania, their impact on Tasmania's emissions to 2050, how these may impact the economy and the overall costs and benefits of implementation.

The insights provided in this paper reflect:

- preliminary analysis of Tasmania's current emissions profile using 2018 State and Territory Greenhouse Gas Inventory (STGGI) data published by the Australian Government;
- the findings of emissions pathway modelling undertaken by Point Advisory and Indufor in 2019 using 2016 STGGI data (the most current emissions data available for Tasmania at that time); and
- consideration of new government policies and technological advances contributing to emissions reductions.

NET ZERO EMISSIONS PATHWAY OPTIONS FOR TASMANIA

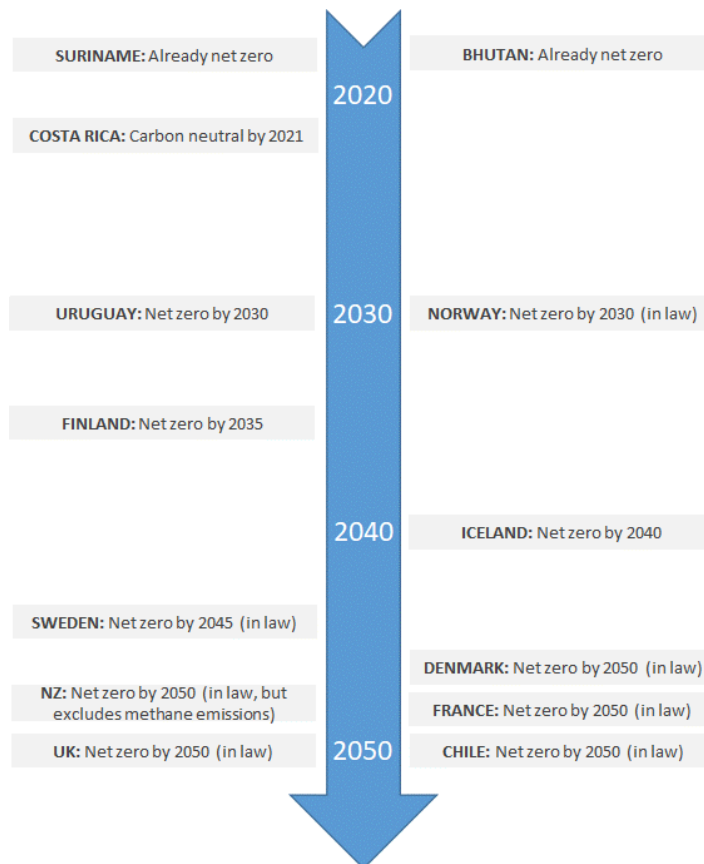
There is now overwhelming evidence that our climate is changing as a result of human-induced emissions of greenhouse gases. The resulting rising temperatures will have a significant impact on rainfall, evaporation and sea level, among many other things. These changes are likely to make our climate more varied and result in more frequent and severe extreme weather events.

To address this situation, in 2015, countries from around the world signed up to the Paris Agreement. This commits countries to keeping global temperature rise to well below 2 degrees Celsius, and to make every effort to keep them below 1.5 degrees Celsius, compared to pre-industrial levels. In practical terms, this means that greenhouse gas emissions need to peak now and reach net zero by 2050 at the latest. The Paris Agreement recognises the important role of sub-national governments in responding to climate change, however meeting this challenge is a shared responsibility that will require action from communities, businesses and governments from around the world.

Under the existing *Climate Change (State Action) Act 2008* (the Act), Tasmania passed a legally binding target to reduce emissions by at least 60% below 1990 levels by 2050. Through the release of Climate Action 21, the Tasmanian Government has committed to a target of net zero emissions by 2050. As part of the independent review of the Act that is currently underway, the Tasmanian Government is seeking to set a more ambitious emissions reduction target for Tasmania, aligned with the goals of the Paris Agreement.

At the domestic level, all states and territories in Australia now have some form of net zero commitment by 2050. Most notably, Victoria has a legislated target to achieve net zero emissions by 2050, and the ACT has a net zero target by 2045. At the international level, a number of countries have set net zero emissions targets by 2050 (or earlier), including many that are enshrined in law.

Figure 1. Timeline of announced international net zero emissions targets¹



Note that New Zealand’s overall net zero emissions target for 2050 excludes methane emissions from agriculture and waste. Methane emissions from these two sectors represent over 40% of New Zealand’s current emissions.

¹ Source: Based on Energy & Climate Intelligence Unit’s Net zero tracker: <https://eciu.net/analysis/briefings/net-zero/net-zero-the-scorecard>

They are covered by a separate target of at least 24-47% reduction below 2017 levels by 2050, with an interim target of 10% reduction by 2030.

With its significant forest estate and low carbon electricity sector, Tasmania is well placed amongst Australian states and territories to achieve net zero emissions at a relatively low cost. Our analysis indicates that Tasmania could achieve and maintain net zero emissions much earlier than 2050, whilst continuing to grow the economy.

Tasmania has the opportunity to position itself as a climate change leader, at both the national and global level, by setting a target to achieve and maintain net zero emissions earlier than 2050. Four target timeframes have been suggested in Table , and outline the relative benefits and risks of each option. Importantly, the ability to achieve these targets is largely influenced by the LULUCF sector maintaining removals at levels broadly aligned with those seen over the past five years. It is expected that this trend will continue into the future under most-likely conditions.

Table 1. Potential emissions reduction target setting options – benefits and risks

Target option	Benefits	Risks
Net zero by 2035	<ul style="list-style-type: none"> • Would be the most ambitious state-level net zero emissions target in Australia. • Highly ambitious at the global level, outside of countries that have extensive forest resources and low emissions electricity sectors. • Aligned with climate science, and therefore robust and defensible. • First mover advantage. 	<ul style="list-style-type: none"> • Could be seen as too difficult / costly to achieve, which may make stakeholders hesitant to commit. • Likely to require significant investment and research and development to support businesses to transition.
Net zero by 2040	<ul style="list-style-type: none"> • Would be the most ambitious state-level net zero emissions target in Australia. • Ambitious at the global level. • Aligned with climate science, and therefore robust and defensible. • First mover advantage. 	<ul style="list-style-type: none"> • Could be seen as not being ambitious enough given Tasmania’s unique position of already having achieved net zero emissions since 2015, and its significant advantages compared with other states. • There is the risk that if Tasmania waits too long to set a net zero emissions targets, the state may miss the opportunity to catalyse innovative research and development and practices, and the associated additional economic activity arising from being a global leader in new technologies and systems.
Net zero by 2045	<ul style="list-style-type: none"> • Would be aligned with ACT’s net zero emissions target so still very ambitious at the national level. • Ambitious at the global level. • Aligned with climate science, and therefore robust and defensible. 	<ul style="list-style-type: none"> • As for 2040 target.
Net zero by 2050 (current emissions reduction target policy position)	<ul style="list-style-type: none"> • Aligned with climate science, and therefore robust and defensible. 	<ul style="list-style-type: none"> • As for 2040 target.

TASMANIA'S EMISSIONS PROFILE

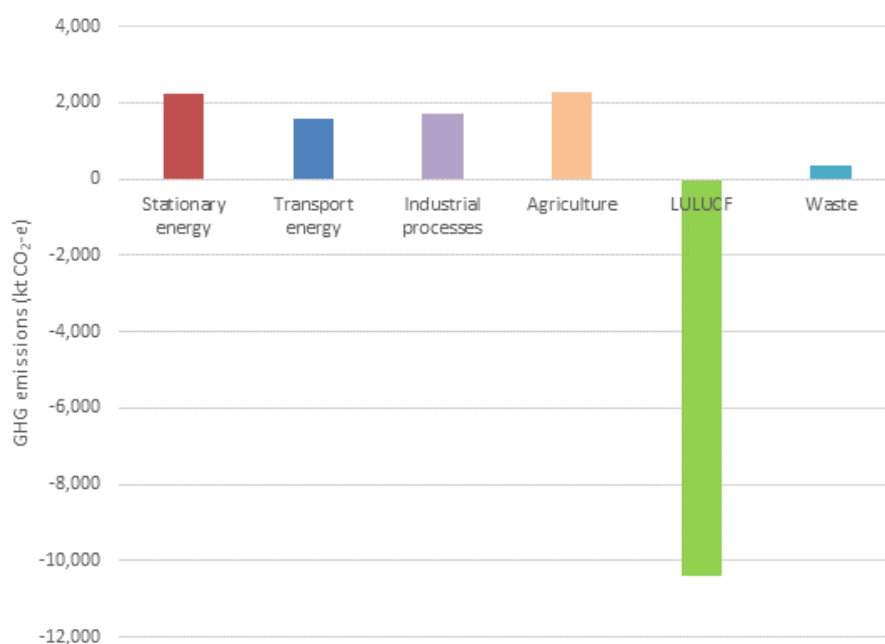
Tasmania's greenhouse gas emissions today

Tasmania's emissions profile is unique among Australian states and territories, as it has maintained net zero emissions since 2015. This achievement has helped to establish Tasmania as an Australian climate change leader.

The achievement of net zero emissions is primarily because of Tasmania's large forest estate (which absorbs a significant amount of carbon dioxide from the atmosphere each year), and because the state generates a high proportion of zero emissions renewable electricity.

Since 2015, total emissions from the energy, industry, agriculture and waste sectors were less than the amount of carbon dioxide absorbed by the land-use, land-use change and forestry (LULUCF) sector. Figure shows the contribution of each these sectors to the state emissions profile in 2018 (the most recent published data).

Figure 2. Tasmania's greenhouse gas profile by sector in 2018



Tasmania's "business as usual" emissions

Despite its current net zero emissions profile, Tasmania's emissions out to 2050 are not fixed under most-likely conditions, unless it takes further action to reduce emissions. There are three key drivers that will influence business-as-usual (BAU) emissions to 2050:

- **Policy drivers** including national and state policies that are in force or are expected to come into force in the coming decades. For example, under the Tasmanian Government's AgriVision 2050 plan², the scale of production from the agriculture sector is expected to increase significantly between now and 2050, which may increase emissions. Conversely, the achievement of the objectives of the Tasmanian Renewable Hydrogen Action Plan³ will likely provide opportunities for emissions reductions across the stationary energy and transport sectors.
- **Economic drivers** including changes in demand for commodities. For example, increases in demand for meat and dairy products may drive up emissions from agriculture. Conversely, Sustainable Timber Tasmania projections for yield harvesting in public native forests show that timber harvesting will stay at a similar level for the next 6-7 years, then drop back progressively through to 2050.

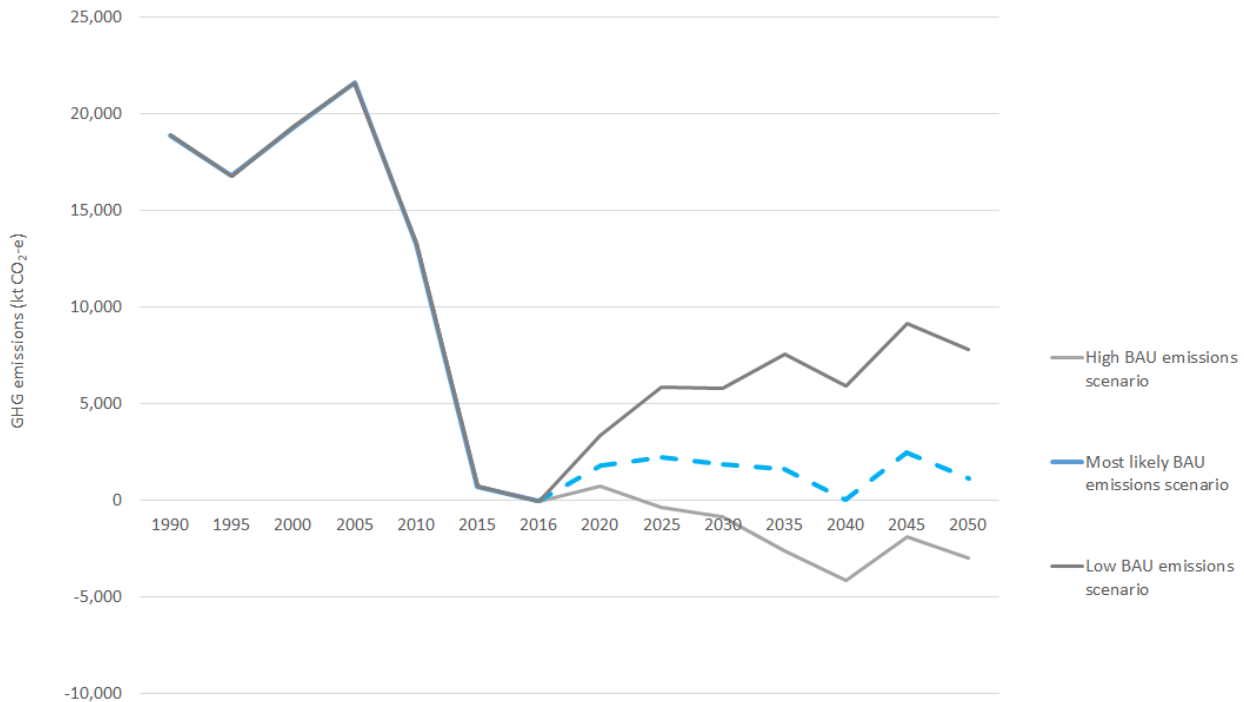
² <https://dpiwwe.tas.gov.au/agriculture/growing-tasmanian-agriculture-research-development-and-extension-for-2050>

³ https://www.stategrowth.tas.gov.au/news/archived_news/the_tasmanian_renewable_hydrogen_action_plan

- **Technology drivers** including predicted technological progress in energy efficiency and electrification of stationary energy and transport, and in low-emissions agricultural practices.

Modelling undertaken in 2019 using the 2016 STGGI data (the most current emissions data available for Tasmania at that time) suggests that under BAU conditions, Tasmania’s annual emissions in 2050 could be anywhere between a net source of 6,000-7,500 kt CO₂-e, and a net sink of 3,500-5,000 kt CO₂-e (Figure). Within this range, there is a plausible scenario that emissions remain above net zero between now and 2050. This demonstrates the need for Tasmania to identify additional emissions reduction opportunities to achieve and maintain net zero emissions into the future.

Figure 3 Tasmania’s business as usual net emissions forecast to 2050 with uncertainty bands⁴



Source: Previous modelling undertaken by Point Advisory and Indufor, 30 January 2019 (to be updated by mid-2021). Please note: this modelling uses emissions data from 2016 STGGI, which was the most current emissions data available for Tasmania at that time.

⁴ There is a clear risk of major bushfires in Tasmania over the next 30 years, and further climatic changes make it likely that these will occur at a higher frequency and with greater severity than in the past. To account for this risk, the business as usual scenarios include major bushfire events, modelled to occur every ten years in 2025, 2035 and 2045 (see Figure 2).

OPPORTUNITIES TO REDUCE EMISSIONS

Table presents a set of “best-fit” emissions reduction opportunities for Tasmania to adopt in coming years. These opportunities were selected in collaboration with a range of Tasmanian Government agencies based on how achievable they are likely to be in the current policy context. While some of these opportunities align with existing government policy priorities, other opportunities - if pursued - would require further analysis in consultation with key industry sectors as they are likely to involve significant capital investment, research and development and undergo cost benefit analysis. Opportunities that involved new technologies that are still in development or costly were not included.

Table 2. Potential ‘Best-fit’ emissions reduction opportunities for Tasmania

Emissions sector	Opportunity	Relative size of expected emissions reductions in 2050*	Timeframe for implementation	Co-benefits
LULUCF	Reduce conversion of plantations to other land uses following plantation harvesting	Small	Next five years	<ul style="list-style-type: none"> Ongoing revenue from increased sales of hardwood and softwood plantation logs. Diversification of revenue streams for private landowners from carbon credits. Revenue from increased sales of domestic wood products.
	Increased plantations including agroforestry	Small	Next five years	<ul style="list-style-type: none"> Ongoing revenue from increased sales of hardwood and softwood plantation logs. Revenue from increased sales of domestic wood products. Improved crop yields and higher animal productivity from tree planting in shelterbelts.
	Increased proportion of forestry logs go to long term wood products, and increased domestic processing	Small	Next five years	<ul style="list-style-type: none"> Increased revenue from additional domestic processing of long-term wood products. Job creation in the domestic timber processing sector.
	Introduce measures to reduce the risk of major bushfires	Medium ⁵	5-10 years	<ul style="list-style-type: none"> More jobs in the fire management workforce. Reduced impact of bushfires on communities, wildlife and other forest values.
Stationary energy	Reduction of diesel consumption in the agriculture, forestry and fisheries sectors	Small	Next five years	<ul style="list-style-type: none"> Productivity gains could add additional value to Tasmania’s GSP. Brand advantage.
	Demand reduction and energy efficiency measures for manufacturing	Medium	Next five years	<ul style="list-style-type: none"> Operational energy cost savings for manufacturers. Revenue stream for manufacturers from carbon credits.
	Fuel switching: electrification of boilers for manufacturing	Medium	5-10 years	<ul style="list-style-type: none"> Increased revenues for electricity generators and retailers from increased electricity consumption. Revenue stream for manufacturers from carbon credits.
	Fuel switching: Use of bioenergy / renewable	Large	>10 years	<ul style="list-style-type: none"> Forestry industry sees potential for increased revenue from increased demand for biomass residues.

⁵ Note the emissions reduction potential of this opportunity is variable due to the uncertain nature of bushfires.

Emissions sector	Opportunity	Relative size of expected emissions reductions in 2050*	Timeframe for implementation	Co-benefits
	hydrogen for manufacturing			<ul style="list-style-type: none"> Manufacturing industry sees reduced costs of energy switching from natural gas to hydrogen and/or biomass. Revenue stream for manufacturers from carbon credits.
Transport energy	Increase low emissions vehicle uptake in passenger fleet, including EVs	Large	Next five years	<ul style="list-style-type: none"> Long term cost savings for vehicle owners. Health improvements through reduced air pollution. Electricity generators and retailers grow revenue from additional electricity consumption. Energy security.
	Decarbonise the heavy transport fleet via EVs, hydrogen, drop-in hydrocarbon fuels	Medium	5-10 years	<ul style="list-style-type: none"> Long term fuel cost savings for vehicle owners. Health improvements through reduced air pollution. Electricity generators and retailers grow revenue from additional electricity consumption from electric vehicles.
	Increased uptake of public and active transport	Small	Next five years	<ul style="list-style-type: none"> Possible cost savings for car owners who decide to take active transport compared with private transport. Health improvements through promotion of a healthier lifestyle and less air pollution.
Industry	Use Cement substitutes / Low-emissions cement variants	Large	10-20 years	<ul style="list-style-type: none"> Operational savings for cement producers via reductions in energy consumption.
Agriculture	Reducing agricultural soil emissions through precision agriculture	Small	Next five years	<ul style="list-style-type: none"> Livestock and crop productivity gains could deliver significant additional revenue for farmers. Operational cost savings on things like fertilizer for farmers. Water savings.
Waste	Cut methane emissions from landfills by diverting more organic waste from landfills	Medium	Next five years	<ul style="list-style-type: none"> Landfill operators realise energy savings from capturing and combusting additional landfill gas. Landfill operators generate revenue through carbon credits. Creates additional potential revenue streams, e.g. through compost sales.

*The size of emissions reductions is calculated based on the relative magnitude of expected emissions reductions compared across these opportunities.

small	<125 kt CO ₂ -e per year
medium	125-250 kt CO ₂ -e per year
large	250-450 kt CO ₂ -e per year

ECONOMIC ANALYSIS OF THE NET ZERO EMISSIONS PATHWAY

Point Advisory analysed, at a high level, the impact of the best-fit pathway on the different sectors of Tasmania's economy (as defined by the Australian and New Zealand Standard Industrial Classification (ANZSIC) economic divisions).

Our analysis showed that the transition to a net zero carbon economy could deliver economic benefits across most sectors, including agriculture, forestry and aquaculture, and manufacturing.

In addition to economic benefits, broader economic co-benefits associated with a transition to net zero emissions include:

- Improvements in energy efficiency and productivity leading to reduced costs for energy users and a relative "insulation" from fluctuations in commodity prices.
- An earlier transition to a low carbon economy minimises the risk of stranded assets - particularly for Tasmania's manufacturing sector as international demand for low-emission products and services increases.
- The positioning of Tasmania as a key player in the renewable hydrogen space through the Tasmanian Renewable Hydrogen Action Plan helps ensure that Tasmania is well placed to benefit from the emerging global hydrogen industry. This could create opportunities including fuelling the heavy vehicle fleet in Tasmania with hydrogen and enabling commercial exportation of renewable hydrogen by 2030.
- The creation of additional investment opportunities for Tasmania. For example, the relocation of Australia's data centres to Tasmania due to its affordable low-carbon electricity and milder climate requiring less cooling.

Furthermore, by achieving a successful transition to a low-emissions economy, Tasmania can have a positive influence on other Australian states and other countries in pursuing a low-emissions economy, by demonstrating leadership.