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Tasmania: Net Zero by 2030

Emissions Pathway Review Summary Report

Prepared for:

The Tasmanian Government

2021

TASMANIA – NET ZERO BY 2030

This paper

This paper provides an overview of the analysis undertaken to support the development of a new greenhouse gas (GHG) emissions reduction target for Tasmania, and includes the following:

- A discussion of Tasmania's emissions profile, both currently and how this profile could look in the future, at a state and sector-wide level.
- An overview of the different emissions reduction opportunities available to Tasmania, and how these opportunities will, if implemented, impact Tasmania's emissions profile to 2050.
- A comparison of the proposed 2030 net zero target with other Australian states and territories and with other countries.

The need for climate action

As the United Nations' Secretary-General has repeatedly warned, the world is in a climate emergency. The window for action is closing, with recent research suggesting climate tipping points may be reached very soon. The Bureau of Meteorology recently gave evidence to the Australian Parliament that the country is on track for 4.4°C of warming this century[1], making much of the country uninhabitable. This would be devastating for Australia's society, economy, health, and environment.

To address this situation, countries from around the world signed up to the 2015 Paris Agreement. This commits countries to keeping global temperature rise to within 2°C above pre-industrial levels, and strives to limit warming to 1.5°C; as this will make the worst impacts of climate change less catastrophic. In practical terms, this means Australia's GHG emissions need to peak in the very near future and reach net zero by 2035[2] to be 1.5°C compatible, or by 2050 to be 2°C compatible.

The Paris Agreement recognises the important role of sub-national governments in responding to climate change, along with communities, businesses and governments from across the world.

What does net zero mean?

Net zero emissions means reducing GHG emissions from human activity as much as possible and balancing out any remaining emissions through activities that remove carbon from the atmosphere. Reducing emissions can involve producing energy from renewable sources like wind and solar power instead of using fossil fuels, and using more efficient farming practices to reduce agricultural emissions. Carbon removal can involve planting trees and restoring forests so that additional carbon is drawn out of the atmosphere.

There are many different pathways to achieving net zero emissions. However, a successful transition will need all members of society, including government, industry and the community to work together. It will require innovative and flexible approaches to finding solutions to new challenges.

The Tasmanian Government's commitment to net zero emissions

Under the *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 subsequent 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, the Tasmanian Government is seeking to set a more ambitious emissions reduction target for Tasmania, aligned with the goals of the Paris Agreement.

The analysis summarised in this document (undertaken by Point Advisory and Indufor on behalf of the Tasmanian Government) shows that Tasmania can be a climate change leader, at both the national and global level. Tasmania is currently at net zero emissions, and our analysis indicates that Tasmania could maintain this position into the future, whilst continuing to grow the state's economy.

Therefore, a new emissions reduction target of net zero emissions by 2030 is achievable.

[1] https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;db=CHAMBER;id=chamber%2Fhansardr%2F32f9c2b2-1ee9-4d5f-b741-8e194c4befdc%2F0027;query=Id%3A%22chamber%2Fhansardr%2F32f9c2b2-1ee9-4d5f-b741-8e194c4befdc%2F0016%22

[2] https://www.climateworksaustralia.org/wp-content/uploads/2020/04/Decarbonisation-Futures-March-2020-full-report-.pdf

TASMANIA'S EMISSIONS PROFILE

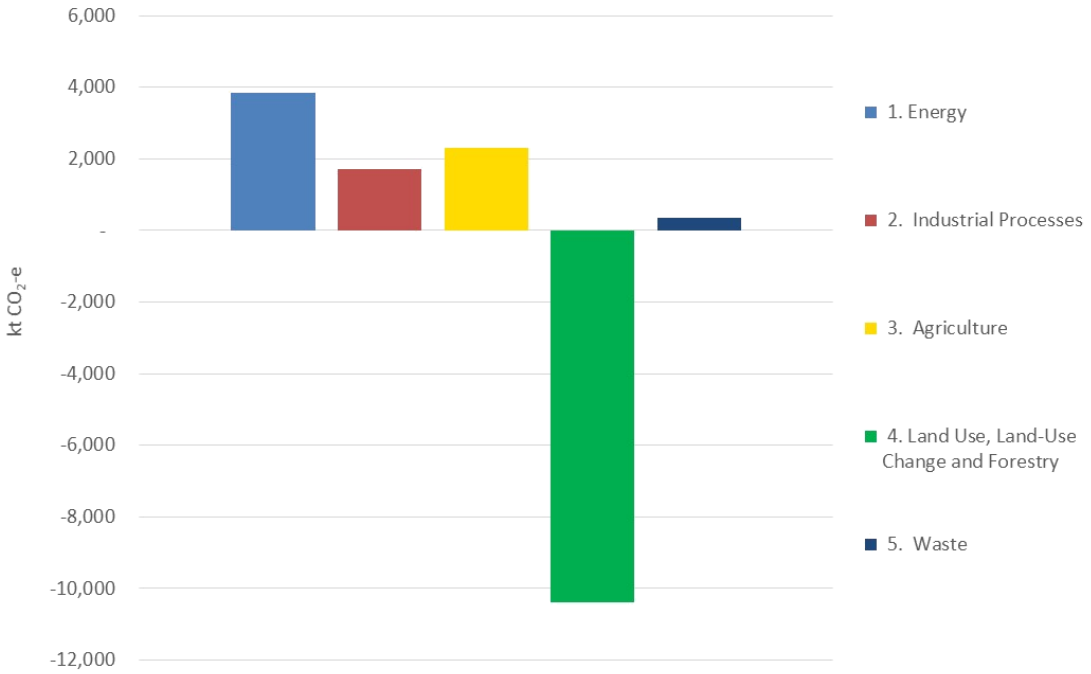
Tasmania's current greenhouse gas emissions

Tasmania's emissions profile is unique among Australian states and territories, as it has been at net zero emissions six out of the seven years since 2013. This achievement has helped to establish Tasmania as an Australian climate change leader.

Tasmania has achieved net zero emissions primarily because of its 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 renewable electricity.

Since 2013, 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 1 shows the contribution of each these sectors to the state's emissions profile in 2018.

Figure 1. Tasmania's greenhouse gas profile by sector in 2018



Tasmania's greenhouse gas emissions in the future

Under 'business-as-usual' (BAU) conditions, Tasmania is not expected to maintain net zero emissions out to 2050. There are three key types of drivers that will influence these BAU emissions:

- **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 plan[3], the scale of production from the agriculture sector is expected to increase significantly between now and 2050, which is likely to put upwards pressure on GHG emissions. Conversely, the achievement of the objectives of the Tasmanian Renewable Hydrogen Action Plan[4] 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.
- **Technology drivers** including technological progress in energy efficiency and electrification of stationary energy and transport, and in low-emissions agricultural practices.

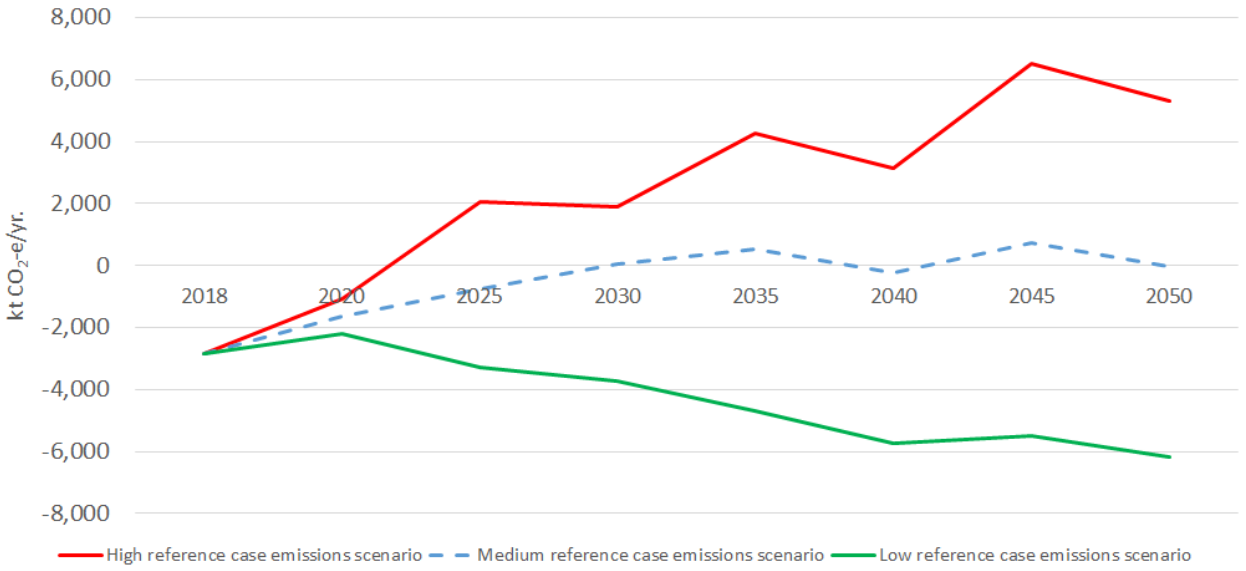
Our modelling indicates that under BAU conditions, Tasmania's annual emissions in 2050 will be between a net source of over 5,000 kt CO_2-e, and a net sink of around -6,000 kt CO_2-e. However, it is most likely to lie somewhere in between these

[3] https://dpipwe.tas.gov.au/agriculture/growing-tasmanian-agriculture-research-development-and-extension-for-2050

[4] https://www.stategrowth.tas.gov.au/news/archived_news/the_tasmanian_renewable_hydrogen_action_plan

points at around net zero (Figure 2). The main factors in determining where actual emissions will sit within this range are the levels of timber harvesting from native forests, the level of plantation activity, the rate of uptake of electric vehicles and the growth (and speed of growth) in the agricultural sector. Our modelling indicates that Tasmania's net emissions are never forecast to return to historical high levels (i.e. 19,685 kt CO_2-e in 2000).

Figure 2. Tasmania's business as usual net emissions forecast to 2050 with uncertainty bands



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[5], modelled to occur every ten years in in 2025, 2035 and 2045 (as shown by the 'sawtooth' pattern in Figure 2).

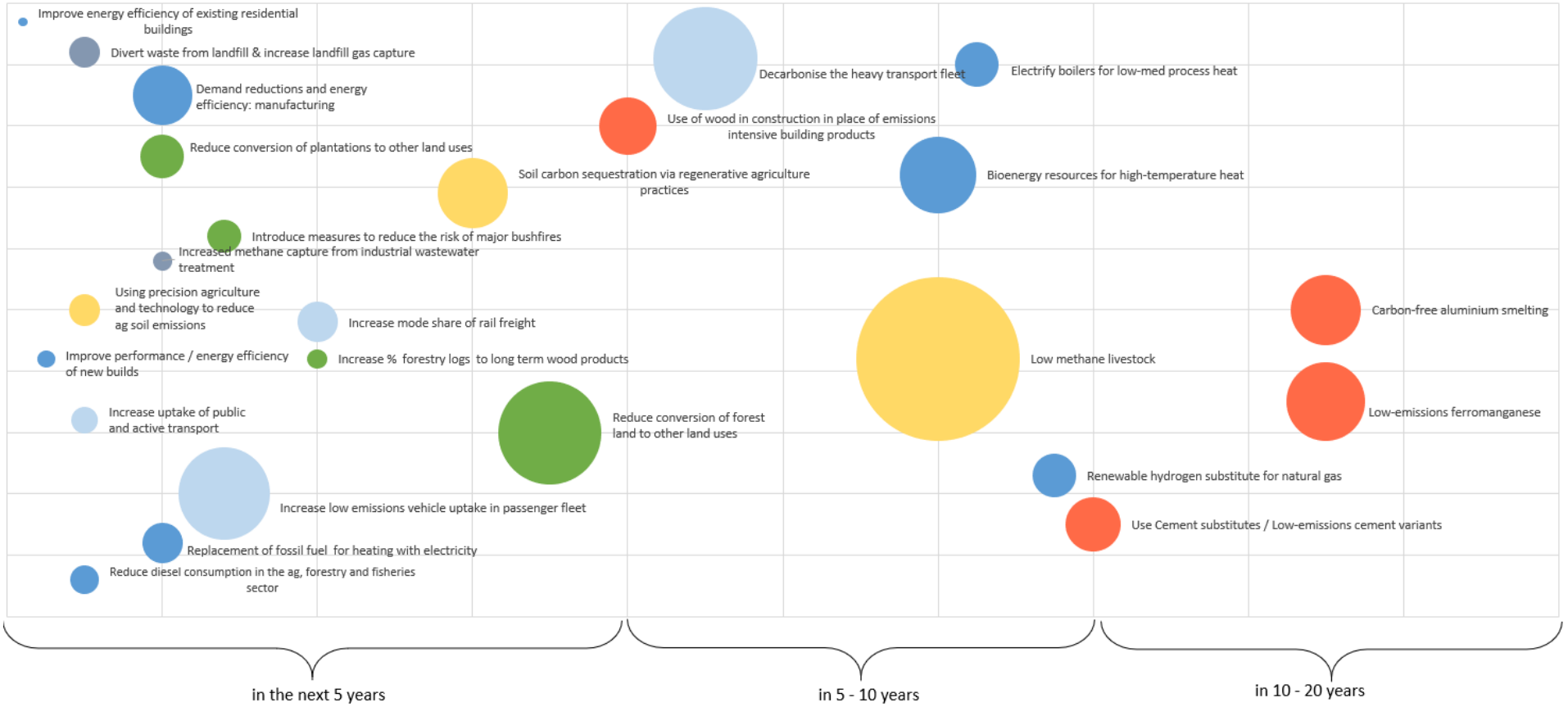
OPPORTUNITIES TO REDUCE EMISSIONS

Emissions reduction opportunities investigated for Tasmania

A total of 26 emissions reduction opportunities were identified and investigated across all sectors of Tasmania's economy. Figure 3 illustrates the anticipated implementation timeframes for the various opportunities, with the size of the bubbles indicating their abatement potential in 2050.

[5] It should be noted that the Australian Government makes provisions under international conventions to place an upper limit on the impact of bushfires on the national greenhouse gas inventory. This effectively means that Australia, with the States and Territories incorporated, can exclude the impact of major fires on annual accounts, provided the area burned is restored over an allocated period – and if not, the land use conversion and associated emissions are then recorded in the inventory.

Figure 3. Quantum of abatement and implementation readiness from opportunities (for illustrative purposes)



Identifying the best-fit opportunities for Tasmania

From the 26 opportunities presented in Figure 3, a shortlist of 16 "best-fit" opportunities were selected in collaboration with a range of Tasmanian Government agencies based their achievability in the current policy context. The opportunities below represent one pathway that could be pursued to achieve a target of net zero emissions by 2030.

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 research, development and/or commercialisation support to drive deployment.

Table 2. 'Best-fit' emissions reduction opportunities for Tasmania

Emissions sector	Opportunity	Annual abatement in 2050 (kt CO_2-e/yr)	Co-benefits
Land use, land use change and forestry (LULUCF)	**Reduce conversion of plantations to other land uses following plantation harvesting**	125	• 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	300	• 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 to long term wood products, and increased domestic processing	25	• 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	70[6]	• More jobs in the fire management workforce. • Reduced impact of bushfires on communities, wildlife and other forest values.
Stationary energy	**Use precision agriculture to reduce diesel consumption in the agriculture, forestry and fisheries sectors**	55	• Productivity gains could add additional value to Tasmania's GSP. • Brand advantage.
	Demand reduction and energy efficiency measures for manufacturing	230	• Operational energy cost savings for manufacturers. • Revenue stream for manufacturers from carbon credits.
	Fuel switching: electrification of boilers for manufacturing	125	• Increased revenues for electricity generators and retailers from increased electricity consumption. • Revenue stream for manufacturers from carbon credits.
	Fuel switching: Use of bioenergy / renewable hydrogen for manufacturing	370	• Forestry industry sees potential for increased revenue from increased demand for biomass residues. • Manufacturing industry sees reduced costs of energy switching from natural gas to hydrogen and/or biomass. • Revenue stream for manufacturers from carbon credits.
	Renewable hydrogen, biogas and / or synthetic gas substitute for residual natural gas across stationary energy sectors	145	• Position Tasmania as a leader in the renewable hydrogen space (if consumed hydrogen is produced locally). • Reduce dependence on imported natural gas, which could add additional value to Tasmania's GSP.

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

Emissions sector	Opportunity	Annual abatement in 2050 (kt CO_2-e/yr)	Co-benefits
Transport energy	**Increase low emissions vehicle uptake in passenger fleet, including EVs**	550	• 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	690	• 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. • Position Tasmania as a leader in the renewable hydrogen space (if consumed hydrogen is produced locally). • Reduce dependence on imported transport fuels, which could add additional value to Tasmania's GSP.
	Increased uptake of public and active transport	50	• Cost savings for car owners who decide to take active transport compared with private transport. • Health and lifestyle improvements through promotion of active travel and less air pollution.
Industry	**Use of wood in construction in place of emissions intensive building products**	210	• Increased demand for domestically produced timber products, adding value to the forestry and wood products industries. However, across the Tasmanian economy as a whole it is likely that there would be no significant net difference in value, as this opportunity involves a transfer of value from the cement industry to the forestry industry. • Potential decrease in material costs for construction industry, through switching to timber.
Agriculture	**Low methane livestock**	1,700	• Livestock productivity gains could deliver significant additional revenue for farmers. • Additional value for the fisheries sector generated through the sale of Tasmanian-grown seaweed (*asparagopsis taxiformis*). • Asparagopsis contributes to healthier oceans as it de-acidifies water, stripping out carbon dioxide.
	Use of precision agriculture and supporting digital technologies to reduce agricultural soil emissions	70	• Livestock and crop productivity gains could deliver significant additional revenue for farmers. • Operational cost savings on things like fertilizer for farmers. • Water savings.
Waste	**Reduce waste to landfill and deployment of additional landfill gas capture technology**	60	• Creates additional potential revenue streams, e.g. through compost sales. • Landfill operators realise energy savings from capturing and combusting additional landfill gas. • Landfill operators generate revenue through carbon credits.

NET ZERO EMISSIONS PATHWAY OPTIONS FOR TASMANIA

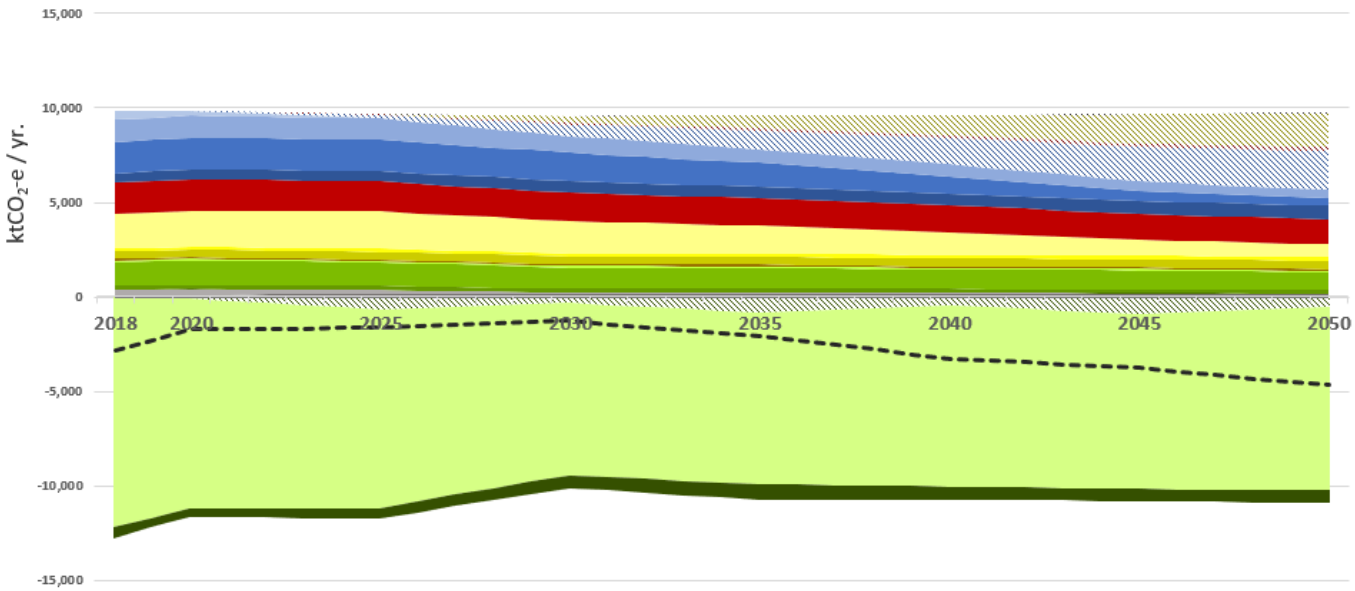
The pathway to net zero emissions

By applying these emissions reduction opportunities to the 'business as usual' emissions trajectory, a best-fit emissions pathway was developed for Tasmania (see Figure 4). The pathway shows that the state can achieve a 'steady state' of net zero emissions if the selected emissions reduction opportunities are implemented.

Of these 16 best-fit opportunities, nine directly reduce fossil fuel CO_2 emissions, while the remaining seven reduce biogenic carbon emissions. While it is important to reduce emissions across all sectors of the economy, reducing fossil fuel emissions is considered to be critical as long-term stabilisation of the global climate cannot be achieved unless these emissions are almost entirely eliminated.

This best fit pathway would see Tasmania maintaining net zero emissions easily from now until 2050, with the state acting as a net sink of over 4,700 kt CO_2-e per annum in 2050. Of this impact, 12% is from carbon sequestration opportunities in the LULUCF sector, and the remainder is direct emissions reductions.

Figure 4. Best-fit net zero emissions pathway to 2050

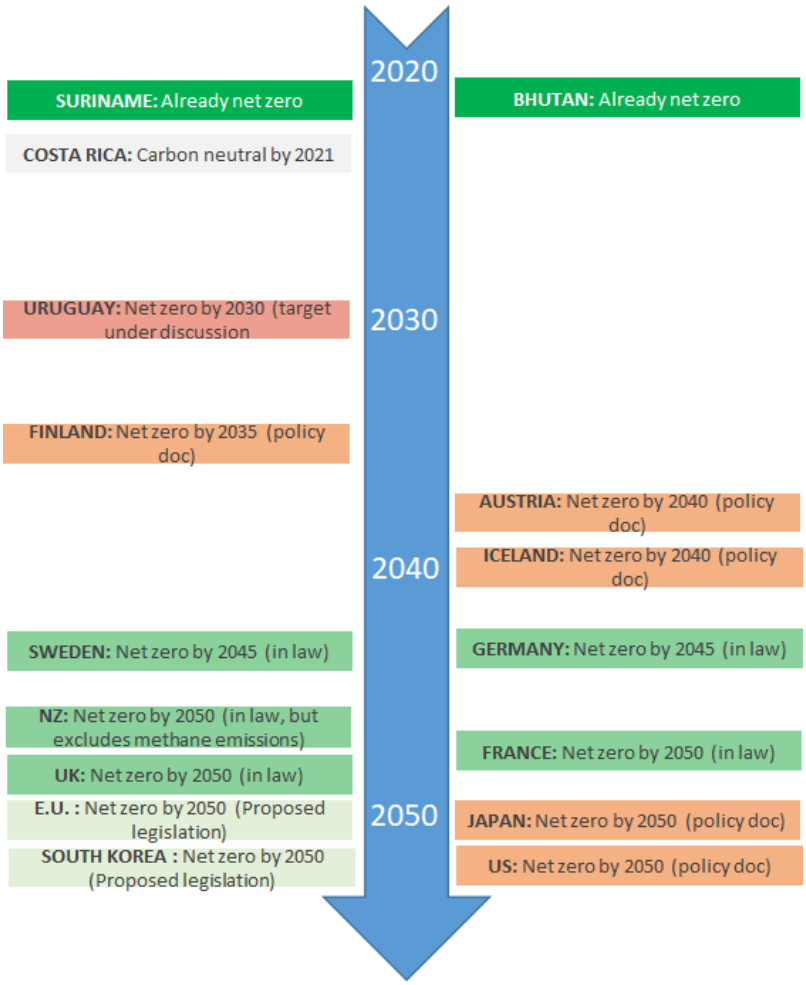


Targets set by Tasmania's peers

Dozens of cities, states and nations around the globe are committing to action on climate change in the coming decades, many of them by setting net zero emissions targets. Several countries have set net zero emissons targets by 2050 (or earlier), including many that are enshrined in law (

Figure 5). Overall, 34 countries have targets that are achieved, in law, in proposed legislation or in policy documents. Another 98 are actively discussing set net zero targets by 2050.

Figure 5. Timeline of announced international net zero emissions targets[7]



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. With its significant forest estate and low carbon electricity sector, Tasmania is uniquely well placed amongst Australian states and territories, allowing the State to position itself as a transition leader.

Net zero target options for Tasmania

Our analysis indicates that Tasmania could maintain its current net zero emissions position into the foreseeable future, whilst continuing to grow its economy (refer to the best-fit emissions reduction pathway presented in Figure 4). Therefore, the state could be a world leader on climate change by setting a target to achieve and maintain net zero earlier than 2050.

Five GHG emissions reduction target timeframes have been suggested in

[7] Source: Based on information provided in the Energy & Climate Intelligence Unit's Net zero tracker: https://eciu.net/netzerotracker

Table 1, which also outlines 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, and all other sectors starting to decarbonise. This will require policy and economic support from government, private industry and other key stakeholders.

Based on Tasmania's current net zero emissions position and the analysis conducted as part of this project, the state could consider legislating a target to achieve net zero emissions by 2030.

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

Target option	Benefits	Risks
Net zero emissions by 2030	• Would be the most ambitious state-level net zero emissions target in Australia. • Highly ambitious at the global level. • Aligned with climate science, and therefore robust and defensible. • First mover advantage.	• 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 emissions by 2035	• As for 2030 target.	• As for 2030 target.
Net zero emissions by 2040	• Would be the most ambitious state-level net zero emissions target in Australia. • Ambitious at the global level, outside of countries that have extensive forest resources and relatively low emissions electricity sectors. • Aligned with climate science, and therefore robust and defensible. • First mover advantage.	• Could be seen as not being ambitious enough given Tasmania's unique position of already having achieved net zero emissions since 2013, 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, then 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 emissions by 2045	• Would be aligned with ACT's net zero emissions target so still very ambitious at the national level. • Ambitious at the global level, outside of countries that have extensive forest resources and relatively low emissions electricity sectors. • Aligned with climate science, and therefore robust and defensible.	• As for 2040 target.
Net zero emissions by 2050 ***(Tasmanian Government's current emissions reduction target policy position)***	• Aligned with climate science, and therefore robust and defensible.	• As for 2040 target.