



Emissions Reduction Pathways for Hobart Final Report

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Summary for decision makers

SPR was commissioned to provide advice and recommendations on science- and evidence-based greenhouse gas emissions reduction pathways for both the City of Hobart and the municipality as a whole (the Hobart community). A recognition that current Hobart targets (p.32) were not aligned with the need for action indicated by the latest climate science led to the commissioning of this report. This report will help inform the development of a 2030 Hobart Climate Change Strategy.

For a brief overview of this report, this summary should be read in conjunction with the summary of recommendations (p.11) and the summary tables of the pathways for both the community (p.55) and the City of Hobart (p.58).

Principles

We recommend that the following principles are applied in determining the City's climate response:

- Emissions targets should be based on the latest climate science and a recognition that wealthier countries and cities such as Hobart should be taking a leading role in driving emissions reduction.
- While the necessity of urgent action is unarguable, the nature of the Council's *response* to this scientific reality, and the degree and timing of its actions, are legitimately determined by the Council itself, in consultation with the community.
- The greatest focus should be placed on reducing the largest emissions sources first.
- Council should demonstrate both responsibility and leadership by focusing on reducing its own emissions to zero as rapidly as possible, and by 2035 at the latest.
- Council has less direct control over community emissions but has a strong influence on some of these (particularly transport) and should exercise its influence through Council policies and programs as well as through advocacy and leadership.
- The Council should undertake carefully targeted representations and advocacy, on behalf of the Hobart community, with all parties that have leverage and control over local emissions, notably prioritising the State Government and government business enterprises.

Climate Science

The United Nations is now warning that the world has a 50/50 chance of exceeding 1.5° C of global warming within the next 5 years. An increasing number of climate scientists are warning that, after decades of inadequate action, it is *almost* too late to prevent catastrophic climate change. The only chance of limiting climate damage to tolerable levels is to reduce global emissions to zero as quickly as possible.

It is therefore critical to break out of ‘business as usual’ thinking and respond to climate change like the crisis that it is (see p.17).

Science-based targets

The leading target calculating methodology suggests that the minimum targets for the Hobart community that could be considered science-based are a 64% reduction in emissions by 2030, and net zero on or before 2050 (see p.33). However, the methodology assumes certain trajectories would be followed from 2018, which many populations – including Hobart – have not done. This means even faster reductions are now required to remain within the dwindling global emissions budget. Many cities have set far more ambitious targets (eg, 24 cities have set targets of net zero community emissions by 2030 without using carbon credits – see Section 4.4). We recommend the Council propose and engage with the community on targets of at least a 70% reduction by 2030 and zero emissions by 2040 at the latest.

For the City, we propose that it demonstrates leadership by setting higher/earlier targets than for the broader community, 75% reduction by 2030 and zero emissions by 2035. Since over 90% of the City of Hobart’s emissions are associated with McRobies Gully, this site requires urgent and immediate attention if these targets are to be met.

Emissions reduction pathways

We identify three emissions pathways:

1. A **Reference pathway** – this includes the changes that are expected to occur without additional effort on the part of the City of Hobart. This pathway is not expected to meet science-based targets. Rather, it illustrates the outcomes that are expected in the absence of additional action by the City of Hobart.
2. A **Minimum Required Actions pathway** – that aims to ensure that science-based targets are (just) met, but with the least possible degree of cost, intervention, advocacy and leadership.
3. A **Climate Leader pathway** – that aims to provide greater confidence that the targets will be met, including for the community’s Scope 3 emissions, and which actively embraces leadership by the City of Hobart to achieve climate justice and ensure no-one is left behind.

The pathways are described in more detail in chapter 5, while the emissions reduction opportunities that constitute the pathways are summarised in the tables for both the community (p.55) and the City of Hobart (p.58). It is open to Council and the community to mix and match the actions and programs that combine emissions reduction with cost-effectiveness, community support, and benefits beyond emissions reduction.

Characteristics of the Reference Pathway

As noted, the Reference pathway is anticipated to lead to some reduction in emissions without additional policy initiatives by the Council. This will be due to factors such as:

- progressive but slow electrification of the city and community vehicle fleets, and housing and businesses, in line with market signals
- state government targets such as its 200% renewable electricity are assumed to be met
- progressive but slow lifting of housing and building standards, and higher minimum energy performance standards for appliances, equipment and energy-using systems
- continued progressive moves towards zero waste, but offsets may continue to be sold from McRobies gully, leading to no or minimal net abatement from this facility
- while there may be no formal phase out of natural gas use in this scenario, it may also be that relative prices and other market-led phenomena lead to lower gas use in future.

These developments will not be sufficient to meet science-based emissions reduction targets.

Characteristics of the Minimum Required Actions Pathway

Actions additional to those in the Reference pathway above may include (but only to the extent necessary for meeting the targets):

- the Council allocating additional resources and/or leveraging additional support and partnerships for faster roll-out of EV infrastructure (including the state-owned public transport fleet) and for active transport infrastructure and associated behaviour change
- banning, or at least strongly discouraging, gas connections to any new development, and actively promoting electrification of existing gas applications
- actively minimising methane emissions from McRobies Gully landfill through oxidation and capture, and ending the sale of offsets relating to this activity
- encouraging and promoting the use of rooftop PV, and encouraging passive solar design, energy efficiency retrofits and other emissions-reducing initiatives in the community.

Characteristics of the Climate Leader pathway

A Climate Leader pathway would aim to increase confidence that science-based targets are met, (allowing for unforeseen contingencies in future), and could also support higher/earlier targets if desired. It would also pay greater attention to the equity outcomes of abatement measures, aiming to ensure that no-one is left behind. Additional commitment, leadership and endeavour could deliver:

- reputational benefits for Hobart, helping with (clean or zero-carbon) investment attraction

- cost reductions for Council, households, and businesses (where faster abatement action is cost effective).

Actions under this pathway, additional to those above, might include:

- Careful targeting of measures to ensure that the benefits of zero-carbon mobility, technologies and housing are accessible to all. This may include, for example, encouraging community-based solutions for solar and batteries, to overcome limitations for apartment dwellers in accessing solar; minimum standards for rental properties that include solar and efficient, electrical space and hot water heating; access to on-street charging for EVs
- Focused efforts by the Council to eliminate methane emissions from landfill (at McRobies Gully and any other sites at which the Hobart community's waste is disposed) as quickly as possible, through waste avoidance, diversion of organic waste from landfill, and active management of landfills to achieve maximum methane oxidation and capture, aiming to realise zero emissions by 2040 at the latest
- No recourse to using offsets, even if investments to promote ecological and community benefits through improved landscape management are made; that is, targeting zero emissions by 2040, not net zero.

Further detail on the emissions pathways can be found in chapter 5.

Inventories

As part of this project, we were commissioned to review and comment on two inventories:

- **Community inventory:** This covers the emissions induced by activities undertaken by people who live in, work in, and visit the municipality.
- **Corporate inventory:** This covers the emissions induced by activities undertaken by the Council.

Summaries of existing inventories and their deficiencies are in Chapter 3, Measuring emissions, and in Appendix 2: Review of existing inventories.

Accurate inventories are essential for setting emissions reduction priorities and measuring performance over time. Development of accurate inventories is beyond the brief for this report. However, it was necessary to have a reasonably robust understanding of existing emissions in order to make recommendations on the opportunities that provide the greatest potential for reducing emissions. For this reason, we reviewed corporate and community inventories for Hobart prepared by others and recommended actions that the Council should take to improve the compliance and accuracy these inventories. We then composed best estimates based on those inventories. These estimates are illustrated in Figure 1.

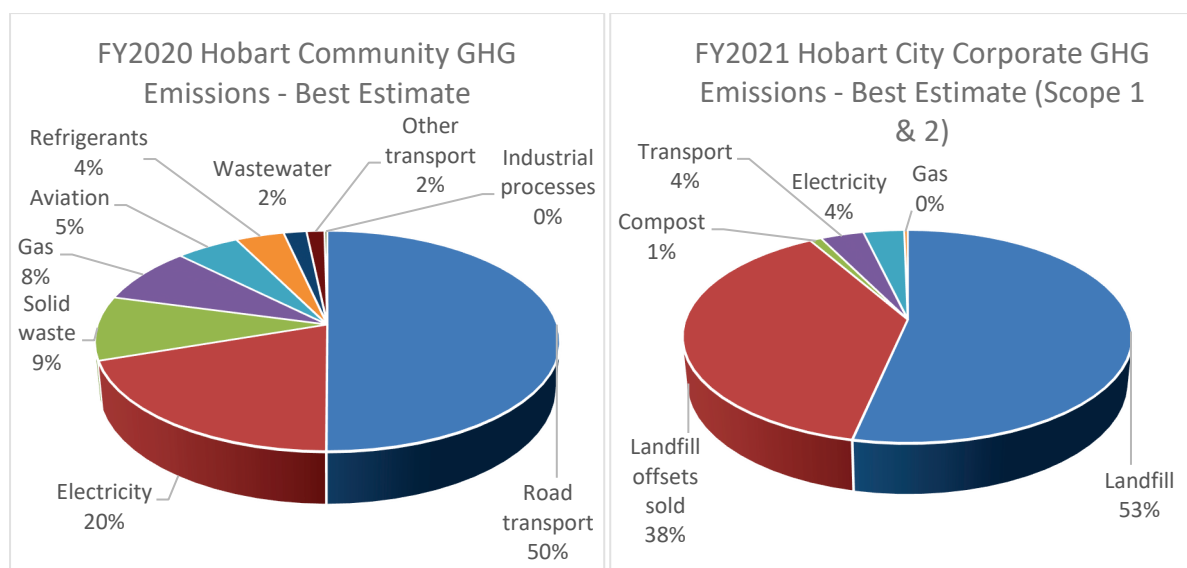


Figure 1: Hobart's Community and Corporate Greenhouse Gas Emissions, FY2021

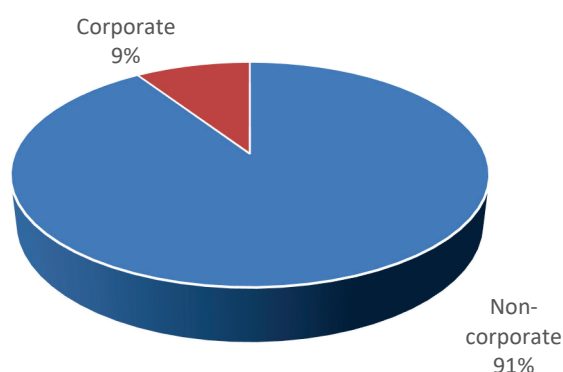


Figure 2: The Council's corporate emissions make up 9% of Hobart's community emissions

Notable conclusions from these best-estimate inventories are:

- The Council's corporate emissions make up around 9% of Hobart's community emissions (Figure 2)
- For the Hobart community, 57% of emissions derive from transport, with electricity and waste-related emissions in second and third places
- For the Council, 91% of emissions arise from waste and landfill operations.

Consistent with the principles recommended above, these conclusions suggest that the City's abatement strategy should prioritise urgent action on reducing waste and transport emissions, while also encouraging action on other emissions sources.

Summary of recommendations

Recommendations are here sorted into groups, rather than the order in which they appear in the report. See the referenced page for more details on individual recommendations.

Setting targets

R.4: Community emissions target: The Council should propose and engage with the community on a science-based community emissions reductions targets of at least a 70% reduction in gross emissions by 2030 using a 2018 baseline; and zero emissions by 2040 at the latest. (p.35)

R.5: Corporate emissions target: The Council should adopt a science-based corporate emissions reductions targets of at least a 75% reduction in emissions by 2030 using a 2018 baseline; and zero emissions by 2035 at the latest. (p.35)

R.6: Fossil free policy: The proposed 2030 Hobart Climate Change Strategy should set a date (eg, no later than 2030) to eliminate fossil fuel use from council operations; and state the intention to make Hobart fossil fuel free as rapidly as possible. (p.37)

Measuring and reporting emissions

R.1: Community inventory: the Council should annually produce a community inventory that fully complies with GCoM / GPC BASIC+ and is open and transparent with activity data and emissions factors. Consumption-based emissions should be added to the inventory once better methodologies for this are available. (p.28)

R.2 Corporate inventory: The Council should continue annually producing a corporate inventory, with it brought up to full compliance with the GHG Protocol Corporate Value Chain Standard. (p.29)

R.3 Climate-related disclosure standards: The City of Hobart should align its approach to assessing, disclosing, and addressing climate-related risks and opportunities with standards from the International Sustainability Standards Board (ISSB). (p.31)

Reducing emissions

R.9: Minimise methane emissions from landfill: The Council should commission a technical study into how methane emissions from the McRobies landfill facility can be minimised in the short-term and eliminated as quickly as possible thereafter. Any landfill site to which waste is to be disposed in future should be carefully designed, operated, and maintained to keep methane emissions to an absolute minimum. (p.64)

R.8: No sale of offsets: The Council should urgently cease generating, or allowing its contractors to generate, carbon credits from its abatement projects. (p.48)

R.7: Prioritise electrification: The proposed 2030 Hobart Climate Change Strategy should emphasise the importance of electrification, for both the Council and the community, and the Council should aim to rapidly electrify almost all of its assets. The Council should also run a public campaign encouraging electrification, backed by assistance for low-income households. (p.43)

1. Introduction

1.1 Overview

This report provides advice and recommendations on science- and evidence-based greenhouse gas emissions reduction pathways for Hobart (both the City of Hobart ‘the Council’ and the municipality as a whole ‘Hobart community’ or ‘Hobart¹’).

It includes a review of:

- contemporary climate science
- international, national and state climate commitments, and case studies from other cities
- science-based targets
- emissions reduction opportunities, risks and priorities
- emissions pathway options for community and corporate emissions.

Note that our scope does not include:

- compiling emissions inventories (although it is necessary for us to make ‘best estimate’ judgements for FY2020, for target calculation purposes)
- making quantitative emissions projections
- undertaking emissions abatement program design
- calculating optimal (from a benefit cost perspective) abatement strategies.

1.2 Background and Objectives

In 2023, the City of Hobart is developing the 2030 Hobart Climate Change Strategy. This will represent an evidence-based and integrated response to climate change by the Council and the Hobart community.

An important component of the evidence-base is an understanding the City of Hobart’s emissions reduction pathways, and the risks, opportunities and implications for the City of Hobart (corporate) and community (municipality).

In this context, SPR has developed this report on potential emissions reduction pathways for both corporate and community emissions. The brief is to:

- provide evidence and recommendations for decision-makers to set science-based targets

¹ ‘Hobart’ in this report generally refers to the municipality of Hobart, not the Greater Hobart area. The later includes at least the municipalities of Clarence and Glenorchy and may also include Kingborough and Brighton.

- clarify strategic priorities for emissions reductions
- identify genuine and measurable solutions/actions, including approaches that leave no-one behind.

Focus questions for the study are:

- What are emissions reduction pathways for Hobart? (eg, Business As Usual, Minimum Required Actions and Climate Leader pathways)
- What are the economic and social implications of the pathways? (solutions, resources, risks, opportunities, barriers)
- What are potential emissions reduction targets over short, medium & long-term for the City of Hobart, as a corporate entity, and the municipality of Hobart including Scope 1&2 - net zero, when? Scope 3 - net zero, when?
- What does leadership look like beyond net zero? (Climate Positive? True zero? Regenerative?)

The brief also asks SPR to present recommendations on how to enhance GHG emissions and energy reporting, including recommendations of third-party vendors for carbon accounting.

1.3 Summary of Approach

Climate science

First, we review key aspects of the international scientific consensus on climate change. While the science of climate change has been settled for decades, there has also been a considerable expansion in the scope of research and in the depth of understanding of the phenomenon over time. This has led to increasing capability and precision in projections and exploration of the consequences of different global emissions trajectories for many aspects of the geophysical systems on Earth, but also for communities and ecosystems. There has been extensive investigation of tolerably safe degrees of global warming, peak concentrations of greenhouse gas emissions in the atmosphere, and feasible as well as necessary global abatement (or emissions reduction) pathways. This work is global in scope but brought together under the aegis of the Inter-governmental Panel on Climate Change (IPCC).

It is important to distinguish between scientific conclusions and advice, on the one hand, and international, national and local commitments to emissions reductions, on the other. Hobart's emissions targets, and the timelines in which they are met, should primarily be determined by the climate science. The geophysical system that is the climate cannot be negotiated with. However, the nature of the Council's *response* to this scientific reality, and the degree and timing of its actions, are legitimately determined by the Council itself, in consultation with the community.

Responses in other jurisdictions

Second, we set out the framework of international, national, and local responses to the climate science as they stand today, including documenting some relevant case studies from other cities around Australia and globally. It is also important to distinguish these responses from the science of climate change. Policy commitments, targets and reflect political judgements in countries and cities around the world, including in Australia, as to the feasible or acceptable pace and nature of the changes made to reduce emissions. They are also prey to the political economy, where many powerful economic actors have strong incentives to discourage governments from taking effective and timely action. Bluntly, the geophysical processes that are driving climate change do not wait for or heed such considerations.

Approach on inventories

Third, we focus on Hobart, beginning with the inventory of Council and community emissions, at least as it is currently understood. We find that there are workably complete and accurate inventories available, sufficient for the purposes of this report, but we also make a number of recommendations that would aim to improve the accuracy, resolution and confidence in the inventory over time. An accurate inventory of emissions is not an objective in its own right, but rather is important to ensure that the abatement responses of the Council and of the community are as effective and targeted as possible. In this context, we review the relevant international protocols for emissions reporting and make recommendations that are informed by the best international practices.

Targets

As noted, the Council's targets (with respect to both community and corporate emissions) should be governed by the science of climate change, with other considerations (cost, feasibility) considered but subsidiary to the goal of achieving the required outcome. In Chapter 4 we review standard methodologies for calculating science-based targets and apply the most appropriate to Hobart. Even this methodology is now 5 years old, and with global emissions having continued since then, more ambitious targets are called for. We review targets set by cities around the world and recommend specific targets for Hobart's community and corporate emissions.

A strategic approach to emissions reduction

The inventory of emissions is also a kind of task list. It tells us what needs to change. These specific emissions, as documented in the inventory, need to reach zero, as quickly as feasible. The key questions are:

- Which parties are responsible for, and/or in a position to influence, each of these emissions?

- Are the emissions likely to be reduced to zero in the near future? In many cases, change processes are already well advanced – or at least underway – that will deliver, or help to deliver, zero emissions outcomes in Hobart. In other cases, this outcome is not likely to be achieved without focused action of one kind or another.
- If not, what changes would need to occur to enable this? These might include technological or process changes, regulatory changes, support options, or others.
- Finally, how can the Council most effectively enable this outcome, both for its own emissions, and how can it help lead the community to rapidly reduce their emissions to zero?

In section 5.2, we identify five key principles that would embody a strategic approach to emissions reduction for Hobart.

Approach to pathways and opportunities

In Chapter 5 we summarise emissions reduction opportunities and how they may be combined to offer Hobart a range of pathways to zero emissions.

It is important to recognise that the world will not stand still over the period from now to 2030 or 2040. Much future change can already be anticipated through current technological and cost trends, planned investments (eg, in electricity infrastructure), and the expected future impacts of existing policies (such as housing and buildings standards that will apply to future construction work). In particular, with the transition to an emission-free economy being not just a local or an Australian, but also a global phenomenon, the commercialisation of many zero carbon technologies, practices and systems will accelerate in coming years. This will likely ease the burden of transition, including in ways that are difficult to foresee today. At the same time, the hope of this outcome must not be used as an excuse for inaction today.

Emissions reduction pathways can be differentiated in a number of ways:

- differing degrees of leadership/ambition, aimed at achieving emissions targets ahead of schedule
- differing degrees of communication, advocacy, budget allocations, regulatory change and support for community action, and/or for policy change that would assist community action
- differing qualitative outcomes, such as ensuring that no-one is left behind, that those facing unusually high costs are assisted as required, and that all sectors contribute equitably to the overall abatement task.

The final sections of the report address the opportunities and prospects for each element of the inventory to reach zero in the near future. Sections 5.8 and 5.9 set out the most important, relevant and cost-effective emissions abatement opportunities. This analysis is driven by the inventory of Hobart's actual emissions, and proceeds sector by sector. While it

is not within our scope to review specific sites and sources of emissions, we do review the major drivers of emissions in each sector, what the outlook is for change in coming years, and where additional effort is likely to be required, beyond business-as-usual, or expected outcomes.

2. Context

2.1 Climate science

The Intergovernmental Panel on Climate Change (IPCC) prepares comprehensive Assessment Reports about the state of scientific knowledge on climate change. The reports are developed through a rigorous process of scoping, drafting and review, and approved by the 195 IPCC member governments. Below is a high-level summary of the relevant science, directly quoting or paraphrasing headline statements from the AR6 Synthesis Report {IPCC 2023c} to which the IPCC attributes "high confidence" or "very high confidence". We have added emphasis by highlighting parts that we believe are especially important.

Human activities, principally through emissions of greenhouse gases, have unequivocally caused global warming.

Widespread and rapid changes have occurred in the atmosphere, ocean, glaciers, and living systems. Human-caused climate change is already causing extreme weather in every region across the globe. This has caused widespread losses and damages to nature and people.

Some future changes are unavoidable and/or irreversible but can be limited by deep, rapid and sustained global greenhouse gas emissions reduction.

Humans can adapt, but only to an extent, which will be further limited by more global warming.

*Limiting human-caused global warming **requires net zero CO₂ emissions.***

All global modelled pathways that successfully limit warming to 2°C, involve *rapid and deep and, in most cases, **immediate greenhouse gas emissions reductions in all sectors this decade.***

*There is a rapidly closing window of opportunity to secure a liveable and sustainable future for all. **The choices and actions implemented in this decade will have impacts now and for thousands of years.***

Deep, rapid and sustained mitigation and accelerated implementation of adaptation actions in this decade would reduce projected losses and damages for humans and ecosystems, and deliver many co-benefits, especially for air quality and health.

Delayed mitigation and adaptation action would lock-in high-emissions infrastructure, raise risks of stranded assets and cost-escalation, reduce feasibility, and increase losses and damages.

Rapid and far-reaching transitions across all sectors and systems are necessary to achieve deep and sustained emissions reductions and secure a liveable and sustainable future for all.

Many options are available for reducing emission-intensive consumption, including through behavioural and lifestyle changes, with co-benefits for societal well-being.

Effective climate action is enabled by political commitment, well-aligned multilevel governance, institutional frameworks, laws, policies and strategies and enhanced access to finance and technology.

Carbon budgets

Australia's 'carbon budget' (the cumulative emissions that can be released while having a reasonable chance of staying below the 1.5° C warming limit) is expected to be exhausted in 5 – 6 years from now {CTP 2021}.

The global task, including for Hobart, is therefore to eliminate greenhouse gas emissions, and to do so as quickly as technically and economically feasible.²

Thus, the task of reducing emissions is far more urgent than is generally understood. Setting and achieving near-term goals that aim to achieve the maximum possible degree of emissions reduction in the shortest timeframe feasible, is more consistent with contemporary climate science than is the past practice of setting goals for 2050 and, because of this, failing to act with urgency now.

2.2 International context

In December 2015, over 190 countries (including Australia) approved the Paris Agreement. The Paris Agreement is a legally binding international treaty on climate change. Its goal is to limit global warming to well below 2, preferably to 1.5 degrees Celsius (°C), compared to pre-industrial levels. To achieve this long-term temperature goal, countries aim to reach global peaking of greenhouse gas emissions as soon as possible to achieve a climate neutral world by mid-century {UNFCCC a}.

While the 2015 Paris Climate Agreement importantly acknowledged that global emissions must reach net zero by 2050, this had the unfortunate side-effect of encouraging many countries, including Australia, to overlook the need for immediate emissions reductions. Instead, there was a focus on decades-long 'pathways' towards net zero emissions by 2050.

On 20 April 2023 the UN Secretary-General made the case for the urgency of stronger climate policies {UN 2023}:

"If governments continue with the same environmental policies currently in place, the world will become 2.8°C hotter by the end of the century, which would be 'a death sentence.'"

² Noting that sequestration may play a small role in this overall task.

He said the possibility remains, of limiting global temperature rise to 1.5°C:

“But only if the world takes a quantum leap in climate action. And that depends on you. We need global acceleration through cooperation. And that means rising above disagreements, differences and tensions.”

A key focus for both the United Nations Framework Convention on Climate Change (UNFCCC) and Intergovernmental Panel on Climate Change (IPCC) processes has been, from the start, the question of the moral obligation of the developed world – which has emitted the vast majority of cumulative global emissions since pre-Industrial times – to also lead both on the global abatement task and in meeting the major part of the costs associated with this task.

2.3 National context

Australia is a signatory to the Paris Agreement which came into force in 2016. Under the agreement, Australia must submit emissions reduction commitments known as Nationally Determined Contributions. Australia submitted its first NDC to the UNFCCC in 2015. An updated version was submitted in 2022. The update commits Australia to reducing its emissions to 43% below 2005 levels by 2030 and to net zero by 2050 {DCCEEW 2022 p.3}. However, these commitments fall well short of the UN’s call for ‘...rapid and deep and, in most cases, immediate greenhouse gas emissions reductions in all sectors this decade.’

The Australian Government’s Annual Climate Change Statement 2022 contains two projections {DCCEEW 2022, p.66}:

- a baseline emissions projection reflecting already-implemented policies or those where the detailed design is already complete, which achieves a 32% reduction in emissions on 2005 levels by 2030.
- a ‘with additional measures’ scenario, which incorporates the Safeguard Mechanism reforms and a national 82% renewable electricity target, achieves a 40% reduction in emissions on 2005 levels by 2030, still short of the current target.

The report notes that:

“To be on track for net zero by 2050, Australia needs to reduce emissions over the next eight years by a similar amount to what was achieved over the previous 18 years. This means the pace of emissions reduction needs to more than double. It also means emission reduction efforts must broaden across sectors.”

The Australian Government’s major initiatives in emissions reduction include:

- the recently amended [Safeguard Mechanism](#) which is intended to ensure Australia's largest emitters are contributing towards Australia's emissions reductions task.

- the [Emissions Reduction Fund](#) which offers “landholders, communities and businesses the opportunity to run projects in Australia that avoid the release of greenhouse gas emissions or remove and sequester carbon from the atmosphere.”
- The operation of the Australian Renewable Energy Agency ([ARENA](#)) and the Clean Energy Finance Corporation ([CEFC](#)) which support research and financing of renewable technologies.
- A recently released [National Electric Vehicle Strategy](#)
- [Climate Active](#): a voluntary scheme which encourages Australian businesses to become carbon neutral by awarding Climate Active Carbon Neutral Standard certification.

Overall, our view is – and the Australian Government’s own projections {DCCEEW 2022, p.66} show – that Australia is not on track to meet its 2030 target, even though that target falls well short of what the UN indicates the science demands. Therefore it must be considered almost certain that there will need to be further national policy development in the near future, to align Australia with other leading UN nations.

2.4 Tasmanian context

Tasmania’s climate policy and programs are managed through the Climate Change Office, Renewables, Climate and Future Industries Tasmania (ReCFIT) which sits within the Department of State Growth. Many of the initiatives are based on recent amendments to the Tasmanian Climate Act {TasGov2008}.

The Act as amended:

- Sets a target of net zero (or lower) greenhouse gas emissions from 30 June 2030.
- Provides a framework for the development of sector-based emissions reduction and resilience plans, including:
 - the first plan for transport emissions within 12 months,
 - first plans for all other sectors (energy; industrial processes; agriculture; land-use, land-use change and forestry; and waste) within 24 months.
- Sector based emissions reduction and resilience plans are to be updated at least every five years.
- Requires the development of a statewide climate change risk assessment (the first within two years and then every five years).
- Requires the Government to prepare and publish an annual greenhouse gas emissions report and an annual climate change activity statement.

- Requires a Climate Change Action Plan to be released within 12 months and then at least every five years. (Since the passing of the amendments the state government has released a draft Climate Change Action Plan 2023-2025 {ReCFIT 2023}.)

Separate to the actions under the climate change legislation the state government has released a number of other relevant policies although these are focussed more on industry development than on emissions reduction. These include:

- The Tasmanian Renewable Energy Target which sets a goal of doubling renewable electricity generation by 2040 {TRET 2020} {ReCFIT nd}
- Various initiatives related to the development of a renewable hydrogen industry including a Tasmanian Renewable Hydrogen Action Plan
- A draft Future Gas Strategy (the final strategy is expected to be release mid 2023).

See page 43 for suggestions on areas in which the Council could advocate to the State Government for stronger emissions reduction policies and possible areas of cooperation.

2.5 Hobart context

The City of Hobart first committed to climate action in 1999. The City reported a 19.9% reduction in its corporate emissions from 2010 to 2020, exceeding its target of 17%. This was in part achieved by energy efficiency improvements, which the City reported saving over \$1.2million in the 6 years to 2019-20 {CoH 2020}.

The City became the first Australian capital city to declare a Climate & Biodiversity Emergency in June 2019, to "affirm its commitment to future generations in addressing catastrophic climate change and biodiversity loss through its on-going policies, strategies and leadership" {CoH 2019}.

The Council endorsed the Sustainable Hobart Action Plan 2020-2025: towards zero emissions Hobart in November 2021. The plan lists the following targets:

1. By 2030, the City of Hobart will reduce its 2020 corporate greenhouse gas emissions by 20%.
2. The City will support the community to identify targets and actions by 2022 to reduce local greenhouse gas emissions.
3. The City of Hobart will achieve 100% net renewable electricity by 2040.

The plan includes a strategic goal to "create a path to a zero-emissions future for the City and community" but does not set a specific date for achieving zero or net-zero emissions.

The corporate target is not in line with the science and the community target needs to be set with the community to align to global city standards set by the Global Covenant of Mayors for Climate and Energy and CDP (discussed further in chapter 4. Setting targets).

In October 2021, the Council requested "the CEO undertake an assessment and provide recommendations on how the City will prepare for and strengthen its existing strategies, targets, practises and policies so that the City can assist in meeting the Tasmanian Government achieve net zero by 2030 target. That this assessment look broadly to harmonise and standardise our organisation's approach and consider our role operationally and as a policy maker including in planning, community development, waste, transport, corporate energy efficiencies and natural resources management" {CoH 2021c}.

In response to this motion, the CEO recommended development of a new Climate Strategy to enable an evidence-based and integrated response to climate change by the City and with the community. The recommendations build on the existing policy framework to support the City of Hobart to act in line with the declared climate and biodiversity emergency.

Other relevant City targets that contribute to the risks and opportunities of climate change include:

- Zero waste to landfill by 2030 {CoH 2016}
- Increase the canopy cover across Hobart's urban areas from 16.7 per cent to 40 per cent by 2046 {CoH 2017}

2.6 Emissions reduction plans in other jurisdictions

This section contains descriptions of the emissions reporting and emissions reduction targets and policies of selected leading cities. Selection was based on membership of the Global Covenant of Mayors and a level of ambition that could inform the City of Hobart's approach.

Generally, we advise against relying too greatly on precedents set in the past by other cities. The scientific advice about urgency of eliminating emissions has evolved rapidly in recent years – in part, because global emissions have continued to rise, rather than fall as required – so many cities have targets and plans that reflect longer term and less ambitious targets than are now required.

Wellington NZ

Wellington is the capital of New Zealand and has had an estimated population of 213,000 at June 2022. The city reports corporate emissions (Scope 1,2 & 3) of approximately 180,000 tCO_{2e} and city wide (Scope 1 and 2 only) emissions of 853,513 tCO_{2e}.

The Wellington City Council's "2022 Update: Te Atakura, First to Zero" {Wellington 2022} covers both city corporate and community emissions. It also covers adaptation and resilience as well as emissions reduction. Most policy areas (including Scope 3 emissions) are mentioned. A range of proposed policies and initiatives are documented, however the graphs on p.9 and p.11 illustrate the shortfall between current policies and the 2030 and 2050 targets.

The graph on p.12 shows that for corporate emissions, scope 3 emissions are 49.5% of total emissions. Page 12 explains some of the limitations of their calculation of scope 3 emissions.

Wellington City's reporting illustrates the value of measuring the full scope of emissions, even though some areas are difficult to calculate, and it is not always within the Council's ability to control.

"Wellington City has had targets of 80% emissions reductions by 2050 for both the city and the Council for a more than a decade. Those targets are no longer viable. The Council must go further, and in particular, it must go faster."

{Wellington 2019, p.28}

Newcastle NSW

The Newcastle LGA had a population of 155,411 at the 2016 census. The city's Climate Action Plan {Newcastle 2020} sets targets of Net Zero in corporate operations by 2030.

The aims for city operations include a 50% reduction in carbon emissions by 2025 and reaching Net Zero in operations by 2030. Aspirational goals for the wider city community include 30% reduction in city-wide emissions by 2025 and net zero from electricity by 2030.

Greater London UK

The Greater London area had an [estimated population](#) in 2016 of 8.8 million. Although clearly not comparable to Hobart in many ways, it has been included because of its comprehensive emissions reduction policies.

The report *Analysis of a Net Zero 2030 Target for Greater London* {Element 2022a} sets out four emissions reduction scenarios. In 2023 the Mayor adopted the 'Accelerated Green' scenario as the preferred policy {GLA 2023}. This policy is modelled to achieve a 78% reduction in emissions by 2030 relative to 1990 levels with remaining emissions offset to achieve net zero by 2030.

The Element report and the Greater London Authority (GLA) policy only addresses city wide emissions. There is no separate inventory of emissions from corporate operations by GLA or constituent boroughs. The policy covers scope 1 & 2 emissions, but the only scope 3 emissions reported in LEGGI {Element 2022b} are those "associated with the disposal or treatment of waste that is generated within the city boundary but disposed of outside the city boundary".

City of London UK

The City of London (aka 'the Square Mile') is one of 33 parts of Greater London. The Square Mile "counts around 8,000 residents, 513,000 daily commuters and 10m annual visitors."

Within the overall framework of the Greater London Authority, the Square Mile is administered by the City of London Corporation.

In 2020 the Corporation adopted an ambitious Climate Action Strategy {London 2020a} committing it to:

- “Achieve net zero carbon emissions from our own operations by 2027
- Achieve net zero carbon emissions across our investments and supply chain by 2040
- Support the achievement of net zero for the Square Mile by 2040
- Invest £68m over the next six years to support these goals of which £15m is dedicated to preparing the Square Mile for extreme weather events.”

The Corporation provides an interactive [Climate Action Dashboard](#) which gives access to actual and target emissions for its own operations (scope 1 & 2), its ‘Value Chain’ (scope 3) and for community emissions for the Square Mile (GCoM BASIC+ methodology).

Details of the strategy are set out in {London 2020b}.

Bristol UK

Bristol is a city of approximately 460,000 people in the Southwest of England. The Bristol One City Plan documents the year-by-year goals until 2050, across six different themes: Economy and Skills, Children and Young People, Transport, Homes and Communities, Environment and Health and Wellbeing {Bristol nd}. The [Climate page](#) provides a summary of initiatives related to climate change.

The city’s net zero by 2030 plan {Bristol 2019} is based on ‘virtually zero’ scope 1 and scope 2 emissions by 2030. The plan sees little scope for sequestration within the city and argues against relying on external offsets {p.22}. It addresses community wide emissions and does not separately address corporate emissions.

Amsterdam

The City of Amsterdam:

“aims to have decreased the city’s CO₂ emissions by 55% in 2030 and by 95% in 2050, compared to 1990. The city will move over to 100% sustainably generated energy. In 2040, Amsterdam will no longer use natural gas and we aim for all traffic to be emission-free as early as 2030. The municipal organisation will also be climate neutral by 2030.”

Details of the plan are set out in *Roadmap Amsterdam Climate Neutral 2050* {Amsterdam 2020}.

3. Measuring emissions

3.1 Overview of inventories

Greenhouse gas inventories (or 'emissions inventories', or simply 'inventories') are an essential tool for understanding, improving, and tracking progress over time of a given entity's impact on climate change. This entity may be an individual organisation, community, state, nation, or humanity globally.

An inventory is an accounting of the amount of global warming gases emitted to, and removed from, the atmosphere as a result of the activities of the given entity. This includes a broad range of activities, such as gas and electricity used in buildings; fuel used in vehicles; refrigerants leaked from equipment; methane emitted from livestock; carbon released from or captured by plants and soils as a result of changes to land use; methane emitted from the breakdown of solid waste in landfills and wastewater in treatment plants; and the emissions released elsewhere from the mining, processing, manufacturing, and transportation for goods and services used by the entity.

As part of this project, we were commissioned to review and comment on two inventories:

- **Community inventory:** This covers the emissions induced by activities undertaken by people who live in, work in, and visit the municipality.
- **Corporate inventory:** This covers the emissions induced by activities undertaken by the Council.

The corporate inventory is thus a subset of the community inventory (see Figure 2, p.10). For example, the community inventory includes the tailpipe emissions of all cars in Hobart, whereas the corporate inventory includes just those cars used to undertake the Council's operations.

Accurate inventories are essential for setting emissions reduction priorities and measuring performance over time. Development of accurate inventories is beyond the brief for this report. However, it was necessary to have a reasonably robust understanding of existing emissions in order to make recommendations on the opportunities that provide the greatest potential for reducing emissions. For this reason, we reviewed corporate and community inventories for Hobart prepared by others and recommended actions that the Council should take to improve the compliance and accuracy these inventories. We then composed best estimates based on those inventories.

3.2 Community inventory

Standards and scope

The City of Hobart is one of more than 12,500 cities that are signatories of the Global Covenant of Mayors {GCoM nd a}. GCoM specifies a reporting standard called the Common

Reporting Framework (CRF). The emissions inventory requirements in the CRF are consistent with the *Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories* {GHGP 2021a}, which is the most detailed and authoritative standard for community emissions reporting. It is more commonly known as the GHG Protocol for Cities (GPC).

The GPC specifies two levels of reporting:

- **BASIC** includes emissions that occur within the city boundary from energy, transport fuels, and waste; and emissions that occur outside the city boundary from electricity used in the city and waste generated in the city.
- **BASIC+** covers all of the BASIC sources as well as emissions that occur within the city from industrial processes and product use (IPPU); and agriculture, forestry, and other land use (AFOLU); and emissions that occur outside the city boundary from transboundary transportation and energy transmission and distribution.

BASIC has a reduced scope to accommodate cities in developing countries that do not have the capacity measure other emissions sources. The GPC states "where these sources are significant and relevant for a city, the city should aim to report according to BASIC+". Since transboundary transportation (especially aviation) is significant and relevant for Hobart, the city should aim to report according to BASIC+.

The cities that are leading in this space also report consumption-based emissions (i.e. upstream scope 3 emissions, see Appendix 1: Emissions scopes), which includes the embodied emissions of goods and services consumed by residents and organisations within the community, rather than only those due to activities occurring within the city boundary. This is important especially because most cities in developed countries are increasingly importing goods and services, which can appear to reduce their emissions, but in reality those emissions are being "offshored" to other (usually less developed) countries. For example, the ACT Government estimated that 94% of its community's emissions are scope 3 {ACTGov nd}.

Consumption-based emissions inventories enable cities to better understand their ability to contribute to emissions reduction activities beyond their city boundaries {C40 nd b}. However, estimating consumption-based emissions is currently quite labour-intensive and of limited accuracy. It is an active area of research, with better methodologies in development by leading cities.

In terms of transparency, the GCoM CRF specifies the following requirements:

- Local governments **shall** report activity data (in MWh, PJ, etc.) and emission factors for all sources of emissions, disaggregated by activity/fuel type.
- To the extent possible, all relevant activity data, data sources, methodologies, assumptions, exclusions and deviations **shall** be documented and reported. Such transparency is important to allow for review, replication of good practice to support consistent inventories over time and tackling challenges identified.

- Local governments **shall** ensure sufficient accuracy to give local decision makers and the public reasonable assurance of the integrity of emissions reported. Efforts **shall** be made to reduce uncertainties and make improvements over time.

Existing inventories

To date, three different community inventories have been developed for Hobart:

- STCA:** Community Energy and GHG Footprints, prepared by the Southern Tasmanian Councils Authority for 2006-07 and 2016-17 {STCA 2019a}.
- Hobart GCoM,** the Council reports for the Global Covenant of Mayors, prepared annually since 2016. The most recent inventory was for the 2020/21 financial year, submitted to GCoM in 2022. Only a high level summary is publicly accessible via the GCoM website {GCoM nd b}.
- Snapshot Climate:** A free online tool developed by Ironbark and Beyond Zero Emissions that produces community inventories for all LGAs nationwide using publicly available data. The website currently provides inventories for 2018-19, 2019-20, and 2020-21 {Snapshot nd}.

None of these approaches fully comply with BASIC+, and there are significant differences between both their approaches and their results. These differences are described in more detail in Appendix 2: Review of existing inventories. Overall, the Snapshot inventory is best, and is also quick and free. However, it is inaccurate for electricity and waste in particular and possibly also gas, omits aviation, and doesn't publish activity data or emissions factors.

Best estimate

We composed a best estimate inventory for the financial year to 30 June 2020 totalling 435 ktCO₂-e. The methodology is outlined on p.82.

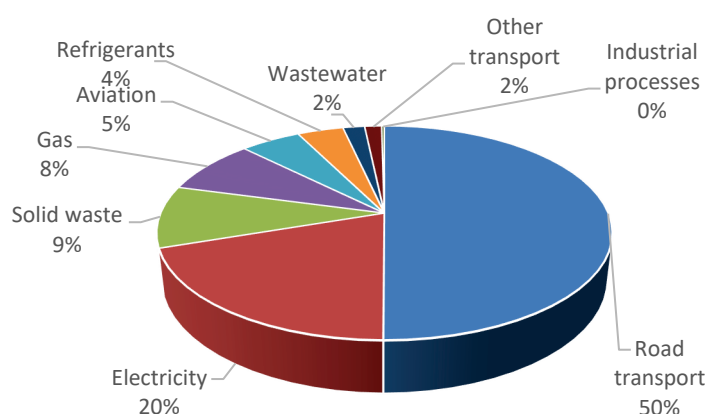


Figure 3: FY2020 Hobart Community GHG Emissions - Best Estimate

***R.1: Community inventory:** the Council should annually produce a community inventory that fully complies with GCoM / GPC BASIC+ and is open and transparent with activity data and emissions factors. Consumption-based emissions should be added to the inventory once better methodologies for this are available.*

We recommend negotiating with the developers of Snapshot Climate to:

- include more accurate activity data for electricity, gas, and waste
- add aviation emissions from airports that serve Hobart, attributed to LGAs on a defensible basis
- ensure underlying activity data and emissions factors are made public.

If these points cannot be negotiated, then Hobart should prepare its own community inventory annually. This is because the inventory is a critical indicator of progress towards targets over time, and there must be transparency in the preparation of this critical resource.

3.3 Corporate inventory

Standards and scope

The relevant standards for corporate inventories are the GHG Protocol's Corporate Standard and Corporate Value Chain Standard, and the Australian Government's Climate Active carbon neutral certification scheme standard.

The Corporate Standard was originally published in 2001. It requires reporting of scope 1 and scope 2 emissions, and leaves scope 3 emissions as optional. As greenhouse gas accounting expertise grew, so did the realisation that scope 3 emissions often represent the largest source of emissions for organisations and present the most significant opportunities to influence greenhouse gas reductions and achieve a variety of related objectives. As such, the Corporate Value Chain Standard was developed and published in 2011. It has since become widely used and is considered best practice.

Climate Active is the Australian Government's carbon neutral certification scheme. Inventory requirements are based upon, and very similar to, the Corporate Value Chain Standard. Climate Active also requires emissions reduction planning and implementation, as well as offsetting. 16 councils are certified Climate Active carbon neutral: City of Adelaide, Bayside City Council, Brisbane City Council, City of Darebin, Logan City Council, Maroondah City Council, City of Melbourne, Merri-bek City Council, Moonee Valley City Council, Mornington Peninsula Shire Council, Randwick City Council, City of Subiaco, Surf Coast Shire Council, City of Sydney, Woollahra Municipal Council, and City of Yarra. In Tasmania, the University of Tasmania is certified Climate Active, along with some SMEs.

Existing inventories

The City of Hobart has been publishing its scope 1 and scope 2 corporate emissions since 1999/2000. A few different methodologies have been used:

1. **Internal:** For corporate inventories up to and including the 2019/20 financial year, the Council developed the inventory in-house.
2. **SLT:** For the 2020/21 financial year inventory, the Council engaged Sustainable Living Tasmania (SLT) to develop its corporate inventory, under the instruction that the same methodology should be used as for previous inventories. SLT did this, but also presented an alternate methodology for solid waste emissions that complied with best practice.
3. **STCA:** For the 2021/22 financial year, the STCA developed the corporate inventory with some methodological changes.

None of these inventories comply with the Corporate Value Chain Standard, and there are significant differences between both their approaches and their results. These differences are described in Appendix 2: Review of existing inventories.

Best estimate

The SLT inventory is the best estimate available, which totalled around 40.9 ktCO₂-e for the financial year to 30 June 2020. Note that it excludes scope 3 emissions. We were unable to estimate these due to a lack of activity data.

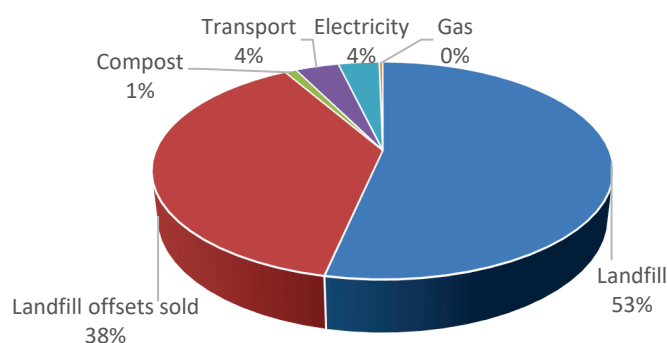


Figure 4: FY2021 Hobart Corporate GHG Emissions - Best Estimate (excludes scope 3 emissions)

***R.2 Corporate inventory:** The Council should continue annually producing a corporate inventory, with it brought up to full compliance with the GHG Protocol Corporate Value Chain Standard.*

Calculation methodologies, especially for waste, should be improved and checked by a third party for compliance with relevant standards.

An experienced consultant should be engaged to advise on best practice in estimating and reporting scope 3 corporate emissions. Inventory software solutions should be considered to streamline and improve the quality of future corporate inventories.

Improving inventories will be essential for tracking future progress but this should not delay commencing action on reducing emissions as soon as possible.

3.4 Climate-related disclosure

Emissions inventories are just one element of overall climate-related disclosure that organisations should undertake. Standards on what and how information relating to climate change should be provided by organisations have emerged in recent years from the financial sector. In 2017, the Taskforce on Climate-related Financial Disclosures (TCFD) released recommendations designed to help companies provide better information to support informed capital allocation {TCFD 2017}. The TCFD recommendations are structured around four thematic areas that represent core elements of how organisations operate: governance, strategy, risk management, and metrics and targets. The recommendations provide a structured framework for organisations to assess, disclose, and address climate-related risks and opportunities. As a result of widespread and rapid adoption, the International Sustainability Standards Board (ISSB, into which the TCFD will converge) was formed in 2021 to further develop sustainability-related reporting standards.

The Australian Government Treasury is currently undertaking a consultation process on the detailed implementation and sequencing of standardised, internationally-aligned requirements for disclosing climate-related financial risks and opportunities in Australia. The consultation paper references and is largely modelled on ISSB/TCFD standards {AusGov 2023}. While local governments are outside the regulatory scope of the proposed reform, Logan City Council {LCC 2023} and Blacktown City Council {BCC 2023} have made submissions advocating for the development of standards that can apply to public sector entities. We speculate that such standards are likely to be developed soon, and that they will be similarly modelled on ISSB/TCFD standards.

In addition to being prepared for such reforms, the City of Hobart moving to align with ISSB/TCFD standards would provide the following benefits:

- **Mainstream and operationalise climate considerations into the City's budgetary processes** and accelerate project approval by the finance department by presenting climate projects in financial terms.
- **Build understanding and a broad base of support for climate action** by more accurately quantifying the financial costs of inaction and the advantages of policies to mitigate and adapt to climate change.
- **Boost funding for climate action and reduce investment that is incompatible with a climate-safe future** by incorporating climate risk into financial plans, budgets and capital investments, making green projects (and funding gaps) more visible.

***R.3 Climate-related disclosure standards:** The City of Hobart should align its approach to assessing, disclosing, and addressing climate-related risks and opportunities with standards from the International Sustainability Standards Board (ISSB).*

A good starting point is the Guidance Note on the TCFD Recommendations for City, State, and Regional Governments {TCFD 2022}.

4. Setting targets

4.1 Existing City of Hobart targets

As discussed under section 2.5. Hobart context, the City of Hobart has the following targets:

1. By 2030, the City of Hobart will reduce its 2020 corporate greenhouse gas emissions by 20%.
2. The City will support the community to identify targets and actions by 2022 to reduce local greenhouse gas emissions.
3. The City of Hobart will achieve 100% net renewable electricity by 2040.

A recognition that these targets were not aligned with the need for action indicated by the latest climate science led to the commissioning of this report. This in turn will inform the development of a 2030 Hobart Climate Change Strategy.

4.2 Why set targets?

Emissions reduction targets play two distinct roles:

- As a statement of intent
- As a basis against which future achievements can be measured.

Several (somewhat opposing) arguments can be made against setting targets:

- It may be best to know the expected cost and effectiveness of measures to reduce emissions, before or at the same time as setting targets.
- Organisations and governments are not in control of many of the factors that will determine future emissions.
- If it is accepted that there is a climate emergency and that every available action to reduce emissions should be taken, longer-term targets can be seen as discouraging an immediate all-out effort.

As the reality of climate change becomes more and more apparent over time, and the chances of avoiding increasingly severe damage decline, there may be a temptation to believe that it no longer matters what emissions outcomes are achieved locally. However, as noted before, the more cities and places that react this way, the worse climate change will be for everyone. While climate-related damages are already being experienced in Australia and around the world, and these will unavoidably worsen over time, other damages *can* be mitigated, and the *degree* of future impacts can be reduced. The one critical strategy and focus for action is to reach (at least) zero emissions as quickly as possible.

After that, the focus will shift progressively to restoration of damages incurred, and adaptation of the built environment to limit the severity of future impacts. However, it is important to note that, so long as global emissions are not controlled and reduced to zero,

climate change damage will continue to accumulate and worsen. Attempting to adapt to continually accelerating climate change may prove impossible, or at least extremely expensive. This is why we stress that reducing emissions to zero must be the first priority.

Overall, SPR supports setting targets for the near term. If it is desired to set longer-term targets, such as for 2040 or beyond, then these must be accompanied by short-term targets as well, to avoid encouraging delay in taking action.

When setting targets, it is important to clarify:

- What base year is the target set against?
- The extent of the use of offsets (and their quality) envisaged as being used to meet the target
- The scope of the target, in particular whether it includes consumption-based (upstream scope 3) emissions.

Different targets may be set for corporate emissions (for which the City is largely responsible) and community emissions, where the Council can play a leadership and facilitation role, but is not directly responsible for decision making.

4.3 Science-based targets

The City of Hobart is a member of the Global Covenant of Mayors for Climate and Energy {GCOM} which is one of the partners in the Science Based Targets Network, which produced a report titled *Science-based Climate Targets: A Guide for Cities* {SBTN 2020c}. It defines “science-based” as “Aligned with Earth’s limits and societal sustainability goals” and “targets” as “Measurable, actionable, and time-bound objectives”.

The guide identifies three different science-based target setting methodologies. One, the Tyndall Centre's methodology, only includes energy-related emissions and so is not appropriate for HCC. Another is the C40's Deadline 2020 methodology {C40 nd}, which is based on since superseded science covered in IPCC's Fifth Assessment Report (AR5) in 2015. The third and best suited is the Alignment Method used by the One Planet Cities Challenge (OPCC) – a biennial competition organised by WWF to encourage climate action in cities {WWF 2023}. It is based on data from IPCC's 2018 Special Report on Global Warming of 1.5°C, often abbreviated to SR15 {IPCC 2018}. It has been applied to 280 cities participating in OPCC's 2021-2022 cycle.

The OPCC methodology requires *global* per capita GHG emissions to be reduced by at least half of 2018 levels by 2030; and to reach net zero on or before 2050. To reflect historical responsibility and capacity to affect reductions, cities' Human Development Indexes (HDI) are used to adjust 2030 reduction percentages. For Hobart, this results in a minimum 2030 target of 64% reduction in per capita emissions over a 2018 baseline.

These are the bare minimum targets that could be considered credible science-based targets. The methodology assumes the prescribed emissions trajectories are followed from 2018, which many populations – including Hobart – have not done. This means even faster reductions are now required to remain within the dwindling global emissions budget.

4.4 Leading targets in other jurisdictions

To be considered a genuine leader, the City of Hobart must be significantly more ambitious with its targets and back them up with serious action. Many cities have gone significantly further than the minimum science-based targets. CDP-ICLEI Track – the world's leading city climate reporting platform used by more than a thousand cities, including Hobart – includes a public database of emissions reduction targets that have been submitted by local governments {CDP 2022}. The database shows 24 cities spread across USA, Canada, Denmark, Sweden, Italy, UK, and Argentina that have committed to net zero community emissions by 2030 without using carbon credits.

In total, there are 161 cities in the database with targets more ambitious than the minimum science-based targets outlined above. Of these, 70 cities declared they will not use carbon credits. Only 38 said they plan to use carbon credits, 15 of those specifying the percentage of their target they planned to meet with carbon credits with a median value of 12%.

The CDP target database is not exhaustive. It is missing, for example, three of the most ambitious community targets set by councils in Australia:

- Bass Coast Shire's community target of net zero by 2030 {BCS 2020}
- City of Yarra's community target of net zero emissions by 2030 {Yarra 2020}
- Merri-bek's community targets of "75% emissions reduction by 2030 (against 2011/12 baseline), net zero by 2035, and drawdown ('negative emissions') by 2040." {Merri-bek nd}.

While these three cities' targets do involve some carbon credits, they focus strongly on emissions reduction, aiming to phase out use of carbon credits over time.

The targets discussed above are all for community emissions. As far as councils' corporate emissions targets go, 16 Australian councils have already achieved net zero corporate emissions through becoming certified carbon neutral under the Australian Government's Climate Active scheme (see p.28). The City of Yarra has a further corporate target of *gross* zero emissions (without offsets) by 2030 {Yarra nd}, as have other cities in USA, Canada, Sweden, and the UK.

4.5 Recommended targets

Community emissions targets

***R.4: Community emissions target:** The Council should propose and engage with the community on a science-based community emissions reductions targets of at least a 70% reduction in gross emissions by 2030 using a 2018 baseline; and zero emissions by 2040 at the latest.*

The scope of these targets should be BASIC+ as specified in the GHG Protocol for Cities (see p.28). When consumption-based emissions are added to the inventory (as per R.1) the scope of the target can be expanded to cover them using the same percentage reductions.

Note that the 2018 baseline will need to be established.

Reducing emissions to zero is required regardless of global population growth. In Hobart's case, where population growth is modest compared to some developing countries, there is no need, or ethical or economic basis, for adjusting targets to accommodate population growth. Indeed, to the extent that future population growth is expected, then this increases the urgency of reducing emissions, as population growth will increase pressure for emissions growth.

We have emphasised elsewhere the concern that, in the absence of near-term targets, longer-term targets can inadvertently distract from the need to rapidly reduce emissions now. For this reason, the main focus of the Council's planning should be on 2030 targets at the latest. Nevertheless, there is value in the Council expressing its longer-term ambition.

Corporate emissions targets

The same science and methodology, and therefore proportional reduction requirements, apply to the Council's corporate emissions. Corporate targets should be at least as ambitious as the community targets. The City could decide to play a leadership role in the community by setting more ambitious targets. This would be justified by the fact that the City has far greater control over its corporate emissions. For example, the Council can replace its entire passenger vehicle fleet with electric vehicles far more quickly than this can be achieved in the broader community.

***R.5: Corporate emissions target:** The Council should adopt a science-based corporate emissions reductions targets of at least a 75% reduction in emissions by 2030 using a 2018 baseline; and zero emissions by 2035 at the latest.*

The scope of the corporate targets should comprehensively include all direct and indirect emissions sources, as covered by the GHG Protocol Corporate Value Chain Standard (see page 28).

4.6 Fossil fuel targets

In response to the release of the AR6 Working Group 2 Report the Secretary-General of the UN issued a blunt warning {UN 2022} about the need for immediate action, including that:

“Fossil fuels are a dead end – for our planet, for humanity, and yes, for economies. A prompt, well-managed transition to renewables is the only pathway to energy security, universal access and the green jobs our world needs.”

There are widespread calls for rapid phasing out of fossil fuels (coal, oil products and natural gas), but also significant opposition to this. Of particular note, the Australian Government has consistently defended ongoing development of coal export developments. The Tasmanian Government has argued against phasing out gas use and opposed a proposed legislated amendment to rule out new fossil fuel exploration in Tasmania {Climate Tasmania 2023}.

Potential responses to this issue might be different for the Council and community emissions.

In relation to **corporate emissions**, the Council policy on fossil fuels could range from the following (in increasing order of ambition):

- Make no explicit statement on the role of fossil fuels and assess individual proposals just on their cost-effectiveness and potential for emissions reduction.
- Make a statement on the need to urgently reduce the use of fossil fuels, acknowledging that they need to be fully replaced (or offset) by 2040.
- Actively pursue the replacement of existing gas use where it is cost-effective. Replace existing use of liquid transport fuels where cost effective.
- Actively pursue the replacement of existing gas use and liquid transport fuels irrespective of cost.

In relation to **community** emissions, the Council policy on fossil fuels could range from the following (in increasing order of ambition):

- Make no explicit statement on the role of fossil fuels and pursue policies just on their cost-effectiveness and potential for emissions reduction.
- Make a general statement of intent to make Hobart fossil fuel free as rapidly as possible.
- Set a target year for Hobart to be fossil fuel free.
- Support all measures to electrify transport use (or replace with sustainable, zero emissions liquid fuels).
- Oppose the extension of gas reticulation in Hobart and oppose new gas-fired infrastructure in new developments and significant renovations.

Strong policies on rapid phase-out of fossil fuels in Hobart would increase the credibility of the Council’s advocacy to the Tasmanian and Australian governments on fossil fuel policy.

*R.6: **Fossil free policy:** The proposed 2030 Hobart Climate Change Strategy should set a date (eg, no later than 2030) to eliminate fossil fuel use from council operations; and state the intention to make Hobart fossil fuel free as rapidly as possible.*

4.7 True leadership

Hobart could truly become a climate leader by:

- Setting higher or earlier targets than those generated by the science-based target methodology, such as phasing out fossil fuel use in Council operations earlier than the science-based target requires.
- Setting a goal for Hobart to be a net exporter of renewable energy – this would align with the State Government's target of 200% renewable electricity, and would contribute to decarbonisation of Australia through exports that displace fossil fuel use in other states.
- Setting a goal to become climate positive – that is, having a net positive impact on the climate. This can be done by ensuring that there are net negative emissions from the Hobart LGA, through a combination of zero operational emissions, surplus renewable energy exports (as above) and/or net sequestration of carbon in soils and tree-cover.
- Supporting the efforts of other parties to also reach at least zero emissions. This may include regional councils, businesses that operating both in Hobart and in other locations, organisations that contribute to Hobart's scope 3 emissions (suppliers, service providers, airports, transport companies, etc)
- Setting new and leading standards for social inclusion and climate justice, as an integral part of Hobart's climate strategy, by ensuring that the benefits of the zero-carbon economy extend to (at least) all residents and businesses operating in Hobart. While much of the required investment will be undertaken by residents and businesses, a purely market-based approach will leave some behind, exposed to higher energy and mobility costs, poorer health outcomes and risks of mortality in extreme climate events such as heatwaves.

5. Emissions reduction pathways and opportunities

5.1 What a zero emissions Hobart looks like

Given it is clear the end goal is zero emissions, it is worthwhile outlining the likely characteristics of Hobart once it has achieved zero community emissions. Below is a summary of these characteristics, written in past tense from the future scenario in which Hobart has achieved zero emissions. Envisaging this future is useful in helping to identify necessary changes (eg, electrifying all vehicles), distinguish them from distractions (eg, using hybrid vehicles as a stepping stone from fossil vehicles to full battery electric vehicles when the latter are already available), and helping to identify the actions that The City of Hobart may undertake to accelerate necessary changes.

Transport

- The majority of powered vehicles are battery electric charged by 100% renewable electricity, with some vehicles fuelled with 100% green hydrogen or 100% biofuels. No vehicles use fossil fuels whatsoever. This includes road, rail, sea, and air transport of both of passengers and goods.
- People move around Hobart using more active transport, micro-mobility, and public transport than in 2023.
- Air travel is predominantly fuelled by 100% biofuels, with some flights made in battery electric aircrafts.
- Hobart City Council:
 - Led the way by rapidly transitioning to an all-electric passenger vehicle fleet, and progressively transitioning other plant as soon as non-fossil alternatives became viable.
 - Embedded Transit-Oriented Development principles across all scales of development in the city, reducing the overall need for transport and improving the effectiveness of public transport.
 - Improved active transport infrastructure to facilitate widespread uptake.
 - Facilitated electric vehicle charging solutions, including for residents and businesses without off-street parking.

Stationary energy

- The vast majority of Hobart's stationary energy needs are met by 100% renewable electricity, with much smaller contributions from wood, biogas, and 100% green hydrogen. No fossil fuels are used whatsoever. This includes residential, commercial, and industrial sectors for all end uses.
- Notably, all gas heaters, hot water systems, and cookers have been replaced with efficient electric equivalents: heat pumps, heat pump hot water systems, induction stoves, electric ovens, and electric fryers.
- Hobart's buildings are significantly more efficient than they were in 2023, making them more affordable to maintain at comfortable and healthy temperatures. Newer buildings are oriented north to benefit from free passive solar energy with eaves to provide

summer shade, and are well insulated, sealed, and ventilated. Older buildings have been retrofitted to the extent that this is cost effective over the medium to long term.

- Practically all buildings with suitable roofs have solar panels installed.
- Hobart City Council:
 - Led the way by replacing fossil gas with biogas for the Flame of Remembrance.
 - Rapidly electrified the other four gas-using assets they had in 2023³.
 - Improved energy efficiency across all sites.
 - Installed solar panel systems on all City of Hobart owned buildings with suitable roofs.
 - Introduced solar access regulations so that residents and businesses could invest with confidence in both passive and photovoltaic solar.
 - Banned (or advocated for a ban on) new gas connections.
 - Provided incentives (or advocated) for better passive solar design.
 - Provided means-tested subsidies for building retrofits.

Waste

- Hobart residents and businesses are careful to reuse materials and minimise waste; especially food waste.
- Practically all organic waste is composted or biodigested.
- Only a small amount of solid waste generated in Hobart goes to landfill. The landfill site is carefully managed to capture and utilise practically all the methane that is produced.
- Wastewater treatment plants that service Hobart capture and utilise practically all the methane that they produce.
- The City of Hobart:
 - Led the way by minimising waste from its own operations through sustainable procurement and reuse, including meeting its commitment to achieve zero waste Hobart by 2030.
 - Provided FOGO bins in public areas throughout the city.
 - Closed McRobies Gully landfill and rehabilitated the land.
 - Actively worked with Southern Waste Solutions to ensure practically all the methane produced at the Copping landfill is captured and utilised.
 - Ceased allowing the sale of offsets from methane capture at McRobies and Copping landfill sites.

Industrial processes & product use

- All heating, ventilation, and air-conditioning equipment; refrigerators; freezers; chillers; and heat pump hot water systems have been replaced or retrofitted with refrigerants that have negligible greenhouse warming potential.
- The City of Hobart:
 - Led the way by rapidly having all refrigerant containing equipment replaced or retrofitted with refrigerants that have negligible greenhouse warming potential.

³ Doone Kennedy Hobart Aquatic Centre, Mathers House, North Hobart Oval, and 62 Clare Street.

Land-use

- Bushfire risk is pro-actively minimised.
- Urban areas have significant tree coverage.
- The City of Hobart:
 - Led the way by planting and managing trees in parks and streets.
 - Pro-actively manages bushland to minimise bushfire risk.

Embodied emissions (other scope 3)

- Hobart residents and businesses prioritise low emissions products and suppliers.
- All materials used in Hobart are recycled or made using zero emissions technologies (such as ore reduction using 100% green hydrogen).
- The City of Hobart:
 - Led the way by measuring their corporate scope 3 emissions and minimising them by prioritising this in their procurement policies and processes.
 - Led the way by rapidly replacing the use of Portland cement with geopolymers for non-structural applications (eg, footpaths) and using alternative materials (e.g. engineered timbers) or low Portland blend cements for structural applications.

Co-benefits

- Since Hobart is one of the first cities to achieve net zero emissions, its businesses enjoy increased demand from customers all over the world seeking to minimise their own emissions.
- The Hobart community is recognised as a climate leader for genuine, measurable, and creative climate solutions.
- Significant tree coverage makes for beautiful urban spaces.
- People enjoy the mental and physical health benefits associated with greater uptake of active modes of transport.
- People are healthy from having better outdoor air quality due to less wood heaters and combustion engine vehicles, and better indoor air quality due to no gas appliances and less wood heaters.
- Homes and businesses are more comfortable and energy use is more affordable due to good passive solar design and insulation, and rooftop solar panel systems.

5.2 Strategic principles for emissions reductions

Hobart should be strategic about the nature and timing of its emissions abatement actions. This will enable it to maximise the impact of its efforts, make best use of its resources and opportunities and, at the same time, minimise costs to the Council and to the community. We identify five key principles that would embody a strategic approach to emissions reduction for Hobart.

1. Focus on the largest emissions sources in Hobart's emissions inventory – whether community or corporate emissions – and then move progressively to smaller

emissions sources. As discussed below, Hobart has a unique and atypical inventory, and this raises specific challenges and opportunities.

2. Adopt and promote strategies that have the potential to reduce these largest emissions sources to zero as rapidly and as cost-effectively as possible.
3. The Council has direct emissions as a corporate entity, and it demonstrates both responsibility and leadership to focus on reducing these to zero as rapidly as possible, and by 2035 at the latest. This will also ensure that the Council is not accused of calling for others to take actions if it were not willing to take those some actions itself.
4. The Council should ensure that *every* aspect of Council operations actively encourages, and does not present barriers to, emissions reductions by the Hobart community. Examples include planning schemes and provisions, protecting solar access,⁴ enabling properties without off-street parking to access electric vehicle (EV) recharging facilities, incentives created by the structure of Council fees, charges and regulations; and local infrastructure provision that encourages active transport/mobility.
5. The Council should undertake carefully targeted representations and advocacy, on behalf of the Hobart community, with all parties that have leverage and control over local emissions, notably prioritising the State Government and government business enterprises.

5.3 Specific issues related to emissions reductions

Before developing recommended pathways to meet targets, we address some overarching policy issues below.

Hobart's advantages and challenges in reaching zero emissions

Hobart, along with the rest of Tasmania, is blessed with significant renewable energy resources and virtually emissions-free electricity.⁵ Also there are – so far as we can ascertain – no large industrial emissions sites or sources within Hobart City's boundaries, as well as no significant agricultural activity. This is important, as some industrial and agricultural sites can present technical challenges in reaching zero emissions, and/or require significant investments to do so.

⁴ Solar access refers to the ability of houses or buildings to be as free as possible from over-shading that inhibits access to passive solar benefits (eg, sunlight in winter) or active solar benefits (sunlight reaching solar panels or hot water collectors).

⁵ Some emissions are effectively imported across Basslink, when Tasmania imports electricity from the mainland, although this effect will diminish as the emissions intensity of electricity on the mainland falls over the next 10 years or so. In addition, natural gas is occasionally used in Tasmania to generate electricity.

For the Hobart community, road transport represents half of all emissions, with electricity in second place at 20%, and waste and natural gas use as the other key emissions sources. For the ‘corporate’ emissions of Hobart City Council, waste-related emissions account for 92% of all emissions – see Figure 1. A key advantage here is that the Council is directly involved in the waste management process and can exercise at least a degree of control over emissions outcomes.

Turning to the Council’s corporate emissions, it was noted that these are dominated by waste-related emissions, and particularly operation at McRobies Gully. While there are emissions-capture technologies installed both in McRobies Gully and in the Copping waste facility (which is outside Hobart’s boundaries, but which accepts waste from within those boundaries), these do not – and may not in future – capture 100% of the emissions, even if there appears to be scope to *significantly* improve recovery rates. Therefore, it is possible that Hobart will need to sequester emissions at other sites to effectively offset remaining emissions, in addition to pursuing a circular economy and avoiding adding new organic material to waste sites in future.

Critically, the Council currently allows offsets generated at McRobies Gully to be sold, thereby allowing other parties to release additional emissions in direct proportion to the abatement that is achieved at this site. As a result, few if any emissions are abated, in net terms, from the whole of this activity. The practice of allowing the sale of offsets would need to change before the Council could claim net emissions reductions from this site, let alone reach zero emissions.

While transport and natural gas are smaller emissions sources for the Council, electrifying or otherwise eliminating these emissions would offer leadership while potentially also reducing operational costs, albeit – in common with other sectors that need to reduce emissions – there is likely to be an investment cost associated with this for the Council.

Electrification

Electrification of activities currently powered by fossil fuels presents the greatest opportunity to reduce emissions, especially in Tasmania because of the low emissions intensity of grid electricity. This includes:

- **Passenger and freight transport.** Replacing fossil petrol, diesel, and gas with electric vehicles immediately reduces greenhouse emissions and has the potential to eliminate them altogether as fossil electricity is phased out. Further, electric vehicles they are significantly more energy efficient and cheaper to run, and produce no tailpipe emissions thereby improving local air quality. Electric vehicle model availability has rapidly expanded beyond passenger road vehicles to include most vehicle types, including passenger and freight vehicles that travel by road, rail, water, and air.

- **Residential and commercial stationary energy.** Replacing fossil gas for heating, hot water, clothes drying, and cooking with electric heat pump room heaters, water heaters, and clothes dryers; induction stovetops; and other electric cooking appliances immediately reduces greenhouse emissions and has the potential to eliminate them altogether as fossil electricity is phased out. Further, these electric appliances are significantly more energy efficient, cheaper to run, and produce no indoor air pollution. Scientists have found that around 12 per cent of childhood asthma in Australia can be attributed to the use of gas stoves for cooking {Knibbs 2018}.

*R.7: **Prioritise electrification:** The proposed 2030 Hobart Climate Change Strategy should emphasise the importance of electrification, for both the Council and the community, and the Council should aim to rapidly electrify almost all of its assets. The Council should also run a public campaign encouraging electrification, backed by assistance for low-income households.*

The Council should aim to rapidly electrify all of its assets, with the lone exception of the Flame of Remembrance which should be switched to biogas or green hydrogen.

Advocacy

The City of Hobart can and does play a wider role in advocacy around climate change policy. Strengthening and carefully targeting its advocacy activities would help to position Hobart as a leader in emissions reduction and would help to target abatement opportunities for the Hobart community that are beyond the direct control of either the Council or the community.

In particular, direct advocacy on Tasmanian state government climate policy could be highly influential. The Hobart municipality comprises slightly under 10% of Tasmania's population, and the greater Hobart region (Hobart, Clarence, Glenorchy, Kingborough and Brighton LGAs) comprises 40% of Tasmania's population.

Advocacy and information sharing within Hobart

The emissions of the Hobart community as a whole are much greater than those directly attributable to the City of Hobart (see Figure 2, p.10). Some community emissions can be directly influenced by the Council's policy and actions; however, the Council also has an important role in advocating for emissions reduction activities by Hobart residents and organisations. The question is how extensive should this role be?

Given the wide range of sources of advice already available, the Council's information sharing activities should focus on those initiatives that are identified in the chosen pathway.

Advocacy and partnerships with the Tasmanian State Government

Opportunities for advocacy and partnerships with the Tasmanian State Government include (in roughly decreasing order of importance):

- Advocacy for measures that reduce the emission intensity of grid electricity consumed in Tasmania (see p.77 for explanation).

- Advocating for policies to encourage electrification in residential and commercial properties.
- Cooperation on the development of the Emissions Reduction and Resilience Plan for government operations (many aspects of which will have direct relevance to reducing the Council's corporate emissions).
- Advocating for the phase out of fossil fuel gas and identification of opportunities for the development of bio-methane and renewable methane for application that cannot be electrified.
- Advocacy on other Emissions Reduction and Resilience Plans:
 - The Transport plan will be relevant to both corporate and community transport emissions.
 - Reduction of emissions from cement manufacture (in the plan for industrial processes) could have a significant impact on scope 3 emissions for the Hobart community.

Advocacy and partnerships with the Australian Government

Opportunities for advocacy and partnerships with the Australian Government include (in roughly decreasing order of importance):

- Advocacy for stronger energy efficiency standards for new and existing buildings.
- Cooperation with the funding announced in the May 2023 budget for upgrades to the energy efficiency of homes and upgrades to social housing {Chalmers 2023}.
- Advocacy for more active policies in support of electric vehicle take-up.
- Advocacy for strengthening the integrity of ACCUs to ensure that the sequestration they support are additional, permanent and that they support biodiversity and social equity.

As an example, the Merri-bek 2040 Framework sets out priorities for advocacy to the state and federal governments {Merri-bek 2022a, p18-19}.

Partnerships with the Hobart community

Partnerships between the Council and the community will be crucial in reducing community emissions. A good example is The City of Adelaide's Carbon Neutral Adelaide initiative {CoA nd}.

Equity considerations

The project brief requires that we develop pathways that include “approaches that leave no-one behind”. We consider this to be an important objective, as there is indeed a significant risk that people may be left behind in a number of ways. For example:

- People may not be able to benefit from the ongoing financial savings from building thermal efficiency (eg, insulation), rooftop solar, and electric vehicles if they cannot afford the upfront cost or are renting and so find themselves in a split-incentive situation⁶. The Council can help people overcome these barriers by running something similar to The City of Adelaide's Solar Savers scheme. This involved the City of Adelaide providing advance funding for the purchase and installation of solar panel systems. A separate rate charged to the land enabled the systems to be paid off in quarterly instalments over a 10-year period. Note that the \$1.3B of funding for household energy upgrades announced in the Australian Government's 2023-24 budget {AusGov nd} could potentially be used to help implement a program of this nature.
- Another reason people may not be able to benefit from battery electric vehicles is if they do not have off-street parking to enable home charging. The Council can help people overcome this by facilitating charging solutions for on-street parking.
- Another reason people may not be able to benefit from solar panels is if they do not have a suitable roof. The Council can help people overcome this by running, seeding, or otherwise supporting community renewable energy initiatives, such as those run by Geelong Sustainability {GS nd}.

Equity considerations can arise in both the choice of opportunities to pursue (for example supporting EVs versus public transport) and in the detailed implementation of programs (for example having income eligibility conditions for subsidies). The former are taken into consideration in the choice of opportunities in the pathways described in section 5.8. The latter are at least as important but detailed design of program is beyond the scope of this project.

Zero vs net zero

As argued extensively elsewhere in this report, rapidly and deeply reducing emissions must be the highest priority. However, as the city gets closer to zero emissions, remaining emissions may prove harder and more expensive to eliminate. If emissions cannot be eliminated within the required timeframes, *net* zero emissions can be achieved by removing carbon from the atmosphere. Before we explore this further, some important terms must be clarified:

- **Sequestration** is the removal of carbon dioxide from the atmosphere through nature restoration. Sequestration can have other environmental benefits such as protecting biodiversity and endangered species through the restoration of natural habitats. If the land is within the City's geographic boundary, then the sequestration sits within the

⁶ This is where the upfront costs and benefits are unevenly split between the parties involved. For example, the benefits of solar or ceiling insulation generally flow to the tenant, but only for the duration of their tenancy. Tenancies are rarely long and secure enough to empower a tenant to make such an investment.

City's inventory as a negative emission (or 'removal'), directly reduces the City's net emissions, and is not considered an offset. If the land is outside the City's geographic boundary, then it is considered offsetting.

- **Insetting** is acting to reduce your suppliers' emissions. For example, the Hobart community could inset by helping the farmers that supply their food to reduce the emissions involved in producing that food. If such consumption-based emissions were included in the scope of Hobart's emissions inventory, then this would directly reduce the inventory. As such, this is not considered an offset.
- **Offsetting** is acting to reduce emissions that do not directly affect your inventory. For example, the Council could invest in the restoration of native forests outside the City's geographic bounds.

Local sequestration

There are three ways in which carbon could be sequestered within the city boundary:

- Increasing carbon storage in bushland areas within the council boundary
- Increasing tree cover in urban areas (street trees and parks)
- Encouraging increasing tree cover on private land.

The existing Hobart Street Tree Strategy {CoH 2017} provides a useful starting point:

This strategy recommends an aspirational target for canopy cover (the spread of trees over an area of land) for Hobart's urbanised areas of 40% by 2046, up from the existing coverage of 16.7%. {CoH 2017 p.8}

a medium to large deciduous tree sequesters in the order of 20 kg of CO₂ per annum. At this rate Hobart's street trees could be taking up to 185,000kg of CO₂/annum from city air each year {CoH 2017 p.20}

This is just 0.4% of corporate emissions, and 0.04% of community emissions. That these removals are small in comparison to overall emissions should not dissuade the City from pursuing street trees as they have myriad other benefits, including in relation to climate change by reducing urban heat island effects.

Encouraging increased tree cover on private land would also be of very limited scale and may also prove impractical.

Increasing carbon storage in bushland areas within the council boundary (Knocklofty, the Domain and parts of Wellington Park) is difficult and may be undermined by bushfire losses.

Offsets

Offset projects may involve avoiding emissions (eg, renewable energy, energy efficiency), or removing carbon from the atmosphere (eg, reforestation, ecosystem restoration).

The use of offsets to meet emissions reduction targets is considered controversial. Concerns include:

- **Delaying emissions reduction:** That the offsets will be used as a low-cost alternative to delay making genuine emissions reductions.
- **Additionality:** Do purchased offsets lead to any emissions reductions at all, or only – at best – swap one entity’s abatement for another’s emissions with a zero-sum gain? If the offsets are not in fact genuine, then net emissions could rise overall.
- **Permanence:** Will the offsets persist? This is of particular concern in relation to tree planting schemes and reductions in land use emissions.
- The **impacts on biodiversity** (particularly for land-based offsets), which can potentially be positive or negative.
- **Social justice:** Moved emissions problems from a rich country to a developing country may have adverse effects on vulnerable populations.

Certified offset schemes attempt to address these concerns; however, they generally fall well short. For example, the Australian Government's Emissions Reductions Fund has been heavily criticised for not ensuring reductions are additional {Macintosh 2022a,b,c}.

Even if strong compliance on the above criteria could be assured, there are further problems with offsetting. If the whole world is to reach net zero emissions, then opportunities to transfer emissions reduction from one project or location to another are at best temporary. Further, sequestration opportunities will be needed to draw down historical carbon emissions, rather than offset current emissions.

UN Environment climate specialist Niklas Hagelberg {UNEP 2019} notes:

“UN Environment supports carbon offsets as a temporary measure leading up to 2030, and a tool for speeding up climate action. However, it is not a silver bullet, and the danger is that it can lead to complacency...”

The ACT Government has taken a distinctive approach to the issue of offsets. They have chosen not to purchase external offsets and instead will invest a “social cost of carbon” equivalent to emissions from its operations into local emission reduction initiatives. They have also chosen not to include land-based carbon sequestration within their targets but will:

“... consider carbon sequestration as an additional measure where there are adaptation, economic or biodiversity co- benefits.” {ACTGov 2019 p.74}

The Sustainable Hobart Action Plan reports on consultation undertaken which, in relation to setting of targets says:

“In our consultation with the community, we asked whether you wanted us to set targets for greenhouse gas emissions and renewable energy use for the City’s operations, and for the community as a whole.

The response was resounding. Ninety per cent supported targets for the Council and 89% supported community targets.

- *We believe targets should be **real** and **achievable**.*
- *We also believe targets should be achieved by **local action, not by purchasing offsets** from corporations around the world.” {CoH 2021a, p.6}*

If the Council cannot reach its emissions targets without using offsets, we recommend investing in high-quality sequestration projects in Tasmania. This would allow for better control and accountability than those from mainland or overseas projects. It is important to recognise that offsets from Tasmanian sequestration projects on the [Emissions Reduction Fund \(ERF\) project register](#) are currently already completely bought up and may continue to be unavailable into the future.

Such projects require a very long-term commitment and are therefore a potentially expensive option. For example, trees planted must be managed to ensure they survive and lock up the offset amount of carbon for at least a century. If these trees were destroyed by fire at any point over 100 years, they would need to be replanted. Done well, such an activity could generate ecological and/or community benefits but would also involve ongoing costs every year. We recommend that, if sequestration is determined to form part of Hobart’s eventual emissions reduction pathway, that a careful due diligence study is undertaken in advance, to ensure that those high integrity standards can be met and maintained over time.

Generation of offsets

Notably, there are already two projects within the City of Hobart recorded on the Emissions Reduction Fund project register, the [Hobart City Council diversion of kerbside organics from landfill](#) and the [Hobart McRobies Gully Landfill Gas Abatement Facility](#). The former has no ACCUs issued; however, the latter has had 163,419 ACCUs (each equal to 1 tCO₂e) issued from its registration in 2014 to 2022/23.

Landfill gas projects have been one of the most criticised types of offset under the ERF, in part because many of them – McRobies landfill gas project included – existed years before ERF registration, and so should not be considered additional {Macintosh 2022a}. Further, while the Council’s landfill gas operator has been selling these offsets – giving their purchaser the ‘right to pollute’ – the Council has been simultaneously claiming the reductions from its own inventory. This double counting of emissions reductions contravenes basic carbon accounting standards and further undermines the integrity of offsets.

*R.8: **No sale of offsets:** The Council should urgently cease generating, or allowing its contractors to generate, carbon credits from its abatement projects.*

If this is not immediately possible due to existing contractual arrangements with its landfill gas contractor, the Council should purchase and voluntarily retire any carbon credits generated from the McRobies Gully Landfill Gas Abatement Facility.

The number of ACCUs issued for the McRobies landfill gas project varies each year. For the most recent complete year (2022/23), 10,552 ACCUs were issued. The value of ACCUs also varies over time. Over the past 12 months the market value has varied between \$25 and \$40 per ACCU, with it being \$32 at the time of writing. This puts the total annual value of ACCUs from the McRobies landfill gas project at around \$338,000.

5.4 Relationship between pathways and opportunities

In this section we identify the most important opportunities based on the actual emissions profile of the Council and the Hobart community. For broad areas of opportunity, we identify how this opportunity might be pursued based on two action pathways: Minimum Required Actions and Climate Leader.

We identify three pathways that could be further explored and quantified as Hobart moves towards decision-making in this key area:

1. A **Reference pathway** – including the myriad of changes that are expected to occur in any case, without new and additional effort on the part of the City of Hobart. Critically, however, and subject to quantitative analysis that is outside the scope of this project, it is unlikely that this pathway will achieve science-based targets.
2. A **Minimum Required Actions pathway** – that aims to ensure that science-based targets are met, with the least degree of cost, risk, intervention, advocacy, and leadership.
3. A **Climate Leader pathway** – that aims to at least achieve science-based targets, including for the community's Scope 3 emissions, and/or to achieve them ahead of schedule. This pathway actively embraces leadership by the City of Hobart to achieve climate justice and to ensure no-one is left behind.

The tables on pages 55 and 58 respectively identify both the major opportunities and how they might be pursued under the two scenarios. Starting on page 63 we describe these major opportunities.

5.5 Characterising pathways

Reference pathway

A Reference pathway will feature significant change and emissions reduction.⁷ The Australian Energy Market Operator (AEMO), for example, sets out detailed and evidence-based projections for many key variables – renewable energy uptake, EV uptake, electrification, economic and housing growth, etc – under a range of scenarios. AEMO's

⁷ Note that the scope of this project does not include quantifying the emissions outcomes expected under different pathways.

stakeholders overwhelmingly voted for a scenario known as *Step Change* as the most likely of all those detailed.⁸ This scenario would, for example, see renewable energy accounting for 82% of all electricity generation (across the whole of the National Energy Market or NEM) by 2030, rapid EV uptake, and rapid electrification. However, this pathway is not likely to enable Hobart to achieve science-based targets, subject to verification via quantitative modelling. Key outcomes that would be expected in Hobart under this pathway may include:

- progressive electrification of the city and community vehicle fleets
- state government targets such as its 200% renewable electricity being met
- progressive lifting of housing and building standards, and higher minimum energy performance standards for appliances, equipment and energy-using systems
- continued progressive moves towards zero waste, but offsets may continue to be sold from McRobies gully, leading to no or minimal net abatement from this facility
- while there may be no formal phase out of natural gas use in this scenario, it may also be that relative prices and other market-led phenomena lead to substantially lower gas use in future.

Minimum Required Actions pathway

A Minimum Required Actions pathway would aim to ensure that science-based targets for Hobart are (just) met. Offsets generated from Tasmanian sequestration, and that meet strict integrity standards, might be used to assist in achieving targets where this forms part of a least-cost solution. Outcomes additional to those in the Reference pathway above may include (but only to the extent necessary for meeting the targets):

- The Council allocating additional resources and/or leveraging additional support and partnerships for faster roll-out of EV infrastructure (including the state-owned public transport fleet) and for active transport infrastructure and associated behaviour change
- banning, or at least strongly discouraging, new gas connections
- working with others to implement a targeted electrification program for existing houses and businesses
- actively minimising methane emissions from McRobies Gully landfill through oxidation and capture, and ending the sale of offsets relating to this activity
- enabling the take-up of roof-top solar by low-income households and those in rental accommodation

⁸ See <https://aemo.com.au/en/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp>, viewed online 1/6/2023.

- encouraging and promoting the use of rooftop PV, and encouraging passive solar design, energy efficiency retrofits and other emissions-reducing initiatives in the community

Climate Leader pathway

A Climate Leader pathway would aim to generate additional benefits for Hobart by increasing confidence that science-based targets will be met, and aiming higher than the science-based targets, or achieving them earlier. This additional commitment, leadership and endeavour could deliver:

- reputational benefits for Hobart, helping with (clean or zero-carbon) investment attraction
- cost reductions for Council, households, and businesses (where faster abatement action is cost effective)
- greater certainty of achieving targets (allowing for unforeseen contingencies in future).

Actions under this pathway, additional to those above, might include:

- Rapid and active electrification of all fossil fuels used by the Council and in the community, whether in transport or stationary applications
- Ensuring that the benefits of electrification are accessed by the whole community, and not only those with higher incomes.
- Focused efforts by the Council to eliminate methane emissions from landfill (at McRobies Gully and any other sites at which the Hobart community's waste is disposed) as quickly as possible, through waste avoidance, diversion of organic waste from landfill, and active management of landfills to achieve maximum methane oxidation and capture, aiming to realise zero emissions by 2040 at the latest
- Reducing the Council's indirect or Scope 3 emissions to zero in line with science-based targets, and including the community's Scope 3 emissions within science-based targets
- No recourse to using offsets, even if investments to promote ecological and community benefits through improved landscape management are made; that is, targeting zero emissions by 2040, not net zero.

5.6 Economic and Social Implications

Reference pathway

As noted, the Reference pathway already involves change over time. These changes will be driven by new technologies, market forces such as changing relative prices of fuels and technologies; overseas, national and state policies; and the changing attitudes and preferences of Hobart's residents and businesses. Many of these changes will have economic and social implications. Subject to forecasting limitations, changes that are relevant to greenhouse gas emissions could be quantified in future analyses. Doing so would importantly create a baseline against which the economic and social implications of other pathways could be compared in a quantitative manner.

However, it is important to recall that the Reference pathway is not expected to achieve science-based targets, and care needs to be taken to avoid suggesting that meeting such targets is optional. This can be implied if costs associated with meeting these targets are described as 'additional to' those that are expected to occur in the reference case. Of course, Hobart should aim to minimise costs, but also not to shirk its responsibilities. In reality, the objective should be to reach zero emissions as rapidly as possible while minimising economic and social costs and at the same time maximising economic and social benefits.

The Minimum Required Actions and Climate Leader pathways offer differing visions of how science-based targets might be achieved, and of the future carbon-free Hobart that results from these pathways.

Minimum Required Actions pathway

Broadly, the Minimum Required Actions pathway would privilege economic outcomes such as least cost abatement (regardless of who benefits from this), and avoiding extra costs wherever possible, while still meeting science-based targets. There are risks for the community associated with this approach. For example, if access to EVs, rooftop solar, and home upgrades such as heat pumps and insulation, are key elements of a sustainable living lifestyle in Hobart in future, then those households that have greater wealth, that own their own homes, and that can actively manage their energy consumption, may do relatively well. At the same time, those households that are renting, living in apartments or other dwellings with relatively poor solar access, and/or that have low incomes, may be worse off than before.⁹ They may continue to use gas equipment and pay higher costs for this fuel as the gas industry depreciates past investments that are no longer commercial and passes the costs

⁹ This is sometimes referred to as 'the solar divide', highlighting the different outcomes for those who, and those who cannot access the benefits of solar energy (and, by extension, to other clean and sustainable technologies).

to fewer and fewer customers as wealthier households electrify. They may have to pay full retail prices for grid-based electricity, rather than benefiting from rooftop solar.

Science-based targets for Hobart might be met, under this scenario, through zero-emissions electricity being provided to the City, by electrification and other actions being taken by businesses, organisations, and households that can afford to do so, by abatement action by the Council with respect to its own emissions, and by any residual emissions (relative to targets) being offset by the Council or state, for example. Cost of living outcomes for households able to benefit from these strategies, and energy cost outcomes for businesses that can do the same, may be very attractive. However, these same low- and zero-carbon options may further disenfranchise those unable to similarly benefit, widening future income disparities. Note that in the future, having or not having will not simply be a matter of money. Even relatively well-off households may be disadvantaged if they are renting and their landlord refuses to invest in solar, if they have no driveway in which to park and safely recharge an EV, or if their dwelling is over-shadowed. Gaining access to the benefits of sustainable and zero-carbon systems may also require community-minded and social investments that actively seek to overcome the barriers noted.

Climate Leader pathway

Under the Climate Leader pathway, additional costs may be incurred by different parties to implement the actions required to achieve the societal benefits identified. Examples might include additional investment in active transport and/or electric vehicle infrastructure, additional direct or indirect costs at McRobies Gully associated with enhanced methane oxidation and capture. However, additional costs may not need to be incurred if innovative and leveraged solutions can be identified. Some examples include:

- New solutions that enable apartment-dwellers to access the benefits of solar energy are already being commercialised.¹⁰
- The Council might use its planning scheme or other regulatory powers or incentives to minimise over-shadowing risks and ensure equitable access to solar energy.
- Partnerships that leverage outcomes such as on-street EV charging infrastructure for those without driveways could bring commercial benefits for electricity and technology providers, enabling the service to be provided without additional costs to the Council or power users.
- Additional methane capture costs at McRobies Gully may be offset by additional (renewable) electricity sales from the site.
- EV- and active-transport-based micro-mobility hubs may enable last-mile freight costs to be reduced at the same time as emissions.

¹⁰ See <https://allumeenergy.com/au/>, for example, viewed online 1/6/2023.

- Other moves towards resource efficiency and energy independence may spawn new businesses, business models and new opportunities for upskilling labour to meet the needs of the zero-carbon economy.

These and other potential benefits and opportunities, and cost-mitigation opportunities, could be researched and quantified in more detail in future.

5.7 Pathway summaries

Community pathways opportunity mapping

Emissions source (descending order)	% of FY2020 Emissions	Key opportunities	Reference case expectations	Minimum Required Actions	Climate Leader
Road Transport	50.1%	Encourage electric vehicle uptake	Progressive but slow uptake of EVs, particularly before 2030 No or poor access to recharging in urban streets	Advocate for increased public charging infrastructure Add more charging facilities at City-controlled facilities – eg, carparks	Partnerships in place for rapid roll-out of in-street charging facilities, prioritising areas with little off-street parking Require provision in new buildings
Road Transport		Mode shifting	Continued but modest uptake of cycling, walking and public transport E-scooters	Protected cycleways Greater priority for pedestrians E-bike hire scheme Advocate for free electric and increased public transport	Car free zones or congestion charging
Electricity	19.8%	Rooftop PV residential and commercial	State 200% renewable electricity target Continued progressive uptake by homeowners with suitable roofs Emissions imported across Basslink fall to near zero by mid-2030s	Interest free loans PV installation paid for through council rates Subsidies for social and low income residences	City-initiated bulk purchase schemes Guarantee solar access in planning scheme Enabling access to community-based PV (and storage)
		Contract for zero emissions electricity	Minimal take-up. Larger users only and only if cost effective	City to investigate and promote to large users	Joint purchase arrangements between the Council and large users.
Solid Waste	9.4%	See Corporate table			

Emissions source (descending order)	% of FY2020 Emissions	Key opportunities	Reference case expectations	Minimum Required Actions	Climate Leader
Gas	8.3%	Electrification	Slow, progressive electrification due to market forces Disconnection costs capped by AER	Assistance provided for households and businesses on a needs basis	Effective ban on all new gas connections Plan with major gas users how to electrify all current gas uses
Aviation	5.1%	Low emissions aviation Transfer air travel to sea	Some uptake of electric aircraft, starting with light aircraft, then short-haul commuters.	Advocate for lower costs for commuters and tourists on Spirit of Tasmania Partner with TICT to promote carbon neutral tourism	Reducing community use of air travel largely beyond Council control
Refrigerants	3.9%	Replace with low/zero GWP refrigerants	Progressive but slow replacement due to installation of new chillers, and capture during a/c gas replacement	Leadership by example – City to adopt low GWP refrigerants Improve own maintenance practices Coordinate a campaign to mobilise households and businesses	Seek funding for a program of mandatory refrigerant replacement in all existing facilities Require low GWP refrigerants in all new installations
Wastewater	1.8%	Oxidation and methane capture from wastewater		Advocate with TasWater to improve oxidation and methane capture at wastewater treatment plants that service Hobart.	Form a commercial alliance with TasWater to improve oxidation and methane capture at wastewater treatment plants that service Hobart
Other transport	1.4%	Electrification of water transport Use of biofuels Green hydrogen			
Industrial process	0.2%	Replace insulator gases in distribution transformers	No change	Advocate for TasNetworks to replace SF6 with “G ³ ” gas or similar	Generate a commercial alliance to replace all SF6 with low/zero GWP gases

Emissions source (descending order)	% of FY2020 Emissions	Key opportunities	Reference case expectations	Minimum Required Actions	Climate Leader
Other Scope 3 emissions	Not yet quantified eg: Emissions embodied in construction materials such as bitumen, road base	Products and services from zero emissions suppliers Timber/timber laminate building products Geopolymer, low Portland blend, and magnesium-based cements Zero emissions metals	Progressive reduction in emissions- intensity of products and services used	Lead by example (see corporate table) and promote adoption in the community Behaviour change campaigns around circular economic principles	Run a program in partnership with businesses to accelerate the elimination of emissions from products and services through active supply chain engagement.

Table 1: Community pathways opportunity mapping

Corporate pathways opportunity mapping

Emissions source (descending order)	% of FY2020 Emissions	Key opportunities	Reference case expectations	Minimum Required Actions	Climate Leader
Landfill	53.4%	Waste minimisation Diverting organics from landfill to compost Improve efficiency of methane capture	Methane capture efficiency will improve as waste is increasingly transferred to Copping	Divert more organics from landfill to composting Encourage reduced organics to waste Initiate behaviour change campaign to achieve zero waste	Aim for 100% methane capture, or near to, for McRobies Gully
Landfill offsets sold	38.3%	Change contractual arrangements to cease sale of offsets		Cease when contracts expire	Pay to terminate contracts and/or purchase and retire ACCUs
Transport	3.6%	Passenger and other light fleet vehicles to EVs	Progressive but slow replacement as cost-effective	Accelerate fleet vehicles replacement Target for 100% fleet replacement	City staff to travel by Spirit of Tasmania
		Heavy vehicles to EVs or other low emissions technology	Progressive but slow replacement, particularly of heavy or specialised equipment		Set target date for total elimination of fossil fuels in heavy vehicles
Electricity	3.4%	Contract for zero emissions electricity	State 200% renewable electricity target	Purchase Greenpower	PPA with developer of new renewable infrastructure
		Embedded generation on council properties	Increases based on cost savings	Solar PV on all suitable Council properties	Explore potential for wind power within Council premises
Compost	1%	Biodigestion			

Emissions source (descending order)	% of FY2020 Emissions	Key opportunities	Reference case expectations	Minimum Required Actions	Climate Leader
Gas	0.3%	Biogas/green hydrogen		Convert Flame of Remembrance to biogas or green hydrogen	
Gas		Electrification		Electrify all other current uses	Eliminate gas use rapidly, as leadership by example Promote this solution to business, State Government and others
Scope 3 emissions	Not yet quantified	Products and services from zero emissions suppliers Timber/timber laminate building products Geopolymer, low Portland blend, and magnesium-based cements Zero emissions metals	Progressive reduction in emissions-intensity of products and services used	Prioritisation of no- and low-emissions products and services in procurement policy Use of geopolymer cement for non-structural applications (e.g., footpaths) Use of low Portland cement blends for structural applications.	Actively working with suppliers to eliminate or reduce emissions associated with their products and services.

Table 2: Corporate pathways opportunity mapping

5.8 Priority opportunities for reducing community emissions

In this section we describe in more detail the most substantive opportunities for reducing community emissions identified in the table on page 55. Descriptions are provided in the same order as the table (ie, with opportunities related to largest emissions first).

Opportunities in road transport

Encourage electric vehicle uptake

As described in the Reference pathway, the take-up of electric vehicles (EVs) is already accelerating. This is the result of both market forces and policy encouragement (both the Australian and Tasmanian government have policies designed to encourage this).

Because of the low emissions intensity of Tasmania's electricity, moving for fossil fuel powered vehicles to electric offers a larger and more immediate reduction in emission in Tasmania when compared to the mainland.

Policies the Council could take to accelerate community take-up of EVs include:

- Adding more charging facilities at City of Hobart controlled carparks.
- Requiring provision of EV charging in new buildings (especially apartment blocks).
- Facilitating access to on-street charging for those without access to off-street parking.

Examples:

Tasmanian Government [ChargeSmart Grants](#)

The Yarra Climate Emergency Plan proposes actions to increase take-up of EVs {Yarra 2020, p.73}

Mode shifting

Relying only on electric cars to reduce community transport emissions will not solve congestion problems. It also risks exacerbating social inequalities, since EVs have higher upfront costs but lower running costs and hence are less accessible to those without access to capital.

The Council already has a range of policies to encourage mode shifting (from private vehicles to public transport and active transport).

Both to reduce emissions and increase health and social equity additional action the council could take on mode shifting include:

- Streetscape improvements to foster active transport, including footpath upgrades, protected cycleways, and street trees.
- E-bike hire schemes (similar to the Council's current e-scooter program)

- Advocacy to the state government on increased (and electrified) public transport.

More direct (and more ambitious) policies to discourage use of private cars and incentivise mode shifting include:

- Car free zones
- Increasing parking charges, possibly through dynamic pricing
- Congestion charging

Programs of this sort will need to be carefully designed to minimise adversely affecting those who are unable to use active or public transport.

Examples:

The report on a net zero target for Greater London lists various policies to support modal shift and assesses their impact {Element 2022a, p.vii, p.58, p.64}.

Wellington Council (NZ) lists various initiatives to support modal shift, including bike network planning, e-scooters and council assistance with workplace travel planning {Wellington 2022, p.16}.

The Mayor of London's proposal on a net zero 2030 pathway assesses the impact of Introducing London-wide road user charging by the mid-late 2020s {GLA 2022, p.24}

The Merri-bek Action Plan sets out actions and potential collaborators and partners to facilitate mode shifting {Merri-bek 2022b, p.17-18}.

The Yarra Climate Emergency Plan proposes actions on public and active transport {Yarra 2020, p.71-72}

Opportunities in electricity supply

Rooftop PV residential and commercial

There are many existing examples of schemes to encourage residential and commercial uptake of solar PV. Type of schemes include:

- Advice and referral services
- Subsidy schemes for low income households (for example the Tasmanian No-interest Loan Scheme - NILS)
- **Rebates and interest free loans** such as [Solar Victoria](#) and the Tasmania [Energy Saver Loan Scheme](#).

Other examples:

[Solar Savers](#) is an initiative of 13 Victorian local governments. It helps households and businesses to install rooftop solar. It provides information on available rebates and a facility for getting quotes from selected solar suppliers.

[City Switch](#) is an initiative of the cities of Sydney, North Sydney, Melbourne and Adelaide. It assists businesses to reduce their emissions by providing information on best practice and allowing member businesses to connect with other similar businesses to share information.

[Solar My School](#) was an initiative of Waverly, Randwick and Woollahra Councils and now covers a range of other (mainly NSW) councils. It provides free independent support and guidance to primary and secondary schools looking to power their buildings with on-site solar.

[Smart Green Apartments](#) is a City of Sydney program which provides advice and arranges finance and upgrades for apartment buildings to reduce energy and water use.

Merri-bek Council provides grants of up to \$3000 towards solar panel installation or \$2000 towards insulation and draught proofing for [residents on a low income](#).

Of particular relevance at the municipal level are schemes which allow homeowners and landlords to install solar PV at no upfront cost and pay off the purchase through a rate levy.

Example: Darebin Council's [Solar Saver Rates Program](#)

More ambitious options include:

- Council organised bulk purchase schemes. Examples include [Hepburn Solar Bulk-buy](#), [Willoughby Council](#) (NSW)
- Providing for guaranteed solar access in the planning scheme to prevent buildings being overshadowed
- Initiating community battery and community owned solar PV.

Contract for zero emissions electricity

Details of the options for reducing emissions from purchased electricity are discussed in the corporate opportunities section (p.66). Council action on these opportunities could also provide leadership to larger businesses in the community. More ambitiously, the Council could take a lead in negotiating joint purchase agreements between Council, large businesses and developers of new renewable electricity generation.

Opportunities for reducing emissions from waste

Most of the Hobart communities waste is managed by the Council and discussion of opportunities for reducing emissions are in the corporate opportunities section (p.63).

Opportunities for reducing emissions from gas

The major opportunity for reducing gas usage, in both residences and businesses is to replace gas water and space heating with electric heat pumps (see the section on Electrification p.42).

Actions in support of this could include:

- Providing assistance to households and businesses on a needs basis (grants or interest free loans)

- Documenting and sharing Councils actions in electrifying heating loads.

More ambitious options include:

- Banning new gas connections
- Working with individual large commercial gas users to identify ways they can electrify heating loads.

Replacement of gas infrastructure should be part of a wider approach to building retrofits, including upgrading insulation.

Examples:

Around 9,000 Wellington NZ homes have received insulation through the Warmer Kiwi Homes initiative since 2011 {Wellington 2022, p.19}.

The Australian Government has allocated \$1.3 billion to establish the Household Energy Upgrades Fund and a further \$300 million to support upgrades to social housing (Chalmers 2023}.

Opportunities for reducing emissions from aviation

Reducing the community use of air travel and facilitating low-emissions aviation is largely beyond Council control. Possible advocacy activities include:

- Advocating for lower costs for commuters and tourists on the Spirit of Tasmania
- Partnering with TICT to promote carbon neutral tourism.

5.9 Priority opportunities for reducing corporate emissions

In this section we describe in more detail the most substantive opportunities for reducing corporate emissions identified in the table on page 58. Descriptions are provided in the same order as the table (ie with opportunities related to largest emissions first).

Opportunities in landfill and waste reduction

Emissions from waste (most notably methane not captured at McRobies Gully) is the most significant source of corporate emissions. Four major opportunities will need to be combined to achieve zero emissions from waste:

- **Cessation of the sale of offsets from methane capture.** See page 48 for explanation and recommendations.
- **Waste minimisation:** Reducing the overall amount of waste generated is already a priority for the Council. In addition to Councils public education activities on this, support could be given to community activities promoting a circular economy and re-use. To affect landfill methane emissions, reducing food waste is especially important. Council could run behaviour change programs to assisting residents and grocery and

hospitality businesses to minimise food waste and separate food waste into FOGO bins.

- **Diverting organics from landfill:** Methane emissions from landfills arise from anaerobic decomposition of organic matter. Diversion of this organic material *before* it gets to landfill is more effective than attempting to capture the methane from landfill. Additional work is required to ensure that the Council's existing FOGO system is expanded to all businesses and public spaces, and that collected material is digested aerobically and re-used.
- **Carefully managing landfills to minimise methane emissions:** A range of operational practices can promote methane oxidation in cover soils. Any remaining methane produced can be captured and utilised to generate renewable electricity, with further operational practices used to maximise capture efficiency. Achieving high methane reductions requires careful, site-specific planning, design, and ongoing management. A technical study is required to identify specific changes and their likely effectiveness in reducing methane emissions.

If waste ceased being added to McRobies today, the rate of methane emitted would gradually decrease over time, but our best estimate is that in 2040 it would still be around 40% of today's rate of emissions. This means that, if and when McRobies landfill is closed, it must continue to be actively managed. At some point – perhaps sooner than later – careful rehabilitation of the site will be the best option to minimise, and hopefully even eliminate, methane emissions from the site.

It is important to note that, if the Council arranges to have waste that is generated in the city disposed at landfills outside the city, the emissions that result from that waste are still part of both the corporate and community inventories. All of the above four strategies would still be equally relevant, although the Council may not have as much control over their implementation.

*R.9: **Minimise methane emissions from landfill:** The Council should commission a technical study into how methane emissions from the McRobies landfill facility can be minimised in the short-term and eliminated as quickly as possible thereafter. Any landfill site to which waste is to be disposed in future should be carefully designed, operated, and maintained to keep methane emissions to an absolute minimum.*

An excellent starting point is the report Key Strategies for Mitigating Methane Emissions From Municipal Solid Waste {RMI 2022}, which includes tables of recommendations for designing, operating, and maintaining landfills, implementing landfill covers, and monitoring methane emissions (Exhibits 15 through 18, pp. 47-50).

Methane is also emitted from wastewater. The basic principles are the same for solid waste management: Methane can be minimised through aerobic processes, and any remaining methane can be captured and utilised or destroyed. However, the technical and operational

details differ. Eliminating these emissions requires a partnership with TasWater, which is responsible for processing all of Hobart's (and most of Tasmania's) wastewater.

Opportunities in transport

Road transport is the largest contributor in Hobart's community emissions (50.1%) but only a small fraction (3.6%) of corporate emissions. However, there is strong synergy between the two. Council actions can remove some of the barriers to EV ownership and its own purchases can act as an example to the community. In addition, the Council's fleet purchases will, over time, increase the supply of second-hand EVs for the community. Fleet purchases can significantly increase the range of EV models available.

Passenger and other light fleet vehicles to EVs

Actions the Council could take to reduce emissions from its own light vehicle fleet include:

- Accelerating the conversion of its light vehicle fleet to electric, or more ambitiously, setting a target date for total fleet replacement.
- Negotiating joint EV fleet purchases with other government and business fleet owners.

Cost: Selective replacement of heavily used vehicles with EVs is likely to save money. Early replacement of the whole Council fleet would involve additional up-front cost.

Examples:

Wellington (NZ) Council has a program to replace all the light passenger vehicles in its fleet with EVs by 2025, and all SUVs, vans and utes EV by 2030 {Wellington 2022, p.23}

The City of Adelaide plans to "Integrate at least 75% electric vehicles into the City of Adelaide light passenger vehicle fleet by 2025 as cost effective and fit-for-purpose models become available, as a Foundation Partner of the SA Electric Vehicle Fleet Pledge." {CoA 2023, p.6}

The Yarra Climate Emergency Plan proposes actions to increase low emissions vehicles in the Council's light and heavy vehicle fleets {Yarra 2020, p.74}.

Heavy vehicles to EVs or other low emissions technology

Action the Council could take to reduce emissions from its heavy vehicles include:

- Investigating and trialling various low emissions options for heavy vehicles (biodiesel and hydrogen as well as electric).

Opportunities for reducing emissions from electricity

Despite the fact that Tasmania's electricity generation is largely renewable, emissions from electricity use still make a significant contribution to Hobart's emissions (19.8% of community emissions and 3.4% of corporate emissions). The reason for this is explained on page 77.

Although emissions from electricity are significant, conversion of transport and stationary energy uses from fossil fuels to electricity provides significant emissions reduction benefits as well as running cost advantages.

As described on page 49, the emissions intensity of electricity is expected to reduce over time irrespective of action by Council. The question arises then as to whether Council should take action to further reduce the emissions intensity of electricity used by Council and the community and/or assist the community to overcome certain barriers to accessing solar.

Contract for zero emissions electricity

There are two ways the Council can reduce the emissions from electricity it purchases from the grid:

- **Greenpower:** Purchasing [Greenpower](#) (or purchasing and retiring Large-scale Generation Certificates (LGCs) which is effectively the same thing) ensures that 100% of the electricity comes from renewable generation built since 1997, but is not associated with particular generation assets.
- **Contracts for zero emissions electricity:** The most common arrangement is a Power Purchase Agreement (PPA). If the power purchase agreement facilitates the construction of new renewable generation this has the advantage of a tangible new asset as well as emissions reduction.

Costs: Greenpower generally has a price premium over normal grid-purchased energy. PPAs (which, if they involved variable renewable generation, would need to include firming contracts) may cost more than grid-purchased energy, but this would only be ascertained by negotiating with individual suppliers.

Cobenefits: Facilitates development of new renewable electricity infrastructure.

Examples:

[ACT Reverse Auctions](#)

The [Victorian Renewable Energy Target auction](#) (VRET2).

The City of Melbourne has provided a [guide to buying off-site renewable energy](#).

The [Melbourne Renewable Energy Project](#) (MREP1) facilitated the purchase of renewable electricity from the Crowlands Wind Farm for a number of organisations including the cities of Melbourne, Moreland and Yarra.

Embedded generation on council properties

The Council has already installed a significant amount of solar PV on its various premises.

Further action the Council could take includes commissioning an investigation of the potential for increasing the amount of solar PV on Council properties and funding these prioritised according to pay-back time.

Costs: Should save money over time.

Cobenefits: Highly visible demonstration of Council commitment to reducing emissions.

While solar PV is a more straightforward option than wind power, a most ambitious pathway to reduce emissions would include investigating the potential for wind power on Council properties.

6. Conclusion

Climate science makes it clear that all available measures need to be taken to reduce greenhouse gas emissions as rapidly as possible. Practical and moral considerations suggest that wealthy countries and cities such as Hobart should be taking a leading role in driving this action.

While the necessity of urgent action is unarguable, the nature of the Council's *response* to this scientific reality, and the degree and timing of its actions, are legitimately determined by the Council itself, in consultation with the community.

We have recommended various improvements to the inventories used to track corporate and community emissions. Implementing these will be useful for tracking future progress but this should not delay commencing action as soon as possible.

In the chapter above we have mapped out possible actions based on two levels of ambition and urgency, however it is open to Council and the community to mix and match the actions and programs that combine emissions reduction with cost-effectiveness and community support.

Many actions the council can take have benefits other than emissions reduction. At an absolute minimum, Council should act urgently on those actions that are cost-effective, significantly reduce emissions and offer other benefits.

However, Hobart council and community can demonstrate real leadership (and reap additional benefits) by going well beyond this minimum. To use a well-worn catch cry "If not now, when? If not us, who?"

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Appendix 1: Emissions scopes

Emissions scopes is an important concept in carbon accounting. Emissions sources are classified as scope 1, scope 2, or scope 3 depending on the relationship of the emissions source to the reporting entity (nation, community, or organisation). This is done to allow entities to quantify all of the emissions they are directly or indirectly responsible for, while ensuring emissions from multiple entities can be added together in a way that avoids double counting.

Scope 1 emissions

Scope 1 emissions are those that occur directly from equipment or land controlled by the entity. For example, emissions from the exhaust pipe of a car owned by the Council are classified as the Council's scope 1 emissions.

Scope 2 emissions (electricity)

Scope 2 is a special category of indirect emissions specifically made for electricity, due to its importance in driving emissions. Scope 2 emissions are those that occur at power plants as a result of electricity used by the entity. Emissions that occur at a gas or coal fired power station in Victoria to make electricity that the Council uses in its buildings are the power station's scope 1 emissions and City's scope 2 emissions.

Standardised methodologies are used to attribute the direct emissions that result from power stations in one state to electricity consumers in other states, factoring in how much energy is traded between the states. By exporting zero emissions electricity from Tasmania to Victoria and importing higher emissions-intensive electricity from Victoria to Tasmania, Basslink effectively lowers the 'emissions intensity' of grid electricity in Victoria, while increasing it in Tasmania.

As a result, while Tasmania generates about as much renewable electricity as it consumes, due to the above methodology, any two-way flow across Bass Strait increases the emissions attributed to Tasmanian electricity use. This means that even if the Tasmanian Government's legislated target of 200% renewable electricity {TRET 2020} is achieved it will not reduce the emissions attributed to Tasmanian electricity use under accepted methodologies. In fact, the opposite may be the case. If Marinus link and Hydro Tasmania pumped storage is built there is likely to be more two-way flows and hence an increase in the emissions intensity of Tasmanian electricity use until such time as emissions intensive electricity generation in Victoria is replaced by renewable generation.

This applies only to electricity purchased from the grid. If the Council or the Hobart community increase their use of on-site solar PV this will reduce grid purchased electricity and hence actual as well as calculated emissions. Other mechanisms for reducing emissions from purchased electricity (PPAs and purchase of Greenpower) are discussed on page 66.

Scope 3 emissions

Scope 3 emissions are emissions that occur indirectly, either up or down the supply chain, as a result of the entity's actions. These occurring up the supply chain are also known as "embodied emissions" or "consumption-based emissions". For example, emissions from a factory used to make the paper that the Council uses in its offices are the paper manufacturer's scope 1 emissions and the Council's scope 3 emissions¹¹. A prominent example of downstream scope 3 emissions is those occurring from waste that is generated by the entity but disposed of by another entity. For example, the emissions that result from any waste that the Council sends to Southern Waste Solutions' (SWS) Copping landfill are SWS's scope 1 emissions and the Council's scope 3 emissions.

Scope 3 emissions from waste

As noted on p.25, scope 3 emissions from waste are required to be reported in the GCoM methodologies.

Consumption-based community emissions (upstream scope 3 emissions)

The cities that are leading in this space also report consumption-based emissions (i.e. upstream scope 3 emissions), which includes the embodied emissions of goods and services consumed by residents and organisations within the community, rather than only those due to activities occurring within the city boundary. This is important especially because most cities in developed countries are increasingly importing goods and services, and appearing to reduce their emissions, when in reality those emissions are being "offshored" to other (usually less developed) countries. For example, the ACT Government estimated that 94% of its community's emissions are scope 3¹².

Consumption-based emissions inventories enable cities to better understand their ability to contribute to emissions reduction activities beyond their city boundaries¹³. However, estimating consumption-based emissions is currently quite labour-intensive and is of limited accuracy. Our recommendations on estimating and reporting on scope 3 emissions (other than those from waste) are on page 28.

¹¹ The total emissions from the paper manufacturer are allocated as Scope 3 emissions to all end consumers according to their proportion of consumption of the total product manufactured.

¹² <https://envcomm.act.gov.au/latest-from-us/acts-scope-3-greenhouse-gas-emissions/>

¹³ <https://resourcecentre.c40.org/resources/consumption-based-ghg-emissions>

Appendix 2: Review of existing inventories

Community inventories

To date, three different community inventories have been developed for Hobart:

- 4 **STCA:** Community Energy and GHG Footprints, prepared by the Southern Tasmanian Councils Authority for 2006-07 and 2016-17 {STCA 2019a}.
- 5 **Hobart GCoM,** the Council reports for the Global Covenant of Mayors, prepared annually since 2016. The most recent inventory was for the 2020/21 financial year, submitted to GCoM in 2022. Only a high level summary is publicly accessible via the GCoM website {GCoM nd b}.
- 6 **Snapshot Climate:** A free online tool developed by Ironbark and Beyond Zero Emissions that produces community inventories for all LGAs nationwide using publicly available data. The website currently provides inventories for 2018-19, 2019-20, and 2020-21 {Snapshot nd}.

While all of these approaches claim consistency with GPC, there are significant differences between both the approaches and the results. These differences are described in more detail below.

Those inventories are assessed below by the following criteria:

1. Scope
2. Data quality
3. Calculation methodology
4. Transparency
5. Cost

Scope

The Snapshot Climate inventory is the most complete; complying with BASIC requirements, and only missing aviation from BASIC+ requirements. The inventory excludes aviation because emissions from the airports that service Hobart are incorrectly attributed entirely to Clarence as the council within which the airports are physically located¹⁴. In a meeting with the Snapshot Climate developers, they indicated that they could add the functionality of attributing aviation emissions to surrounding LGAs, probably involving the Council engaging them for a fee.

¹⁴ The standards are clear in requiring emissions from flights departing airports that serve a city, even if the airports are not in the geographic boundary of the city. GPC includes the case study of how international airports located outside London's city boundary are apportioned to London.

The Council GCoM inventory excludes biological treatment of waste and wastewater, both of which are mandatory for BASIC and GCoM compliance. It also excludes industrial processes, product use, livestock, and land, all of which are required for BASIC+ compliance; however, it can be argued that emissions from these sources are not occurring (or are negligible) in Hobart.

The STCA inventory is similar in scope to the Council GCoM inventory, with the following differences:

- It also excludes solid waste, which is mandatory for BASIC and GCoM compliance.
- It excludes aviation, which is required for BASIC+.

None of the inventories include other scope 3 emissions, which are optional under GCoM and GPC standards.

Data quality

The GCoM documentation states that the most preferred to least preferred sources of activity data are:

- 1) Real activity data disaggregated by sub-sector
- 2) A representative sample set of real activity data from surveys
- 3) Modelled data
- 4) Incomplete or aggregate real activity data
- 5) Regional or national fuel consumption data scaled down using population or other indicators.

The STCA inventory utilises the most preferred type of activity data for electricity, but the least preferred for everything else.

The City GCoM inventory uses the most preferred type of data for electricity and solid waste disposal, and the least preferred for everything else.

The Snapshot Climate inventory relies almost solely on the two least preferred types of activity data; however, in a meeting, its developers indicated that they will, for no fee, integrate the most preferred data types for electricity and waste provided those data can be made available to them. We recommend the Council facilitates this.

Calculation methodology

The STCA and the Council GCoM inventories downscale statewide data using a simple per capita approach. Snapshot Climate downscales in more sophisticated ways by drawing upon additional contextual data such as the number of households, socio-economic index, building approvals, and jobs numbers in relevant sectors/industries. For residential emissions, it can be argued that this additional sophistication is unnecessary – that a simple per capita downscaling is sufficient. However, this is not the case for industrial emissions, where a small

number of very large emitters skew the results considerably. Snapshot Climate tackles this by drawing upon NGER data to allocate these large emitters to the correct municipalities, and the remainder is allocated using additional data such as job numbers in relevant sectors.

Close attention must be given to solid waste emissions. The Council GCoM and STCA inventories have calculated emissions after landfill gas capture; however, the landfill gas operator has generated and sold ACCUs for at least some portion of the landfill gas captured, and it contravenes basic carbon accounting standards to count these reductions twice.

Transparency

The Snapshot Climate inventory is publicly available and the methodology behind it is documented in great detail¹⁵ and uses all publicly available data sources. Unfortunately, the underlying activity data is not provided. Underlying data is required by GCoM and would also be useful for planning and evaluating emissions reduction efforts. However, in a meeting with Snapshot Climate's developers, they indicated it will be possible to access this information, probably with a fee attached. We recommend the Council investigate this further.

Only a very high level summary of the Council GCoM inventory is publicly available via the GCoM website¹⁶. The methodology is not publicly available. In the report submitted to GCoM, there are minimal notes on methodology in the inventory table. The Council could publicly publish its full GCoM inventory but has not done so to date.

The STCA inventory is publicly available via the STCA website. While the reports cite sources of activity data and emissions factors, the methodology used to calculate emissions is not described. There is a methodology document {STCA 2019b} that provides a broad overview, but this is not publicly available.

Cost

Snapshot Climate is free to use, and the inventory can be generated within seconds.

The costs of the City GCoM and STCA inventories are unknown, but it would appear a significant amount of labour goes into them.

Results

The Hobart GCoM inventory appears to contain large transcription errors. There are two markedly different versions: (1) that submitted through the GCoM webform, and (2) the spreadsheet used to calculate the values upon which the GCoM submission is based. They are herein referred to as the **Hobart GCoM webform** and **Hobart GCoM spreadsheet** inventories respectively.

¹⁵ https://snapshotclimate.com.au/media/jc_media/2022/12/22/CIU_SNP_005_Methodology_v1a.pdf

¹⁶ <https://www.globalcovenantofmayors.org/cities/oceania/australia/hobart/>

We composed a **best estimate** inventory by selecting for each emissions source the value from the inventory that had the highest quality source data and methodology. Aviation was one exception; because none of the inventories had a satisfactory methodology, we took Snapshot's estimate for Hobart airport and distributed it between LGAs served by the airport on a per capita basis. Solid waste was the other exception, where SLT's estimate from the corporate inventory was used.

The best estimate inventory is compared with Snapshot and City of Hobart GCoM inventories in Figure 5.

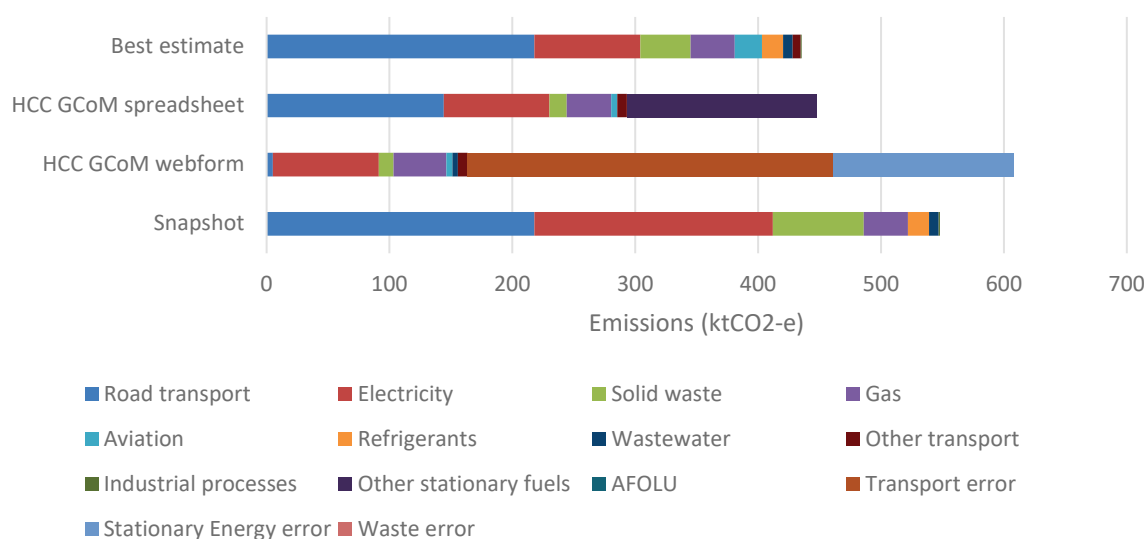


Figure 5: Comparison of community inventories for FY2020¹⁷

¹⁷ The STCA inventory was omitted from this chart because the most recent version of it was FY2017.

Table 3: Comparison of community inventories

Category / subcategory	Reporting standard requirement		Data level used (1-5) and source			Recommended methodology
	BASIC	BASIC+	STCA	Hobart GCoM report 2022	Snapshot Climate	
STATIONARY ENERGY						
Electricity	Scope 1&2 required	Required	1 TasNetworks meter data by postcode	1 TasNetworks meter data by postcode	5 AES and 4 NGER	STCA
Other stationary energy	Scope 1&2 required	Required	5 AES	5 AES	5 AES and 4 NGER ¹⁸	Snapshot
TRANSPORTATION						
Aviation	Scope 1&2 required	Required	Excluded	5 AES ¹⁹	Excluded ²⁰	Estimate Hobart Airport emissions from all departures, then distribute to council areas served (e.g. on a per capita basis) Also investigate other aviation (e.g. Hobart/Cambridge Aerodrome YCBG)
Other transportation	Scope 1&2 required	Required	5 AES	5 AES	5 AES and 4 GEIE	Snapshot. Could be improved with local data collection.

¹⁸ This includes energy usage and emissions for Tasmania's six major greenhouse emitters: Grange Resources Savage River magnetite (iron) mine, Cement Australia Railton cement manufacturing plant, Grange Resources Port Latta iron ore pelletising plant, Norske Skog Boyer paper mill, Liberty Bell Bay manganese alloy smelter, and Rio Tinto Bell Bay aluminium smelter. Because these emitters are so large, they skew LGA results considerably, and so it is important to factor them in.

¹⁹ AES aviation fuel figures significantly underestimate aviation emissions in Tasmania because many flights do not refuel at Tasmanian airports. GPC specifies that aviation emissions should be estimated from the number and distance of flights departing airports that service the city.

²⁰ Snapshot uses BITRE aviation data to estimate emissions from departing flights from Hobart Airport (HBA) to the top 20 Australian airports (excludes some important destinations such as King Island, Flinders Island, and Auckland), and attributes them all to the inventory for the City of Clarence.

Category / subcategory	Reporting standard requirement		Data level used (1-5) and source			Recommended methodology
	BASIC	BASIC+	STCA	Hobart GCoM report 2022	Snapshot Climate	
WASTE						
Disposal of solid waste	Required	Required	Excluded ²¹	1 McRobies tonnage data ²²	5 NWD, AGEIS	1 CoH waste tonnage data from McRobies and Southern Waste Solutions Lutana/Copping
Biological treatment of waste	Required	Required	Excluded ²³	Excluded ²⁴	5 NWD, AGEIS	1 CoH FOGO tonnage from kerbside collection, green waste tonnage dropped at McRobies, any other biologically treated waste.
Wastewater	Required	Required	Excluded	Excluded ²⁵	5 AGEIS	Review – May be possible to utilise more localised data from TasWater

²¹ The City of Hobart does quantify and report solid waste emissions in its corporate inventory; however, the methane capture and destruction efficiencies of McRobies and Copping landfills used in the calculations are questionable and need to be reviewed.

²² In the comments cell of the inventory table, it states "Uses NGER reporting methodology for McRobies Gully landfill"; however, the value entered is approximately half of the value SLT calculated using the NGER Solid Waste Calculator. The reason for this discrepancy needs to be checked. In any case, there is also waste generated in Hobart that is disposed of elsewhere (Copping) that needs to be accounted for.

²³ The City of Hobart does quantify and report biological treatment of waste (composting) at McRobies in its corporate inventory. If any (e.g., kerbside FOGO) waste is composted at other facilities, this must be added to the total even if the facilities are located outside the council's geographic boundary (e.g., Pure Living Soil facility near Oatlands).

²⁴ In the comments cell of the inventory table, it states "Refers to methane and nitrous oxide emissions from composting of green waste (received at McRobies Gully waste processing facility) and food and organics waste (from kerbside collection) at the Pure Living Soil facility near Oatlands". However, there is no value entered and the reason given is "NO", which stands for not occurring (i.e., there were no emissions), which is incorrect.

²⁵ Values left blank. The reason selected from the notation key is "NO", which stands for not occurring (i.e. there were no emissions). However, in the comments cell, it states "outside the scope of the existing community inventory". As such, the notation key should be set to "NE" (which stands for not estimated). However, according to the standard, "NE cannot be used for emission sources that are required by the mandatory reporting level".

Category / subcategory	Reporting standard requirement		Data level used (1-5) and source			Recommended methodology
	BASIC	BASIC+	STCA	Hobart GCoM report 2022	Snapshot Climate	
INDUSTRIAL PROCESSES AND PRODUCT USE (IPPU)						
Industrial processes	-	Required	5 AES ²⁶	Excluded ²⁷	5 AGEIS and 4 NGER	Snapshot
Product use	-	Required	Excluded	Excluded ²⁷	5 AGEIS and 4 NGER	Snapshot
AGRICULTURE, FORESTRY AND OTHER LAND USE (AFOLU)						
Livestock ²⁸	-	Required	Excluded, but not occurring	Excluded, but not occurring	1 ABSAC	Snapshot
Land ²⁹	-	Required	Excluded	Excluded	5 DCCEEW	Review
OTHER SCOPE 3						
Other scope 3	-	Optional	Excluded	Excluded	Excluded	Review

²⁶ Only includes emissions resulting from fuel use. Includes electrodes used in aluminium and manganese metallurgy in Bell Bay, attributed on a per capita basis statewide.

²⁷ In the comments cell of the inventory table, it states "outside the scope of the existing community inventory. Considered the responsibility of State Government to report on behalf of local government at the moment". However, there is no value entered and the reason given is "NO", which stands for not occurring (i.e., there were no emissions), which is incorrect.

²⁸ There is negligible livestock in the HCC municipal area, and so it is reasonable to report livestock emissions as zero, as effectively done by all three methodologies reviewed here.

²⁹ There has been negligible land use change in the HCC municipal area, and so it is reasonable to report land emissions as zero, as effectively done by all three methodologies reviewed here.

Legend

Good
Satisfactory, but could be improved
Unsatisfactory
Excluded despite being required

AES = Australian Energy Statistics

NGER = National Greenhouse and Energy Reporting

GEIE = Google Environmental Insights Explorer

NWD = National Waste Database

AGEIS = Australian Greenhouse Emissions Information System

ABSAC = Australian Bureau of Statistics, Agricultural Commodities

DCCEEW = Dept. Climate Change, Energy, the Environment, and Water data sets on land use by bioregion

Corporate inventory

The City of Hobart has been publishing its scope 1 and scope 2 corporate emissions since 1999/2000. A few different methodologies have been used:

1. **Internal:** For corporate inventories up to and including the 2019/20 financial year, the Council developed the inventory in-house.
2. **SLT:** For the 2020/21 financial year inventory, the Council engaged Sustainable Living Tasmania (SLT) to develop its corporate inventory, under the instruction that the same methodology should be used as for previous inventories. SLT did this, but also presented an alternate methodology for solid waste emissions that complied with best practice.
3. **STCA:** For the 2021/22 financial year, the STCA developed the corporate inventory with some methodological changes.

These inventories are assessed below by the following criteria:

1. Scope
2. Data quality
3. Calculation methodology
4. Transparency
5. Cost

Scope

All three methodologies have had the same scope: landfilled waste, composted waste, electricity, gas, and liquid fuels. This encompasses all scope 1 emissions (including waste stored or processed within the city) except for refrigerants, all scope 2 emissions, and scope 3 emissions from solid waste generated in the city but disposed of elsewhere. Note that the latter source only became relevant in 2021/22 when the Council had some waste disposed of at Southern Waste Solutions' landfill in Copping.

Scope 3 emissions sources should be evaluated, with those deemed most important added as a priority. These may include, for example, cement and bitumen used for the construction and maintenance of roads and pavements. Such emissions are less difficult to estimate than consumption-based emissions for communities. The impact of these emissions on the overall inventory is expected to be large. For example, Wellington City Council estimated that its scope 3 emissions are 49.5% of total corporate emissions {Wellington 2022, p.12}.

Data quality

Electricity data used has been actual metered data for all City of Hobart run sites, with the exception of unmetered lighting, for which electricity usage was estimated by multiplying nominal power ratings by expected hours of operation. This is considered best practice.

Gas data used was also metered, which is best practice.

Liquid fuel use was reported by the Council fleet managers, ostensibly being volumes metered at the pump, which is again best practice.

Waste amounts were from weighbridges for at least the past decade, with historical values estimated by Pitt & Sherry in 2012. While the historical data is of poor quality, it is the best that can be achieved. Landfill gas destroyed in tonnes of carbon dioxide equivalent was reported by the landfill gas operator. SLT raised concerns about the accuracy of this data. At the time of writing, the Council staff were following this up with the new landfill gas operator to ensure greater confidence in future landfill gas data.

Calculation methodology

The inventories use different methodologies for estimating solid waste emissions. The internal and SLT inventories used what is defined in the GPC as the First Order of Decay (FOD) approach, which estimates methane emissions that occurred only in the given reporting period from waste added to the landfill in all past years. By contrast, the STCA inventory used what is defined in the GPC as the Methane Commitment (MC) approach, which estimates all emissions that will ever result from the waste added only in the given reporting period. While both approaches are considered valid, FOD is more accurate, especially because future landfill gas capture efficiencies are difficult to predict.

The internally produced inventories used a poor methodology, with temporally downscaled input data entered into an oversimplified and outdated calculator. The SLT inventory used the best practice methodology, entering the best available input data into the Australian Government's NGER Solid Waste Calculator.

Another key difference is that the STCA methodology assumed that the future landfill gas collection efficiency at McRobies would have the same average as it had from 2009-10 to 2021-22. This is a very optimistic assumption, especially given capture efficiency fell sharply in 2021-22. It is important to note that this assumption alone can have a very large impact on the overall corporate emissions total.

Further, all three methodologies include reductions in emissions from landfill gas capture; however, the landfill gas operator has generated and sold ACCUs for at least some portion of the landfill gas captured, and it contravenes basic carbon accounting standards to count these reductions twice. The SLT inventory tackled this by adding ACCUs generated back into the inventory.

While the methodologies used for non-waste emissions were ostensibly the same for all three inventories, there are some discrepancies between the results, which were not investigated here.

Transparency

All of the inventories are publicly available. However, documentation of the methodologies used could be greatly improved.

Cost

The majority of the cost incurred to develop a corporate inventory is the result of internal time spent collating activity data. This can be greatly reduced over time by developing standard data requirements, formats, and collection processes, with clearly defined responsibilities and timeframes. Software solutions can also assist.

Results

Most scope 3 emissions are excluded from all three inventories, and so none can be considered complete inventories. However, we consider the SLT inventory to be the best estimate available with existing data. A comparison of the inventories is included in Figure 6.

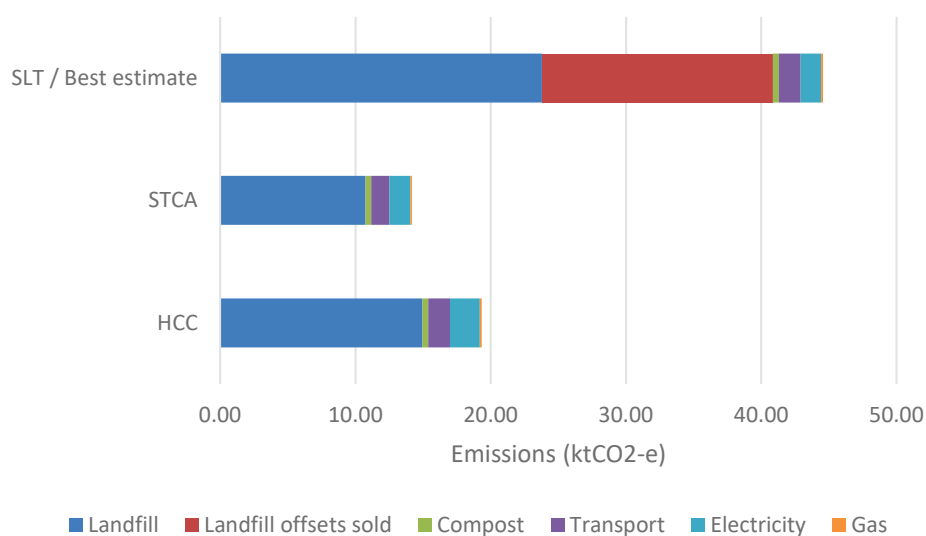


Figure 6: Comparison of corporate inventories for FY2021

Contact

Philip Harrington

philip_harrington@strategypolicyresearch.com.au

0419 106 449

Strategy. Policy. Research. Pty Ltd

ABN 38 615 039 864

www.strategypolicyresearch.com.au

