Transport and Infrastructure Net Zero Consultation Roadmap

Take the survey

Department of Climate Change, Energy, Environment and Water

Response received at:
August 6, 2024 at 5:04 PM GMT+10

Response ID:
sbm2fbc92cb917dfd8fd4826

1 Confirm that you have read and understand this privacy notice.
Yes

2 Please indicate how and if you want your submission published.
Public

3 Published name
Gillian King

4 Confirm that you have read and understand this declaration.
Yes

5 First name
Gillian

6 Last name
King

7 Email
[redacted]

8 Phone

[redacted]

9 Who are you answering on behalf of?

Individual or individuals

10 Organisation name

Not answered

11 What best describes you or your organisation?

Not answered

12 What sector do you represent?

Not answered

13 What state or territory do you live in?

Australian Capital Territory

14 Postcode

2604

15 What area best describes where you live?

City

16 1. Do you support the proposed guiding principles?

Yes

17 1.1 Please add details to your response.

Not answered

18 2. Do you support the use of the avoid-shift-improve framework as a tool to identify opportunities for abatement?

Yes

19 2.1 Please add details to your response.

Not answered

20 3. Do you agree the development of a national policy framework for active and public transport will support emissions reduction?

Yes

21 3.1 Please add details to your response.

Not answered

22 4. What should be included in a national policy framework for active and public transport and how should it be developed?

Not answered

23 5. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure the movement of people contributes to transport emissions reduction?

Not answered

24 6.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure that the movement of goods contributes to transport emissions reduction?

Not answered

25 6.2. How would these actions address the identified challenges and opportunities for emissions reduction in the movement of goods?

Not answered

26 7. Do you agree with the proposed net zero pathway for light road vehicles?

No

27 7.1 Please add details to your response.

Misses Avoid & Shift

28 8. The Australian Government is currently developing an Australian New Vehicle Efficiency Standard and has already begun to implement actions in the National Electric Vehicle Strategy.8.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce light vehicle emissions?

Not answered

29 8.2 How would these actions address the identified challenges and opportunities to reduce light vehicle emissions?

Not answered

30 9. Do you agree with the proposed net zero pathway for heavy road vehicles?

No

31 9.1 Please add details to your response

Misses Avoid & Shift

32 10. The proposed pathway for heavy road vehicles relies on a mix of battery electric, hydrogen fuel-cell and low carbon liquid fuels.Rank from 1 to 3, the order in which these should be prioritised for emissions reduction.

1: Battery electric

33 10.1 Please add details to your response. Why did you rank them in that order?

Not answered

34 11. What role should low carbon liquid fuels play in the heavy vehicle

decarbonisation?

Not answered

35 12. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce heavy vehicle emissions?

Not answered

36 13. Do you agree with the proposed net zero pathway for rail?

Not answered

37 13.1 Please add details to your response.

Not answered

38 14. The proposed pathway for rail relies on a mix of battery electric, hydrogen fuel-cell and low carbon liquid fuels.Rank from 1 to 3, the order in which these should be prioritised for emissions reduction.

1: Battery electric

39 14.1 Please add details to your response. Why did you rank them in that order?

Not answered

40 15. What role should low carbon liquid fuels play in rail decarbonisation?

Not answered

41 16. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce rail emissions?

Not answered

42 16.1 How would these actions address the identified challenges and

opportunities to reduce rail emissions?

Not answered

43 17. Do you agree with the proposed net zero pathway for maritime?

Not answered

44 17.1 Please add details to your response.

Not answered

45 18. The Australian Government is engaging in consultation as part of the development of the Maritime Emissions Reduction National Action Plan and those consultations will also inform the final Roadmap and Action Plan. 18.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce maritime emissions?

Not answered

46 18.2 How would these actions address the identified challenges and opportunities to reduce maritime emissions?

Not answered

47 19. Do you agree with the proposed net zero pathway for aviation?

No

48 19.1 Please add details to your response.

Misses Avoid & Shift

49 20. The Australian Government has already engaged in consultation on aviation decarbonisation through the development of the Aviation White Paper and those consultations will also inform final Roadmap and Action Plan.

Not answered

50 20.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce aviation emissions?

Not answered

51 21. Do you agree with the proposed net zero pathway for transport infrastructure?

No

52 21.1 Please add details to your response.

Misses Avoid & Shift, and role of infrastructure in Avoid & Shift for other parts of transport system

53 22. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce transport infrastructure emissions and ensure that transport infrastructure is ready for and enables low-emission transport modes?

Not answered

54 22.1 How would these actions address the identified challenges and opportunities to reduce transport infrastructure emissions?

Not answered

55 23. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure the energy mix is ready to support transport emissions reduction?

Not answered

56 24. How should the use of low carbon liquid fuels (LCLFs) be prioritised across different transport modes over time to achieve maximum abatement?

Not answered

57 25. What are the best ways for the Australian Government to work collaboratively with industry, business, governments and communities to implement the proposed pathways?

Not answered

58 25.1 What are good domestic or international examples of partnership and collaboration on transport and transport infrastructure emissions reduction that could inform the final Roadmap and Action Plan?

Not answered

59 25.2 What opportunities can Government leverage to show leadership in Australia and internationally?

Not answered

60 26. What measures and metrics should be used to evaluate the final Transport and Infrastructure Net Zero Roadmap and Action Plan?

Not answered

61 26.1 What other data and evidence could governments use and how could this offer further insights on the pace, scale and location of transport emissions reduction pathways?

Not answered

62 27. Do you have any feedback on the proposed review process?

Not answered

63 28. Do you have any further feedback on the Consultation Roadmap and proposed pathways?

Not answered

64 28.1 Is there anything missing? Are the sections appropriately integrated? Is the Roadmap appropriately ambitious?

Not answered

65 29. Is there any further information or documentation that you wish to be considered with your submission?

Not answered

66 Would you like to upload a document?

Yes

67 Have you removed any identifying information from your submission?

Yes

68 Upload a submission

Australia's path to ZNE - G King - May 2024.pdf

69 Upload a submission

Not answered

70 Upload supporting file

Not answered

71 Upload supporting file

Not answered

Sustainable Jill

ABN 77633712883

PO Box 6025
GRIFFITH ACT 2603

Australia's Path To Net Zero Emissions: Targets, Pathways and Progress

Submission

May 2024

Thank you for the opportunity to contribute to the development of Australia's path to net zero greenhouse gas emissions.

In this submission I outline a vision and key strategies for building a sustainable, thriving and healthy future for Australia that no longer damages our climate yet deals with the changing climate that is the consequence of damage already done. The recommendations I make are some of the actions needed to allow Australia to flourish and demonstrate its leadership. By implementing them *together* (unless specified otherwise), we can become a really innovative, comfortable, welcoming and resilient place to live and work in an increasingly warm, arid and extreme climate.

I make the submission in my capacity as citizen, resident and interdisciplinary professional with long-term interests in climate change, urban and natural environments, 'hidden' communication, and community. The submission is a quick adaptation of one prepared for the ACT Government in 2018, wide-ranging yet not fully comprehensive in scope or updating *all* details. I would welcome opportunities to expand on and further my contribution.

Gillian King
MSc, GradDipPubPol, DipPM
Thought leader | Speaker | Sustainability strategist, facilitator & mentor

Focus: integrity for flourishing in a habitable climate
Founder, Sustainable Jill

Table of Contents

Part 1: The big picture

1. Introduction

Thank you for this opportunity to contribute to the development of Australia's targets and pathways to stop our contribution to damage to the stable climate that has allowed life as we know it - including humans and human civilisation - do develop and flourish.

As we develop our strategy for Australia achieving net zero emissions, we now have the opportunity to build on and ramp up our leadership on policy and action for minimising damage from climate disruption.

We need to grab the opportunity! By doing so, we can consolidate our reputation as an exciting place of innovation and action. We will have to be quick, though. Not only does our future and the future of life as we know it depend upon fast, transformative action, but we will need to do so just to keep up economically. In an article for the World Economic Forum's Sustainable Development Impact Summit in September

2017, Johan Rockström, Executive Director, Stockholm Resilience Centre, said that:

> Industrialised societies are pushing Earth towards potentially irreversible tipping points. The world must pull back from the brink.
>
> …Climate change is no longer some distant risk to future generations. It is here and now…
>
> Protecting the global commons must become the number one priority....
>
> [We need] science-based targets to support the global commons. And we need a new narrative for humanity as a global species in control of its long-term destiny...
>
> We need [the[movement to swell with more organisations and industry partners, underpinned by science-based targets and new narratives for people and planet. Our aim is no less than to create a tipping point towards a safe operating space for humanity.[1]

Australia can help show the way to 'a global mindshift towards stewardship of the global commons, new goals for societies that break away from a singular fixation on economic growth at all costs, and new rules of the game' launched in 2017at the World Economic Forum's Impact Summit in New York.[2]

2. Vision

My vision for Australia is a thriving, innovative, responsible, healthy, caring and friendly country where people live in ways and environs that are sustainable, highly liveable, and resilient in our changing climate: a highly desirable place to live, work, and visit - now and into the future.

We can create this future by working together, nurturing and harnessing the assets within Australian society, and building on our climate policies and action to date.

Now is the time to forge ahead with our innovation and leadership!

[1] Rockstrom, J. 2018. We can still rescue this planet from climate change. Here's how', World Economic Forum, 19 September 2017, https://www.weforum.org/agenda/2017/09/planet-climate-change-johan-rockstrom, accessed 19 March 2018

[2] Rockstrom, J. 2018. We can still rescue this planet from climate change. Here's how', World Economic Forum, 19 September 2017, https://www.weforum.org/agenda/2017/09/planet-climate-change-johan-rockstrom, accessed 19 March 2018

3. Targets

3.1 Types of targets

There are three main types of targets to be considered:

1. Overarching targets: the most widely-known targets, reductions in overall greenhouse gas emissions, usually expressed as percentage of CO_2-equivalent relative to a certain date in the past, to be achieved by a date in the future. These would apply to the whole of Australia.

2. Sector-specific targets: these can be expressed as reductions in greenhouse gas emissions per sector or as a change in activity or quantity or type of product. These would apply to a specific sector, such as energy, transport or construction.

3. Activity-specific targets: these can be expressed as a change in activity or quantity. Because they are more 'concrete' and easily understood, activity-specific targets can also help focus planning and action by those directly involved in an activity, such as use of wood for heating, driving to work or school, municipal organic waste taken to landfill, or high-emissions cement used for concrete.

Reaching zero net emissions before 2050 will require transformation across sectors and activities. It therefore makes sense to include sector- and activity-specific targets as well as overarching targets.

Where Australia's emissions are known and accounted for in a sector, then we can set sector-specific emissions-reduction targets.

Where this is not the case, or where targets need to be easily understood, then activity-specific targets can be useful for getting action to reduce emissions underway and for measuring progress. This is an easy way for Australia to take responsibility for reducing its 'Scope 3' emissions.

Sector- and activity-specific targets could be set after overarching targets are set. They could, however, also be used to inform overarching targets, particularly as progress to achieving overarching targets is reviewed.

Recommendation 1:

To achieve zero net emissions, overarching, sector-specific and activity-specific targets be set.

3.2 Setting targets with our eyes open

In setting targets for reducing greenhouse gas emissions, we need to:

- accept that the damage already done to our climate means that the consequences of that damage are built in for several hundred years - unless we very rapidly reverse the damage by shifting to zero and then negative net emissions;
- acknowledge the adverse effects that even about 1.1°C of average global warming since the Industrial Revolution has been having - beyond the current adaptive capacity of many people, other species (including those we use for food and amenity here in the ACT), systems and infrastructure; that the effects at 1.5°C will be much worse and at 2°C much worse again and definitely unsafe; and that we are currently heading for 4°C warming;
- pay attention to the precautionary principle and risk management;
- be aware that continuing to emit greenhouse gases worsens the ability of all life on Earth - including us - to survive into the future; and
- accept that it is in the interests of everyone to contribute to action to limit the increase in global average temperature compared with pre-industrial levels

3.2.1 Reducing the risk to our future

The global context

We need to be clear about the real goal for reducing greenhouse gas emissions to zero: leading the way to ensuring the survival and, hopefully, continued flourishing of life as we know it.

There is a level of risk associated with any level of climate change, including the approximately 1.1°C increase in global warming above pre-industrialised levels[3] and the degree of ocean acidification that we are already experiencing. To have the best chance of ensuring a habitable planet and flourishing into the future, we need to minimise that risk.

Part of minimising that risk is setting and meeting global, national, sub-national, local and sectoral targets to limit the impacts of those emissions – and preferably coming in under budget and well ahead of schedule.

[3] NASA. 2023. 'Global Temperatures', https://earthobservatory.nasa.gov/world-of-change/global-temperatures

Given the impacts that are likely to result from a 2°C warming, our current trajectory that we are currently heading for 4°C warming, and that there seems to be no contingency buffer for actions or international cooperation to not work properly, a 67% chance of having a habitable climate (which is the net outcome of the binding goal in the Paris Agreement) is not a good enough bet.

We need to be working for a 100% chance (or as close as we can get it, given the inertia we have already built into global warming and ocean acidification).

The IPCC is clear that 'Risks and projected adverse impacts and related loss and damages from climate change escalate with every increment of global warming.'

There is mounting evidence that even limiting warming to 1.5°C will be catastrophic. It is not known when critical tipping points will be reached and there is increasing evidence that we may have already reached some. It is therefore quite possible that irreversible and catastrophic climate change may be precipitated with 1.5°C warming – or less – if they have not occurred already.

As well, as part of Australia and the global community, we should be aiming to meet the aims of the Paris Agreement: 'keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and pursuing efforts to limit the temperature increase even further to 1.5 degrees Celsius'.[4]

We should, therefore, be aiming for - and modelling for - a maximum of 1.5°C warming and not be dissuaded by arguments against doing so.[5],[6]

As we are globally on track for reaching at least 4°C warming, limiting warming to a maximum of 1.5°C will mean we need to turn around our trajectory. This in turn means that we need to stop and then reverse damage to our climate, that is stop emissions (reach zero net emissions) and then draw greenhouse gases out of the atmosphere (create 'negative' emissions).

It is misguided to think that a 2035 target in the range of 65%-75% is ambitious. Such a target is out of line with climate science and Australia's best interests. It ignores the unfolding, clear and accelerating negative consequences that the current warming of the Earth is having. It also ignores the wide reporting of Australia's underestimated fossil methane emissions. These unaccounted methane emissions means the country must do more, rather than less to retain integrity in its climate

[4] United Nations. 2018. 'The Paris Agreement', https://unfccc.int/process/the-paris-agreement/the-paris-agreement
[5] Climate Analytics. 2015. '1.5°C risks and feasibility', http://climateanalytics.org/files/1o5_key_points.pdf
[6] Roberts, D. 2018. 'This graphic explains why 2 degrees of global warming will be way worse than 1.5', Vox, 19 January 2018, https://www.vox.com/energy-and-environment/2018/1/19/16908402/global-warming-2-degrees-climate-change

policy, including shifting to direct measurement based methods for coal and gas project emissions reporting.[7]

As an advanced economy greatly exposed to climate impacts and signatory to the Paris Agreement, Australia has the ability and responsibility to act in line with climate science to keep warming below 1.5ºC. Doing so is also in the national interest, both from protecting Australia and the people who live here from the worst consequences of damage already done to our common home and from the opportunities that rapid reductions in greenhouse gas emissions offers.

Furthermore, it is clear that Australia must dramatically step up ambition to reduce its contribution to damaging the climate. Australia cannot contribute its fair share of the global emissions reduction (even for 1.5°C or warming) without increasing its 2030 ambition. This is because:

- Australia is already off track for delivering even its less ambitious 43% reduction target,[8] and
- the science shows that domestic emissions in Australia must fall to below 75% below 2005 levels by 2030, and zero by 2035[9] for Australia to contribute its fair share of the global emissions reductions to have any hope of limiting warming to 1.5°C.

Recommendation 2:

Targets and modelling be based on a achieving maximum of net global warming of 1.5ºC warming, noting that this will likely require drawdown of emissions (that is, negative emissions).

Timing and scale: urgent, transformative, emergency-scale action is needed

The faster we in the Australia take action to reach zero and then negative net emissions, the faster we will see the results - including others following our lead. The faster global emissions are turned around and damage to our climate is halted

[7] Potter, B. 2024. 'Coal mine methane twice official disclosures: Sims', *Australian Financial Review,* 30 April 2024, https://www.afr.com/policy/energy-and-climate/coal-mine-methane-twice-official-disclosures-sims-20240429-p5fnfv

[8] https://www.climatechangeauthority.gov.au/annual-progress-advice-0

[9] Nicholls, Z. and Meinshausen, M. 2022. 'Comparison between Australia's 2030 and 2050 emission reduction targets and 1.5°C pathways', Climate Resource, Briefing, March 2022, https://www.climate-resource.com/reports/wwf/WWF_March2022_a.pdf

and reversed, the lower the costs of trying to adapt to the changing climate will be and the more likely life as we know it will be able to continue into the future.

To reach zero net emissions and ensure a good future, the scale and speed of action needed will need to be transformative. We have changed the natural and physical world that is our common home so much that civilisation faces imminent collapse – unless we make transformations on the scale and at the speed that was undertaken by many countries during World War II. In other words, all of us – collectively as well as individually – need to move to a transformative, 'emergency' footing. I find this analogy resonates for a few reasons:

- We are now in a long-term emergency regarding our future - and an emergency situation requires an emergency response.
- This could be regarded as a 'war' in the sense that we are fighting for our lives, for the continuation of civilisation and life as we know it – including the continuation of the human species.
- The scale and speed of the transformation needed is at least the same as that undertaken in World War II.
- We know that it can be done because it has been done before.

In the unfolding climate emergency, we need to set our targets accordingly. They should convey the sense of urgency needed for effective action to stop damaging our climate (that is, by achieving zero net emissions of greenhouse gases) and then reversing the damage (achieving negative net emissions).

Delivering on – and preferably beating – the targets will be vital.

We need to set our targets so that we can achieving zero net emissions urgently - 2045 is too late and sends the wrong message about the existential reality in which we are living and the scale and speed of transformation needed.

<u>Recommendation 3</u>:

Targets be set for achieving zero and then negative net emissions urgently - well before 2050.

Communication about targets - and how they are developed - will need to be handled carefully to ensure that the rationale for them is understood and supported throughout the community in Australia. This is because reaching zero net emissions will require the whole Australian community to be involved.

Different narratives should be tested for effectiveness. Narratives to be tested should include those already in existence, including ‘emergency footing/mode’, ‘transformation for a better future’, ‘and ‘Create Your Future’.

It may be that different narratives suit different audiences.

Recommendation 4:

Effective narrative(s) be used to support development and communication about targets for achieving zero net emissions.

3.2.2 Scope

Australia must join other affluent, developed and/or high-emitting societies as part of its global contribution to emissions reduction and innovation leadership.

Australia needs to take responsibility for its own emissions, at least - like ACT is doing. Australia must take responsibility for reducing its emissions itself, instead of buying offsets elsewhere. This approach shows moral leadership and offers opportunities it offers to the Australian economy. The moral and economic benefits could be even greater if Australia takes on responsibility for reducing emissions for its exported emissions and/or for entities outside the ACT.

We should not limit our effort to reducing emissions for which we are formally accountable (that is, ‘Scope 1’ and ‘Scope 2’ emissions). As an affluent, developed and historically high-emitting society there is certainly a moral case for taking responsibility for all the emissions that we cause, including those for which we are not bound to account for (such as embodied or ‘Scope 3’ emissions).

Action to reduce ‘Scope 3’ emissions need not be limited by accounting requirements and practices or lack of data for those emissions. We can still reduce emissions by taking action. For example, we can reduce emissions from major climate-damaging activities (such as cement and steel by using low or zero emissions cement and steel, and such as excessive product ‘consumption’ and packaging by changing laws to reduce packaging and include the right to repair and . This in turn means that we can set activity-based targets (targets for changing a particular activity or quantity or type of product) as proxy targets for reducing ‘Scope 3’ emissions.

Recommendation 5:

The Australian community:

(a) take responsibility for all the emissions that we cause (including embodied or 'Scope 3' emissions); and

(b) set activity-based targets (targets for changing a particular activity or quantity or type of product) as proxy targets for reducing remaining major sources of 'Scope 3' emissions urgently.

3.2.3 Targets agreed and legislated

A feature of successful climate-related targets to date has been that, in addition to having community support, they have:

- had support from all political parties represented in the government; and
- been legislated.

(Multipartite support is also another example of where the 'emergency mode' or 'war footing' analogy works: in such circumstances, parties tend to put aside partisanship and work together (or at least support the government).

<u>Recommendation 6</u>:

As soon as possible, Australian governments (at all levels):

(a) work to obtain agreement of all parties represented to major new, community-agreed targets for reducing greenhouse gas emissions in Australia as a matter of urgency (and well before 2050); and

(b) enshrine in legislation the major new, community-agreed targets.

3.2.4 Making and measuring progress

To ensure that we are making timely and efficient progress towards our goal, it is vital that we be able measure our progress and adjust our targets and actions as necessary.

Interim targets

Interim targets can help our focus as well as provide points for measuring progress. Setting the timing of interim targets is a delicate balance between having them:

- close enough to spur on action;

- distant and spaced enough that progress can be made and measured; and
- timed in such a way as to be effective and adjusted as necessary.

Guidance on this balance may be obtained from:

- climate scientists, evidence and modelling;
- experiences during long emergencies, particularly World War II when no-one knew how long it would last, what all the challenges would be, or what solutions and remedies would be developed - yet amazing changes were made in a very short period of time by people working together with a single focus;
- community members aware of the climate situation;
- experience from policy competition between parties.

This last point suggests that the longest period between interim targets for Australia should be 2-3 years (the election cycle), although this is unlikely to be frequent enough for an emergency response.

Having interim targets coinciding with election campaigns opens the way for friendly competition between the parties to increase ambition further.

<u>Recommendation 7</u>:

Interim targets be:

(a) set for overarching emissions and major emission sectors and activities;

(b) informed by:

(i) climate scientists, evidence and modelling;

(ii) experiences during long emergencies, particularly World War II;

(iii) the community; and

(iv) consistency with an emergency-level approach to reducing emissions;

(c) set at intervals no greater than jurisdictional elections, with the latest timing being the year before elections.

Monitoring

To see how we are progressing, we need to be able to assess the effectiveness of our actions against projected achievement as well as targets and other goals (such as our vision!). This needs to be done in a timely, independent, transparent and, ideally, efficient manner. Transparency means the community - not just government - needs to be involved.

This will require deficiencies in the current system to be remedied.

Recommendation 8:

As soon as possible, Australian governments:

(a) establish systems, involving the community, for reviewing progress to zero net emissions and for adjusting targets accordingly; and

(b) enshrine in legislation the agreed system and associated requirements.

3.2.5 Decision-making processes focussed on achieving targets

It is important to ensure that all parts of government (at all three levels) and the broader Australian community are working and making decisions that work to achieve - and not hinder - achieving the objective and targets in a timely and efficient manner.

To date, there is little evidence that this is happening, particularly on decisions that have significant effects on behaviour or long-term investment (such as funding and delivery of transport infrastructure and services, and planning and development).

Rectifying this at government level will require mechanism(s) be put in place to ensure:

(a) policies, decisions and actions made by governments, officials and contractors contribute towards the targets

(b) effective collaboration within and between government agencies, focussed towards meeting the targets.

Similar arrangements can be put in place in businesses, other organisations and parts of the wider community.

Recommendation 9:

As soon as possible, and by the end of 2025, mechanisms be put in place to ensure:

(a) all policies, decisions and actions made by governments, officials and contractors contribute towards (or at least do not hinder) achieving the objective of reaching net zero and then negative net emissions;
(b) collaboration within and between government agencies towards achieving the objective and associated targets; and
(c) for all Australian governments (at all 3 levels), all Cabinet/Council submissions and all Budget, funding and development proposals are required to show how the proposal contributes to reaching Zero Net Emissions.

Recommendation 10:

Businesses, other organisations and the wider Australian community:

(a) work to ensure that their policies, decisions and actions contribute towards (or at least do not hinder) achieving the objective of reaching zero and then negative net emissions; and
(b) collaborate with others to achieve the objective and associated targets and co-benefits.

4. Engaging the whole community

The gravity and size of the transformational change involved in reaching zero (and then negative) emissions - and adapting to our changing climate - will require everyone to be involved.

The question is, how might we to do it well?

There are several key considerations, including:

- clear vision and goals;
- trust, through transparent processes and involvement;
- strategic narrative(s);
- allowing and empowering anyone to lead and act (ie not just government);
- meeting people where they are; and

- using all available resources and channels.

Furthermore, community engagement should be based on the best available evidence.

4.1 Clear vision and goals

It is well known that life is easier if our vision and goals are clear.

Within Australia, the ACT has already shown this with its target of 100% renewable energy by 2020.

In section 3 of this submission I have made recommendations for how targets are set.

However, we are yet to have a clear, overarching vision for Australia that provides both a context in which these and other goals and policies sit and are evaluated and inspiration to take supportive action. Once we have such a vision, how we go about our lives, and the choices we make every day, will be so much clearer and able to support our climate-related goals.

Connecting through shared values builds trust between people, so the vision for Australia should be based on values shared throughout the Australian community.

My vision for the Australia combines commonly-shared values with how Australia is positioning itself and what is needed to survive and thrive into the future:

> a thriving, innovative, responsible, healthy, caring and friendly community living in ways and environs that are sustainable, highly liveable, and resilient in our changing climate: a highly desirable place to live, work, and visit - now and into the future.

This is, of course, very wordy. It could, though, serve as the basis and explanation for something much more succinct that could be used as a slogan'. Ideally, the content and wording would need to be developed and tested with the community to ensure it is effective.

<u>Recommendation 11</u>:

A clear, overarching vision for Australia be developed, so as to provide both:

(a) context and guidance for emission-reduction targets, policies, goals and decisions; and

(b) inspiration to take supportive action.

4.2 Trust, through transparent processes and involvement

People are more likely to take supportive action if they are co-owners and emotionally vested in the targets, vision, goals and sub-goals, and how they will be implemented. This is thus a key principle of community engagement. Where, for various (personal) reasons they cannot (or do not want to) be directly involved in the decision-making, they need to trust that the processes involved will look after their interests before they will give their 'social licence' (ongoing acceptance).

At very least, development of Australia's vision and its (climate-related) goals and sub-goals, and methods of implementing them, should be consistent with the IAP2 Core Values for Public Participation developed by the International Association for Public Participation (IAP2).[10]

I recognise that there is, however, a long way to go before the Australian community has a shared vision and goals for its future and trust in processes of government and other decision-making processes affecting the community.

There is a growing distrust of much of its decision-making processes. Many people feel overwhelmed by engagement systems focussed on reaction (instead of creation and empowerment) in short timeframes, often on multiple processes and issues that should be linked yet appear to unlinked. Furthermore, others have little time or do not see the need to be involved (yet).

There are several approaches, methods and tools for involving community members in decision-making. They include those used by practitioners from Art of Hosting, IAP2, Social Permaculture[11] and other communities. Practitioners who reside and/or work in Australia could be called upon to help genuine and meaningful community engagement.

Another challenge is how to deepen and scale up community engagement for co-creating our zero-emissions future, in other words how to 'create a ripple that turns into a tide'. Some work on this has already occurred in Australia.

Full community engagement will take longer and be more messy than consultation for the 'DAD' (Decide, Announce and Defend) and traditional linear project management approaches - yet the results will be much better and are what is needed for the challenge we are facing.

[10] International Association for Public Participation. Core Values, https://www.iap2.org/?page=corevalues

[11] see, for example, https://www.regenerative.com/magazine/seven-permaculture-principles-social-communities

It will be important, therefore, to allocate sufficient time and resources to the processes that will enable robust community engagement and support. Government and other decision-makers must not rely on a few volunteers and organisations (both community and their own) with insufficient resources and training.

For government and others used to making decisions for others to live with, perhaps after some consultation, this will mean some big changes as they learn to live with less control and learn to involve and trust the broader community in co-creating our future.

Recommendation 12:

Australia's clear, overarching vision developed by Australian governments and the broader Australian community.

Recommendation 13:

Australian governments work with relevant practitioners and the broader community to develop a comprehensive framework, strategies and resources for:

(a) engaging and empowering the community on reaching zero and then negative net emissions urgently;

(b) resourcing for the parties involved in community engagement; and

(c) improving the transparency of public decision-making processes.

4.3 Strategic narrative(s)

Narratives help with building (emotional) engagement.[12] They give substance and meaning to the vision and goals.

Narratives can:

- unite people behind a common purpose and direction;
- create a context for change;
- link together and make sense of multiple initiatives;

[12] See, for example, Robertson, D. 2012. 'The power of storytelling, the key to consumer engagement', *The Guardian*, 23 May 2012, https://www.theguardian.com/media-network/media-network-blog/2012/may/23/storytelling-key-audience-consumer-engagement

- align leaders so they demonstrate strength and unity;
- inspire people, creating pride and camaraderie;
- create a personal connection to the strategy;
- challenge and change people's beliefs and behaviours; and
- keep the vision, goals and strategy alive.[13]

All these will be necessary in our journey to zero and then negative net emissions. Development of an inspiring narrative is therefore another principle for community engagement.

Ideally, we would have one narrative, but the reality of our complex situation is that we are likely to need strategic narratives at several levels:

- a strong, overarching narrative that relates to the vision for Australia
- a narrative about the main goal of reaching zero and then negative net emissions;
- narratives about sub-goals (perhaps for specific sectors or actions); and
- narrative variations for specific audiences

The narratives will need to be strategic so that people can see the vision, where we have come from and where we are going - and their role. This is particularly so during times of change. Narratives can play an essential leadership and guidance role by defining the gap between where we are now and where we want to be, and making clear and compelling what our new priorities are and why the changes are necessary (including the urgency).

Compelling narratives will motivate and empower people to be involved in co-creating our shared future. Our narratives therefore need to include the message that we can create this future by working together, nurturing and harnessing the assets within Austraian society, and building on our climate policies and action to date (see section 4.4).

To maximise engagement, the narratives will need to:

- be authentic;
- talk about the real world (not abstract ideas);

[13] Engage for Success. c2017. 'Hints & Tips: Developing a Strategic Narrative', http://engageforsuccess.org/hints-tips-developing-a-strategic-narrative

- connect with what matters to the audience (including our sense of place[14]; and
- be created by the community.[15]

As with development of a vision and narratives for targets, the content and wording of narratives should be developed and tested with the community.

<u>Recommendation 14</u>:

Australian governments work with expert professional communicators and the broader Australian community to develop strategic narratives to support development and implementation of the strategy as follows:

(a) a strong, overarching narrative that relates to the vision for Australia;

(b) a compelling narrative about the main goal of reaching zero and then negative net emissions;

(c) narratives about sub-goals (perhaps for specific sectors or actions); and

(d) narrative variations for specific audiences.

4.4 Allowing and empowering anyone to lead and act

Developing and implementing a strategy for reaching zero and then negative emissions cannot and should not all be done by government.

We also have enormous social and technical assets in the people who live and work in Australia and they could play an important role. We can honour, nurture, and harness the tacit and professional skills and knowledge in our community. We can do so by working together and by allowing and empowering anyone to lead and take action to make our shared vision a reality.

Everyone making changes and working together will enable us to co-create our future, rather than having it imposed upon us - if we are allowed and empowered to do so. Indeed, such is size and gravity of the task at hand that we must work together. Communities delivering to their own members is also another principle of community engagement. Doing so will, in turn, help build a stronger community with

[14] Scannell, L & Gifford, R. 2011. Personally Relevant Climate Change: The Role of Place Attachment and Local Versus Global Message Framing in Engagement, *Environment and Behaviour*, **45**(1): 60-85 http://journals.sagepub.com/doi/abs/10.1177/0013916511421196

[15] *ibid.*; and Climate Outreach. 2018. 'Communications Handbook for IPCC Scientists', https://climateoutreach.org/resources/ipcc-communications-handbook/

better mental health - which is also vital for the resilience needed in our changing climate.

Recognising the diversity of interests, abilities and availability, it is important that policies, practices, systems and opportunities allow, encourage & help people to participate according to interest and availability. Using asset-based community development (ABCD) and the IAP2 Public Participation Spectrum[16] could be helpful with this. ABCD could build on the Coggle map that the Canberra Transition Town community[17] has already begun. So too could providing opportunities for conversation, collaboration and impetus for action - such as through:

- mass events such as a 1000 Table Conversations[18] (not necessarily at the same time or en masse);
- a website or web portal that helps people to become empowered to take action and to self-organise. Ideally, at a minimum it would collect and publish ideas for action (beginning with those submitted through this consultation process and relevant actions from the Project Drawdown list[19]) and provides a means for people to publicly pledge action, connect with other people wanting to take similar action, and measure their progress;[20] and
- challenges similar to the global Drawdown EcoChallenge[21] held during April 2018.

Recommendation 15:

Australian governments allow and empower anyone in their communities to lead and take action to make our shared vision a reality.

Recommendation 16:

We honour, nurture, and harness the tacit and professional skills and knowledge in our community and work together to make our shared vision a

[16] International Association for Public Participation. Public Participation Spectrum, *https://c.ymcdn.com/sites/www.iap2.org/resource/resmgr/foundations_course/IAP2_P2_Spectrum_FINAL.pdf?hhSearchTerms=%22spectrum%22*

[17] see https://transitionnetwork.org/transition-near-me/initiatives/canberra-transition-town/

[18] roughly along the lines of the 1000 Tables event in Israel in 2011 - see http://artofhosting.ning.com/forum/topics/1000-table-world-cafe-in-israel-interview-inspiration-invitation

[19] https://www.drawdown.org/solutions

[20] One local example of a website helping people to self-organise was The Musical Offering website, that facilitated the local musical community stepping up to the challenge of hold at least one musical performance in Canberra's centenary year. See for example, https://the-riotact.com/154-musical-offerings-in-100-days-but-still-a-long-way-to-go/100251

[21] https://drawdown.ecochallenge.org

reality and achieve the objective of reaching zero and then negative net emissions (including associated targets and co-benefits).

<u>Recommendation 17</u>:

Australian governments provide resources (such as funds for a website or portal) to facilitate asset-based community development approach to help empower and facilitate anyone in their communities leading and taking action to make our shared vision a reality.

<u>Recommendation 18</u>:

A website or web portal be developed that will help people to become empowered to take action and to self-organise. Its features should include:

(a) collecting and publishing ideas for action (beginning with those submitted through this consultation process, ideally made public in accordance with Recommendation 18); and

(b) providing a means for people to publicly pledge action, connect with other people wanting to take similar action, and measure their progress.

<u>Recommendation 19</u>:

Time-limited action challenges be issued to Australian communities, similar to the global Drawdown EcoChallenge held during April 2018.

4.5 Meeting people where they are

Connecting with people and creating change begins where people are, literally and figuratively. This is vital for wholehearted community engagement in the challenge we are embarking upon.

We need to factor this into narratives, framing and language and into where and how we meet with others.

Conversations will be an important part of engaging people where they are. There are several models for hosting and facilitating appropriate conversations, including Art of Hosting, Kitchen Table Conversations and Climate for Change.[22]

[22] http://www.climateforchange.org.au

In both literal and figurative senses, going to where people are already - instead of having them come to us - will also be important. This is a way to connect with people who have different backgrounds, cultures, knowledge, language skills, availabilities, or access to technology.

Recommendation 20:

Ensure that people are met where they are, literally and figuratively, in any community engagement and communications about objective and developing and implementing our shared vision, targets, goals and sub-goals.

4.6 Using all available resources and channels

In order to maximise opportunities for engagement, we will need to use all available resources and channels of communication and engagement. As well as traditional public communication avenues, we can:

- spread the word and conversation, for example by sharing stories of how people are living low emissions lifestyles[23] or via commentary, particularly on social media;
- host or participate in conversations, both facilitated and informal;
- make use of people outside government. As well as allowing and empowering anyone to act (section 4.4), there are plenty of people in Australia with expertise is relevant areas such as communications, community engagement, public participation, community organising, strategic or scenario planning, community development, conversation hosting and facilitation, and project management. Most are working professionally in these areas. While there may be some willingness for volunteer or pro bono work, the expertise and effort involved should be honoured and paid for by the community (probably primarily by the government most relevant to the geographic area of work involved).

To help individuals and smaller community organisations organise and take action, the Australian governments and other organisations can help by doing things like:

- sharing information (for example, by encouraging and re-posting blog and social media posts or by providing speaking or meeting opportunities) - as

[23] I have already begun this on my blog, starting with http://sustainablejill.com/365-days-of-low-carbon-living-day-0-deciding-to-change/

well as spreading the word, sharing common messages and information resources is another principle of community engagement;

- making available resources such as funds, meeting spaces and in-kind support; and
- sponsoring innovative methods of communication and engagement, such as has been done with Beyond Zero Emissions *Creating A Climate For Change* playback theatre project[24] in Melbourne or various projects funded by the ACT's Community Zero Emissions Grants Program.[25]

Recommendation 21:

To help engage the whole Australian community in reaching zero and then negative emissions, make use of all available resources and channels of communication and engagement, including:

(a) sharing stories of how people are living low emissions lifestyles;

(b) social media;

(c) conversations, both facilitated and informal; and

(d) people and organisations outside government.

Recommendation 22:

The Australian, State and Territory governments and other large organisations:

(a) pay for services and advice for engaging the broader community rather than relying on volunteer and pro bono work and expertise, particularly from small organisations;

(b) make available meeting spaces and in-kind support to help individuals and smaller community organisations organise and take action towards our shared vision and reaching zero and then negative net emissions; and

[24] http://bze.org.au/music-magic-amplify-climate-solutions-creating-climate-change-melbourne-playback-theatre-event/

[25] ACT Government. 'Community Zero Emissions Grants Program', https://www.climatechoices.act.gov.au/policy-programs/community-zero-emissions-grants

(c) sponsor innovative methods of communication and engagement about our shared vision and reaching zero and then negative net emissions.

Part 2: Action on the ground

In this section, I outline a number of key actions that need to take place in different sectors in order to reduce net emissions to zero (and then negative) as a matter of urgency and realise a vision of Australia as a thriving, innovative, responsible, healthy, caring and friendly community living in ways and environs that are sustainable, highly liveable, and resilient in our changing climate.

The actions presented are not an exhaustive list, and I have many more to suggest and recommend.

Most of my recommendations involve overcoming a major barrier to emissions reduction: behavioural change, for the various levels of government and/or all or part of the broader Australian community. They include ways to help that behavioural change.

Many (particularly in Transport and Land Use) will also help Australia to reduce the consequences of damage to our climate that we feel locally. A key here is cooling urban areas by reducing the amount of paving to reduce heat islands and using the resultant wider verges, wider median strips, kerb bump-outs and islands and the like for increasing vegetation and tree cover to shelter pavements and provide biodiversity corridors and food; increasing local water infiltration and nutrient retention; and providing places for resting, sheltering and/or rehydrating. All these actions are, of course, interlinked.

Practical actions are more understandable by the general community than action at a more conceptual level. In turn they can spark interesting conversations, engagement and action in the community.

Work by Beyond Zero Emissions across all sectors shows that transitioning Australia to zero emissions can be done within 10 years. The ACT has a head start, with its strong community support, political support across parties, shift to renewable energy well underway, and lack of heavy-emitting industries. Given the urgency with which we need to stop damaging our climate - and the economic and other opportunities involved in moving ahead of the rest of the pack - Australia should, at very least, work out what transition in 10 years (or less) could entail. Such an exercise could also help make the transition more concrete for most people. In line with my recommendations in Section 4, having a clear, inspiring vision, goals and narrative, and engaging the broader community through transparent processes, could help make this a positive experience for the Australian community. The Transition Towns model offers one way of doing this.

Recommendation 23:

Australian communities, with help from experts like Beyond Zero Emissions, work out what the details of transition to zero emissions in 10 years (or less) could entail and offer.

It is also important that implementation of changes be undertaken in a way that is as fair and in tune with nature as possible, while being mindful of the need for urgency and that delay may increase longer term costs and other adverse effects.

5. Stationary energy

The stationary energy sector has been both the greatest source of greenhouse gas emissions and the initial focus of efforts to reduce emissions, both in Australia and worldwide.

Of that, electricity generation used to be our major source of emissions, so it made sense to concentrate on first making our electricity from 100% renewable energy.

5.1 Focus on 100% renewable energy

In order to reach zero net emissions, all our energy must come from clean, renewable energy sources.

Setting targets for achieving this is important, particularly given the urgency with which we need to stop damaging our climate. This is the basis for my recommendation to set sector-specific targets (Recommendation 1).

Legislating the targets gives added force to them and ensures they have parliamentary and legal support.

Care is needed in how these targets are expressed, though. For example, the way the ACT's target for reducing emissions in the energy sector is expressed has, however, caused some confusion. It was and is widely talked about as being for 100% renewable energy by 2020, less so as 100% renewable *electricity* by 2020. When clarification has been sought on this language problem, ACT Government Ministers and officials have frequently said that it is 100% renewable *energy*. The legislation is also somewhat confusing. Section 9 (Renewable Energy Targets) of the *Climate Change and Greenhouse Gas Reduction Act 2010* (ACT)[26] specifies that 'The Minister must determine...targets for the use or generation of renewable energy

[26] *Climate Change and Greenhouse Gas Reduction Act 2010* (ACT), as amended and effective as at 16 June 2017, http://www.legislation.act.gov.au/a/2010-41/current/pdf/2010-41.pdf

in the ACT'. The determination (*100 per cent target for the use of renewable energy (electricity) in the ACT by 2020*)[27] is more ambiguous, although it indicates that the target refers to all the ACT's *electricity* being generated from renewable energy.

There is also a lot of boasting and praise about the ACT having now put contracts in place to ensure the target is met. However, despite the rhetoric,[28] the legislation that enables the contracts limits the so-called 100% renewable energy to a fixed amount. [29] A quantity is not the same as a percentage, and specifying a quantity for the amount of electricity that will be supplied from renewable energy does not ensure that 100% will be. Furthermore, the initial quantity specified was based on then-current uses of electricity plus provision for powering the ACT's first stage of light rail. Without adjustments, this approach did not allow for all future energy needs to be met from renewable energy because it does not allow for energy currently delivered using gas and transport fuels to be delivered by electricity.

It is vital that Australia move quickly to have all its energy needs met by clean renewable energy and so targets for delivering this should be expressed and legislated clearly, not limited by quantity or type of end-use.

Recommendation 24:

Australian governments legislate targets for achieving 100% renewable *energy* as a matter of urgency.

Differences in the ease with which different energy supplies and end-uses can be converted to electricity, coupled with the need to make the changes as quickly as possible, suggest that having ambitious sector-specific and activity-specific targets would be appropriate interim steps towards achieving 100% renewable energy.

[27] Climate Change and Greenhouse Gas Reduction (Renewable Energy Targets) Determination 2016, Disallowable Instrument DI2016–38 made under the *Climate Change and Greenhouse Gas Reduction Act 2010* (ACT), s 9 (Renewable Energy Targets), http://www.legislation.act.gov.au/di/2016-38/current/pdf/2016-38.pdf

[28] Corbell, S. 2016. 'ACT to be powered by 100% renewable energy by 2020', media release, 29 April 2016, http://www.cmd.act.gov.au/open_government/inform/act_government_media_releases/corbell/2016/act-to-be-powered-by-100-renewable-energy-by-2020

[29] See s 9 (FiT Capacity) of *Electricity Feed-in (Large-scale Renewable Energy page 5 Generation) Act 2011* (ACT), s 9 (FiT Capacity), as amended and effective as at 9 November 2017, http://www.legislation.act.gov.au/a/2011-56/current/pdf/2011-56.pdf and 'How do the ACT's renewable energy reverse auctions work?, Legislation Framework', https://www.environment.act.gov.au/energy/cleaner-energy/how-do-the-acts-renewable-energy-reverse-auctions-work

<u>Recommendation 25</u>:

Australian governments legislate ambitious sector-specific and activity-specific targets for towards achieving 100% renewable *energy* as a matter of urgency.

One early target would be that all new urban and suburban developments and re-developments be all-electric. Targets should also be set for changing existing households, existing suburbs, commercial cooking and heating, transport, manufacturing and other uses to be powered solely by electricity from 100% renewable energy.

<u>Recommendation 26</u>:

Australian governments legislate that all new urban and suburban developments and re-developments be all-electric,.

<u>Recommendation 27:</u>

Australian governments develop and then legislate and implement targets for changing existing households, existing suburbs, commercial cooking and heating, transport, manufacturing and other uses to be powered solely by electricity from 100% renewable energy.

Generating electricity locally, particularly via roof-top solar panels with storage or grid connection, can make the electricity system more secure and robust. Few sources and transmission routes for meeting our energy requirements carries a much higher risk of failure or disruption through, for example extreme weather (more likely as climate change worsens) or terrorist attack, than multiple, dispersed sources and transmission routes.

Using the sun to heat water reduces demand for electricity or other energy, particularly during summer peak demand and offers hot water users free hot water once the installation is paid for.

Roof-top solar panels (for water or electricity) would also cool roof-tops in increasingly hot weather. (They would also reduce demand for electricity at summer peak times; so too would ‘green roofs.).

Many energy consumers have or are already making the changes required because they recognise the long-term savings and control over their energy bills.

Increasing rooftop electricity generation and solar hot water can be sped up by regulation and encouragement. Mandating photovoltaic panels would facilitate the change faster than encouragement, which would be faster than leaving it to the market. In light of the need for urgent transformation, mandation seems appropriate. Economic encouragement could be by way of a campaign about how it is 'cool' to have solar panels on your roof.

Recommendation 28:

Australian governments:

(a) mandate solar hot water and photovoltaic generation (or green roofs) on all new apartment, office and commercial buildings with flat roofs or roofs facing approximately north

(b) require retail electricity utilities to offer no/low interest loans for installation of solar hot water or photovoltaic systems and repayment via electricity billing systems.

Currently-offered Feed-in Tariffs offer windfalls to electricity utilities. Smaller electricity generators should be paid feed-in tariffs that reflect the prices being charge to consumers. In other words, new smaller supplier customers should be paid what their electricity is actually worth at a particular time. The benefits (of contributing electricity supply and adding robustness and security to the electricity market) should also flow to smaller generators, not just network businesses, network users and consumers.

Recommendation 29:

Australian governments require electricity utilities to offer small electricity generators feed-in tariffs that closely reflect the prices they are charging consumers.

5.2 Getting off gas

Vital to reaching zero net emissions is ensuring that there are now new sources of emissions.

Fossil gas (primarily methane) should no longer be viewed as an interim energy source for reducing greenhouse gas emissions. We have known for a long time that

methane is a much more potent greenhouse gas than carbon dioxide but now we know that it is even more potent and faster-acting than we had previously realized. Furthermore, there are substantial leaks during gas extraction and at every point in the distribution infrastructure, again much worse than previously known.

Furthermore, the perception being created that there is a shortage of fossil gas only arises when domestic gas supplies are made available on the export market that currently pays a higher price than the domestic price. Gas prices would only fall domestically if domestic supply was increased to levels large enough to lower the world price. That can only occur by exploiting unconventional gas.

Along with adding to the problems of climate change and ocean acidification, unconventional gas causes immense, irreparable damage to local environments, people's health and groundwater in a time when all these are under increasing stress as climate change progresses. Flaring from unconventional gas wells also increases the risk of fires, which are already on the increase as a result of climate change.

There is absolutely no need to use coal seam gas, shale oil and gas and other new sources of fossil fuels. Quite the opposite : pursuing them will create and exacerbate problems facing the Australian community. Many of those problems – such as poisoning scarce water and soil resources for which we have no alternatives – will be irreversible.

If methane gas is required for some applications until alternatives can be developed, it can be captured from existing biological sources, such as sewerage farms and rubbish dumps that still contain organic material. Capturing methane from these sources is already practiced, particularly in Asia and in newer rubbish dumps in Australia (such as at Mugga Lane). It also has an added benefit of slightly reducing methane emissions to the atmosphere from those sources.

It is much easier and cheaper to stop new sources than to close down or change existing sources of greenhouse gas emissions such as fossil gas.

5.2.1 Urgency needed in the shift away from gas

Because methane is such a quick-acting and powerful greenhouse gas, and also contributes carbon dioxide when it is burnt, the longer gas continues to be supplied and used, the faster we accelerate damage to our climate. Rapidly phasing out gas would reduce damage to our climate more quickly than phasing out other sources carbon dioxide emissions. This would, in turn, buy time for making changes in sectors in which it is harder to stop climate-damaging emissions.

Use and reticulation of gas must therefore be phased out as a matter of highest urgency.

Recommendation 30:

The Australian community work together to transition off gas as a matter of highest urgency.

5.2.2 Fossil gas must stay in the ground

To have any chance of limiting global warming to 1.5°C requires dramatic cuts to greenhouse gas emissions this decade, alongside significant reductions in extraction of fossil fuels such as fossil gas..

The Climate Change Authority must recommend that Australian fossil fuels (coal and fossil gas and oil) reduce in line with the climate science, not in line with the profit motives of the fossil fuel industry (which, being mostly foreign-owned, takes most of the profits offshore).

The latest science has Australia needing to phase out all production by 2031 if we want to limit warming to 1.5ºC.[30]

Furthermore, the Climate Change Authority should establish specific science-based reduction targets across all methane sources, with particular emphasis on achieving at least a 75% reduction to 2030 from 2020 levels in fossil methane emissions from coal and gas, in line with the IEA's Net Zero by 2050 scenario.

This aligns with Australia's commitment to the Global Methane Pledge,[31] which identifies the Energy (coal, oil and gas) sector as a primary focus for near term emission reductions to 2030 (as well as the waste sector) and the priority of improving frameworks for measuring, reporting and verification of methane emissions and emissions reductions.

Recommendation 31:

The Climate Change Authority recommend, and Australian governments agree:

(a) that Australian fossil fuels (coal and fossil gas and oil) reduce in line with the climate science, not in line with the profit motives of the fossil fuel industry

[30] https://fossilfueltreaty.org/cser-extraction-report
[31] https://www.globalmethanepledge.org/resources/global-methane-pledge

(a) to establish specific science-based reduction targets across all methane sources, with particular emphasis on achieving at least a 75% reduction to 2030 from 2020 levels in fossil methane emissions from coal and gas, in line with the IEA's Net Zero by 2050 scenario and Australia's commitment to the Global Methane Pledge.

5.2.3 Accelerating transition requires careful management

The accelerated transition away from gas to more benign alternatives will need to be carefully managed in order to minimise adverse consequences, particularly for businesses and gas-based tradespeople. Demand, supply and service aspects will all need to be addressed. People are already shifting away from gas because of its rising cost. It is now cheaper for new houses to not connect to gas, or for existing houses with one gas appliance to disconnect, and instead go all-electric. As gas prices continue to rise and people increasingly want to shift to reduce climate and other health and environmental damage, more people will want to shift away from gas. Our shift to zero net emissions will accelerate that shift.

Lessons from other disruptions show the need for thorough planning, retraining and support to minimise hurt to affected people and businesses, particularly those involved in supplying and servicing gas appliances and infrastructure. The hurt will be worse if the gas industry collapses as customers shift to renewable energy or if damage to our climate is allowed to accelerate (with associated massive climate disruption, social and economic chaos). This will be worse if the gas industry and gas use expands first.

<u>Recommendation 32</u>:

Australian governments work with local gas businesses, local gas tradespeople and the broader community to carefully manage accelerating the transition transition off gas, with a clear end-date (say, 2020) that indicates urgency.

The shift away from gas will be faster if people:

- do not buy gas and appliances in the first place - and this means addressing both demand and supply sides;
- decide (or are forced to) actively change away from gas (either as users or as suppliers or servicers).

5.2.4 Changing demand

On the demand side, use of gas will need to cease and the services it is used for changed to alternatives.

Education, incentives and regulation can help reduce demand for gas and resistance to alternatives (while increasing demand for the alternatives). At the moment, many people are unaware of or lack experience with alternatives to meeting their end-uses. Furthermore, the more recently someone has paid for a gas appliance the less supportive they are likely to be to replacing that appliance (with an electric one).

Education can help people understand the benefits and practicalities of alternatives to gas for meeting their end-needs (eg heating, cooking). This might be in the form of:

- explaining safety, health, and convenience of electricity over gas;
- giving people practical experience of cooking with induction stoves;
- showing how clever design and careful construction (or retrofitting) can make houses and other buildings warm in winter.

This has already begun.

Public attitudes can also shift, making it ‘uncool’ to be cooking or heating with gas and ‘cool’ to be cooking and heating with clean electricity generated from renewable energy.

Recommendation 33:

Australian governments and relevant professional, community and business organisations help the broader Australian community to:

(a) understand the benefits and practicalities of alternatives to gas for meeting their end-needs;

(a) develop a culture that it is ‘uncool’ to be cooking or heating with gas and ‘cool’ to be cooking and heating with clean electricity generated from renewable energy.

Incentives can help accelerate changes in technology and behaviour away from gas. Modelling could indicate the effectiveness of different sizes and types of incentives for accelerating the reduction in demand for gas. These should include cash rebates for replacing existing gas appliances with electric or solar alternatives.

Recommendation 34:

Australian governments, utilities and businesses consider offering financial incentives to accelerate replacement of gas heaters, water heaters and cooking appliances with electric or solar alternatives.

Regulation can be added to these measures to give certainty and added impetus to ending use of gas. This can happen on the demand side (eg making it illegal for a building to have a gas heater, water heater or cooking appliance installed) as well as on the supply side (eg for phasing out and stopping advertising and sales of gas appliances).

5.2.5 Positive transition for supply and service businesses and trades

On the supply and services sides, it is clear that substantial change will be needed, both to make the shift away from gas and to deal with the psychological and financial changes involved. Despite the Australian policy of achieving zero net emissions and the urgency of the need to stop damaging the climate, there is little evidence of change in attitudes and focus in the local gas industry. To the contrary, as we have seen in the recent Australian government announcement and in businesses continuing to promote gas appliances[32]

Australian governments can show the way by making changes in the organisations they own.

Workforce re-training and business restructuring are key elements of the energy sector transitioning fairly to becoming fossil fuel-free. The people (especially gas-fitters) will need to re-skill (perhaps into the renewable energy industry) in order to maintain their incomes. Businesses will need to re-focus and perhaps transform into something completely different. The Australian community can help with this and doing so would reduce resistance and difficulties from the people most affected. This is where Recommendations 11, 20-22 and 30 come into play.

Recommendation 35:

Australian governments that are owners or part-owners of gas businesses, require those businesses to immediately stop advertising and promoting gas and gas appliances.

[32] Canberra Institute of Technology. 2018 Trades, Certificate III in Plumbing CPC32413, Overview, https://cit.edu.au/courses/trades/plumbing/C3-TS01

Biogas is often promoted as a renewable source of energy, particularly from landfills, sewage farms and intensive agriculture. Because burning methane creates carbon dioxide (a less potent and slower acting greenhouse gas), capturing and burning biogas can reduce the climate damage from existing systems until they are changed to become more benign and use aerobic processes. However, building energy systems based on biogas:

- does not deal with the source of the gas in the first place (eg keeping organic materials out of landfill);
- perpetuates the 'fuel=energy' mentality that has led to climate damage and perpetuates resistance to the changes needed for a safe climate; and
- at the end of the day, still entails all of the problems with gas outlined above - and not all the gas can be captured.

<u>Recommendation 36</u>:

Australian State, Territory and local governments:

(a) weigh up capturing and using biogas from existing sewage treatment systems and landfills compare with changing them to more climate-benign systems; and

(b) not pursue biogas as an energy source for the longer term but rather work to stop gas being produced in the first place.

Although it can be used as a benign fuel, it is hard to make a case for pursuing hydrogen as a source of energy because:

- unlike electricity, it is not readily available off the shelf so doing so is likely to divert attention and resources from putting in place readily available renewable energy technologies;
- it comes with considerable safety problems;
- hydrogen does not occur naturally in large quantities, so considerable amounts of energy is needed to make it in industrial quantities in the first place; and
- it would perpetuate the 'fuel=energy' mentality that has led to climate damage and perpetuates resistance to the changes needed for a safe climate.

Recommendation 37:

Australia not pursue hydrogen as a source of energy.

5.4 Burning 'waste' is a distraction

As with biogas, burning 'waste' is a distraction from avoiding generating waste and any associated climate-damaging emissions in the first place. It also:

- perpetuates the 'fuel=energy' mentality that has led to climate damage;
- can create air and solid pollution;
- wastes nutrients and moisture, if food and garden waste, paper, cardboard and wood is burnt; and
- can increase climate damage, if carbon-rich material that would otherwise keep the carbon as solids and out of the atmosphere and oceans is burnt.

Recommendation 38:

Australian governments not permit 'waste-to-energy' developments.

5.4 Why waste wood?

Burning wood for energy is not healthy, clean, renewable or sustainable - and it contributes to climate damage. Woodsmoke also makes it difficult for people to use active transport and it can reduce the amenity of neighbours.

Furthermore, the wood that is burnt usually comes from remnant woodlands and native forests worsens climate change. Removal of these trees reduces the capacity of woodlands and forests to be carbon sinks and to be resilient to the consequences of damage to our climate. Protecting native forests is one of the quickest, safest and cheapest ways to help stop climate change.[33]

Amongst Australian governments, policies regarding wood heating are inconsistent and need to be brought in line with reaching zero emissions urgently. For example,

[33] See, for example, Project Drawdown. n.d. 'Summary of Solutions by Overall Rank', https://www.drawdown.org/solutions-summary-by-rank

the ACT's Wood Heater Replacement Program[34] recognises the desirability of reducing wood smoke and helping people shift to cleaner, more energy efficient heating. However, new wood heaters are still permitted to be sold and installed.

Recommendation 39:

Australian governments work with local suppliers and installers of wood and wood heaters, chimney sweeps, health professionals, health and active transport organisations, residents' groups, and the broader community to phase out wood heating in their jurisdiction, with a clear end-date that indicates urgency.

5.5 Energy efficiency for lower costs and greater comfort

Reducing energy-related emissions and increasing energy efficiency is much easier to achieve if the starting point is focussing on what end-users need (comfortable living and working places, heat, power, electrical energy) rather than the type or source of energy. It is particularly important to move away from 18th and 19th century industrial thinking that fuel (and fossil fuels in particular) is the best or main way of providing energy. Rather, we need to be thinking of how to meet the needs of end-users in a sustainable, cost-effective way. That means focussing attention on, for example, building standards and people's behaviour, rather than just on energy supply.

Energy security can also be enhanced if energy and comfort needs can be met via multiple modes of provision. For example, highly energy efficient, passive solar and carefully constructed buildings mean that occupants can remain at comfortable temperatures without relying on external sources of energy : they do not need electricity to run air conditioners. Where buildings are less energy efficient, consumers can meet much of their thermal comfort needs through appropriate behaviour (how they 'drive' their building). In this way, consumers can be more in control of their own energy security.

Costs for grid-connected energy users are also rising in part due to suppliers having to install extra generation capacity to cope with peaks in demand due to extreme weather, and heat waves in particular. These demands are likely to increase because extreme weather increases as climate change progresses. However, there are alternatives to air-conditioning powered by grid-supplied electricity, such as:

[34] https://www.actsmart.act.gov.au/what-can-i-do/homes/wood-heater-replacement-program

- having more energy efficient buildings and heating and cooling buildings naturally, through, for example, good design or external shading;
- using solar-powered ‘air-conditioning’; and
- people changing their behaviour, for example, to change when they use air-conditioning or to cooling down by other means (e.g. water).

One way of doing helping to control and reduce consumption of externally-supplied energy is is to dramatically raise minimum energy performance standards – and enforce them. (Enforcement is vital.) In this way, the overall efficiency of the stock pool is improved as stock is replaced or improved. This is very important for improving the energy efficiency of the relevant stocks, which are in operation for many years. This is particularly the case with buildings, especially housing.

Improving energy efficiency has long been regarded as ‘low hanging fruit’ when it comes to reducing greenhouse gas emissions and energy costs.

Global assessment has confirmed that Australia is well behind other industrialised countries when it comes to energy efficiency.[35,36]

Our poor energy efficiency standards and performance leads to:

- energy bills being higher than they need to be, with flow-on effects in terms of financial stress and lower international business competitiveness;
- demand for energy being higher than it needs to be - which has implications for energy security and, with increasing population and increasingly hot and extreme summers, for the renewable electricity and energy targets and contracts;
- lower levels of comfort in buildings, particularly as a result of draughts and the need for artificial heating and cooling;
- more people dying each year during weather extremes - and this is increasing as summers become more extreme and energy prices increase; and
- increased damage to the climate, while we still use fuels for energy.

[35] Energy Efficiency Council. 2016. ‘Australia confirmed as a global laggard on energy efficiency’, 21 July 2016, http://www.eec.org.au/news/eec-news/article/australia-confirmed-as-a-global-laggard-on-energy-efficiency

[36] Pears, A. 2017. ‘Global clean energy scorecard puts Australia 15th in the world’, *The Conversation*, 16 February 2017, https://theconversation.com/global-clean-energy-scorecard-puts-australia-15th-in-the-world-73047

The poor energy efficiency of our buildings in particular makes living and working in Australia more uncomfortable than it needs to be for many people.

There is a lot of scope for Australia to improve energy efficiency through taking action locally (eg by improving energy efficiency requirements and practices for buildings) and nationally (eg by harmonising such requirements and practices as needed).

Improving the energy efficiency of our housing and other buildings will:

- reduce or stabilise energy bills;
- help stabilise (or reduce) demand for renewable electricity, which in turn will help us meet our renewable energy targets and avoid the need for unnecessary renewable energy investment and contracts;
- improve levels of comfort in buildings, improving the people's health and their resilience in extreme weather; and
- reduce damage to the climate, while we still use fuels for energy.

Advice from the Energy Efficiency Council[37] and other experts can be used to guide activities to improve energy efficiency.

The past and current culture in our construction and property industries needs to be addressed, with a focus on improving the quality of design, construction and maintenance. It tends to be focussed on doing and providing the minimum required (or less). For example, many new apartment blocks are of such poor quality that they are the cause of much dissatisfaction amongst occupiers; some are the subject of legal suits and might be demolished and rebuilt as they were done so badly. Unless changes are made, this problem is likely to get worse as Canberra becomes more dense and our ageing population looks to downsize. Priority should therefore be given to:

- increasing the minimum energy efficiency requirement for new buildings to bring them up to good international standard for our climate and extend them to being performance standards (that is, as built rather than as designed);
- introducing and increasing minimum energy efficiency standards for existing buildings, including rental buildings, to bring them up to good international standard for our climate;
- requiring the current actual (not designed) energy efficiency rating of housing to be disclosed when selling or leasing;

[37] Energy Efficiency Council. n.d. 'Policy and Projects', http://www.eec.org.au/policy-advocacy/handbook

- introducing minimum insulation requirements for all housing within each climate zone, with the requirements being good practice for that climate
- retrofitting existing buildings to improve their energy efficiency; and
- encouraging highly efficient (preferably zero or negative net emissions) buildings.

<u>Recommendation 40</u>:

Australian governments as a matter of urgency:

(a) increase the minimum energy efficiency requirement for new buildings to bring them up to good international standard for our climate and extend them to being performance standards;

(b) introduce and then increase minimum energy efficiency performance standards for existing buildings, including rental buildings, to bring them up to good international standard for our climate;

(c) require the energy efficiency ratings to be based on performance rather than just design;

(d) require the current energy efficiency rating of housing to be disclosed when leasing, as well as when selling;

(e) introduce minimum insulation requirements for all housing, commensurate with good practice for our climate.

<u>Recommendation 41</u>:

Australian governments and broader Australian community:

(a) retrofit existing buildings, particularly homes, to improve their energy efficiency;

(b) insulate up to good international standard for our climate all existing public and community properties urgently; and

(c) encourage highly efficient (preferably zero or negative net emissions) buildings.

Introducing retrofit programs for homes and other buildings would accelerate improving the energy efficiency of the existing building stock as well as having other

co-benefits. Retrofit programs have been undertaken successfully in other countries and would be consistent with improving economic efficiency, particularly within Australia and in supporting our most vulnerable people. People will also love homes that are cooler in summer and warmer in winter, as well as the jobs that retrofitting will create.

Recommendation 42:

Australian governments consider introducing formal programs to retrofit homes to accelerate improvement in their energy efficiency.

Appropriate educational means can improve the behaviour of people for improved energy efficiency. Some government and community-led programs are making an important contribution and should be continued and expanded.

Recommendation 43:

Continue and expand government and community-led programs for behavioural change for improved energy efficiency.

6. Transport

After stationary energy, transport has been one of Australia' (and is now the ACT's) biggest source of emissions. With most of our stationary energy already on track to coming from clean and renewable sources, achieving zero net emissions from transport must be a high priority. Given our spread out, car-focussed urban areas and lifestyle, it will also entail a major cultural challenge.

The only way to reduce our transport emissions is to reduce consumption of transport fuels. There are four options for this:

1. reducing our travel;
2. changing to non-motorised modes of transport;
3. changing to more energy- and space-efficient modes of transport;
4. electrifying motorised transport.

When considering ways to reduce transport emissions we also need consider how to make transport deliver Australia''s overarching vision. In particular, we need to

consider how transport can help enable people in Australia to have healthy, caring and friendly communities that lives in ways and environs that are sustainable, highly liveable, and resilient in our changing climate. How will we make Australia a highly desirable place to live, work, and visit - now and into the future - with transport zero net emissions?

Without dramatically changing the layout of urban areas, achieving this vision means making active and public transport the attractive, safe (and perceived to be safe), easy and convenient transport choice, with private (electric) motor vehicles the fall-back option for people with mobility difficulties. It also means making travel in little personally-owned[38] boxes less desirable than other options for most people. This is the opposite to the current situation, where travel in private motor vehicles is the default option for most people because it is the easiest, most obvious and often the only way for most people to travel around urban areas.

As well, active transport has physical and mental health benefits and a range of other co-benefits.

We also need to remember that travelling in cars (and light commercial vehicles) is the least space-efficient, sustainable and friendly form of transport. Roads and carparks take up huge amounts of land and resources like tar (a form of fossil oil) and concrete (made from cement that is currently made in a way that responsible for large contribution to climate damage). They also:

- absorb huge amounts of heat and radiate it back on us and our plants and pets, making life in summer and heatwaves even less pleasant;
- create large areas that are impermeable to water, which denies water to street trees and adds to flooding (especially flash flooding), which is more likely given that intensity of rainfall (when it happens) is increasing as a consequence of the climate change now unfolding;
- contribute to water pollution, as the rainwater running off roads is usually contaminated by fuel and tyre residues;
- require us to give up public space, incidental interpersonal interactions, health, safety, nature, and local aesthetics, amenity and safety for people not in cars.

Increasing population and induced traffic demand means that, without cultural change to travel by other means, these problems just get worse and worse.

The faster we use road-based motor vehicles less, the faster fewer cars will be on the road, so the faster less road and parking will be needed...and the faster our

[38] including ‘ownership’ by way of salary packaging or hire-purchase (‘finance’).

urban areas will become more people friendly (designed for people rather than motor vehicles), less expensive to construct and maintain, less of heat islands in summer, and less polluted. Fewer vehicles on the road will make urban travel faster for those vehicles that *are* needed.

Who wouldn't want to live and work in a place that is attractive, friendly and comfortable and supports easy travel and healthy lifestyles and future?

In this regard it is important to note that actions to reduce emissions from individual motor vehicles (for example, by electrification) will reduce emissions of greenhouse gases and air pollutants will not necessarily reduce congestion, air pollution, noise pollution or sedentary lifestyle diseases. Such actions will only reduce congestion and air pollution if there are fewer motor vehicles that each contribute to these problems and/or each contributing vehicle is used less. Shifting modes of travel away from private vehicles is vital to meeting all the objectives we have for transport in Australia.

Our current high use of cars and slow rate of change to alternatives means that we have a long way to achieve zero emissions and all the other benefits.

Furthermore, with our huge size and reliance on ground transport, Australia needs to ensure we are not left behind on changes that are happening around the world - especially if we want to maintain our leadership position.

Increasingly, cities around the world are deciding to shift away from being car-focussed to being people-focussed. They are returning public realms to the people, and changing transport systems and infrastructure to make it easy, safe and pleasant to travel by active and public transport and to discourage car travel, particularly in city centres. Other changes include fuel-powered vehicles being phased out in other countries and by vehicle manufacturers. This means that, apart from the need to urgently reduce greenhouse gas emissions to zero, a fuel-powered transport system without a supply of fuel-powered vehicles is a recipe for disaster.

Instead of being on the back foot, we need to urgently start upgrading our transport system so that it matches our needs into the future.

We can do this by actively pursuing two goals for Australian urban areas:

- first, anyone being able to accomplish general day-to-day or tourist travel easily and safely without a car
- second, anyone being able to do each such trip with a maximum travel time of 30 minutes door-to-door.

Recommendation 44:

Australia actively pursue two goals for its urban areas:

(a) first, anyone being able to accomplish general day-to-day or tourist travel easily and safely without a car; and

(b) second, anyone being able to do each such trip with a maximum travel time of 30 minutes door-to-door.

6.1 Reducing our travel

We are a highly mobile society. We live in a spread-out city and most of us travel around it a lot, mainly in cars and light commercial vehicles. We also travel interstate and overseas a lot, mostly by car or plane.

Urban consolidation and densification and a growing preference for city and sustainable lifestyles is allowing more people to again starting to live close to where they work, shop and attend education and entertainment - or at least convenient public transport to get them there - if they can afford it.

Increasing use of IT and flexible working arrangements means that people no longer always have to travel to work, meetings, education or shopping. We have seen this shift since early 2020 as a result of the start of the COVID-19 pandemic. Greater use of IT and local hubs and other facilities for working, meeting, education and shopping could reduce the need to travel even more. Using local hubs and other facilities requires less travel to reach. It also builds and strengthens local communities, increasing community capability and resilience - both of which are needed for reducing emissions (see section 4.4) and in times of stress.

Recommendation 45:

Australian government and other employers, organisations and businesses:

(a) encourage people to work from home or local hubs, where their work can be adapted to do so;

(b) encourage people to hold long-distance meetings via teleconference or other means, instead of interstate or overseas travel; and

(c) showcase how their people travel by active or public transport or hold long-distance meetings via teleconference or other means, instead of by car or interstate or overseas travel.

Recommendation 46:

Australian governments, schools, businesses and community organisations encourage people to use their local schools and shops, instead of travelling to more distant ones.

Budgets should reflect the changes needed to reduce emissions, not the status quo. This is particularly the case for transport.

Budgets of Australian governments at all levels need to be re-prioritised to reflect the changes needed in transport to reduce emissions, and in particular the shifts to public and active transport needed. This includes allocating at least 50% of transport budgets being dedicated to public transport and 20% to active transport, in line with international best practice.[39,40]

Recommendation 47:

Australian governments at all levels re-prioritise their budgets to:

(a) reflect the changes needed in transport to reduce emissions, and in particular the shifts to public and active transport needed; and

(b) allocate at least 50% of transport budgets being dedicated to public transport and 20% to active transport, in line with international best practice.

Holidaying far away can seem exciting, exotic and/or luxurious - yet it also causes a lot of climate damage because just one flight can outweigh an awful lot of low-emissions living.

Excitement, the unusual and luxury can all be found in or close to where most people in Australia live - with extremely low (or no) damage to the climate from transport. ‘Staycations’ take this to the next level. Holidaying locally can also strengthen the

[39] Climate Council. 2022. *Are We There Yet? Clean Transport Scorecard for States and Territories*. https://www.climatecouncil.org.au/resources/are-we-there-yet-clean-transport-scorecard-for-australian-states-and-territories/

[40] UNEP (United Nations Environment Programme). 2016. ‘Global Outlook on Walking and Cycling—Policies & realities from around the world. ‘https://europa.eu/capacity4dev/unep/documents/global-outlook-walking-and-cycling-policies-realities-around-world

local economy and keep the place lively: Canberra would no longer ‘empty out’ during holidays.

Of course, making Australia more attractive, comfortable and easy to get around without a car would make holidaying locally more attractive (see the rest of sections 6 and section 9).

Promoting tourism to Australia goes against this. Tourism travel by plane and cruising contributes unnecessary damage to the climate. Australia should look to diversify away from long-distance travel for pleasure and business.

Recommendation 48:

Australia shift away from unnecessary long-distance travel, particularly by:

(a) encouraging Australian residents to holiday locally instead of travelling to more distant places (particularly by Australian governments and local attractions and businesses promoting the benefits and desirability of local holidays and providing incentives to and advice for holidaying locally); and

(b) develop plans to diversify tourism- and convention-related businesses away from long-distance travel.

6.2 Upgrading to non-motorised modes of transport

6.2.1 Getting our transport priorities right

Despite our health, transport and emissions reductions goals and the fact that everyone is a pedestrian or cyclist for at least some of their journey, Australia does not prioritise active travel. Currently, most urban and transport planning and budget expenditure - and almost every single street and road - in Australia prioritises motor vehicles and their occupants over other forms of transport and a pleasant, people- and nature-focussed public realm.

Most Australian streets and roads are built, managed and operate to facilitate travel by motor vehicle.

In contrast, these features mcombined with the lack of dedicated infrastructure, serve to hinder people walking, cycling or getting to public transport and make their journeys more difficult.

Prioritising cars can have unintended consequences, such as increasing the difficulty or time it takes for people to walk, roll or ride[41] or access public transport stops, such as:

- drivers not giving way to people on foot or bicycle and being being unaware of when they need to do so - with the result that, in the interests of preserving their safety, people on foot or bicycle tend to give way to motor vehicles;
- people on foot or bicycle waiting for long periods facing an empty road - which leads to some taking risks and crossing against the lights, sometimes with tragic consequences; and
- people needing or wishing to cross roads without traffic lights (eg to access bus services) having to wait for longer and longer times as longer and longer turning lanes make for longer and longer streams of traffic.

Furthermore, road design and speed limits geared to maximising safe travel speeds for motor vehicle reduce the safety and sometimes the speed of travel by active transport.

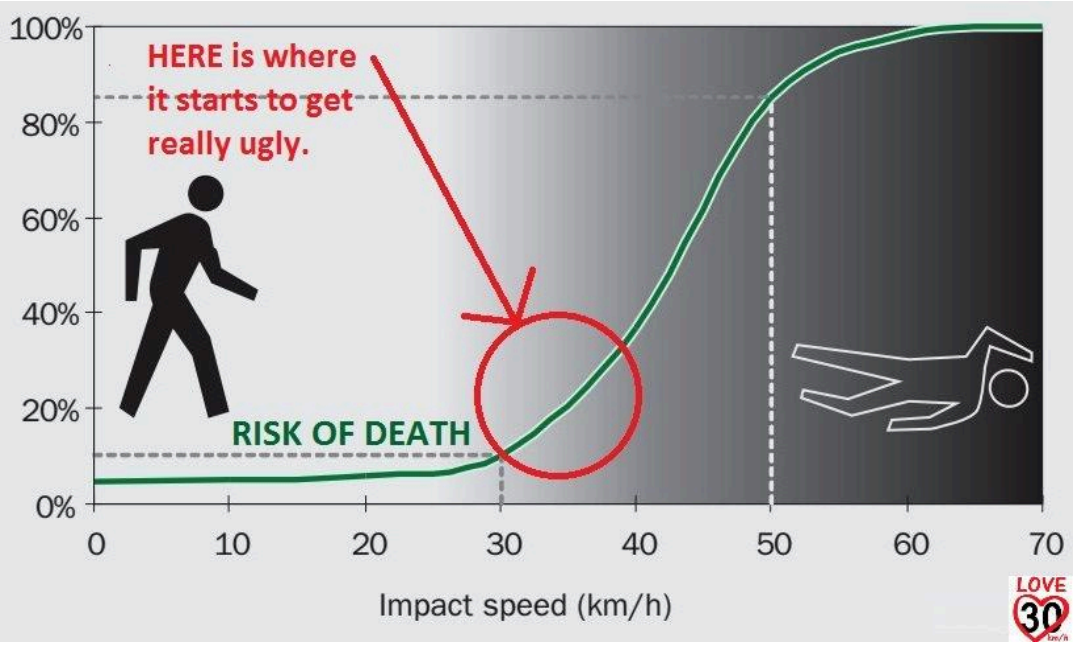
- Where there are lower limits in areas of high pedestrian activity, they are still set at levels geared for motor vehicle convenience (except in a few 'shared spaces') and set for only very small areas immediately adjacent to schools and shops, rather than what is needed.
- Safety (especially the chance of avoiding death or serious injury) for vulnerable road users decreases dramatically above 32km/h (20mph).[42,43,44]

[41] Commonwealth of Australia, Department of Infrastructure and Transport. 2012. Walking, Riding and Access to Public Transport. Draft report for Discussion, October 2012, https://infrastructure.gov.au/infrastructure/pab/active_transport/files/active_travel_discussion.pdf

[42] Walker, A. 2016. 'How Likely You Are To Get Killed By A Car, Depending On Its Speed', *Gizmodo*, 30 May 2016, https://www.gizmodo.com.au/2016/05/how-likely-you-are-to-get-killed-by-a-car-depending-on-its-speed/

[43] Groeger, L. 2016. 'Unsafe at Many Speeds: Your risk of getting killed by a car goes up with every mile per hour', *ProPublica*, 25 May 2016, https://www.propublica.org/article/unsafe-at-many-speeds?utm_campaign=sprout&utm_medium=social&utm_source=twitter&utm_content=1464207000

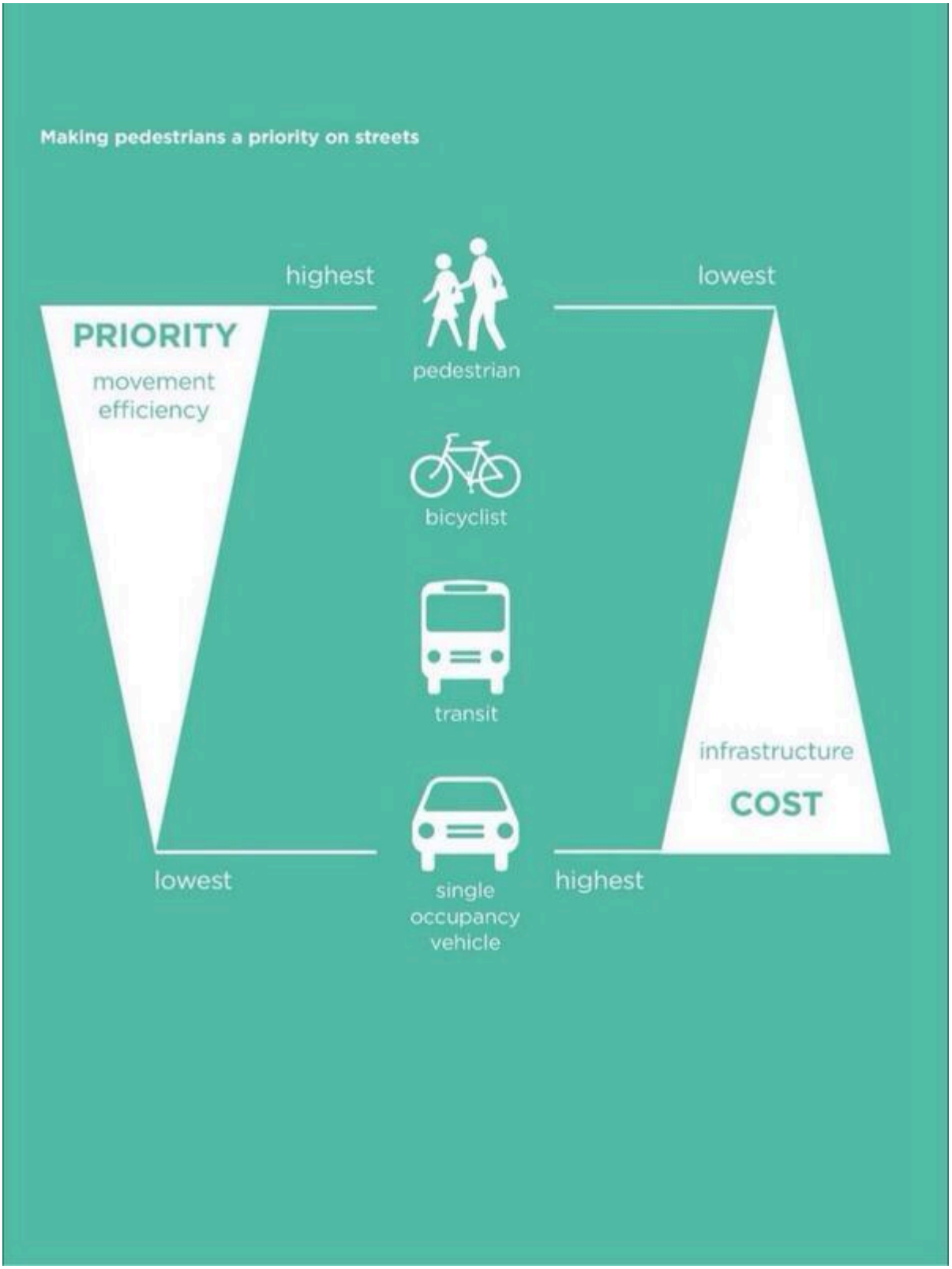
[44] Pless, I.B. 2000. Killing speed, *Injury Prevention* **6**:163-165, http://injuryprevention.bmj.com/content/6/3/163



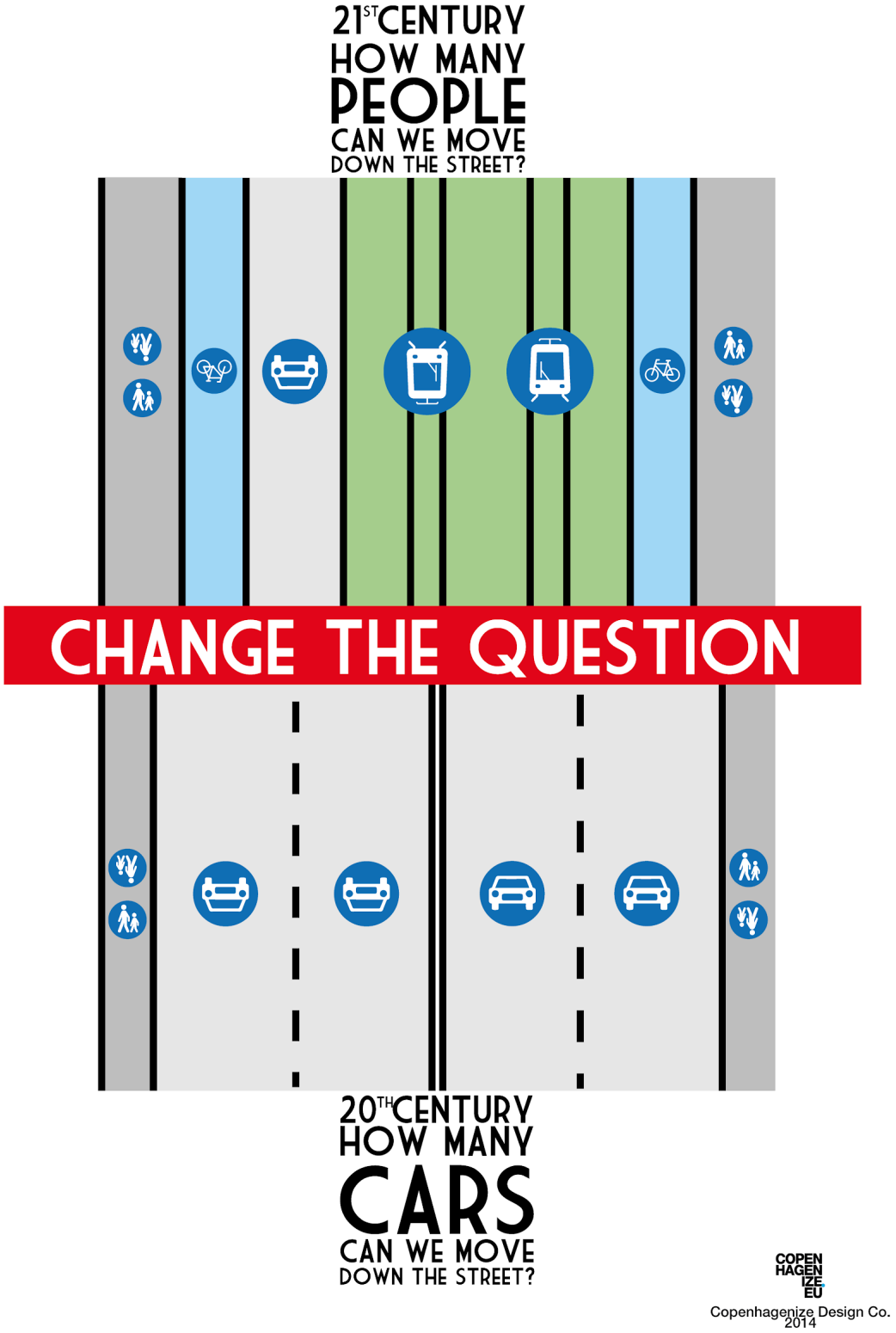
(Source: Love 30 Canada, https://love30.ca)

- The higher the speed of traffic the harder it also is for people using active transport to cross streets and roads without traffic signals or pedestrian crossings - and this problem is compounded on multi-lane streets and roads.

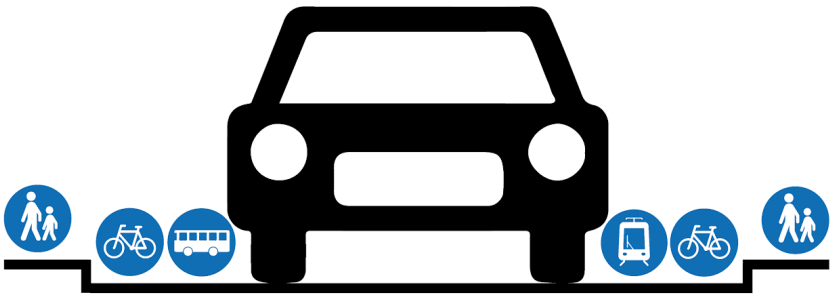
Instead of prioritising cars and other private motor vehicles, we need to prioritise people. The graphics on the following three pages illustrate the cultural shift in priorities that is needed.



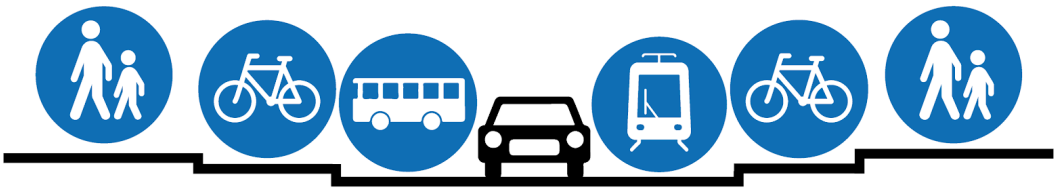
(Source: Dale Calkins, Twitter)



(Source: Mikael Colville-Andersen, Flickr, CC BY-NC-ND 2.0)



How most traffic engineers see your city



How cities should be designed

COPEN HAGEN IZE .EU
Copenhagenize Design Co.
2013

(Source: Mikael Colville-Andersen, Flickr, CC BY-NC-ND 2.0)

Recommendation 49:

Australian governments ensure that their transport systems, laws, policies, programs and practices:

(a) have as their main objectives reducing emissions from transport to zero as a matter of urgency while helping to deliver the overarching vision for Australia (Recommendation 11); and

(b) are undertaken in partnership with their communities, including local climate change, transport and residents groups and community experts.

Recommendation 50:

Australian governments ensure that Budget planning and expenditure for transport has as its main objectives reducing emissions from transport to zero as a matter of urgency while helping to deliver the overarching vision for Australia (Recommendation 11).

6.2.2 Making active travel easy, safe and obvious

People are more likely to use active travel for their transport if it is easy, safe and obvious. Everyone uses active transport at some point of their journey, even if it is getting to and from their motor vehicle at either end of their trip. Making active travel safe as well as easy and obvious can also help reverse the trend to restrict children's independent mobility,[45] which in turn can help improve their health, problem-solving and confidence in their abilities. Furthermore, active travel is the main way people reach public transport - so improving the attractiveness of active transport can improve the attractiveness of public transport. In this regard, it is important to note that the Australian Government's principles to support walking, riding and access to public transport include:

- improving access to public transport stops particularly 5–10 minute walking catchments;
- creating safe environments for pedestrians and bicycle riders by:

[45] Policy Studies Institute. 1990. *One False Move: A study of children's independent mobility* by Mayer Hillman, John Adams & John Whitelegg. PSI Publishing: London. 107pp, https://mayerhillman.files.wordpress.com/2014/10/one-false-move.pdf

- separating modes by speed, in particular separating pedestrians and bike-riders from motor vehicles at high-speed and high-volume traffic;
- allocating or share road space, with appropriate speeds, in lower-traffic environments; and
- recognising the vulnerability of bicycles as road vehicles.[46]

In 2018, academics at the University of Queensland suggested a way forward to making Australian cities more attractive for active transport, noting that:

> research has unequivocally shown that substantive changes can occur only through a combination of high-quality infrastructure, pricing policies and education programs'.

They recommended three main types of action:

> **1. Ideas**: Active travel must become normalised as an integral part of transport planning. Footpaths, crosswalks and bicycle lanes must be standard elements of street templates and guidelines, just like telephone lines and fire hydrants.
>
> **2. Interest**: Councils must secure strong political support for walking and cycling, as well as unity and collaboration within the active travel community. Solid evidence [must be provided, particularly to members of the public and to people designing and constructing infrastructure] on the benefits of high-quality walking and cycling environments and on the impacts on businesses and households of removing traffic and parking lanes to accommodate footpaths, bike paths and pedestrian malls.
>
> Persistence and consistency in messages to the public, and a non-antagonistic stance, are also important. To embrace active travel, people must feel positive about creating a more just, fun, safe and healthy world through their informed travel choices.
>
> **3. Institutions**: More government funding for active transport – independent of political cycles – must be provided, while at the same time allowing more local planning autonomy.[47]

---

[46] Commonwealth of Australia. 2013. Walking, Riding and Access to Public Transport: Supporting active travel in Australian communities', Ministerial Statement, Australian Government, Department of Infrastructure and Transport, https://infrastructure.gov.au/infrastructure/pab/active_transport/files/infra1874_mcu_active_travel_report_final.pdf

[47] Pojani, D, Butterworth, E, Cooper, J, Corcoran, J and Sipe, N. 2018. 'Australian cities are far from being meccas for walking and cycling', *The Conversation*, 5 February 2018, http://theconversation.com/australian-cities-are-far-from-being-meccas-for-walking-and-cycling-87331

Just as (or perhaps more) importantly, changes are needed so that using active transport must be - and be perceived to be - safe, relatively comfortable and more convenient than travelling by car.

A person walking, cycling or using another means of active transport has far less protection in the event of a collision with a motor vehicle. It is this vulnerability from lack of protection that is a major deterrent to people from using active transport. The problem is exacerbated by drivers abusing people on bicycles. If the vulnerability results in injury or death, then all the other benefits are negated.

To overcome these problems, it is vital to reduce the chances of people using active transport interacting directly with motor vehicles, particularly vehicles travelling over 30km/h. That means keeping active transport users and motor vehicle users separated wherever possible and/or reducing speed limits to 30km/h or less. There are three main aspects of this:

1. suitable infrastructure
2. laws that are clear and consistent and prioritise active travel over people motor vehicle travel
3. appropriate behaviour by road users, especially by people driving motor vehicles.

People can travel actively in relative comfort if they can do so on smooth surfaces and with shelter from sun and heat, rain, and wind (all of which are becoming stronger as the consequences of damage to our climate unfold. This also comes down primarily to the quality and maintenance of infrastructure, including shelter trees.

Infrastructure

Remedying the infrastructure problems outlined above (at the start of 6.2.1) so that people walking and cycling are prioritised over people driving motor vehicles:

- makes it easier and safer for people to use active travel; and
- signals to everyone (especially drivers) the prioritisation of active travel over motor vehicle travel to people.

We need to give at least the same level of attention to funding, designing, building and maintaining infrastructure and facilities for people using active travel as we do for people using motor vehicle travel - and preferably more.

Currently, roads and streets are built to take people places - without breaks yet the same cannot be said for infrastructure designed for active travel. When roads are built, they connect up. Why don’t our paths and cycle lanes? Would anyone expect

to acquire or build a destination (eg a house or office) without it being serviced by a road or street fit for driving on? That is a frequent situation for people who walk or cycle in Australia. Given that everyone is a ‘pedestrian’ but not everyone has or travels by motor vehicle, why are people using active (and public) transport not given the same level of service as people using motor vehicle transport Can you imagine the outrage from people driving motor vehicles if a road suddenly ended or was blocked by a sign telling them to turn around or cross to the other side? It happens regularly to shared paths and cycle paths, either by design, construction or lack of maintenance or by infrastructure works.

Just like roads and streets, paths and cycle lanes need to connect so that people can complete their journeys without having to worry about dealing with fragmented infrastructure that and probably results in increased danger, difficulty and/or delay for them. Particular attention must be given to where the design or lack of active travel infrastructure currently increases the danger for users.

Safety and social aspects are key considerations for whether people choose to walk or cycle for transport, exercise or pleasure and so should influence path design. Paths should therefore comfortably accommodate side by side or passing each other at least two people riding bicycles or walking with prams or shopping buggies or suitcases. They should also be usable by people of different ages and abilities.

Careful infrastructure design, construction and maintenance, with attention to detail and the needs of vulnerable road users, can make a huge difference to how easy and safe it is for people to use active transport. Attention to detail can often make the difference between active travel infrastructure being fully functional and easy and relatively comfortable to use. This was one of the improvements that resulted from San Francisco Municipal Transportation Agency introducing a requirement for all people designing active transport infrastructure to travel by bicycle at least once a month so they could experience what it is like to actually travel by bicycle.[48] Design, however, is one thing; actual construction may be something rather different. It would therefore make sense to introduce a similar requirement for both the people who design our for people who use active travel and the people who build and maintain that infrastructure. As well as giving them direct experiences of how the infrastructure on which they work is experienced by active travel users, it could also improve their health and encourage them to use active travel more.

Upgrading our infrastructure so that active travel is easy, safe and obvious will be a big task yet it is also necessary and urgent to achieve so many of our goals, particularly zero emissions from transport and making Australia an attractive, safe, convenient, and comfortable physical place into the future.

[48] Timothy Papandreou, personal communication.

An alternative to building and maintaining high quality infrastructure to separate transport modes according to speed is to have shared streets that are designed and regulated for no-one to travel faster than 30km/h. This is particularly useful where separation of modes is not desirable or is too expensive.[49] It is also part of a global move: countries and cities around the world are legislating 30 km/h as the default speed limit and the United Nations' World Health Organisation is leading a campaign to make 30 km/h streets the norm for cities worldwide.[50,51 ,52]

<u>Recommendation 51</u>:

Australian governments work with the community to make the following changes to legislation, standards and infrastructure urgently (where it is not already in existence), to make active travel easy and safe:

(a) Ensure that every road and street in urban areas either has separated paths alongside (or a path and a separated cycle lane where appropriate) with convenient pedestrian/bike-priority crossings or is converted into a 'living street' (or 'woonerf') designed and regulated for no-one to travel faster than 30 km/h.

(b) On most streets (especially where there is no separation of cycling from motor vehicles):

(1) Widen the road verges and/or median strips to make street carriageways/paving narrower and allow for complete tree cover.

(2) Make corner radii sharp.

(3) Convert streets into 'living streets' (low traffic streets, designed for everyone to travel no faster than 30 km/h) or 'complete

[49] King, G. 2022. 'Could more road maintenance make streets more inclusive and better for everyone?', *The Canberra Times,* 16 December 2022, available online at https://www.canberratimes.com.au/story/8020633/smart-street-design-makes-for-safer-better-maintained-and-more-inclusive-roads/

[50] World Health Organisation. 2021. 'Campaign launched to make 30 km/h streets the norm for cities worldwide', 22 March 2021, https://www.who.int/news/item/22-03-2021-campaign-launched-to-make-30-km-h-streets-the-norm-for-cities-worldwide

[51] World Health Organisation. n.d. 'Decade of Action for Road safety 2021-30, https://www.who.int/news/item/22-03-2021-campaign-launched-to-make-30-km-h-streets-the-norm-for-cities-worldwide

[52] World Health Organisation, 'Global Plan for the Decade of Action for Road Safety 2021-2030', 20 October 2021, https://www.who.int/publications/m/item/global-plan-for-the-decade-of-action-for-road-safety-2021-2030

streets' (higher traffic streets, with modes separated by speed and convenient, priority crossings for slower modes).

(c) Ensure that the paving on shared paths and the edges of roads and streets is level with gutters (if present) and is kept smooth and free from debris or obstructions, and consider a regular program of inspection and/or apps to allow automatic reporting by people on bikes or by motor vehicles to facilitate this.

(d) Ensure that shared paths and on-road cycle lanes, along with their pathways, are continuous and that they do not increase the risks to people using them, particularly where they are needed most and especially at places where likely to come into competition or conflict with motor vehicles (including intersections, slip lanes, roundabouts, bus stops and, for on-road cycle lanes, road narrowings, traffic islands and across on- and off- ramps).

(e) Ensure that all off- and on-road cycle lanes are:

(1) separated from traffic and parked vehicles (including open-doors and allowing for the extra width of small trucks); or

(2) wide enough to accommodate an adult person on a bicycle *and* allow them to ride out of the gutter and off broken tarmac and debris on the road *and* allow them to wobble or deviate from a straight line (eg because of physical or skill limitations or an obstacle in the lane) *and* keep them out of the door-opening zone of parked cars and trucks *and* allow <u>all</u> motor vehicles (including buses and heavy trucks) to pass them at the regulated safe distance.

(Note that this may require reconfiguring roads, streets and intersections, including shifting parking and bus stops, or to remove at least some on-road cycle lanes altogether.)

(f) Build or remake shared paths, particularly those beside roads and where paths intersect with roads, to ensure that they have only low gradients and wide curves.

(g) Increase the minimum widths required for shared paths, so that they can comfortably accommodate side by side or passing each other two people riding bicycles or walking with prams or shopping buggies or suitcases or using wheelchairs.

(h) At all intersections with traffic lights, ensure that people on foot or bike are prioritised:

(1) Change pedestrian and bike lights so that the default is that they change to green automatically before the motor vehicle lights change to green.

(2) Ensure that pedestrian lights remain on green long enough for slow walkers to have ample time cross the road.

(2) Ensure a fast response time for any pedestrian-activated traffic lights, say 15-20 seconds so that people using the crossing are not inconvenienced much and motor vehicle traffic has time to stop safely.

(3) Make changes to light-controlled T-intersections, intersections crossing median strips and/or controlled 4-ways, and intersections with slip lanes so that people on foot or bike (particularly slow walkers) can cross the road on a single light.

(4) Shorten the pulses available for vehicles to proceed, particularly for traffic entering collector roads and access streets, so that people wishing to cross unsignalled collector roads and access streets have some opportunity to do so (bearing in mind that other traffic will also be using those roads and streets).

(i) Convert into pedestrian scrambles major intersections controlled by traffic lights and used by of people walking and cycling .

(j) Install 'wombat crossings' at all unsignalled crossings of streets that are not 'living streets', starting in areas of high walking and cycling activity.

(k) Ensure application of Australian standards for good lighting on paths in urban areas.

(l) Mandate minimum requirements for easily accessible bicycle parking:

(1) at the same or greater rates as currently apply for car parking;

(2) to be easily accessible by bike from the street and main building entries and positioned in a way that is safe for users (including being in places that are well lit and easily visible to the passing public) in multi-unit housing developments, commercial

developments and at educational, community, health, and major transport facilities;

(3) to include provision at shopping centres and educational and community facilities for cargo or passenger cycles, trolleys or other active transport equipment involved in dropping off or picking up goods and people or in shopping.

<u>Recommendation 52</u>:

Australian governments work with active travel, road safety, urban and landscape design, and community groups organisations and members of local neighbourhoods on the details of making streets more people- and active-travel friendly in a warming climate (eg by widening verges and median strips, making street corner radii sharper, and converting streets to 'living streets' or 'complete streets').

In our changing climate, increasingly extreme weather indicates that shelter will become more and more important for anyone using or considering using active travel. Shelter increases comfort and can reduce illness and death from extreme weather, particularly extreme heat. Shelter can come in the form of:

- trees with dense, spreading and contiguous canopies or
- constructed shelters such as breezeways or refuges.

Increasing shelter from trees will entail planting and keeping in good health trees that provide good shelter, particularly in summer when people are increasingly likely to suffer heat stress. Just as is important, though, is providing favorable conditions for tree growth. This is covered in more detail under Laws and Behaviour (in this section) and in sections 6.2.3 and 7.

Ideally, Australian urban areas should be highly 'walkable' and 'cyclable'. This can be measured using tools such as the proprietary Walk Score and Bike Score developed by Walk Score®[53].

Improvements to Australian urban areas' walkability and cyclability may require changes to block, development and street layouts, as well as changes to infrastructure such as those outlined in Recommendation 51.

On top of well-known climate, health, social and environmental benefits, an article in *The Atlantic* summed up the economic co-benefits of improving walkability:

[53] https://www.walkscore.com

> Walkability is more than an attractive amenity--it's a magnet for attracting and retaining the highly innovative businesses and highly skilled people that drive economic growth, raising housing values and generating higher incomes.[54]

Recommendation 53:

Australian Governments and developers make changes to built infrastructure and layout in urban areas so as to improve Walk Score and Bike Score (as measured by Walk Score® or similar tools).

Laws

Currently, road laws and rules regarding active travel are inconsistent. This can be confusing to people and result in perverse outcomes.

Recommendation 54:

Australian governments, in consultation with active travel, road safety, law organisations and the broader community, review relevant legislation to ensure that it is clear, consistent, and prioritise active travel and vulnerable road users over travel in motor vehicles.

Speed limits should be based on the desirability of having zero deaths[55] from road crashes and evidence for safety of the most vulnerable road users, not primarily the convenience of people travelling in motor vehicles. This means changing the speed limit on most streets in residential, commercial and urban areas and around educational, health and community facilities to 30km/h or less. While we still use motor vehicles powered by fuel, lower speeds also reduce the amount of fuel used and thus emissions of greenhouse gases and other pollutants generated.

Recommendation 55:

Australian governments work with road safety, active travel, health, environment and other community groups groups as well as the broader

[54] Florida, R. 2010. 'America's most walkable cities', *The Atlantic*, 15 December 2010, https://www.theatlantic.com/business/archive/2010/12/americas-most-walkable-cities/67988/

[55] Rattenbury, S. 2016. 'New road safety action plan focused on "Vision Zero", Media Release, 15 February 2016, http://www.cmd.act.gov.au/open_government/inform/act_government_media_releases/rattenbury/2016/new-road-safety-action-plan-focused-on-vision-zero

community to reduce urgently the default speed limit on most streets to 30km/h.

Behaviour

People are more likely to do the right thing if they know what the right thing is and if there is a clear consequence of doing the wrong thing.

Culture is also important. 'Official' campaigns and enforcement of laws can make a difference to how well people comply with the law. Grass roots change can lead to powerful change at an informal cultural level, so community organisations will also be important for engendering change in attitudes.

Recommendation 56:

Australian governments actively promote the legal responsibilities and desirable behaviour of people using each road-user mode to people using each other road-user mode.

Respectful language and effective education and campaigns can encourage appropriate and respectful behaviour by road users, especially by people driving motor vehicles towards people using active transport). The more familiar and similar someone is to a person, the more likely the person is to respect them; this means humanising them as people (who are like us or familiar to us) instead of distancing them through labels.

Recommendation 57:

Australian governments and community groups encourage:

(a) respect toward all types of road users by humanising and using the term 'people who…' rather than distancing and using labels (such as cyclists, pedestrians, drivers, motorists);

(b) people driving motor vehicles to slow down, particularly by:

(1) using effective campaign messages (perhaps like 'Speed kills, so kill speed' used in the UK or 'Slow down, kids [or people] around' used in several places); and

(2) promote (especially before implementing Recommendation 55) the desirability of having speed limits of 30km/h on residential and urban streets.

Special events and programs can overcome the lack of familiarity and/or skills that can be a big barrier to people changing their usual transport mode(s). Introducing and extending events and programs such as these could make a big difference to people's willingness to use active transport, particularly if they are held regularly and frequently.

Recommendation 58:

Australian governments consider holding or facilitating frequent regular events to encourage people to try out active travel, including:

(a) car-free days in specific areas or on specific roads;

(b) walk or ride to work days (say each month or week), weeks or months;

(c) walk or ride to shop days.

6.2.3 Creating 'living streets' and 'complete streets'

Rather than primarily facilitating motor vehicle travel, our streets and collector roads could be attractive for multiple purposes including active travel and socialising - and reduce costs of urban maintenance and the effects of extreme weather.

Our streets and collector roads could be delightful places for people of all ages and abilities to be and walk or cycle in, cool in hot weather and sheltered in windy or wet weather (all of which is increasing). Streets that are people-focussed have narrower road pavements, wider nature strips and plenty of shelter, particularly from trees. Neighbourhood public realms that are more attractive places in which to be could have the added benefit of reducing the pressure for private residential recreational spaces, which could in turn help reduce demand for stationary energy.

Making streets healthy and visually attractive places to linger, cherish and safe for active travel are consistent features of good modern street design guidance. So too are involving different disciplines and collaboration with the community in the design and maintenance.[56]

[56] See, for example:

Creating ‘green’, people-focussed shared streets means we will need to design new streets and re-design and retrofit existing streets differently to how we currently do so in most of Australia. Most of our streets could become ‘living streets’ (low traffic streets) or ‘complete streets’ (higher traffic streets), as in Recommendation 52 and (b).

A major component of the changes needed is ‘greening’ our infrastructure for transport and associated public realms. One way this could start is by establishing ‘greenways’ along the lines that Vancouver is doing.[57]

Shelter for active travel comes primarily from trees, be they street trees or private trees and needs to be increased for our changing climate. ‘Leafy suburbs’ are well-known as desirable places to be. As the *ACT Climate Change Adaptation Strategy*[58] points out:

> Providing shade is the most effective way to avoid pavements and buildings heating up, for example canopy trees to shade pedestrian and vehicle pavements...

Private trees are particularly important for completing urban forest canopy over shared paths. Other green infrastructure to cool and beautify our streets comes from shrubs and grass.

Widening verges and median strips will allow more permeable soil surface for rainwater to enter the soil. Narrowing road pavement will reduce heat-absorbing material that heats the soil and is stressing our mainly cool-climate trees in our warming climate. These are two of the reasons for Recommendation 54.

Increasing and maintaining our living infrastructure is an essential part - and challenge - of adapting to our warming climate. It also makes active travel and higher-density urban areas more comfortable and attractive and can reduce energy consumption. Section 7 deals with this in more detail.

There is plenty of guidance around for design principles and details as well as processes for working together on the design, making the changes, and ongoing

- Hawkes, A and Sheridan, G. 2009. ‘Rethinking the Street Space: Toolkits and Street Design Manuals’, *Planetizen*, 31 August 2009, https://www.planetizen.com/node/40394
- Rogers, R. 2011. ‘Green Streets Go Mainstream in Portland’, *Sustainable City Network*, http://www.sustainablecitynetwork.com/topic_channels/water/article_c26ddcfe-b313-11e0-a5fa-001a4bcf6878.html?mode=story
- The original and updated principles for Complete Streets, at Smart Growth America. 2018. ‘The ten elements of a Complete Streets Policy, https://smartgrowthamerica.org/resources/the-ten-elements-of-a-complete-streets-policy/

[57] City of Vancouver. 2018. ‘Greenways: Making Vancouver a more walkable, bikeable city’, http://vancouver.ca/streets-transportation/greenways-for-walking-and-cycling.aspx

[58] Australian Capital Territory. 2016. *ACT Climate Change Adaptation Strategy: Living with a warming climate*, Environment and Planning Directorate, ACT Government, December 2017, July 2016,

maintenance - particularly for 'living streets'. Original[59] and updated[60] Elements of a Complete Streets Policy would be a good starting point for working out key elements and processes for making 'complete streets' in Australia.

6.3 Preferring public transport

The size of Australian urban areas and our current ways of working and living mean that most of us need motorised transport for longer distances or for where active travel is not possible or desirable.

Furthermore, as the population ages a lower proportion of people will want to - or be able to - travel by active travel. There also comes a time when people are no longer able to drive.

More energy-efficient motorised transport means public transport, sharing rides, using motorcycles and motorised bicycles, and, ultimately, only using electric vehicles. When all our vehicles are electric and our electricity comes from 100% clean renewable energy, then electric vehicles will mean that our transport is zero emissions. However, this will happen too slow for Australia to meet its current emissions reduction goals let alone what is needed to return to a safe climate. This is primarily because of the slow rate of turnover of Australia's motor vehicle fleet.[61]

Public transport is the most affordable alternative to driving or active transport for most people.

Considering that the vast majority of passenger travel in Australia - even in major [62] urban areas, where the majority of people live - is by private car, the main way to reduce emissions and achieve a raft of other goals and co-benefits is to shift trips from private car to public transport.

Public transport transports people much more efficiently in terms of the space and energy used than people travelling by car (even with several people per car). If convenient, frequent and direct enough, public transport can also be a more time-efficient option for people travelling longer distances than they can comfortably walk or cycle.

---

[59] National Complete Streets Coalition. n.d. 'The Ten Elements of a Complete Streets Policy', https://smartgrowthamerica.org/resources/the-ten-elements-of-a-complete-streets-policy/

[60] Smart Growth America and National Complete Streets Coalition. 2018. 'The Elements of a Complete Streets Policy, effective 2018', https://smartgrowthamerica.org/resources/elements-complete-streets-policy/

[61] Climate Council. 2023. *Shifting Gear: The path to cleaner transport*. https://www.climatecouncil.org.au/wp-content/uploads/2023/08/CC_MVSA0354-CC-Report-Road-to-Personal-Transport_V6-FA-Screen-Single.pdf

[62] Infrastructure Australia. 2020. 'Australian Infrastructure Audit 2019', Passenger Transport, https://www.infrastructureaustralia.gov.au/sites/default/files/2020-09/audit_passenger.pdf

Some principles that are good practice are that transport (including active and public transport):

1. is **integrated** with land use planning
3. provides **sustainable** travel options and reduces transport emissions
4. is **safe** for moving people however they get around
5. is **accessible** for everybody whatever their level of ability at any time or place

The key to encouraging people to use public transport is to make it convenient and comfortable - and the key to that is to widely and thoroughly consult the local community. This should include consulting before even drafting proposals (preferably collaborating with the community).

The threshold hurdle for any change to public transport is 'Will this make the public transport experience more convenient and comfortable?' to passengers, both existing and - most importantly - potential (that is, the people who are currently not using public transport). How do you know what is more convenient and comfortable to passengers? Ask them!

Convenience of using public transport comes in the form of access, frequency, timeliness, and journey length.

Comfort of using public transport comes in the form of comfort getting to and from public transport stops (that is, during access) and waiting at them, as well as comfort in the public transport vehicles themselves. Sections 6.2.2 and 6.2.3 deal with much of the comfort of getting to and from public transport and waiting at stops. Easy access improves some of this comfort.

Network design is a major determinant of how easily people can access public transport and how long the journey is.

A key factor in getting more trips by public transport is to design the network and services so that passengers find them attractive. Using current or perceived demand as the major determinant does not deliver this outcome.

The way to attract passengers is to ask them what they want - and to particularly ask people who do not (or rarely) use public transport.

As well as being easily physically accessible, public transport needs to be frequent, timely and on time for people to be attracted to - and keep using - public transport. This would also improve the ranking of Australian cities in the Sustainable Cities

Mobility Index[63] and their credentials as sustainable and liveable cities. Services should be available so that:

- anyone in an Australian city or town is able to accomplish general day-to-day or tourist travel easily and safely without a car; and
- anyone in an Australian city or town is able to do each such trip with a maximum travel time of 30 minutes door-to-door.

Currently the availability of public transport means that a most people cannot (or think they cannot) accomplish general day-to-day or tourist travel easily and safely without a car.

Care needs to be taken with increasing distances people have to travel to access public transport, even if it is more frequent. A 2012 Commonwealth Government paper[64] explains the well-documented rationale:

> Research shows that people will generally walk or ride for up to 10 minutes to reach a frequent, direct service such as a train or express bus. This is equivalent to an 800-metre walk or a two- to three-kilometre bicycle ride. However, they will consider walking only up to half this distance to a less frequent or indirect local service.

Furthermore, while there is evidence that people will walk further than global rule-of-thumb 400 m to access public transport (once they have decided to walk), it seems to be unknown how many more people would use public transport or walk to a public transport stop if the stop is closer to home.'[65]

Recommendation 59:

In planning public transport, Australian governments widely and thoroughly consult their communities (especially those people not regularly using public transport) to ensure that:

[63] Arcadis. 2024. 'Sustainable Cities Mobility Index 2022', https://www.arcadis.com/en-au/knowledge-hub/perspectives/global/sustainable-cities-index
[64] Commonwealth of Australia, Department of Infrastructure and Transport. 2012. Walking, Riding and Access to Public Transport. Draft report for Discussion, October 2012, https://infrastructure.gov.au/infrastructure/pab/active_transport/files/active_travel_discussion.pdf
[65] Daniels, R and Mulley, C. 2011. Explaining walking distance to public transport: the dominance of public transport supply, World Symposium on Transport and Land Use Research, Whistler Canada, 28-30 July 2011, http://sydney.edu.au/business/__data/assets/pdf_file/0013/106501/Daniels-Mulley-Explaining.pdf

(a) **for each area, it considers socio-economic circumstances, people's mobility, topography, and physical and social aspects of the neighbourhood (especially perceived safety); and**

(b) **services reflect the needs of people living in or travelling to the areas concerned; and**

(c) **services encourage people to prefer using public transport over private motor vehicles.**

An ongoing problem with much of Australia's public transport is services not running on time (or running at all). This is not helped in some jurisdictions by public transport being considered 'on time' if they depart within a window that includes early[66] or if the service is rewarded for being on time more than it is rewarded for picking up passengers (with the perverse outcome of the service keeping on time by running past stops or stations with passengers ready to board).

While people are generally accepting of services running late from time to time, they are not accepting of them running early or services that are not full not stopping to pick up passengers. Rules amongst users is that public transport can be late but never early, and that if a service is not completely full then it must stop to pick up passengers.

Recommendation 60:

Australian governments ensure that service standards for public transport do not include:

- **early in 'on-time'**
- **'on time' taking priority over picking up passengers**

Infrastructure improvements can help reduce both journey times and service delays. Such improvements include creating:

- more rail transport;

[66] See, for example, Fettes, J. 2018. 'Canberra's ACTION buses failing on-time target almost every week since 2016', 27 March 2018, http://www.abc.net.au/news/2018-03-27/canberra-action-buses-fail-on-time-targets/9589112

- more short bus priority lanes (with bus priority lights) at traffic light bottlenecks;
- longer times for bus priority at traffic lights; and
- more transit-only lanes.

Recommendation 61:

Australian governments upgrade infrastructure used by public transport, in order to reduce journey times and service delays. This should include:

(a) more rail transport;

(b) more short bus priority lanes (with bus priority lights) at traffic light bottlenecks on bus routes;

(c) longer times for bus priority at traffic lights; and

(d) more transit-only lanes and transit-only ways.

6.4 Reducing the desirability and convenience of travelling by private motor vehicles in urban areas

As long as travelling by private motor vehicle is (or is perceived to be) the most convenient, cheapest and most desirable form of transport, people will continue to prefer that mode over other modes like public and active transport.

Given that we need to shift people out of private motor vehicles and into active and public transport for a variety of reasons, travel by private motor vehicle needs to become inconvenient, expensive and undesirable.

As the Heart Foundation points out:

> To encourage higher levels of physical activity and promote health neighbourhoods should [amongst other things]...be places where walking, cycling and catching public transport are cheaper, more convenient and more enjoyable than travelling by car.[67]

[67] Heart Foundation. n.d. 'Benefits of Infrastructure to Support Active Living', http://healthyactivebydesign.com.au/images/uploads/Publications/ACT_benefits_of_infrastructure_to_support_active_living.pdf

Given cost of living pressures and lack of available and attractive active and public transport options for many people (particularly those on lower incomes living on urban outskirts), care is needed to provide attractive active and public transport options in the first instance.

When public and active transport are well-provided for everyone to use everywhere in urban ares, then one way of reducing the relative cheapness of motor vehicle travel is to make it a lot more expensive to drive, for example by increasing the cost of parking or by introducing a congestion charge. When the cost of parking is increased a little, people it affects tend to complain and then absorb the cost; that is, most people tend not to change their behaviour but simply keep driving. However, when the cost of parking is dramatically increased, then many people do change their behaviour.

It therefore seems reasonable that a dramatic price increase along with a clear and reasonable rationale would be effective and accepted - as long as there are good alternatives to meet most people's needs.

Good carparking is an important component of the convenience of driving to destinations - so the corollary is to make it difficult or illegal to park (except for people who are mobility impaired, taxis and local freight deliveries). Removal of car parking is happening in cities around the world, usually starting in city centres, for a variety of reasons including reducing greenhouse gas emissions.[68,69]

Cultural campaigns and trends can help make driving less desirable. For example, around the world, young people are moving away from driving. Young people also tend to be more fashion conscious and supportive of city living.

Running car-free days in specific areas or on specific roads (Recommendation 58) helps people experience what an area or road would be like without cars.

It is vital to have good alternative transport options before implementing these changes. That way, the message is clear: you are welcome - but your car is not - and Australian cities and towns are responsible, healthy, caring and friendly communities living in ways and environs that are sustainable and highly liveable.

6.5 Electrifying our motorised transport

Modal shift and demand reduction can contribute the bulk of the ACT's efforts to reduce greenhouse gas emissions and air pollution to zero as quickly as possible. They cannot, however, achieve all the reductions needed. That is because there will

[68] Berg, N. 2016. 'Lots to lose: how cities around the world are eliminating car parks', *The Guardian*, 27 September 2016, https://www.theguardian.com/cities/2016/sep/27/cities-eliminating-car-parks-parking

[69] Garfield, L. 2017. '13 cities that are starting to ban cars', 29 November 2017, *Business Insider Australia*, https://www.businessinsider.com.au/cities-going-car-free-ban-2017-8?r=US&IR=T

almost certainly always be a need for motorised transport for tasks such as public transport and transport of people with disabilities.

In reducing transport emissions, there is therefore a need to reduce emissions from individual motorised vehicles. When emissions from each motor vehicle are zero, then transport emissions overall will be lower. This outcome will happen with electric vehicles powered by electricity generated from renewable energy. This is why development and implementation of a strategy to transform the Australian motor vehicle fleet to zero emissions is a necessary part of Australia's strategy to zero net emissions. Doing so as quickly as possible will:

- help reduce transport emissions quickly;
- complement efforts to shift transport modes and reduce overall transport demand; and
- help place Australia more on the front foot as motor vehicles rapidly shift to being powered by electricity.

Several countries have already moved to end the sale of cars powered by fossil oil. Others are joining them.

Most motor vehicle manufacturers are also moving away from manufacturing vehicles powered by internal combustion engines.

Furthermore, this transformation is not confined to cars, nor should it be in our race to zero emissions. Electric models are increasingly available and being taken up for commercial and industrial vehicles including light commercial vehicles, trucks and buses.[70]

In addition to reducing emissions, shifting to zero emissions vehicles:

- will also reduce urban noise;

[70] See for example, these examples from over 5 years ago (noting that there are many more recent examples):

- National Roads and Motorists Association Limited. 2017. 'The Future is Electric', October 2017, https://www.mynrma.com.au/-/media/documents/advocacy/the-future-is-electric.pdf?la=en
- Harrop, P. & Das, R. n.d. 'Industrial and Commercial Electric Vehicles on Land 2017-2027 Material Handling, Construction, Agriculture, Mining, Lawn Care, Taxis etc', IDTechEx, https://www.idtechex.com/research/reports/industrial-and-commercial-electric-vehicles-on-land-2017-2027-000505.asp
- Statista. 2018. 'Forecasted production numbers of electric light commercial vehicles (eLCV) in France from 2010 to 2020, https://www.statista.com/statistics/745182/electric-light-commercial-vehicle-production-france/
- My Electric Car, https://myelectriccar.com.au
- https://www.statista.com/search/?q=electric+vehicles+electric+trucks&sortMethod=idrelevance&isRegionPref=0&sortMethodMobile=idrelevance&statistics=1&accuracy=and&isoregion=0&isocountrySearch=&category=419&subCategory=487&interval=0&archive=1

- can lower vehicle running costs, an important consideration particularly for people on low incomes who cannot use public or active transport and for vehicle-based businesses and community services and given that Canberrans have the very high expenditure on transport compared with people in other Australian capitals and their fuel costs are increasing;[71]
- can also improve energy security for transport, vital in a place with large travel distances; and
- several other co-benefits.[72]

Encouraging rapid reduction in emissions from individual motor vehicles must be done carefully – and in conjunction with other measures – to achieve the desired outcomes.

Care is needed to ensure that electrifying the Australian motor vehicle fleet does not have perverse consequences. For example:

- Increasing size of vehicles outweighing emissions reduction standards. Removing from the passenger class 4WD and SUVs that are clearly designed and used as passenger vehicles exacerbates this problem. (These larger vehicles are also more dangerous to vulnerable road users and people in smaller, aerodynamic, low/zero emissions vehicles.)
- When emissions from each individual vehicle is lower than current vehicles, then transport emissions overall can be lower unless those reductions are countered with an increase in numbers of vehicles and/or individual vehicles are used more – in which case emissions might increase. This may happen if, for example, public transport is made less convenient – particularly as the population ages and older people in Australia continue their preference for driving (although at some point that demand decreases as people age and no longer want or are able to drive).
- EVs will reduce climate damage and air and noise pollution but will not reduce congestion or sedentary lifestyle diseases unless they are used less than current vehicles or (in the case of congestion) their use leads to a reduction in overall vehicle numbers. In contrast to electrifying vehicles, actions to shift

[71] Burgess, K. 2017. 'ACT government urged to set targets for electric cars to combat emissions, *The Canberra Times*, 20 October 2017, https://www.canberratimes.com.au/national/act/act-urged-to-consider-electric-vehicle-targets-report-20171026-gz8fpg.html

[72] See for example: Commissioner for Sustainability and the Environment. 2017. 'Implementation status report on ACT Government's climate change policy', September 2017, http://www.environmentcommissioner.act.gov.au/__data/assets/pdf_file/0018/1116324/CSE-ISR-Report-Aug2017_FA_AccPDF_c2.pdf

travel modes or reduce demand can contribute to broader environmental, health and urban liveability objectives.

- Depending on how they are implemented, actions to reduce emissions from individual vehicles may or may not reduce transport disadvantage. Highly flexible and easily used EVs can make transport more accessible to people with disabilities who may not be able to use active or public transport. Such vehicles can, however, also make transport less accessible. This would be the case, for example, if they need to be bought or hired by people who would have used public transport (at lower cost to them) prior to route changes. Such people would include those on low incomes and those without cars, especially older people who want to maintain their independence at a level greater than that provided by community transport.

Recommendation 62:

The Commonwealth, State and Territory governments and local vehicle and transport industries, community groups and broader community work together to develop and implement a strategy to rapidly transform the entire Australian motor vehicle fleet to zero emissions vehicles. The strategy should:

(a) cover all types of motor vehicles;

(b) include ambitious targets;

(c) include complementary actions to encourage conversion, purchase *and* use of zero emissions vehicles; and

(d) be carefully developed to ensure it does not cause perverse consequences, such as those outlined in this section.

7. Land use

How we use our land is intrinsically linked to climate-damaging emissions, the impacts of the consequences of damage to our climate, and adaptation to our changing climate. These are also interlinked and will determine how sustainable, highly liveable, and resilient Australia is in our changing climate and whether it will be a highly desirable place to live, work, and visit now and into the future.

We will only be able to continue to have high living standards and enjoy our natural world if we continue to have a physical environment that supports us and all life on Earth doing so. Furthermore, as just one example, a 2015 survey found that:

> Canberra has many inviting playgrounds, parks and open space..., a consistent barrier to their use across all ACT regions... is a lack of shade and shelter.[73]

Climate change, development and ageing are all adversely affecting our local trees and, unless significant change is made, this will only accelerate. This affects the aesthetic qualities of Australia's urban areas as well as their capacity to provide shade and shelter (and reduce energy consumption) and to support wildlife. Adapting to climate change impacts is therefore as important as reducing emissions—we want a liveable and resilient city for our future and for future generations.

We must make the changes to our land use and management in order to minimise emissions and disruption from the impacts of the consequences of damage to our climate and to maximise comfort and survival in our changing climate. For sustainability and efficiency, we need to move Australia's urban, rural and natural environments to a more self-sufficient and resilient future.

Changing planning, practices and our built environment will be vital to:

- minimise emissions from land;
- cooling and sheltering our local environments, which in turn will make active travel more attractive and reduce energy consumption;
- improve the resilience of the built environment, vegetation and soil to a warming climate with more erratic rainfall and more extreme weather;
- improving rainwater water infiltration, which in turn will:
    - maintain soil moisture levels, vital for the health of trees and other vegetation and for stability of buildings and built infrastructure; and
    - reduce flash flooding;
- reducing vulnerability to bushfire;
- maintaining the much-valued beauty and amenity of our urban forest and surrounding landscape;

[73] Heart Foundation. n.d. 'Changes to support Active Living in the ACT', http://healthyactivebydesign.com.au/images/uploads/Publications/ACT_changes_to_support_active_living.pdf

- keeping our wonderful biodiversity.

Important components to this include:

- leaving vegetation and topsoil intact. Minimising land disturbance (eg from earthworks) will also minimise emissions arising from the current use of diesel to power earthmoving machinery;
- reducing the amount of hard surfaces that prevent water entering the soil;
- fully implementing water sensitive urban design so as to facilitate rain water entering the soil, including retrofitting existing streets, roads and other paved surfaces;
- looking after and planting more trees in our urban areas;
- increasing dense and deciduous tree canopy cover;
- upgrading our trees and other vegetation so that it is better able to cope with our warming climate, drying soils, and more erratic and extreme weather; and
- providing favorable conditions for tree and other vegetation to grow.

Much of this can be achieved by converting Australia's streets to 'living streets' and developing a culture of appreciating and caring for trees and the outdoors more generally (Recommendations 51(b)(3), 52, and section 6.2.3 refer). Reducing the amount of paving and using the resultant extra permeable land to increasing vegetation and tree cover can cool our local environments, shelter pavements, provide and link biodiversity corridors and habitats, increase local water infiltration and nutrient retention; and improve urban amenity. Extra habitats will in turn will help improve the resilience of local wildlife, particularly in our changing climate.

7.1 Maintaining and upgrading urban tree coverage

Maintaining and upgrading urban tree coverage in a warming climate while maintaining existing tree coverage will be a challenge, particularly for streetscapes.

7.1.1 Making the most of magnificent mulch

Mulch is very important for good soil and plant health. It also helps provide habitat and food for much of our wildlife, particularly geckos and birds. Mulch helps to:

- protect soil from erosion;
- maintain soil moisture;

- add nutrients to the soil and prevent loss of nutrients through water movement (eg erosion) or to the atmosphere via oxidation;
- provide insulation that keeps soil temperatures more even than if there was no mulch;
- keep soils healthy (eg allowing soil organisms to live);
- add carbon to our soils ('carbon sequestration'); and
- maintain levels between hard paths and their verges .

Many if not most municipal areas are blessed with an abundance of material for mulch, particularly in the built environment - yet much (possibly most) of it is wasted. Much of the material in areas outside the tropics and arid areas comes in the form of leaves that mainly fall in autumn in cooler climates (but with climate change the leaf fall throughout the year is increasing) and garden and municipal tree trimmings and other green 'waste'.

The leaves can provide valuable mulch and nutrients to gardens and other vegetation, particularly trees that do or can form part of the 'urban forest'. Mulch helps to maintain soil moisture, increase rain infiltration, reduce erosion, and increase resilience of the vegetation - all of which is particularly needed with as our climate becomes warmer, our soils dryer, and our rainfall more infrequent and heavy.

Leaves as a valuable resource

In the early days of Canberra, residents were encouraged to gather public autumn leaves for their gardens. People understood - and were taught - what a valuable resource they are.

Nowadays, though, many people regard leaves as a nuisance.

Although a lot of gardeners still value them, other people collect them for removal. Some people take them to municipal dumps to be turned into compost that they and others buy back (with extra processing and transport costs and emissions).

In other places, people rake or blow their leaves into the gutter for street sweepers to collect.

This increase in the amount of leaves in the gutters is increasing the workload for the street sweepers as well as increasing their running costs and emissions. Because they are picking up more leaves, they have to make more trips to where they empty their cargo.

While leaves are in the gutter (either naturally or because people have put them there), they can be washed into the stormwater system and contaminate our local watercourses with excessive nutrients.

Current practices mean that the leaves collected by street sweepers and from community paths are contributing to climate damage and resulting in loss of nutrients. It was recently revealed that the leaves are being taken to landfill instead of being composted or used for mulch. In landfill, the leaves decompose anaerobically and create methane, a powerful and quick-acting climate-damaging gas. Furthermore, it costs ratepayers (via rates) to dispose of leaves in landfill.

Emissions could be reduced by using the leaves for mulch or compost. The presence of contaminants from wet roadside leaves means that these leaves would be best used for roadside and rural municipal mulch than for domestic gardens or farming.

Alternatively, as streets are converted to 'living streets' and being more water sensitive, gutters are likely to disappear and people will become more engaged with their neighbours and local environment and the problem of leaves being swept into gutters could well disappear from most residential streets.

In the meantime, we need to change the culture so that tree leaves are seen as - and become - a valuable resource. There are two main options for this:

1. educating people about the value of leaves and what they can do with them; and
2. facilitating local re-use of leaves.

Local re-use of leaves can happen with neighbourhood composting or when neighbours with 'too many' leaves give them to others who want more. When Mark Carmody was the local gardening adviser on ABC Local Radio Canberra, he set up the Great Autumn Leaf Exchange (GALE). It is no longer operational but is a good model for an on-line autumn leaf exchange. Neighbourhood composting that is organised and promoted well can also recycle other organic materials, all without the need for government or private collection, transportation, or processing. Both schemes also have social benefits. They bring people together and neighbourhood composting can build and strengthen neighbourhood communities. Neighbourhood composting also reduces transport emissions.

Recommendation 63:

Australian governments, community groups and horticultural professionals run ongoing campaigns to:

(a) promote leaves and garden trimmings as a valuable resource;

(b) make raking or blowing leaves into gutters socially unacceptable ('uncool')

<u>Recommendation 64:</u>

Local governments facilitate establishment of:

(a) local versions of the Great Autumn Leaf Exchange; and

(b) neighbourhood composting.

<u>Recommendation 65:</u>

Australian governments at all levels cease disposing of road and path sweepings in landfill and instead re-use them for mulch and compost for roadside and rural municipal plantings.

7.1.2 Why waste wonderful water?

In our warming climate, water is becoming more and more valuable - and more destructive. The warming atmosphere holds more water, increasing the time between rains and increasingly releasing water in deluges. Longer dry periods and higher temperatures mean our soils are drying.

Yet our built environments are almost all designed to remove water. Historically we have built our urban roads and buildings with gutters to carry water into stormwater pipes that take the water away to natural watercourses. More recently, we have been installing water tanks and water-sensitive urban design is slowly being introduced into new developments (and the occasional re-development). However, even where it is used for our streets and roads, water-sensitive urban design is patchy and often poorly designed and constructed.

On top of this, our built environments are increasingly made of hard surfaces - roads, paving and buildings. This reduces the ability of water to soak into the ground, compounding the likelihood and intensity of flash flooding that in turn is increasing as a result of rainfalls increasing in intensity. The last Brisbane floods were a good example of this.

To maintain and upgrade our urban forest, we need to change our built environment to:

- capture rainwater where it falls;

- slow water flow; and
- allow water to soak into the ground, preferably where rain falls or very nearby.

Converting most streets to green 'living streets' will help increase the area available for water infiltration.

On other roads, and in the interim, we can change our gutters so that most rain is diverted to water road-side vegetation, especially street trees. This will also reduce the costs associated with stormwater pipeline construction and maintenance. All new gutters and verges (except those on the high side of the road or street) can be constructed according to water-sensitive design principles. Existing streets can be retrofitted. Good examples of this can be found in Arizona and New York City. Brad Lancaster's Rainwater Harvesting for Drylands and Beyond website[74] explains and illustrates several methods and municipal policies for retrofitting streets to capture rainwater on-site.

We can also mandate permeable paving and maximum hard surface coverings on residential blocks. This would also allow room for deep-rooted, sheltering trees to grow in private space. In contrast, any impermeable soil covering stops infiltration of water that is vital for maintaining ground water and long-term tree health.

Recommendation 66:

Australian governments:

(a) mandate effective water-sensitive design for all new construction of roads, streets, paths and shared spaces;

(b) retrofit existing gutters, verges and median strips (unless on the high side of the road paving) to capture rainwater for onsite infiltration;

(b) set, in consultation with the community, a maximum limit (say 50%) to impermeable coverage (eg roofs, decks and paving) on residential blocks.

7.1.3 Species selection

Around the world, trees are increasingly under stress and dying from the consequences of damage to our climate.[75] This is mainly from rising temperatures

[74] https://www.harvestingrainwater.com/street-runoff-harvesting/
[75] Westervelt, A. 2009. 'Climate Change Killing Trees in Countries Around the World', *InsideClimate News*, 17 November 2009, https://insideclimatenews.org/news/20091117/climate-change-killing-trees-countries-around-world

and drying soils. We can see this in our trees in the form of increased shedding of leaves and limbs, tree tops dying (even on very young trees), and increased tree deaths.

On top of that:

- many areas are at the upper temperature limit for many of the ACT's introduced tree species - and that limit is being exceeded as our climate warms;
- many our tree plantings, and the urban trees in particular, are ageing, with much of it at or beyond maximum maturity;
- increasingly erratic and extreme weather, particularly wind, is increasing acute damage to trees;
- urban densification and increasing proportions of land being covered and built on exacerbates the problems of drying soils and damaging winds.

In our changing climate, bushfire and storms are increasing in intensity and frequency so we need to plan and design for fire and storm resistance and shelter. We now know that bushfires can penetrate deep into suburbia, particularly if tree and other vegetation species are highly flammable. Eucalypts and other Myrtacae species are highly flammable, provide little shelter and reflect heat to ground level. In contrast, many other (mainly exotic) species with broad, dense canopies provide good shelter, are cooling and are not highly flammable. Deciduous species have the added benefits of allowing winter sunlight through and providing autumn leaves for colour, mulch and nutrients.

All these factors indicate that we need to carefully re-consider the species of trees commonly planted if we are to ensure that Australia is highly liveable and resilient in our changing climate. In particular, it suggests that we should be seeking species that:

- are more tolerant of high temperatures, dry soils and extreme weather (particularly wind);
- providing good shelter from sun, heat, wind and rain (especially sudden downpours);
- are cooling in summer, while preferably allowing winter sun through; and
- are fire resistant.

These characteristics suggest that, instead of preferring native trees such as eucalypts, we should be preferring exotic, mainly deciduous trees or else intermixing exotic and native trees.

As suggested by SEE-Change Inner South,[76] Canberra's 'urban forest' could also be more like a real forest, with mixed species. It could be self-sustaining, with reduced greenhouse gas emissions from mowing, and contribute to food security and wildlife habitat.

Because of the timeframes involved in growing new trees, selection of newly preferred species is urgent.

Recommendation 67:

If not already done, Australian State, Territory and Local governments urgently revise tree species preferred for their areas, aiming for trees that:

- **are more tolerant of high temperatures, dry or flooded soils and extreme weather (particularly wind);**
- **providing good shelter from sun, heat, wind and rain (especially sudden downpours);**
- **are cooling in summer, while preferably allowing winter sun through;**
- **are fire resistant; and**
- **contribute to food security and wildlife habitat.**

Recommendation 68:

Australian State, Territory and Local governments consider making the urban forest (or at least parts of it) more like a real forest, with mixed species.

7.1.4 Planning plantings

In our pursuit of maintaining and increasing canopy cover, we need to ensure that there are not significant periods of lost canopy between the death or removal of old trees and growth of new trees.

With many of our trees maturing mature, under stress and/or declining as a result of a climate that is warming, more severe, and with much less reliable soil moisture

[76] SEE-Change Inner South. 2010. Submission to the Investigation into the Government's Tree Management Practices and the Renewal of Canberra's Urban Forest, available at https://webarchive.nla.gov.au/awa/20110220103246/http://www.see-change.org.au/?q=node/256

levels (generally drying yet in some places with more inundation), now is the time to be planting new trees in order to increase and gradually renew the urban forest.

New trees can be planted between existing trees so that the new trees can become established and offer some shade before old trees die or are removed. Different species should be considered for the first interplantings. As well as the reasons given in section 7.1.3, saplings of the same species as current trees can have their establishment hindered by allelopathy.

Recommendation 69:

Australian governments plant new trees in order to increase the urban tree canopy while gradually renewing the urban forest.

Recommendation 70:

Australian governments work with neighbours to ensure that there are shade trees are along roads and streets, and particularly over paths, be the trees on private or public land.

7.2 Minimising irreversible change

Some changes to land use cannot be reversed. These include loss of ecosystems, biodiversity, topsoil and nutrients. All of this happens when vegetation is cleared and earthworks are undertaken. It happens that this also causes damage to our climate. It therefore makes sense to minimise such changes.

Recommendation 71:

Australian governments and other land developers cease clearing land and undertaking whole-of-site earthworks and grading to 'prepare' land for sale.

8. 'Waste'

The main problems with the amount of emissions from 'waste' is the behaviour that leads to the 'waste' and then to the emissions in the first place.

Consistent with Recommendation 5, we should therefore reduce the cause of the emissions at their source, by reducing generation of 'waste' and by changing 'waste' management practices so that emissions are avoided or lessened.

This means that efforts to reduce emissions from ‘waste’ need to concentrate on shifting attitudes and behaviours rather than pursuing technological ‘fixes’. In particular, we need to focus on:

- reducing current very high levels of consumerism;
- making closed-loop systems our culture, with the ‘waste’ management hierachy and there being no ‘away’ to throw things to being part of our thinking;
- shifting our culture away from one of ‘consumption’ and ‘energy=fuel’ to one where we see ourselves as members of the natural world living on finite Earth, participants in its great cycles; and
- changing our municipal processes accordingly.

This would be entirely consistent with a vision of Australia as a responsible community living in ways and environs that are sustainable. Given our current high levels of ‘waste’ and despite our high levels of recycling, we have a huge potential for change.

Incentives that have worked in various places include:

- charging for kerbside ‘waste’ collection by volume or weight instead of as a flat charge through rates. Some municipalities have scales built into garbage trucks while others offer different rubbish bin sizes, with rates charged according to bin size;
- encouraging and facilitating alternatives to food and other organic matter being sent to landfill. This can improve health and create jobs. As well, it is something very concrete that engage and empower people;
- requiring retailers to accept back packaging and products that have worn out or no longer work; and
- setting waste reduction targets.

Achieving zero net emissions, promoting the ACT as leading on responsibility and sustainability, and taking responsibility for our own emissions (Recommendation 5) means that we should not :

- increase ‘waste’ or emissions from ‘waste’;
- convert ‘waste’ to energy; or
- export ‘waste’ for conversion to energy or for landfill ‘disposal’ or equivalent.

Recommendation 72:

Australian governments concentrate efforts to reduce emissions from 'waste' on shifting attitudes and behaviours rather than pursuing technological 'fixes'.

Recommendation 73:

Australian governments conduct education and behavioural change campaigns aimed at:

(a) reducing current very high levels of consumerism;

(b) making closed-loop systems our culture, with the 'waste' management hierachy and there being no 'away' to throw things to being part of our thinking; and

(c) shifting our culture away from one of 'consumption' and 'energy=fuel' to one where we see ourselves as members of the natural world living on finite Earth, participants in its great cycles.

Recommendation 74:

Where not already done, Australian governments:

(a) make the 'waste' management hierarchy the basis for their 'waste' management policies, decision-making, practices and contracts;

(b) charge for kerbside 'waste' collection by volume or weight;

(c) ban organic 'waste' from landfill and set up alternative systems to deal with it (such as in Recomendations 63-65);

(d) encourage and facilitate home and neighbourhood composting and worm farms;

(e) require retailers to accept back packaging and products that have worn out or no longer work;

(f) set and actively pursue ambitious zero waste targets;

(g) assess any new 'waste' management proposal for how it helps achieve zero net emissions - and reject any that do not do so;

(f) immediately, clearly state that they will not support any proposal:

(1) that increases 'waste' or emissions from 'waste';

(1) to convert ‘waste’ to energy; or

(1) to export ‘waste’ for conversion to energy or for landfill ‘disposal’ or equivalent; and

(f) immediately reject any proposal:

(1) that increases ‘waste’ or emissions from ‘waste’;

(2) to facilitate waste to landfill or similar ‘disposal’ in their own or other jurisdictions; or

(3) to use or export ‘waste’ for conversion to energy or for landfill ‘disposal’ or equivalent.

9. Food

Growing food locally offers Australia and the Australian community significant opportunities to reduce emissions. That is because locally grown food requires less energy to grow (if grown ‘by hand’), transport and store it than food grown a long way from where it is consumed. Because most of this energy currently comes from sources that damage our climate (i.e. fossil oil, gas and coal), reducing use of that energy reduces the increasing damage to our climate and thus slows the unfolding consequences of that damage. This is a big reason why people seek food with low 'food miles'.

Even though food grown outside Australia (or any jurisdiction) contains ‘Scope 3’ emissions, we should reduce our food-related emissions in order to take responsibility for our own emissions (Recommendation 5).

As well, growing food can improve people’s mental and physical health and create jobs. It is something with which many people engage easily.

<u>Recommendation 75:</u>

Australian governments and community groups:

(a) encourage local food-growing;

(a) facilitate establishment of community and neighbourhood food gardens.

10. Industry

Many industries use materials and products that come from outside Australia Their 'scope 3' emissions are accounted for elsewhere. Taking responsibility for our own emissions (Recommendation 5) means that activity-based targets are ideal for Australia (and State, Territory and local government areas) to show leadership by reducing these emissions.

Priority areas for activity-based targets include:

- Food - amount of food grown (and eaten) in Australia (or sub-national area) or number of people growing (a certain percentage of) their own food;
- Cement - say, at least 50% of cement in infrastructure and multi-story building projects to be low carbon cement, link a recent IS Innovation Challenge[77]
- Steel - percentage of steel made from recycled content and imported into Australia (or sub-national jurisdiction).

Recommendation 76:

Australian governments work with local industry, technical experts and the broader community to establish activity based targets for industries using materials or products that come from outside their jurisdictions and have high levels of embodied emissions, including:

(a) Food - amount of food grown (and eaten) in their jurisdiction or number of people growing (a certain percentage of) their own food;

(b) Cement - say, at least 50% of cement in infrastructure and multi-story building projects to be low carbon cement; and

(a) Steel - percentage of steel made from recycled content and imported into the jurisdiction.

[77] Infrastructure Sustainability Council of Australia. 2014. 'Rethinking cement', https://isca.org.au/component/content/article?id=1098

Summary of recommendations

Targets

<u>Recommendation 1</u>:

To achieve zero net emissions, overarching, sector-specific and activity-specific targets be set.

<u>Recommendation 2</u>:

Targets and modelling be based on a achieving maximum of net global warming of 1.5ºC warming, noting that this will likely require drawdown of emissions (that is, negative emissions).

<u>Recommendation 3</u>:

Targets be set for achieving zero and then negative net emissions urgently - well before 2050.

<u>Recommendation 4</u>:

Effective narrative(s) be used to support development and communication about targets for achieving zero net emissions.

<u>Recommendation 5</u>:

The Australian community:

(a) take responsibility for all the emissions that we cause (including embodied or 'Scope 3' emissions); and

(b) set activity-based targets (targets for changing a particular activity or quantity or type of product) as proxy targets for reducing remaining major sources of 'Scope 3' emissions urgently.

<u>Recommendation 6</u>:

As soon as possible, Australian governments (at all levels):

(a) work to obtain agreement of all parties represented to major new, community-agreed targets for reducing greenhouse gas emissions in Australia as a matter of urgency (and well before 2050); and

(b) enshrine in legislation the major new, community-agreed targets.

<u>Recommendation 7</u>:

Interim targets be:

(a) set for overarching emissions and major emission sectors and activities;

(b) informed by:

(i) climate scientists, evidence and modelling;

(ii) experiences during long emergencies, particularly World War II;

(iii) the community; and

(iv) consistency with an emergency-level approach to reducing emissions;

(c) set at intervals no greater than jurisdictional elections, with the latest timing being the year before elections.

<u>Recommendation 8</u>:

As soon as possible, Australian governments:

(a) establish systems, involving the community, for reviewing progress to zero net emissions and for adjusting targets accordingly; and

(b) enshrine in legislation the agreed system and associated requirements.

<u>Recommendation 9</u>:

As soon as possible, and by the end of 2025, mechanisms be put in place to ensure:

(a) all policies, decisions and actions made by governments, officials and contractors contribute towards (or at least do not hinder) achieving the objective of reaching net zero and then negative net emissions;
(b) collaboration within and between government agencies towards achieving the objective and associated targets; and
(c) for all Australian governments (at all 3 levels), all Cabinet/Council submissions and all Budget, funding and development proposals are required to show how the proposal contributes to reaching Zero Net Emissions.

<u>Recommendation 10</u>:

Businesses, other organisations and the wider Australian community:

(a) work to ensure that their policies, decisions and actions contribute towards (or at least do not hinder) achieving the objective of reaching zero and then negative net emissions; and

(b) collaborate with others to achieve the objective and associated targets and co-benefits.

Engaging the whole community

Recommendation 11:

A clear, overarching vision for Australia be developed, so as to provide both:

(a) context and guidance for emission-reduction targets, policies, goals and decisions; and

(b) inspiration to take supportive action.

Recommendation 12:

Australia's clear, overarching vision developed by Australian governments and the broader Australian community.

Recommendation 13:

Australian governments work with relevant practitioners and the broader community to develop a comprehensive framework, strategies and resources for:

(a) engaging and empowering the community on reaching zero and then negative net emissions urgently;

(b) resourcing for the parties involved in community engagement; and

(c) improving the transparency of public decision-making processes.

Recommendation 14:

Recommendation 14:

Australian governments work with expert professional communicators and the broader Australian community to develop strategic narratives to support development and implementation of the strategy as follows:

(a) a strong, overarching narrative that relates to the vision for Australia;

(b) a compelling narrative about the main goal of reaching zero and then negative net emissions;

(c) narratives about sub-goals (perhaps for specific sectors or actions); and

(d) narrative variations for specific audiences.

<u>Recommendation 15</u>:

Australian governments allow and empower anyone in their communities to lead and take action to make our shared vision a reality.

<u>Recommendation 16</u>:

We honour, nurture, and harness the tacit and professional skills and knowledge in our community and work together to make our shared vision a reality and achieve the objective of reaching zero and then negative net emissions (including associated targets and co-benefits).

<u>Recommendation 17</u>:

Australian governments provide resources (such as funds for a website or portal) to facilitate asset-based community development approach to help empower and facilitate anyone in their communities leading and taking action to make our shared vision a reality.

<u>Recommendation 18</u>:

A website or web portal be developed that will help people to become empowered to take action and to self-organise. Its features should include:

(a) collecting and publishing ideas for action (beginning with those submitted through this consultation process, ideally made public in accordance with Recommendation 18); and

(b) providing a means for people to publicly pledge action, connect with other people wanting to take similar action, and measure their progress.

<u>Recommendation 19</u>:

Time-limited action challenges be issued to Australian communities, similar to the global Drawdown EcoChallenge held during April 2018.

<u>Recommendation 20</u>:

Ensure that people are met where they are, literally and figuratively, in any community engagement and communications about objective and developing and implementing our shared vision, targets, goals and sub-goals.

Recommendation 21:

To help engage the whole Australian community in reaching zero and then negative emissions, make use of all available resources and channels of communication and engagement, including:

(a) sharing stories of how people are living low emissions lifestyles;

(b) social media;

(c) conversations, both facilitated and informal; and

(d) people and organisations outside government.

Recommendation 22:

The Australian, State and Territory governments and other large organisations:

(a) pay for services and advice for engaging the broader community rather than relying on volunteer and pro bono work and expertise, particularly from small organisations;

(b) make available meeting spaces and in-kind support to help individuals and smaller community organisations organise and take action towards our shared vision and reaching zero and then negative net emissions; and

(c) sponsor innovative methods of communication and engagement about our shared vision and reaching zero and then negative net emissions.

Action on the ground

Recommendation 23:

Australian communities, with help from experts like Beyond Zero Emissions, work out what the details of transition to zero emissions in 10 years (or less) could entail and offer.

Stationary energy

Recommendation 24:

Australian governments legislate targets for achieving 100% renewable *energy* as a matter of urgency.

Recommendation 25:

Australian governments legislate ambitious sector-specific and activity-specific targets for towards achieving 100% renewable *energy* as a matter of urgency.

Recommendation 26:

Australian governments legislate that all new urban and suburban developments and re-developments be all-electric,.

Recommendation 27:

Australian governments develop and then legislate and implement targets for changing existing households, existing suburbs, commercial cooking and heating, transport, manufacturing and other uses to be powered solely by electricity from 100% renewable energy.

Recommendation 28:

Australian governments:

(a) mandate solar hot water and photovoltaic generation (or green roofs) on all new apartment, office and commercial buildings with flat roofs or roofs facing approximately north

(b) require retail electricity utilities to offer no/low interest loans for installation of solar hot water or photovoltaic systems and repayment via electricity billing systems.

Recommendation 29:

Australian governments require electricity utilities to offer small electricity generators feed-in tariffs that closely reflect the prices they are charging consumers.

Recommendation 30:

The Australian community work together to transition off gas as a matter of highest urgency.

Recommendation 31:

The Climate Change Authority recommend, and Australian governments agree:

(a) that Australian fossil fuels (coal and fossil gas and oil) reduce in line with the climate science, not in line with the profit motives of the fossil fuel industry

(a) to establish specific science-based reduction targets across all methane sources, with particular emphasis on achieving at least a 75% reduction to 2030 from 2020 levels in fossil methane emissions from coal and gas, in line with the IEA's Net Zero by 2050 scenario and Australia's commitment to the Global Methane Pledge.

Recommendation 32:

Australian governments work with local gas businesses, local gas tradespeople and the broader community to carefully manage accelerating the transition transition off gas, with a clear end-date (say, 2020) that indicates urgency.

Recommendation 33:

Australian governments and relevant professional, community and business organisations help the broader Australian community to:

(a) understand the benefits and practicalities of alternatives to gas for meeting their end-needs;

(a) develop a culture that it is 'uncool' to be cooking or heating with gas and 'cool' to be cooking and heating with clean electricity generated from renewable energy.

Recommendation 34:

Australian governments, utilities and businesses consider offering financial incentives to accelerate replacement of gas heaters, water heaters and cooking appliances with electric or solar alternatives.

Recommendation 35:

Australian governments that are owners or part-owners of gas businesses, require those businesses to immediately stop advertising and promoting gas and gas appliances.

Recommendation 36:

Australian State, Territory and local governments:

(a) weigh up capturing and using biogas from existing sewage treatment systems and landfills compare with changing them to more climate-benign systems; and

(b) not pursue biogas as an energy source for the longer term but rather work to stop gas being produced in the first place.

Recommendation 37:

Australia not pursue hydrogen as a source of energy.

Recommendation 39:

Australian governments work with local suppliers and installers of wood and wood heaters, chimney sweeps, health professionals, health and active transport organisations, residents' groups, and the broader community to phase out wood heating in their jurisdiction, with a clear end-date that indicates urgency.

Recommendation 39:

Australian governments work with local suppliers and installers of wood and wood heaters, chimney sweeps, health professionals, health and active transport organisations, residents' groups, and the broader community to phase out wood heating in their jurisdiction, with a clear end-date that indicates urgency.

Recommendation 42:

Australian governments consider introducing formal programs to retrofit homes to accelerate improvement in their energy efficiency.

Recommendation 43:

Continue and expand government and community-led programs for behavioural change for improved energy efficiency.

Transport

Recommendation 44:

Australia actively pursue two goals for its urban areas:

(a) first, anyone being able to accomplish general day-to-day or tourist travel easily and safely without a car; and

(b) second, anyone being able to do each such trip with a maximum travel time of 30 minutes door-to-door.

<u>Recommendation 45</u>:

Australian government and other employers, organisations and businesses:

(a) encourage people to work from home or local hubs, where their work can be adapted to do so;

(b) encourage people to hold long-distance meetings via teleconference or other means, instead of interstate or overseas travel; and

(c) showcase how their people travel by active or public transport or hold long-distance meetings via teleconference or other means, instead of by car or interstate or overseas travel.

<u>Recommendation 46</u>:

Australian governments, schools, businesses and community organisations encourage people to use their local schools and shops, instead of travelling to more distant ones.

<u>Recommendation 47</u>:

Australian governments at all levels re-prioritise their budgets to:

(a) reflect the changes needed in transport to reduce emissions, and in particular the shifts to public and active transport needed; and

(b) allocate at least 50% of transport budgets being dedicated to public transport and 20% to active transport, in line with international best practice.

<u>Recommendation 48</u>:

Australia shift away from unnecessary long-distance travel, particularly by:

(a) encouraging Australian residents to holiday locally instead of travelling to more distant places (particularly by Australian governments and local attractions and businesses promoting the benefits and desirability of local holidays and providing incentives to and advice for holidaying locally); and

(b) develop plans to diversify tourism- and convention-related businesses away from long-distance travel.

<u>Recommendation 49</u>:

Australian governments ensure that their transport systems, laws, policies, programs and practices:

(a) have as their main objectives reducing emissions from transport to zero as a matter of urgency while helping to deliver the overarching vision for Australia (Recommendation 11); and

(b) are undertaken in partnership with their communities, including local climate change, transport and residents groups and community experts.

<u>Recommendation 50</u>:

Australian governments ensure that Budget planning and expenditure for transport has as its main objectives reducing emissions from transport to zero as a matter of urgency while helping to deliver the overarching vision for Australia (Recommendation 11).

<u>Recommendation 51</u>:

Australian governments work with the community to make the following changes to legislation, standards and infrastructure urgently (where it is not already in existence), to make active travel easy and safe:

(a) Ensure that every road and street in urban areas either has separated paths alongside (or a path and a separated cycle lane where appropriate) with convenient pedestrian/bike-priority crossings or is converted into a 'living street' (or 'woonerf') designed and regulated for no-one to travel faster than 30 km/h.

(b) On most streets (especially where there is no separation of cycling from motor vehicles):

(1) Widen the road verges and/or median strips to make street carriageways/paving narrower and allow for complete tree cover.

(2) Make corner radii sharp.

(3) Convert streets into 'living streets' (low traffic streets, designed for everyone to travel no faster than 30 km/h) or 'complete streets' (higher traffic streets, with modes separated by speed and convenient, priority crossings for slower modes).

(c) Ensure that the paving on shared paths and the edges of roads and streets is level with gutters (if present) and is kept smooth and free from

debris or obstructions, and consider a regular program of inspection and/or apps to allow automatic reporting by people on bikes or by motor vehicles to facilitate this.

(d) Ensure that shared paths and on-road cycle lanes, along with their pathways, are continuous and that they do not increase the risks to people using them, particularly where they are needed most and especially at places where likely to come into competition or conflict with motor vehicles (including intersections, slip lanes, roundabouts, bus stops and, for on-road cycle lanes, road narrowings, traffic islands and across on- and off- ramps).

(e) Ensure that all off- and on-road cycle lanes are:

(1) separated from traffic and parked vehicles (including open-doors and allowing for the extra width of small trucks); or

(2) wide enough to accommodate an adult person on a bicycle *and* allow them to ride out of the gutter and off broken tarmac and debris on the road *and* allow them to wobble or deviate from a straight line (eg because of physical or skill limitations or an obstacle in the lane) *and* keep them out of the door-opening zone of parked cars and trucks *and* allow <u>all</u> motor vehicles (including buses and heavy trucks) to pass them at the regulated safe distance.

(Note that this may require reconfiguring roads, streets and intersections, including shifting parking and bus stops, or to remove at least some on-road cycle lanes altogether.)

(f) Build or remake shared paths, particularly those beside roads and where paths intersect with roads, to ensure that they have only low gradients and wide curves.

(g) Increase the minimum widths required for shared paths, so that they can comfortably accommodate side by side or passing each other two people riding bicycles or walking with prams or shopping buggies or suitcases or using wheelchairs.

(h) At all intersections with traffic lights, ensure that people on foot or bike are prioritised:

(1) Change pedestrian and bike lights so that the default is that they change to green automatically before the motor vehicle lights change to green.

(2) Ensure that pedestrian lights remain on green long enough for slow walkers to have ample time cross the road.

(2) Ensure a fast response time for any pedestrian-activated traffic lights, say 15-20 seconds so that people using the crossing are not inconvenienced much and motor vehicle traffic has time to stop safely.

(3) Make changes to light-controlled T-intersections, intersections crossing median strips and/or controlled 4-ways, and intersections with slip lanes so that people on foot or bike (particularly slow walkers) can cross the road on a single light.

(4) Shorten the pulses available for vehicles to proceed, particularly for traffic entering collector roads and access streets, so that people wishing to cross unsignalled collector roads and access streets have some opportunity to do so (bearing in mind that other traffic will also be using those roads and streets).

(i) Convert into pedestrian scrambles major intersections controlled by traffic lights and used by of people walking and cycling .

(j) Install 'wombat crossings' at all unsignalled crossings of streets that are not 'living streets', starting in areas of high walking and cycling activity.

(k) Ensure application of Australian standards for good lighting on paths in urban areas.

(l) Mandate minimum requirements for easily accessible bicycle parking:

(1) at the same or greater rates as currently apply for car parking;

(2) to be easily accessible by bike from the street and main building entries and positioned in a way that is safe for users (including being in places that are well lit and easily visible to the passing public) in multi-unit housing developments, commercial developments and at educational, community, health, and major transport facilities;

(3) to include provision at shopping centres and educational and community facilities for cargo or passenger cycles, trolleys or other active transport equipment involved in dropping off or picking up goods and people or in shopping.

Recommendation 52:

Australian governments work with active travel, road safety, urban and landscape design, and community groups organisations and members of local neighbourhoods on the details of making streets more people- and active-travel friendly in a warming climate (eg by widening verges and median strips, making street corner radii sharper, and converting streets to 'living streets' or 'complete streets').

Recommendation 53:

Australian Governments and developers make changes to built infrastructure and layout in urban areas so as to improve Walk Score and Bike Score (as measured by Walk Score® or similar tools).

Recommendation 54:

Australian governments, in consultation with active travel, road safety, law organisations and the broader community, review relevant legislation to ensure that it is clear, consistent, and prioritise active travel and vulnerable road users over travel in motor vehicles.

Recommendation 55:

Australian governments work with road safety, active travel, health, environment and other community groups groups as well as the broader community to reduce urgently the default speed limit on most streets to 30km/h.

Recommendation 56:

Australian governments actively promote the legal responsibilities and desirable behaviour of people using each road-user mode to people using each other road-user mode.

Recommendation 57:

Australian governments and community groups encourage:

(a) respect toward all types of road users by humanising and using the term 'people who…' rather than distancing and using labels (such as cyclists, pedestrians, drivers, motorists);

(b) people driving motor vehicles to slow down, particularly by:

(1) using effective campaign messages (perhaps like 'Speed kills, so kill speed' used in the UK or 'Slow down, kids [or people] around' used in several places); and

(2) promote (especially before implementing Recommendation 55) the desirability of having speed limits of 30km/h on residential and urban streets.

Recommendation 58:

Australian governments consider holding or facilitating frequent regular events to encourage people to try out active travel, including:

(a) car-free days in specific areas or on specific roads;

(b) walk or ride to work days (say each month or week), weeks or months;

(c) walk or ride to shop days.

Recommendation 59:

In planning public transport, Australian governments widely and thoroughly consult their communities (especially those people not regularly using public transport) to ensure that:

(a) for each area, it considers socio-economic circumstances, people's mobility, topography, and physical and social aspects of the neighbourhood (especially perceived safety); and

(b) services reflect the needs of people living in or travelling to the areas concerned; and

(c) services encourage people to prefer using public transport over private motor vehicles.

Recommendation 60:

Australian governments ensure that service standards for public transport do not include:

- **early in 'on-time'**
- **'on time' taking priority over picking up passengers**

Recommendation 61:

Australian governments upgrade infrastructure used by public transport, in order to reduce journey times and service delays. This should include:

(a) more rail transport;

(b) more short bus priority lanes (with bus priority lights) at traffic light bottlenecks on bus routes;

(c) longer times for bus priority at traffic lights; and

(d) more transit-only lanes and transit-only ways.

Recommendation 62:

The Commonwealth, State and Territory governments and local vehicle and transport industries, community groups and broader community work together to develop and implement a strategy to rapidly transform the entire Australian motor vehicle fleet to zero emissions vehicles. The strategy should:

(a) cover all types of motor vehicles;

(b) include ambitious targets;

(c) include complementary actions to encourage conversion, purchase *and* use of zero emissions vehicles; and

(d) be carefully developed to ensure it does not cause perverse consequences, such as those outlined in this section.

Land use

Recommendation 63:

Australian governments, community groups and horticultural professionals run ongoing campaigns to:

(a) promote leaves and garden trimmings as a valuable resource;

(b) make raking or blowing leaves into gutters socially unacceptable ('uncool')

Recommendation 64:

Local governments facilitate establishment of:

(a) local versions of the Great Autumn Leaf Exchange; and

(b) neighbourhood composting.

Recommendation 65:

Australian governments at all levels cease disposing of road and path sweepings in landfill and instead re-use them for mulch and compost for roadside and rural municipal plantings.

Recommendation 66:

Australian governments:

(a) mandate effective water-sensitive design for all new construction of roads, streets, paths and shared spaces;

(b) retrofit existing gutters, verges and median strips (unless on the high side of the road paving) to capture rainwater for onsite infiltration;

(b) set, in consultation with the community, a maximum limit (say 50%) to impermeable coverage (eg roofs, decks and paving) on residential blocks.

Recommendation 67:

If not already done, Australian State, Territory and Local governments urgently revise tree species preferred for their areas, aiming for trees that:

- **are more tolerant of high temperatures, dry or flooded soils and extreme weather (particularly wind);**
- **providing good shelter from sun, heat, wind and rain (especially sudden downpours);**
- **are cooling in summer, while preferably allowing winter sun through;**
- **are fire resistant; and**
- **contribute to food security and wildlife habitat.**

Recommendation 68:

Australian State, Territory and Local governments consider making the urban forest (or at least parts of it) more like a real forest, with mixed species.Recommendation 69:

Australian governments plant new trees in order to increase the urban tree canopy while gradually renewing the urban forest.

Recommendation 70:

Australian governments work with neighbours to ensure that there are shade trees are along roads and streets, and particularly over paths, be the trees on private or public land.

Recommendation 71:

Australian governments and other land developers cease clearing land and undertaking whole-of-site earthworks and grading to 'prepare' land for sale.

'Waste'

Recommendation 72:

Australian governments concentrate efforts to reduce emissions from 'waste' on shifting attitudes and behaviours rather than pursuing technological 'fixes'.

Recommendation 73:

Australian governments conduct education and behavioural change campaigns aimed at:

(a) reducing current very high levels of consumerism;

(b) making closed-loop systems our culture, with the 'waste' management hierachy and there being no 'away' to throw things to being part of our thinking; and

(c) shifting our culture away from one of 'consumption' and 'energy=fuel' to one where we see ourselves as members of the natural world living on finite Earth, participants in its great cycles.

Recommendation 74:

Where not already done, Australian governments:

(a) make the 'waste' management hierarchy the basis for their 'waste' management policies, decision-making, practices and contracts;

(b) charge for kerbside 'waste' collection by volume or weight;

(c) ban organic 'waste' from landfill and set up alternative systems to deal with it (such as in Recomendations 63-65);

(d) encourage and facilitate home and neighbourhood composting and worm farms;

(e) require retailers to accept back packaging and products that have worn out or no longer work;

(f) set and actively pursue ambitious zero waste targets;

(g) assess any new 'waste' management proposal for how it helps achieve zero net emissions - and reject any that do not do so;

(f) immediately, clearly state that they will not support any proposal:

(1) that increases 'waste' or emissions from 'waste';

(1) to convert 'waste' to energy; or

(1) to export 'waste' for conversion to energy or for landfill 'disposal' or equivalent; and

(f) immediately reject any proposal:

(1) that increases 'waste' or emissions from 'waste';

(2) to facilitate waste to landfill or similar 'disposal' in their own or other jurisdictions; or

(3) to use or export 'waste' for conversion to energy or for landfill 'disposal' or equivalent.

Food

<u>Recommendation 75:</u>

Australian governments and community groups:

(a) encourage local food-growing;

(a) facilitate establishment of community and neighbourhood food gardens.

Industry

<u>Recommendation 76:</u>

Australian governments work with local industry, technical experts and the broader community to establish activity based targets for industries using

materials or products that come from outside their jurisdictions and have high levels of embodied emissions, including:

(a) Food - amount of food grown (and eaten) in their jurisdiction or number of people growing (a certain percentage of) their own food;

(b) Cement - say, at least 50% of cement in infrastructure and multi-story building projects to be low carbon cement; and

(a) Steel - percentage of steel made from recycled content and imported into the jurisdiction.