Transport and Infrastructure Net Zero Consultation Roadmap

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Department of Climate Change, Energy, Environment and Water

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5 First name
Not answered

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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

2611

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.

Response: In general, I agree with the five guiding principles. However, under Principle 1 – Maximise emissions reduction - rather than "…identify and implement effective policies …. that will result in the largest reductions in emissions, consistent with achieving the government's targets", I would add "in line with the Paris Agreement" or similar. We need to ensure that government targets are in line with the Paris Agreement. We need to remember that 'net-zero' is not the ultimate goal – the goal must be to ensure that global

temperature rise is limited to less than 2 C as much as practicable – we are already seeing the disturbing effects of a changing climate. It is often forgotten that the IPCC's goals are premised on the requirement for 'negative emissions' by around 2050 – i.e. Net zero alone will not be sufficient and there will be a requirement in the future to effectively draw down carbon dioxide out of the atmosphere to stabilise the climate and temperature rise.

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.

Yes – this is not only eminently sensible, but essential.

2.1 Please add detail to your response.

Response: Many people will have problems with the word 'avoid'. e.g. the forecast rise in air travel, with associated likely increase in emissions seems to me to be problematic. The transformation requires a 'whole of society' change and, if we are to limit emissions and temperature rise, people will have to change the mode of travel wherever possible. We cannot continue to travel in the same way as we have done in the past, just 'because we can'. I will elaborate on this further in the other sections.

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.

Response: States and Territories all need to be heading in the same direction and, for some forms of transport, this will require both good coordination and funding. That is why a national policy framework is important. The national government should take the lead in driving the agenda, in setting targets (but in consultation with states and territories). This means that the national framework needs to be overarching with State and Territory programmes developed for implementation underneath the national framework, but with some funding from the Commonwealth. (It seems clear that smaller states and territories may not be able to manage this on their own). The Commonwealth can be instrumental in providing education and awareness of the need for all of us to

change. Perhaps we need a campaign something like the 'Life Be In It' campaign selling the idea of active transport, to get people to use active transport (walk, cycle, e-bike) rather than just 'jumping in the car' because 'we can'. The National Broadcasters, ABC and SBS may be able to assist in this as a 'public service'.
Apart from active transport, which needs to be encouraged, improved alternative forms of transport, e.g, bus and rail services with improved routes and frequency will assist in providing uptake.

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

All forms of active and public transport should be included. Any forms of active and public transport that will help reduce emissions are worthwhile. Plans that are developed need to be credible.

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?

First, ask the question "Is this travel really necessary?" Where practicable, many meetings can be undertaken using teleconferencing or video conferencing.
Minimise the requirements for flying wherever possible.

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?

I am unable to comment on the review of the National Freight and Supply Chain Strategy except to say that, where practicable, we should arrange to convey more goods by rail.
I am unable to comment on Questions 6.1 and 6.2.

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

I am unable to comment on the review of the National Freight and Supply Chain Strategy except to say that, where practicable, we should arrange to convey more goods by rail.
I am unable to comment on Questions 6.1 and 6.2.

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

Yes

27 7.1 Please add details to your response.

The government should, in my opinion, have adopted its preferred Option B for Fuel Efficiency Standards in its entirety – but that is now 'water under the bridge'. The government needs to listen more to 'the people' and not just lobby groups who largely push their own agendas to 'make a buck'. The motor vehicle industry (largely the FCAI) has opposed reforms over many years.

In particular, it's my view that the government should not have agreed to re-categorized Australia's most popular SUVs (Toyota LandCruiser, Ford Everest, Isuzu MUX Nissan Patrol and Mitsubishi Pajero Sport) from passenger vehicles to the light commercial category. In the main, these are not light commercial vehicles. Furthermore, the Transport and Infrastructure Net Zero Consultation Roadmap correctly mentions "A potential challenge to decarbonising light vehicles is that Australians increasingly prefer heavy passenger vehicles like SUVs and utes." That may be the preference of many Australians, but it does not help reduce emissions! Accordingly, it is my view that heavy emitting 'tanks' may need to have some form of price penalty placed on them to discourage uptake. (see response to Q 8.)

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?

There are a number of initiatives that I think the government can take:

(a)) Government(s), in particular, can lead the way by transitioning their existing light vehicle fleets to electric vehicles as quickly as possible.

(b) The government should introduce additional measures to make it either less attractive for consumers to purchase high emitting vehicles or increase incentives to make it more attractive for consumers to purchase lower emitting vehicles and EVs. (i) This may include placing some form of cost penalty on high emitting SUVs. I note that if emissions from all SUVs were considered as a country they would be the 6th highest emitting country in the world. In light of the seriousness of the climate crisis, there is a case for taxing such vehicles out of existence, particularly in urban areas. The government

might consider taking a lead from France on this matter.
(ii) Consideration could be given to assisting the less-well-off to transition to lower emissions vehicles, if this can be done in a practical and cost-effective way.

(c) Governments should regulate and assist vehicles that travel most to go electric. A good example here could be taxi and rideshare vehicles. Many taxis are already hybrids which is a good start both for economy and emissions, but setting a date for these industries to transition to full electric, perhaps with government assistance, would assist in reducing emissions further. Provision for suitable charging arrangements would also need to be made.
(d) The instant tax write-offs may be partly to blame for some of the uptake of utes. If this may be the case, this measure should be reviewed or at least not extended further in the next budget. There also appears to be a loophole with regard to the Luxury Car Tax that applies tax exemptions to high polluting luxury utes such as Ram and Chevrolet utes. These vehicles can best be described as 'large, heavy high polluting 'tanks'' that are disruptive to our environment. What ever happened to the humble 'sedan' which is easier to park and generally has lower emissions?
(e) The government should run education / advertising campaigns to 'sell the idea' of the need to 'go electric' when considering a new vehicle. [This may be opposed by some in the motor vehicle industry – don't worry about it – certain members of the motor vehicle industry will just have to 'adapt'. We cannot afford to have Australia continue to be a dumping ground for less fuel-efficient vehicles.]
(f) Encouragement for carpooling to reduce the number of single-person car trips would help reduce emissions. (Incentives such as reduced cost of parking for cars that are shared might help).
(g) If we are really serious – and we should be – consideration could be given to 'car-less days' or an 'odds and evens' system, as we did during the oil crisis. This would reduce the number of light cars on the road and could significantly reduce emissions from light vehicles. However, I imagine this would be politically sensitive. However, emissions in the transport sector are rising (currently 97.5Mt in the year to March 2023 and rising at 6.4% per annum). A reduction of 3.6 Mt of emissions in the transport each and every year would be required to reduce emissions to zero in 2050. A year-on-year reduction of 8% would be required to reduce emissions in the transport sector to < 10Mt - not an insubstantial task, given that the last remaining emissions may be more difficult to reduce.
(h) The federal government should announce a cut-off date for the purchase of fossil fuel vehicles. This will place the motor vehicle industry on firm notice and set a cut-off date for new fossil fuel emitting vehicles. The ACT has already announced it will put a ban on the sale of petrol and diesel cars in 2035 (and would like to phase them out sooner). The federal government needs to do the same if it is to be serious about reducing transport

emissions as rapidly as possible.

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

(a) The turnover in transitioning government fleets to electric would, in time, provide cheaper electric cars on the second-hand market which would be more affordable for some people.
(b) and (d) Increased cost penalties on high emitting SUVs may deter some from purchasing these vehicles. A question is "given the seriousness of climate situation, and the need to act, should people just be allowed to purchase whatever they want?" A downside of limiting choice is that this may have some political consequences.
(c) Assisting high-use vehicles (eg taxi industry) to go 'all electric' would reduce emissions further compared to existing hybrid vehicles largely used in the industry. In addition, reducing pollution will have a health benefit, particularly in urban areas.

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

Yes

31 9.1 Please add details to your response

Heavy road vehicles are another 'hard to abate' sector, at least in the short term. However, some aspects are encouraging and should be supported as much as possible.

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
2: Low carbon liquid fuels
3: Hydrogen fuel cell

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

Ideally, battery electric and low carbon liquid fuels should be developed together to some degree. However, based on information in the Consultation Paper:

1. I am impressed with what SEA Industries have done and are doing and also the move to manufacturing electric buses. So, initially we should support the battery electric transition for the lighter end of the heavy transport sector. It might be a good idea to keep across the progress of 'battery-swapping' heavy vehicles in China. At this stage, this sounds like a potentially easier approach than hydrogen fuel cell vehicles and the required associated infrastructure for manufacturing, transporting and transporting (green) hydrogen.
2. Low carbon liquid fuels sound the next best option, as they are essentially near 'drop-in' alternatives to diesel. A question that I have is "Are we likely to be able to manufacture LCLFs in sufficient quantities, particularly between 2024-2030?" Bio-fuels / LNG may be considered in the first instance. Let's do what we can in this period. In the longer term, synthetic fuels may be largely emissions free.
3. We have quite a way to go with hydrogen. Fine in theory but apart from the cost of vehicles, infrastructure to transport / distribute hydrogen will likely be costly. I'd suggest, where practical, that we plan to beef up the rail system as much as possible and gear up to transport as much freight by rail as possible.

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

This is really one for industry, but LCLFs are essentially a 'drop-in' fuel. In the end, being 'carbon', LCLFs are still CO2 emitters to some degree, but can help in the transition.

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?

The government, industry and other stakeholders should keep across developments overseas and develop staged milestones for emissions reductions in the heavy transport sector. If other countries can do it, so too can Australia. It is, to a large degree, a matter of 'political will' and being determined to address the climate challenge.
I would look at proposed changes for heavy transport in countries such as Canada (not too dissimilar to Australia in many ways), USA, and China. Common standards should be adopted where possible.
I note that Canada "will develop a medium- and heavy-duty zero-emission vehicle regulation to require 100% of new medium and heavy-duty vehicles sales to be zero-emissions vehicles to be zero-emissions vehicles by 2040 for a sub-set of vehicle types."
In Europe "the law sets that from 2030 new trucks weighing over 7.5 tonnes need to reduce emissions by 45% going up to 65% from 2035 and finally reaching 90% emissions reduction from 2040. New urban buses will need to reach a fully zero-emissions target by

2030, with an intermediate target of 90% within 6 years."
For heavy transport, the UK ultimately sees battery electric playing a major role rather than hydrogen. In the UK some thought has been given to having catenary wires suspended above major roadways to recharge heavy electric vehicle batteries (a novel approach, but I can't see that happening in Australia). None-the-less, the UK government "confirmed its intention to end the sale of new non-zero emission HGVs weighing under or equal to 26 tonnes by 2035, with all new HGVs sold to be fully zero emission at the exhaust by 2040."
Given the above, Australia should also set similar targets, appropriate to Australia, and strive to meet these. The industry will then know where it must head. Much of this will be costly. So, if cost is an issue, I'd suggest it appropriate to put a price on the gas that Australia exports overseas – we are essentially giving this away at zero / near zero cost on the raw resource – and ear-marking that revenue for the transition away from fossil fuels in Australia. The government could also consider ear-marking revenue from road user charges, which will eventually apply to all light vehicles, for roading and/or assisting in the transition in the transport sector, rather than just going into consolidated revenue. This may be more acceptable to motorists who often consider fuel excise 'just another tax'.

12.1 How would these actions address the identified challenges and opportunities to reduce heavy vehicle emissions?
Response: The same challenges occur for other countries as well and, in some respects, other countries are already well on the pathway for emissions reductions. New heavy trucks, in the main, will be imported. Solutions that work in Canada, for example, should also work in Australia.

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

Yes

37 13.1 Please add details to your response.

Yes. While I do not have expertise in this area, the approach outlined generally looks sensible. However, I am not sure whether priority should be given to battery electric or low carbon liquid fuels (see response under 15. below).

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: Low carbon liquid fuels

2: Battery electric
3: Hydrogen fuel cell

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

As mentioned in the consultation, low carbon liquid fuels can be used by existing diesel-electric locomotives to reduce emissions. Battery technology is already being used / trialled and the hydrogen economy is still some way off and not without some challenges.

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

Low carbon liquid fuels (LCLFs) should play an initial but limited role in rail decarbonisation. After all, they are still fossil fuels. On the positive side, they can be readily used by existing diesel-electric locomotives. A concern could be whether LCLFs can be manufactured in sufficient quantities. Furthermore, as mentioned in Chapter 4 of the consultation, one would want to be very confident that emission benefits of LCLFs associated with displacing fossil fuels are not undermined by increasing emissions elsewhere (soil carbon or forest carbon depletion or land use change). Given this concern, perhaps equal effort should go into LCLFs and battery electric, particularly as BHP have made some progress in this area. The government and industry should learn from the trials undertaken by BHP and see if this learning can be implemented elsewhere in the rail network(s).

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?

Two major issues in the consultation paper stand out:
(a) Energy efficiency and regenerative breaking should standout if the associated emissions reductions (8-17% for service commuter trains, ~30% for very dense suburban network trains and 21-55% for freight trains) can be achieved. Perhaps this should be where one starts and prioritises the effort.
(b) Simply improving the reliability and resilience of the rail network could go a long way to making rail a more attractive form of transport (for freight and passengers). However, there seems to have been a fair amount of inertia in improving rail services. That now needs to be overcome. I for one would use passenger rail services if they were improved in terms of speed, and frequency of services.

42 ## 16.1 How would these actions address the identified challenges and opportunities to reduce rail emissions?

Energy efficiency measures are often underrated, but there would appear to be significant opportunity for energy efficiency measures which would reduce emissions. Rail is a low-emissions form of transport. Consequently, there is potential to reduce emissions from the high-emitting road sector if rail can be made a more positive, reliable and cost-effective option for both freight and passenger services. In the longer-term, high-speed rail could replace some air travel, but this will take time to develop.

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

Yes

44 ## 17.1 Please add details to your response.

Broadly

This is a hard to abate sector - I have no experience in this area and have not researched it. The emissions in this sector for Australia are low (2Mt pa). One wonders whether there could be some scope in future ship design to some incorporate some wind/sail assistance, in addition to low emission engines, in order to further reduce emissions.

I realise that emissions in international shipping do not accrue to Australia. None-the-less, this issue needs to be dealt with in international forums if overall 'net-zero' is to be a 'thing' globally. The issue of international bunker fuels (maritime and aviation) needs to be addressed and apportioned to individual countries, rather than being left as an unaddressed issue.

Personally, I would 'ping' recreational travellers for emissions arising from travelling on cruise liners – not that I overly endorse offsets. As I understand it, cruise liners are worse than aviation in terms of emissions per passenger-km (~250gCO2/pax-km for efficient cruise ships and some are even higher). For ships using LNG there is the further issue of methane slippage which needs to be accounted for. As cruises of this type are recreational, and generally can be considered in the 'luxury class', it is my view that if people can afford the cost of the cruise, they can afford to pay to either 'offset' their emissions. This charge should be billed at the time of ticket purchase to either 'offset' emissions or, preferably, quarantined to assist with making direct emissions reductions elsewhere.

I am unable to answer Q18. 18.1 and 18.2.

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?

I only agree with the proposed pathway in part.

48 19.1 Please add details to your response.

Significant gains have been made in increased efficiency in jet engines and this is welcome. However, a lot more needs to be done to reduce GHG emissions and other climate warming effects in the aviation sector.

I agree that Sustainable Aviation Fuels (SAFs) appear to be an obvious choice, if they can readily be developed at the rate and within the timeframe required. It remains to be seen how 'sustainable' these might be. As mentioned in the Consultation Paper, not all SAFs are equal and some may have higher life-cycle emissions than fossil fuels. At this stage, it is difficult to see how the aviation sector can be made completely 'net zero', but it may none-the-less be possible to reduce some emissions.

I note in the Consultation Paper that 'Australia is supporting International Civil Aviation Organisation (ICAO)-led initiatives to reduce emissions from international aviation while facilitating growth in the industry.' I further note that 'For both international and domestic flights, Australia has one of the highest per capita CO2-e emissions (495 and 267 kg respectively in 2018.' Some of these aspects are concerning and may be difficult to adequately address.

There are several problems ahead for the emissions in the aviation sector, as I see it:

(i) Forecast growth in the aviation sector and associated emissions: The forecast increase in growth in the aviation sector - if it becomes reality - is likely to be a major issue. On the international scene, the most recent estimates by the International Civil Aviation Organisation, ICAO, suggest that demand for air transport will increase by an average of 4.3% per annum over the next 20 years" - so an increase of 86% in flights / passenger miles? by the mid-2040's. (The FAA in the US is forecasting growth of 4.7% per

year). For Australia, demand may be even greater, as I note that the Bureau of Infrastructure and Transport Research Economics states 'Total domestic air movements (i.e. revenue passenger kilometres) are projected to grow by around 137% between 2022-23 and 2049-50 under a baseline scenario from around 66.2 billion passenger kilometres in in 2022-23 …" If this forecast is correct, this is a simple annual average of nearly 5.1%! A relevant question is "even with action taken to reduce emissions in the aviation sector, can this be done at a rate that will guarantee a fall in total emissions within the sector? While the Consultation Paper suggests that emissions in the (domestic) aviation sector are expected to grow in line with population growth, and will peak in 2027, this contrasts with forecast increase in emissions ranging from 2 to 4 times the 2015 levels by 2050.

(ii) ICAO / CORSIA: The 41st Assembly of ICAO stated that net-zero carbon emissions by 2050 is a long-term aspirational goal (LTAG) for international aviation. It is hard to see that the aim of CORSIA (see below) to limit emissions to 1990 levels, is in anyway compatible with net-zero in the aviation sector. Aviation is a 'hard to abate' sector. CORSIA – the Carbon Offsetting and Reduction Scheme for International Aviation is controversial and appears, at least to me, to largely be a 'greenwashing' exercise. According to Carbon Market Watch, 'ICAO's General Assembly has further weakened CORSIA its only carbon pricing tool. In June 2020, as a result of intense lobbying by the airline industry, the baseline for the first three years (of the CORSIA trial) was weakened to cover only 2019 emissions, in order to exclude the drop in flights that occurred during the pandemic.'

(iii) Non-CO2 radiative forcing factors for air travel contribute to climate change but are rarely taken into consideration. Non-CO2 radiative effects should be taken into account, if we are to truly address the climate situation. (I realise this may be controversial, and that the aviation industry will likely argue against this. However, if we are to seriously address climate change, this additional radiative factor needs to be accounted for.)

(iv) Emissions from international air travel is not accounted for, but needs to be accounted for in some way. Australia needs to work in international forums to see that this can occur. Once again, some sort of compulsory offset / charging arrangement at the time of ticket purchase, may necessary either to offset emissions or assist in the transition. Perhaps the money raised could go to assisting poorer countries in their transition. After all, poorer countries have not contributed significantly to the current climate situation.

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?

(i) Encourage alternatives to air travel where practicable;
(ii) Consider limiting short-haul air travel (e.g. Canberra-Sydney; Sydney-Newcastle, where reasonable alternative forms of travel are or could be available). This approach has been adopted in France, but France has better arrangements for alternative travel.
(iii) The government could consider making verifiable offsets for air travel compulsory, rather than optional, (perhaps at the time of ticket purchase). While I am not a strong advocate for offsets – I don't think we can offset our way out of the climate situation if we are serious about addressing climate change – some offsetting may assist, but is not a substitute for direct emissions reduction. In addition, planting tress / re-afforestation, if done correctly, is not a bad thing anyway.
(iv) It is my view that calculators should also take into account non-CO2 climate aspects related to air travel. The government should consider accounting for non-CO2 aspects of air travel (perhaps as part of the National Greenhouse Account Factors) so that businesses and others can account for the true impact of air travel on climate. (e.g. In the UK the Department of Environment, Food and Rural Affairs (DEFRA) and the former Department for Business, Energy and Industrial Strategy (BEIS) uses a factor of 1.7x to account for the radiative effects of air travel. This is a conservative value, as some others advocate using high factors (2 or even higher).
The Atmosfair emissions calculator also takes aircraft type, distance travelled, and radiative effects into account when calculating the impact of air travel on climate.
20.2 How would these actions address the identified challenges and opportunities to reduce aviation emissions?
Response: The actions listed in 20.1 would only reduce aviation emissions in a limited way, but may help somewhat. There is no doubt that aviation is a very challenging and hard to abate sector. We must do the best that we can to reduce emissions and encourage the public to travel less by air. Addressing the climate situation will require a complete societal change, if we are to be serious about addressing the climate situation. It is hard to see that we can continue to travel by air increasingly 'just because we can'.

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

Yes

52 21.1 Please add details to your response.

Broadly, Yes. I have only had time to quickly skim this section.

21.1 Please add details to your response.
Response: On a quick skim the following points stand out:
(i) The changing climate and severity and unpredictability of weather events is already evident. It will be necessary to plan well ahead and move some infrastructure that is likely to be subject to inundation. In fact, sad as it may seem, some communities, and associated infrastructure, will need to be relocated. There is no point in throwing good money after bad.
(ii) I agree, reducing the transport emissions that infrastructure enables will require a whole of system planning approach.
(iii) Reducing embodied emissions in infrastructure needs to be a key priority. Having said that, work needs to be done properly, even at additional cost, the first time around. (e.g. Roading needs a good base as a foundation to carry the forecast loads, otherwise on-going repairs will be necessary).
(iv) Finally, the focus should absolutely be on achieving direct absolute emissions reductions. Business as usual is not an option. This is a message that needs to be 'sold' and sold well!

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?

Thank you for providing this public consultation and allowing members of the public to 'have their say'. This response is from the viewpoint of a private citizen who is concerned about the effects of climate change on society, the urgency required to address the situation, and the challenges that this presents to both governments and society in general. I have no particular expertise in transport and infrastructure. As such, the responses provided below are from my own perspective, having done a small amount of personal research on some of the issues. It is apparent that in many cases, there are 'no easy fixes' and the transition to net zero emissions represents a massive challenge to us all.

Thank you for the information that has been provided in the Net-Zero Consultation documentation. This has been very informative.

66 Would you like to upload a document?

Yes

67 Have you removed any identifying information from your submission?

Yes

68 Upload a submission

Response to Transport and Infrastructure Net Zero Consultation Roadmap - WDF.pdf

69 Upload a submission

Not answered

70 Upload supporting file

Not answered

71 Upload supporting file

Not answered

Response to Transport and Infrastructure Net Zero Consultation Roadmap

General:

Thank you for providing this public consultation and allowing members of the public to 'have their say'. This response is from the viewpoint of a private citizen who is concerned about the effects of climate change on society, the urgency required to address the situation, and the challenges that this presents to both governments and society in general. I have no particular expertise in transport and infrastructure. As such, the responses provided below are from my own perspective, having done a small amount of personal research on some of the issues. It is apparent that in many cases, there are 'no easy fixes' and the transition to net zero emissions represents a massive challenge to us all.

Thank you for the information that has been provided in the Net-Zero Consultation documentation. This has been very informative.

1. Do you agree with the proposed guiding principles?

Response:
Yes.

1.2 Please add details to your response.

Response: In general, I agree with the five guiding principles. However, under Principle 1 – Maximise emissions reduction - rather than "…identify and implement effective policies …. that will result in the largest reductions in emissions, consistent with achieving the government's targets", I would add "in line with the Paris Agreement" or similar. We need to ensure that government targets are in line with the Paris Agreement. We need to remember that 'net-zero' is not the ultimate goal – the goal must be to ensure that global temperature rise is limited to less than 2°C, as much as practicable – we are already seeing the disturbing effects of a changing climate. It is often forgotten that the IPCC's goals are premised on the requirement for 'negative emissions' by around 2050 – i.e. Net zero alone will not be sufficient and there will be a requirement in the future to effectively draw down carbon dioxide out of the atmosphere to stabilise the climate and temperature rise.

I have no problems with guiding principles 2-5.

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

Response:
Yes – this is not only eminently sensible, but essential.

2.1 Please add detail to your response.

Response: Many people will have problems with the word 'avoid'. e.g. the forecast rise in air travel, with associated likely increase in emissions seems to me to be problematic. The transformation requires a 'whole of society' change and, if we are to limit emissions and temperature rise, people will have to change the mode of travel wherever possible.

We cannot continue to travel in the same way as we have done in the past, just 'because we can'. I will elaborate on this further in the other sections.

3. Do you agree the development of a national policy framework for active and public transport will support emissions development.
Response: Yes.

3.1 Please add details to your response.

Response: States and Territories all need to be heading in the same direction and, for some forms of transport, this will require both good coordination and funding. That is why a national policy framework is important. The national government should take the lead in driving the agenda, in setting targets (but in consultation with states and territories). This means that the national framework needs to be overarching with State and Territory programmes developed for implementation underneath the national framework, but with some funding from the Commonwealth. (It seems clear that smaller states and territories may not be able to manage this on their own). The Commonwealth can be instrumental in providing education and awareness of the need for all of us to change. Perhaps we need a campaign something like the 'Life Be In It' campaign selling the idea of active transport, to get people to use active transport (walk, cycle, e-bike) rather than just 'jumping in the car' because 'we can'. The National Broadcasters, ABC and SBS may be able to assist in this as a 'public service'.

Apart from active transport, which needs to be encouraged, improved alternative forms of transport, e.g, bus and rail services with improved routes and frequency will assist in providing uptake.

4. What should be included in a national policy framework for active and public transport and how should it be developed?
Response:
All forms of active and public transport should be included. Any forms of active and public transport that will help reduce emissions are worthwhile. Plans that are developed need to be credible.

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 emissions reductions?
Response: First, ask the question "Is this travel really necessary?" Where practicable, many meetings can be undertaken using teleconferencing or video conferencing.

Minimise the requirements for flying wherever possible.

6. The Australian Government has already engaged in consultation on the 2023 review of the National Freight and Supply Chain Strategy and those consultations will inform the final Roadmap and Action Plan.
Response: I am unable to comment on the review of the National Freight and Supply Chain Strategy except to say that, where practicable, we should arrange to convey more goods by rail.

I am unable to comment on Questions 6.1 and 6.2.

7. Do you agree with the proposed net zero pathway for light road vehicles?
Response: Yes – I agree with the proposed net-zero pathway for light road vehicles – but only in part.

7.1 Please add details to your response.

Response: The government should, in my opinion, have adopted its preferred Option B for Fuel Efficiency Standards in its entirety – but that is now 'water under the bridge'. The government needs to listen more to 'the people' and not just lobby groups who largely push their own agendas to 'make a buck'. The motor vehicle industry (largely the FCAI) has opposed reforms over many years.

In particular, it's my view that the government should not have agreed to re-categorized Australia's most popular SUVs (Toyota LandCruiser, Ford Everest, Isuzu MUX Nissan Patrol and Mitsubishi Pajero Sport) from passenger vehicles to the light commercial category. In the main, these are not light commercial vehicles. Furthermore, the *Transport and Infrastructure Net Zero Consultation Roadmap* correctly mentions "A potential challenge to decarbonising light vehicles is that **Australians increasingly prefer heavy passenger vehicles** like SUVs and utes." That may be the preference of many Australians, but it does not help reduce emissions! Accordingly, it is my view that heavy emitting 'tanks' may need to have some form of price penalty placed on them to discourage uptake. (see response to Q 8.)

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?

Response: There are a number of initiatives that I think the government can take:

(a)) Government(s), in particular, can lead the way by transitioning their existing light vehicle fleets to electric vehicles as quickly as possible.

(b) The government should introduce additional measures to make it either less attractive for consumers to purchase high emitting vehicles or increase incentives to make it more attractive for consumers to purchase lower emitting vehicles and EVs.
(i) This may include placing some form of cost penalty on high emitting SUVs. I note that if emissions from all SUVs were considered as a country they would be the 6th highest emitting country in the world.[1] In light of the seriousness of the climate crisis, there is a case for taxing such vehicles out of existence, particularly in urban areas. The government might consider taking a lead from France on this matter.[2]
(ii) Consideration could be given to assisting the less-well-off to transition to lower emissions vehicles, if this can be done in a practical and cost-effective way.

[1] https://www.theguardian.com/environment/2023/feb/28/carbon-emissions-global-suv-sport-utility-vehicles-oil-climate

[2] https://www.euronews.com/green/2024/01/17/higher-taxes-and-more-expensive-parking-how-is-france-cracking-down-on-suvs

(c) Governments should regulate and assist vehicles that travel most to go electric. A good example here could be taxi and rideshare vehicles. Many taxis are already hybrids which is a good start both for economy and emissions, but setting a date for these industries to transition to full electric, perhaps with government assistance, would assist in reducing emissions further. Provision for suitable charging arrangements would also need to be made.

(d) The instant tax write-offs may be partly to blame for some of the uptake of utes. If this may be the case, this measure should be reviewed or at least not extended further in the next budget. There also appears to be a loophole with regard to the Luxury Car Tax that applies tax exemptions to high polluting luxury utes such as Ram and Chevrolet utes.[3] These vehicles can best be described as 'large, heavy high polluting 'tanks'' that are disruptive to our environment. What ever happened to the humble 'sedan' which is easier to park and generally has lower emissions?

(e) The government should run education / advertising campaigns to 'sell the idea' of the need to 'go electric' when considering a new vehicle. [This may be opposed by *some* in the motor vehicle industry – don't worry about it – certain members of the motor vehicle industry will just have to 'adapt'. We cannot afford to have Australia continue to be a dumping ground for less fuel-efficient vehicles.]

(f) Encouragement for carpooling to reduce the number of single-person car trips would help reduce emissions. (Incentives such as reduced cost of parking for cars that are shared might help).

(g) If we are really serious – and we should be – consideration could be given to 'car-less days' or an 'odds and evens' system, as we did during the oil crisis. This would reduce the number of light cars on the road and could significantly reduce emissions from light vehicles. However, I imagine this would be politically sensitive. However, emissions in the transport sector are rising (currently 97.5Mt in the year to March 2023 and rising at 6.4% per annum). A reduction of 3.6 Mt of emissions in the transport each and every year would be required to reduce emissions to zero in 2050. A year-on-year reduction of 8% would be required to reduce emissions in the transport sector to < 10Mt - not an insubstantial task, given that the last remaining emissions may be more difficult to reduce.

(h) The federal government should announce a cut-off date for the purchase of fossil fuel vehicles. This will place the motor vehicle industry on firm notice and set a cut-off date for new fossil fuel emitting vehicles. The ACT has already announced it will put a ban on the sale of petrol and diesel cars in 2035 (and would like to phase them out sooner). The federal government needs to do the same if it is to be serious about reducing transport emissions as rapidly as possible.

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

Response:

(a) The turnover in transitioning government fleets to electric would, in time, provide cheaper electric cars on the second-hand market which would be more affordable for some people.

[3] https://www.theguardian.com/australia-news/article/2024/jul/22/luxury-ute-tax-loophole-emissions-reductions-evs-taxpayers#:~:text=A%20loophole%20in%20Australia's%20tax,revenue%2C%20an%20analysis%20has%20found

(b) and (d) Increased cost penalties on high emitting SUVs may deter some from purchasing these vehicles. A question is "given the seriousness of climate situation, and the need to act, should people just be allowed to purchase whatever they want?" A downside of limiting choice is that this may have some political consequences.

(c) Assisting high-use vehicles (eg taxi industry) to go 'all electric' would reduce emissions further compared to existing hybrid vehicles largely used in the industry. In addition, reducing pollution will have a health benefit, particularly in urban areas.

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

9.1 Please add details to your response

Response: Heavy road vehicles are another 'hard to abate' sector, at least in the short term. However, some aspects are encouraging and should be supported as much as possible.

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 reductions.

Response:

1. Battery electric
2. Low carbon liquid fuels
3. Hydrogen fuel cell

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

Response: Ideally, battery electric and low carbon liquid fuels should be developed together to some degree. However, based on information in the Consultation Paper:

1. I am impressed with what SEA Industries have done and are doing and also the move to manufacturing electric buses. So, initially we should support the battery electric transition for the lighter end of the heavy transport sector. It might be a good idea to keep across the progress of 'battery-swapping' heavy vehicles in China. At this stage, this sounds like a potentially easier approach than hydrogen fuel cell vehicles and the required associated infrastructure for manufacturing, transporting and transporting (green) hydrogen.
2. Low carbon liquid fuels sound the next best option, as they are essentially near 'drop-in' alternatives to diesel. A question that I have is "Are we likely to be able to manufacture LCLFs in sufficient quantities, particularly between 2024-2030?" Bio-fuels / LNG may be considered in the first instance. Let's do what we can in this period. In the longer term, synthetic fuels may be largely emissions free.
3. We have quite a way to go with hydrogen. Fine in theory but apart from the cost of vehicles, infrastructure to transport / distribute hydrogen will likely be costly. I'd suggest, where practical, that we plan to beef up the rail system as much as possible and gear up to transport as much freight by rail as possible.

11. What role should low carbon liquid fuels play in heavy vehicle decarbonisation?
Response: This is really one for industry, but LCLFs are essentially a 'drop-in' fuel. In the end, being 'carbon', LCLFs are still CO_2 emitters to some degree, but can help in the transition.

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?
Response: The government, industry and other stakeholders should keep across developments overseas and develop staged milestones for emissions reductions in the heavy transport sector. If other countries can do it, so too can Australia. It is, to a large degree, a matter of 'political will' and being determined to address the climate challenge.

I would look at proposed changes for heavy transport in countries such as Canada (not too dissimilar to Australia in many ways), USA, and China. Common standards should be adopted where possible.

I note that Canada "will develop a medium- and heavy-duty zero-emission vehicle regulation to require 100% of new medium and heavy-duty vehicles sales to be zero-emissions vehicles to be zero-emissions vehicles by 2040 for a sub-set of vehicle types."[4]

In Europe "the law sets that from 2030 new trucks weighing over 7.5 tonnes need to reduce emissions by 45% going up to 65% from 2035 and finally reaching 90% emissions reduction from 2040. New urban buses will need to reach a fully zero-emissions target by 2030, with an intermediate target of 90% within 6 years."[5]

For heavy transport, the UK ultimately sees battery electric playing a major role rather than hydrogen. In the UK some thought has been given to having catenary wires suspended above major roadways to recharge heavy electric vehicle batteries[6] (a novel approach, but I can't see that happening in Australia). None-the-less, the UK government "confirmed its intention to end the sale of new non-zero emission HGVs weighing under or equal to 26 tonnes by 2035, with all new HGVs sold to be fully zero emission at the exhaust by 2040."[7]

Given the above, Australia should also set similar targets, appropriate to Australia, and strive to meet these. The industry will then know where it must head. Much of this will be costly. So, if cost is an issue, I'd suggest it appropriate to put a price on the gas that Australia exports overseas – we are essentially giving this away at zero / near zero cost on the raw resource – and ear-marking that revenue for the transition away from fossil fuels in Australia. The government could also consider ear-marking revenue from road user charges, which will eventually apply to all light vehicles, for roading and/or assisting in the transition in the transport sector, rather than just going into consolidated revenue. This may be more acceptable to motorists who often consider fuel excise 'just another tax'.

[4] https://tc.canada.ca/en/road-transportation/publications/canada-s-action-plan-clean-road-transportation#
[5] https://www.euronews.com/green/2024/05/13/trucks-and-buses-to-slash-co2-emissions-by-90-by-2040#:~:text=The%20law%20further%20sets%20that,of%2090%25%20within%20six%20years.
[6] https://www.theguardian.com/world/2022/apr/29/hgv-manufacturers-race-to-decarbonise-trucks-lorries-carbon-footprint-uk
[7] https://www.gov.uk/government/calls-for-evidence/infrastructure-for-zero-emission-heavy-goods-vehicles-and-coaches/infrastructure-for-zero-emission-heavy-goods-vehicles-and-coaches

12.1 How would these actions address the identified challenges and opportunities to reduce heavy vehicle emissions?

Response: The same challenges occur for other countries as well and, in some respects, other countries are already well on the pathway for emissions reductions. New heavy trucks, in the main, will be imported. Solutions that work in Canada, for example, should also work in Australia.

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

Response: Yes.

13.1 Please add details to your response.

Response: Yes. While I do not have expertise in this area, the approach outlined generally looks sensible. However, I am not sure whether priority should be given to battery electric or low carbon liquid fuels (see response under 15. below).

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.

Response:

1. Low carbon liquid fuels (LCLFs)
2. Battery electric
3. Hydrogen fuel cell.

14.1 Why did you rank them in that order?

Response: As mentioned in the consultation, low carbon liquid fuels can be used by existing diesel-electric locomotives to reduce emissions. Battery technology is already being used / trialled and the hydrogen economy is still some way off and not without some challenges.

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

Response: Low carbon liquid fuels (LCLFs) should play an initial but limited role in rail decarbonisation. After all, they are still fossil fuels. On the positive side, they can be readily used by existing diesel-electric locomotives. A concern could be whether LCLFs can be manufactured in sufficient quantities. Furthermore, as mentioned in Chapter 4 of the consultation, one would want to be very confident that emission benefits of LCLFs associated with displacing fossil fuels are not undermined by increasing emissions elsewhere (soil carbon or forest carbon depletion or land use change). Given this concern, perhaps equal effort should go into LCLFs and battery electric, particularly as BHP have made some progress in this area. The government and industry should learn from the trials undertaken by BHP and see if this learning can be implemented elsewhere in the rail network(s).

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

Response: Two major issues in the consultation paper stand out:

(a) Energy efficiency and regenerative breaking should standout if the associated emissions reductions (8-17% for service commuter trains, ~30% for very dense suburban network trains and 21-55% for freight trains) can be achieved. Perhaps this should be where one starts and prioritises the effort.
(b) Simply improving the reliability and resilience of the rail network could go a long way to making rail a more attractive form of transport (for freight and passengers).

However, there seems to have been a fair amount of inertia in improving rail services. That now needs to be overcome. I for one would use passenger rail services if they were improved in terms of speed, and frequency of services.

16.1 How would these actions address the identified challenges and opportunities to reduce rail emissions?

Response: Energy efficiency measures are often underrated, but there would appear to be significant opportunity for energy efficiency measures which would reduce emissions. Rail is a low-emissions form of transport. Consequently, there is potential to reduce emissions from the high-emitting road sector if rail can be made a more positive, reliable and cost-effective option for both freight and passenger services. In the longer-term, high-speed rail could replace some air travel, but this will take time to develop.

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

Response: I broadly agree with the outlined pathway.

17.1 Please add details to your response.

Response: This is a hard to abate sector - I have no experience in this area and have not researched it. The emissions in this sector for Australia are low (2Mt pa). One wonders whether there could be some scope in future ship design to some incorporate some wind/sail assistance, in addition to low emission engines, in order to further reduce emissions.

I realise that emissions in international shipping do not accrue to Australia. None-the-less, this issue needs to be dealt with in international forums if overall 'net-zero' is to be a 'thing' globally. The issue of international bunker fuels (maritime and aviation) needs to be addressed and apportioned to individual countries, rather than being left as an unaddressed issue.

Personally, I would 'ping' recreational travellers for emissions arising from travelling on cruise liners – not that I overly endorse offsets. As I understand it, cruise liners are worse than aviation in terms of emissions per passenger-km (~250gCO_2/pax-km for efficient cruise ships[8] and some are even higher). For ships using LNG there is the further issue of methane slippage which needs to be accounted for.[9] As cruises of this type are recreational, and generally can be considered in the 'luxury class', it is my view that if people can afford the cost of the cruise, they can afford to pay to either 'offset' their emissions. This charge should be billed at the time of ticket purchase to either 'offset' emissions or, preferably, quarantined to assist with making direct emissions reductions elsewhere.

I am unable to answer Q18. 18.1 and 18.2.

[8] https://posts.voronoiapp.com/climate/Cruise-Ships-Are-The-Most-Carbon-Intensive-Travel-Method-1036

[9] https://www.reuters.com/business/environment/worlds-largest-cruise-ship-sets-sail-bringing-concerns-about-methane-emissions-2024-01-27/#:~:text=Cruise%20ship%20engines%20have%20an,assumes%20methane%20slip%20at%203.5%25.

19. Do you agree with the proposed net-zero pathway for aviation?
Response: I only agree with the proposed pathway in part.

19.1 Please add details to your response
Response: Significant gains have been made in increased efficiency in jet engines and this is welcome. However, a lot more needs to be done to reduce GHG emissions and other climate warming effects in the aviation sector.

I agree that Sustainable Aviation Fuels (SAFs) appear to be an obvious choice, if they can readily be developed at the rate and within the timeframe required. It remains to be seen how 'sustainable' these might be. As mentioned in the Consultation Paper, not all SAFs are equal and some may have higher life-cycle emissions than fossil fuels. At this stage, it is difficult to see how the aviation sector can be made completely 'net zero', but it may none-the-less be possible to reduce some emissions.

I note in the Consultation Paper that *'Australia is supporting International Civil Aviation Organisation (ICAO)-led initiatives to reduce emissions from international aviation while facilitating growth in the industry.'* I further note that '*For both international and domestic flights, Australia has one of the highest per capita $CO_{2\text{-}e}$ emissions (495 and 267 kg respectively in 2018.'* Some of these aspects are concerning and may be difficult to adequately address.

There are several problems ahead for the emissions in the aviation sector, as I see it:

(i) Forecast growth in the aviation sector and associated emissions: The forecast increase in growth in the aviation sector - if it becomes reality - is likely to be a major issue. On the international scene, the most recent estimates by the International Civil Aviation Organisation, ICAO, suggest that demand for air transport will increase by an average of 4.3% per annum over the next 20 years"[10] - so an increase of 86% in flights / passenger miles? by the mid-2040's. (The FAA in the US is forecasting growth of 4.7% per year). For Australia, demand may be even greater, as I note that the Bureau of Infrastructure and Transport Research Economics states 'Total domestic air movements (i.e. revenue passenger kilometres) are projected to grow by around 137% between 2022-23 and 2049-50 under a baseline scenario from around 66.2 billion passenger kilometres in in 2022-23 …" [11] If this forecast is correct, this is a simple annual average of nearly 5.1%! A relevant question is "even with action taken to reduce emissions in the aviation sector, can this be done at a rate that will guarantee a fall in total emissions within the sector? While the Consultation Paper suggests that emissions in the (domestic) aviation sector are expected to grow in line with population growth, and will peak in 2027, this contrasts with forecast increase in emissions ranging from 2 to 4 times the 2015 levels by 2050.[12]

[10] https://www.icao.int/Meetings/FutureOfAviation/Pages/default.aspx
[11] https://www.bitre.gov.au/sites/default/files/documents/bitre-rr157-summary.pdf
[12] https://www.icao.int/environmental-protection/Documents/EnvironmentalReports/2019/ENVReport2019_pg17-23.pdf

(ii) ICAO / CORSIA: The 41st Assembly of ICAO stated that net-zero carbon emissions by 2050 is a long-term aspirational goal (LTAG) for international aviation. It is hard to see that the aim of CORSIA (see below) to limit emissions to 1990 levels, is in anyway compatible with net-zero in the aviation sector. Aviation is a 'hard to abate' sector. CORSIA – the Carbon Offsetting and Reduction Scheme for International Aviation is controversial and appears, at least to me, to largely be a 'greenwashing' exercise. According to Carbon Market Watch, *'ICAO's General Assembly has further weakened CORSIA its only carbon pricing tool. In June 2020, as a result of intense lobbying by the airline industry, the baseline for the first three years (of the CORSIA trial) was weakened to cover only 2019 emissions, in order to exclude the drop in flights that occurred during the pandemic.'* [13]

(iii) Non-CO_2 radiative forcing factors for air travel contribute to climate change but are rarely taken into consideration. Non-CO_2 radiative effects should be taken into account, if we are to truly address the climate situation. (I realise this may be controversial, and that the aviation industry will likely argue against this. However, if we are to seriously address climate change, this additional radiative factor needs to be accounted for.)

(iv) Emissions from international air travel is not accounted for, but needs to be accounted for in some way. Australia needs to work in international forums to see that this can occur. Once again, some sort of compulsory offset / charging arrangement at the time of ticket purchase, may necessary either to offset emissions or assist in the transition. Perhaps the money raised could go to assisting poorer countries in their transition. After all, poorer countries have not contributed significantly to the current climate situation.

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

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?

Response:

(i) Encourage alternatives to air travel where practicable;

(ii) Consider limiting short-haul air travel (e.g. Canberra-Sydney; Sydney-Newcastle, where reasonable alternative forms of travel are or could be available). This approach has been adopted in France, but France has better arrangements for alternative travel.[14]

(iii) The government could consider making verifiable offsets for air travel compulsory, rather than optional, (perhaps at the time of ticket purchase). While I am not a strong advocate for offsets – I don't think we can offset our way out of the climate situation if we are serious about addressing climate change – some offsetting may assist, but is not a substitute for direct emissions reduction. In addition, planting tress / re-afforestation, if done correctly, is not a bad thing anyway.

[13] https://carbonmarketwatch.org/2022/11/04/time-for-eu-to-act-on-airline-emissions-as-un-aviation-agencys-climate-ambitions-take-a-nosedive-2/

[14] https://www.bbc.com/news/world-europe-65687665#

(iv) It is my view that calculators should also take into account non-CO_2 climate aspects related to air travel. The government should consider accounting for non-CO_2 aspects of air travel (perhaps as part of the National Greenhouse Account Factors) so that businesses and others can account for the true impact of air travel on climate. (e.g. In the UK the Department of Environment, Food and Rural Affairs (DEFRA) and the former Department for Business, Energy and Industrial Strategy (BEIS) uses a factor of 1.7x to account for the radiative effects of air travel.[15] This is a conservative value, as some others advocate using high factors (2 or even higher).
The Atmosfair emissions calculator[16] also takes aircraft type, distance travelled, and radiative effects into account when calculating the impact of air travel on climate.

20.2 How would these actions address the identified challenges and opportunities to reduce aviation emissions?

Response: The actions listed in 20.1 would only reduce aviation emissions in a limited way, but may help somewhat. There is no doubt that aviation is a very challenging and hard to abate sector. We must do the best that we can to reduce emissions and encourage the public to travel less by air. Addressing the climate situation will require a complete societal change, if we are to be serious about addressing the climate situation. It is hard to see that we can continue to travel by air increasingly 'just because we can'.

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

Response: Broadly, Yes. I have only had time to quickly skim this section.

21.1 Please add details to your response.

Response: On a quick skim the following points stand out:

(i) The changing climate and severity and unpredictability of weather events is already evident. It will be necessary to plan well ahead and move some infrastructure that is likely to be subject to inundation. In fact, sad as it may seem, some communities, and associated infrastructure, will need to be relocated. There is no point in throwing good money after bad.

(ii) I agree, reducing the transport emissions that infrastructure enables will require a whole of system planning approach.

(iii) Reducing embodied emissions in infrastructure needs to be a key priority. Having said that, work needs to be done properly, even at additional cost, the first time around. (e.g. Roading needs a good base as a foundation to carry the forecast loads, otherwise on-going repairs will be necessary).

(iv) Finally, the focus should absolutely be on achieving direct absolute emissions reductions. Business as usual is not an option. This is a message that needs to be 'sold' and sold well!

[15] https://www.carbonkit.net/categories/DEFRA_journey_based_flight_methodology#:~:text=The%20emissions%20methodology%20is%20based,haul%20and%20long%2Dhaul%20flights.

[16] https://www.atmosfair.de/en/offset/flight/