



Climate Action Moreland
P.O. Box 381
Fawkner, Victoria, 3060

25 August 2019

Attention: Submissions
Climate Change Authority
GPO Box 787
Canberra ACT 2600
submissions@climatechangeauthority.gov.au

Submission on Australia's Paris Agreement Target

Executive Summary

Climate Action Moreland Submission in relation to the Climate Change Authority's review of advice to the Federal government necessary to achieve Australia's commitments under the 2015 Paris Agreement.

"Change is coming, whether you like it or not."

Greta Thunberg.

This submission is a collective effort by members of Climate Action Moreland. We have focussed on three major sectors of the Australian economy: agriculture, energy (electricity) and transport. We argue that effective policies and targets need to be put in place in each of these sectors to enable greenhouse gas emissions to be reduced quickly to meet short, intermediate and long term targets and Australia's commitments under the UNFCCC Paris Agreement.

Agriculture and Land Use Recommendations

- Move Australia's food production promptly to a mainly plant-based diet, eating a variety of locally grown, seasonal and organically produced food.
- Simultaneously decrease beef, sheep and dairy production.
- Cease all unnecessary import and export of foods, and cease live animal export.
- Promote regenerative farming practices and agro-ecological agriculture and forestry practices, which will simultaneously increase soil fertility while sequestering soil Carbon.
- Promote natural revegetation and reforestation.

- Draw upon indigenous land care knowledge for land use and vegetation management

Energy and Electricity Sector recommendations:

- Development of Energy market competition “behind the meter” including energy efficiency
- Impose Mandatory Conservation Voltage Reduction (CVR)
- Radical tariff reform of retail consumer tariffs
- Develop and construct off-river pumped hydroelectric energy storage (orPHES) nationally for effective energy storage, recharged from renewables
- Building community energy independence and resilience
- Review and update NEM’s wholesale price setting mechanism

Transport Sector recommendations:

- set targets for zero emissions, fossil fuel free transport well before 2050.
- Develop a climate and transport policy and implementation plan to achieve these targets.
- Ensure cost benefit analyses for all transport project business cases account for the additional greenhouse gas pollution that projects will lock in over their lifetime, or pollution avoided (e.g. from public transport improvements).
- Establish mode shift targets for public transport, cycling and walking.
- Ensure that at least 50% of all Federal transport infrastructure spending is directed to public and active (e.g.walking and cycling) transport.
- Federal government to introduce targets to drive uptake of electric buses, trucks, cars and bicycles powered by renewables.
- Establish electric vehicle targets for specific sectors and government operations, including public transport systems and fleet purchases
- Federal Government to introduce strong vehicle greenhouse gas emissions standards
- encourage the rollout of 100% renewable powered electric vehicle charging, particularly in regional areas and interstate routes.
- Put a price on pollution. Consider policies or pricing which better reflects the cost of greenhouse gas pollution or climate impact, so that road, aviation or public transport users bear the cost, or reap economic benefits based on emissions associated with their chosen travel mode.
- End government subsidies, incentives and support for fossil fuel use in the transport sector.
- increase the domestic fuel excise on aviation at least to be in line with automotive fuel excise,
- advocate in ICAO to change 1944 Chicago convention ruling on zero fuel excise for international flights
- introduce a frequent flyer levy for flights (this is an equity measure, so that the people who fly often are hit the hardest)
- moratorium on airport expansion, no new runways, or airports, until low or zero

emissions commercial flight is developed.

- Develop a stringent carbon drawdown scheme to offset existing domestic aviation emissions and climate impact, so that by 2050 aviation climate impact is 100 per cent offset by carbon drawdown from other sectors
- Construct a high speed east coast rail network as part of addressing aviation emissions and limiting aviation demand. High speed regional rail routes could also enhance this service further.
- Australia should set targets for transitioning it's domestic coastal shipping fleet to battery power, or use of hydrogen or ammonia as fuels for longer domestic shipping journeys.
- replacing/updating Spirit of Tasmania with electric/battery power vessel
- Set targets to replace/update urban waterway passenger ferries to 100 per cent battery/electric power to replace present fossil fuel powered ferries
- Monitoring, reporting and verification of CO2 emissions from large ships using Australian ports
- Greenhouse gas reduction targets for the maritime transport sector
- Monitoring, reporting and reduction of Sulphur dioxide emissions both near ports and on high seas. This is in keeping with IMO rule from January 1, 2020, that the marine sector will have to reduce sulphur emissions by over 80% by switching to lower sulphur fuels.
- Monitoring, reporting and reduction of nitrogen oxides (NOx) from diesel ship engines
- Further measures, including market-based measures, in the medium to long term.
- Climate Action Moreland also calls for Australia to advocate strongly in the International Maritime Organisation for a target of zero international shipping emissions by 2050

Overview:

Climate Action Moreland (CAM) is pleased to be given the opportunity to make a submission on this literally vital problem. Major global changes -- now happening earlier than are predicted by the best climate models -- portend a credible existential threat to civilization, even to our species and to countless other larger vertebrate/mammalian species.

Both the IPCC Special report on 1.5C of global warming (October 2018)¹ and the IPCC report on Land and Climate (August 2019)² indicate that all countries, including Australia, need to set targets to rapidly reduce emissions as fast as possible. This is needed to avert catastrophic global heating and climate driven events, and avoid engaging planetary climate feedback loops that would push the climate past tipping points that would accelerate global warming leading to a hothouse earth.³ This poses an existential threat to human civilisation as we know it.

The Paris Agreement, on current global country commitments, is assessed to be consistent with a 2.4 degree to 3.8 degree Celsius temperature range⁴. Australia's current 26-28 percent by 2030 target and climate policy to achieve those targets are rated as "insufficient" by Climate Action Tracker, who further highly criticise Australia's intention to use Kyoto Protocol carry-over emissions from earlier negotiations which effectively halves Australia's already too low target.⁵

Climate Action Moreland strongly opposes use of any carbon credits accrued from Kyoto protocol compliance to be applied to Australia's Paris Agreement targets. These are separate agreements, and any credits should not be transferred between these agreements. It is outside the spirit of the Paris Agreement and not in Australia's direct interest and undermines our diplomatic credibility and international standing.

Australia needs to implement strong measures that will quickly achieve real measurable total country emissions reductions, measured in absolute tonnages of CO₂e, not in percentage terms,

1GLOBAL WARMING OF 1.5 °C – an IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty (October 2018), Myles Allen, Barbiker Mustafa, Priyadarshi R. Shukla, et al, IPCC <https://www.ipcc.ch/sr15/>

2Climate Change and Land, an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. (SRCCL). IPCC (Report) <https://www.ipcc.ch/report/srccl/>

3Trajectories of the Earth System in the Anthropocene (2018) Will Steffen, Johan Rockström, Katherine Richardson, Timothy M. Lenton, Carl Folke, Diana Liverman, Colin P. Summerhayes, Anthony D. Barnosky, Sarah E. Cornell, Michel Crucifix, Jonathan F. Donges, Ingo Fetzer, Steven J. Lade, Marten Scheffer, Ricarda Winkelmann, Hans Joachim Schellnhuber, Proceedings of the National Academy of Sciences Aug 2018, 115 (33) 8252-8259; DOI:[10.1073/pnas.1810141115](https://doi.org/10.1073/pnas.1810141115)

4Climate Action Tracker assessment of global climate policy commitments and NDCs, June 2019 Update. <https://climateactiontracker.org/publications/climate-crisis-demands-more-government-action-as-emissions-rise/>

5Climate Action Tracker Assessment of Australian climate policies and targets, June 2019 <https://climateactiontracker.org/countries/australia/>

and not using any offsets (“zero-net-emissions”, “carbon-neutral”, “emissions trading”). Climate Action Moreland is of the view that to use such offsets disguises or downplays the actual emissions Australian households and businesses continue to release, thus unconscionably delaying the necessary seismic shift to a clean circular economy.

Global equity would suggest that the country of the “fair go” and egalitarianism might aspire to get much much closer to an equitable actual carbon emission allowance/quota of **one tonne CO₂e per person per year**. The longest journey starts with a single step.

None of the contributors to this submission expect the Earth’s atmospheric concentration of CO₂ to even plateau at around 415 ppm to 420 ppm in our lifetimes under business as usual, but we must see a sudden turn around soon towards 350 ppm or less by the year 2100. Survival of human society on the planet may depend upon it.

About Our Group

Climate Action Moreland is a grassroots climate action group that was started in 2008, with a strong local focus addressing climate issues in Moreland, and advocacy at local, state, federal and international levels for strong and rapid climate action.

Climate change is an important imperative for Moreland citizens:

- We know that climate change is already affecting us in Moreland with more frequent and intense heat events, more torrential rainfall events producing flash flooding.
- As a highly urbanised municipality, Moreland is has a strong urban heat island effect.

Climate Action Moreland recognizes climate change is an existential problem that needs to be addressed through declaration of a climate emergency and plans for rapid implementation of emissions reduction to zero carbon emissions and development of carbon drawdown techniques.

John Englart
Convenor
Climate Action Moreland

Agriculture/Land Use

Agri-business in Australia has been fuelled by chemical inputs, large earth-shifting, resource hungry irrigation, and de-forestation / land clearing systems, and with ever reducing human labour input. Once the necessary magnitude of GHG pollution reduction has been generally grasped - and system change could be quick, vast and effective once the problem is recognised - food and fiber and large elements of building materials will of necessity need to come from plant-derived sources. We speak not just of lignin & cellulose but mycelium, bacteria, algae and other marine plants. There are many benefits in this way of feeding, clothing & housing ourselves while drawing down every molecule of CO₂ possible as fast as possible.

Photosynthesis is after all the only safe way we know of to draw down the CO₂-e we're emitting at the scale necessary.

We must take into account ecosystem and climatic changes that are yet to play out in the next decades, and as yet not fully understood. Pertinent to Australia are rain system changes / frequencies and bushfire patterns.

Globally we must change focus and learn to value Carbon in all its solid forms. We recommend that Australia move promptly to a mainly plant based diet (as Recommended by the August 2019 IPCC science report on Land and Climate)⁶, largely locally grown, seasonal, using organic products we now call 'waste', increasing soil fertility by tried and true methods of increasing soil humus through adding composts, manure, bio-char, mulch, growing more perennial crops and less monocultural annual crops etc.

Imagine a largely closed energy loop through carefully thought out composting systems. This production system will be far less wasteful. Pests and weeds can be handled with vigilance and careful management and will be less of a problem than weather extremes. There would need to be a greater work-force in regional areas when farming seasonal varieties of fruit and vegetables, which would open up opportunities for decentralisation.

Production of beef, dairy and sheep must decrease, both for local consumption and for export, given their high embedded carbon emissions, particularly methane⁷. Methane emission control is of utmost importance in the next few decades for global emission reduction, due to its extreme potency over that time scale. Pork and poultry do not emit CH₄ enterically and have a more omnivorous diet, and as such can live from appropriate food waste streams from human food production and on a smaller land footprint.

⁶Quirin Schiermeier, Eat less meat: UN climate-change report calls for change to human diet (8 August 2019) Nature 572, 291-292 (2019) doi: 10.1038/d41586-019-02409-7
<https://www.nature.com/articles/d41586-019-02409-7>

⁷See WJ Ripple, P Smith, H Haberl, SA Montzka, C McAlpine, DH Boucher (2015) Ruminants, climate change and climate policy, Nature Climate Change 4 (1), 2 <https://www.nature.com/articles/nclimate2081>

Live animal export must cease as soon as possible, given a just transition for those farmers implicated, where required.

Our population's health would increase, and we refer here to the proliferating area of research in gut microflora, which if addressed with a varied plant based diet would mitigate many lifestyle and autoimmune diseases that 'plague' western populations⁸. The benefits to the current health budget will be immense with NCDs, unemployment rate, import and export costs of much of our food / fibre trade - true costs if a realistic C price were imposed - all dropping significantly.

Another resounding benefit would be the massive increase the amount of soil Carbon, profiting farmers with the resilience of having soil with greater water porosity and water-holding capacity, greater plant availability of nutrients, meaning healthier deeper rooted plants, less erosion etc. The amount of land required to feed our population would be no more and probably a good deal less than current food producing land, though land in better rainfall areas or with good water sources would be premium. More land would become available for natural revegetation / reforestation. Water cycles would be positively influenced (the small water cycle: trees create evapotranspiration and when in large enough amounts, influence the weather around them).

Food exports become a matter of ethics - of who needs our produce rather than who can afford to pay - but then Australia will have to think carefully about the current economics of exporting other products such as coal.

There are many examples of working with nature / regenerative farming practises⁹, many already underway in Australia. These must be implemented as urgently as is the RE industry. The benefits to Homo sapiens' health, well being and the climate will become more obvious the more we travel this path.

Agriculture and Land Use recommendations:

- Move Australia's food production promptly to a mainly plant-based diet, eating a variety of locally grown, seasonal and organically produced food.
- Simultaneously decrease beef, sheep and dairy production.
- Cease all unnecessary import and export of foods, and cease live animal export.
- Promote regenerative farming practices and agro-ecological agriculture and forestry practices, which will simultaneously increase soil fertility while sequestering soil Carbon.
- Promote natural revegetation and reforestation.
- Draw upon indigenous land care knowledge for land use and vegetation management

We hope there are people devising an economic system that will support this submission's

8 Dr David Perlmutter, Brain Maker, Hodder & Stoughton Ltd., 2015

9Paul Hawken, Drawdown, Penguin (2017) See Project Drawdown website: <https://www.drawdown.org/>

suggestions (and not vice versa). The politics must change; the will of the people will make this happen.

Energy - Electricity Supply

Electricity is but a subset of energy supply, with its only useful function being to deliver energy services at the customer's premises. Australia can exploit its abundant solar, wind, (recycled) water and skilled labour resources to fast-track to a zero carbon national electricity grid: "*no coal, no gas, no nukes, no worries*" well before 2050, provided that visionary leadership sets the agenda and forces the dysfunctional market to deliver real CO₂ reductions.

Australia also has the potential to develop extensive wave, and tidal energy resources to tap the power of the oceans that surround our continent. Geo-thermal energy also shows potential for exploitation in some locations, and exploration and development of geothermal energy would provide a valuable use for mining sector infrastructure and labour.

Climate Action Moreland's electricity market blueprint fit for a Climate Emergency:

A "bottom up" integrated suite of evidence-based and rapidly achievable measures to **catapult Australia from laggard to world leader** in respect of the rate and depth of actual CO₂ emissions cuts to zero by 2030, without the use of any dubious emissions offsets:

1. **Energy market competition "*behind the meter*"**: Zero-carbon energy services must be vigorously fast-tracked by the zealous use of *economically efficient market bypass* of monopoly/duopoly energy supply conduits, many of which are privatised. Because we are in a climate crisis and face an existential threat, governments demonstrating strong responsible leadership will put the people before corporate profits, and declare **#ForceMajeure** to ban certain activities and mandate others. A simple potent example is clothes drying: a ban should be placed on mains electric powered clothes dryers until such time that the mains power day and night is 100% renewable (via storage). Gas powered clothes dryers get banned immediately. In the meantime, it will be the ultimate virtue signalling to hang out the washing on an apartment balcony, an activity no longer able to be forbidden by any body corporate, landlord, or local government aesthetics police. The term **#Negawatts** was coined by Amory Lovins decades ago. The concept was then adopted by the publicly-owned Sacramento Municipal Utility District (SMUD)¹⁰. It must come to the fore again. **Energy efficiency** is another effective tool in

¹⁰Not unlike Victoria's situation now with unreliable, ageing lignite-fired power stations, in 1989 SMUD closed a costly unreliable nuclear power station and suddenly had to find creative ways to cut the "baseload" electricity demand of their customers by about 900 megawatts.

the #Negawatts toolbox. Any fair and balanced inquiry by the **Productivity Commission** would find that much stronger enforceable energy efficiency standards for buildings^[11] and appliances are good medicine for an Australian economy in the doldrums.

2. Mandatory **Conservation Voltage Reduction (CVR)**, not for the electricity distributor's (the DNSP's) occasional operational convenience, but *in the public interest everywhere and at all times* throughout the NEM, targeting DNSPs at the suburban (and rural city or town) level, namely at the local **zone substations** where customer voltage is set. Suburban supply voltage is under full control of the local monopoly service provider at all times. Traditional utility operational behaviour is to allow voltages to drift higher at night, as customers switch off most loads, and then sleep. High voltage settings are a way to maximize the wattage drawn by any remaining loads, and so are of particular commercial and operational benefit to "baseload" generators i.e. inflexible generators like coal and nuclear power plants. High off-peak voltage is of most commercial benefit to Australia's vertically integrated "gentailers" who try to keep their inflexible generation units idling inefficiently each night rather than shutting them down. However, any DNSP's upper limit supply voltage set at **250-253 volts, though very helpful for extending the commercial life of coal power, is of demonstrable detriment to customers** because these higher default voltages reduce the product life of light globes and appliances, increase power bills, and increase the customer's carbon footprint. Conversely, lower supply voltages, say around 220 volts at all off-peak times, will instantaneously *and safely* cut power consumption for all customers in the suburb being so treated.^[12]

Throughout the NEM, mains supply voltages measured randomly at multiple urban locations over decades suggest cabal-type behaviour, namely *DNSPs appear to act as if they have no qualms about doing huge favours for other market players*: the retailers, especially the coal-fired gentailers, and even appliance manufacturers & sellers. Industry

<https://www.washingtonpost.com/archive/politics/1993/03/21/sacramento-finds-nuclear-free-power-saves-money-worry/b12844ee-1875-447a-ab42-6950ea329bd2/>

¹¹Buildings new and old; i.e. mandate energy efficiency retrofits to an audited 8-Star standard in the entire Australian residential housing fleet.

¹²[Some DNSPs are already implementing CVR during peak times](https://www.ecogeneration.com.au/demand-response-voltage-solution-keeps-the-power-on/), and have publicly admitted that reduced voltage in a typical suburban network will instantly cut power consumption in that suburb. If they can do it safely during peak times for the very reasonable operational objective of avoiding a total blackout, then **they can and must be made to deliver lower voltage** say 220 volts every night so that we can quickly cut coal's market share, thus helping Australia deliver on our Paris commitments: Ref: <https://www.ecogeneration.com.au/demand-response-voltage-solution-keeps-the-power-on/>

spin over decades has vehemently contradicted the scientific evidence, the facts, regarding CVR's ability to quickly reduce off-peak energy sales, reduce customers' energy bills, and hence the market share of baseload coal. The lights will stay on, provided that many more GW of renewables *in tandem with many more GWh of storage* are built in a planned way as coal units are phased out fast, in our coordinated, common-sense response to the climate imperative.

- 3. Radical tariff reform for retail consumer tariffs:** At night the sun does not shine. At night in SE Australia, the wind speed and hence the wind power available to terrestrial wind turbines is reduced. Given these demonstrable facts, night-time mains electricity is, on average, significantly more carbon-intensive than daytime electric energy, with its large clean solar, and enhanced clean wind power inputs. **Cheap night tariffs are, in effect, the utterly perverse marketing of coal power, given our dire climate predicament.** They must be abolished immediately. The calculated infiltration of misleading concepts such as “zero net emissions” by vested interests has tended to greenwash dirty electricity to appear clean e.g. Melbourne's Yarra Trams on a windless evening claims to run its fleet on “zero net emissions” electricity when the demonstrable fact is that the trams would stop dead in their tracks if coal power were withheld from the market. On most winter evenings 95% of tram megawatt-hours are sourced from the combustion of lignite in the Latrobe Valley. Similarly EV owners love to proclaim their car as “zero net” either by virtue of offsets they assert come from their “zero net” residential rooftop photovoltaics¹³, or from their retailer, e.g. Powershop using net-zero carbon accounting, but offering a cheap night tariff knowing full well that the customers' EVs will in reality be charging predominantly on coal power every night.¹⁴
- 4. Pick Winners,** demonstrating strong leadership. During an existential crisis it is incumbent upon our political leaders to study the scientific, technical, engineering facts, by consulting with genuinely independent experts, and pick winner technologies. A

¹³ Any homeowner who has had solar PVs installed and has taken advantage of a solar rebate, has effectively sold the PVs lifetime estimate of lifetime emissions reduction into the carbon trading market, by surrendering their RECS, so to additionally claim zero net emissions for their EV recharging **appears to be double dipping, counting the emissions reduction benefit twice.**

¹⁴ Powershop's FAQ page explains that they use UNCERs, United Nations Certified Emissions Reduction (certificates!), traded internationally. CAM's view is that the effect of such offsets by any electricity retailer is a misleading marketing ploy to disguise the proportion of coal power in the retailer's electricity sales, especially after sunset each evening. Net zero is not zero!

national electricity grid requires that security and reliability benchmarks are being consistently met. A number of studies have clearly demonstrated by detailed technical modelling that 100% renewables can *keep the lights on for years* by adding sufficient storage. In the case of affordable despatchable bulk electric energy delivered via **off-river pumped hydroelectric energy storage (orPHES)**, Bureau of Meteorology historical data for eastern Australia, time-synched with actual NEM half-hourly electricity usage data has elegantly demonstrated that with about 400GWh^[15] of orPHES, the [Blakers ANU 100% renewables-with-storage physical reality model](#) clearly demonstrates **“what is needed where”** for 100% renewable *electric energy not to run out in any hour over a five year period*. Unless other off-the-shelf, proven technologies can be deliverable fast for under \$100/MWh (LCOE+LCOB) then orPHES may well be the leading benchmark for other less proven technologies to beat on the criteria of fiscal certainty, price and speed of construction/commissioning. In CAM’s considered view, given the rapidly closing window of opportunity to avoid a climate tipping point, it is vital that quick-build timelines for two hundred orPHES installations averaging 2,000 MWh each (e.g. 200MW for ten hours) are set and contracts let. Building 40GWh per year for 10 years starting in 2020 is an enormous engineering undertaking^[16], bigger than the post-war Snowy Mountains Scheme. **Climate imperatives dictate** that we should give it our best shot. They also dictate that all the **orPHES sites coming online will be immediately forbidden from ever using coal-power to recharge at night**, drawing exclusively from PV and wind resources as ageing coal plants are decommissioned in an orderly transition carefully orchestrated by Parliament.

5. A significant proportion of customers achieving independence, resilience and reliability by choosing to implement “islanding at night” or full off-grid capability can proportionally reduce the total amount of GWh storage needed by a zero-carbon, fossil-free NEM. Most residential and commercial customers will stay grid-connected without batteries, the majority without any solar panels at all. For this majority, the total build of energy storage by NEM participants necessary to service these customers’ off-peak, night-time and seasonal requirements, whether by utility batteries or hydroelectricity or compressed

¹⁵400 gigawatt-hours is 400,000 megawatt-hours, enough electric energy to run a 1000-watt bar radiator for four hundred million hours, or 45,631 years.

¹⁶Two hundred sites, each having a peak power rating of 200MW is a staggering 40GW of despatchable power: **twenty-five Hazelwoods** worth of power.

air energy storage, can be reduced even further by effective implementation of items 1, 2 and 3 above (namely monopoly market bypass, off-peak CVR and tariff reform).

6. A robust declaration of #ForceMajeure, based upon the clear existential climate threat, must give federal politicians^[17] real teeth: authority over ACCC, AER, AEMC and AEMO, forcing them to conduct radical surgery on **NEM's wholesale price setting algorithm**, which is at the core of what is rotten in the privatised marketplace, more closely resembling a high-rollers' gambling den at times. Generators should get paid a boring fixed price which is cost-reflective plus a regulated profit margin, and get despatched when they are told to by AEMO. A detailed critique of how the Kennett-era Victorian Government managed to force this utterly discredited market model on all the other states in NEM, is in [the late Robert Booth's talk to the SA Press Club](#),^[18] winter 2001: highly recommended, still a very relevant critique of NEM's abject failure over the past two decades.

Q. What is relevant so many years later about Robert Booth's analysis? ---

A. In the context of Australia's urgent need to slash emissions to meet, and **go well beyond the Paris targets**, it is only by restoring boring old cost-reflective wholesale pricing that the right mix of emissions-free generation, cheap bulk energy storage, energy efficiency and market bypass #negawatts can achieve a least cost balance of investment signals, without the gross distortions of the greedy gambling den.

17...perhaps even a bi/tri-partite "national unity regime" in a Standing Senate Committee or the COAG Energy Council, with this "national unity regime's" powers limited specifically to the electricity industry, to at last find bi/tri-partite science-based actions to fully decarbonise NEM with maximum haste, **picking winners** free of the distorting influence of vested corporate interests.

18<http://sapressclub.com.au/project/dr-robert-booth/>

Transport

At the moment the Climate Change Authority Transport section is focussed on:

- emissions reduction for cars,
- investigate emissions reduction standards for heavy vehicles, and
- best roles for delivering EV infrastructure

This list is a bare start in tackling transport sector emissions, presently at 18.9 percent of Australia's total emissions in the year to December 2018, and with sectoral emissions on a growth trend.¹⁹

Introducing Emissions reduction standards and conversion of vehicle fleet to electric or hydrogen is a start, but far from sufficient. We need to change our mobility social behaviours, change our city infrastructure to support zero transport emissions which will entail changing how we move about cities, regions and our continent.

Our ground transport, freight, domestic shipping and aviation habits and emissions must all change.

¹⁹Department of Environment, Quarterly update of Australia's National Greenhouse Gas Inventory: December 2018

Climate Council Recommendations on Transport

The Climate Council, in their September 2018 report '*Waiting for the Green Light: Transport Solutions to Climate Change*' recommended²⁰ Federal government policy makers should:

- set targets for zero emissions, fossil fuel free transport well before 2050.
- Develop a climate and transport policy and implementation plan to achieve these targets.
- Ensure cost benefit analyses for all transport project business cases account for the additional greenhouse gas pollution that projects will lock in over their lifetime, or pollution avoided (e.g. from public transport improvements).
- Establish mode shift targets for public transport, cycling and walking.
- Ensure that at least 50% of all Federal transport infrastructure spending is directed to public and active (e.g. walking and cycling) transport.
- Federal government to introduce targets to drive uptake of electric buses, trucks, cars and bicycles powered by renewables.
- Establish electric vehicle targets for specific sectors and government operations, including public transport systems and fleet purchases
- Federal Government to introduce strong vehicle greenhouse gas emissions standards
- encourage the rollout of 100% renewable powered electric vehicle charging, particularly in regional areas and interstate routes.
- Put a price on pollution. Consider policies or pricing which better reflects the cost of greenhouse gas pollution or climate impact, so that road, aviation or public transport users bear the cost, or reap economic benefits based on emissions associated with their chosen travel mode.
- End government subsidies, incentives and support for fossil fuel use in the transport sector.

Climate Action Moreland concurs with these policy recommendations, but would argue we need a major change in focus of infrastructure priority funding from roads projects to public and active transport, greater even than the 50 per cent the Climate Council has specified, to catch up with the decades long deficit in public transport and active transport funding in Australia.

²⁰Climate Council, (September 2018) '*Waiting for the Green Light: Transport Solutions to Climate Change*' <https://www.climatecouncil.org.au/resources/transport-climate-change/>

Aviation emissions and Climate Impact

What is missing from the Climate Council recommendations is any specific approaches to limiting Australian aviation emissions growth and aviation demand. Domestic aviation emissions, and the climate impact from those emissions, are covered by the cross-sectorial target commitments that Australia made in its commitment to the Paris Agreement.

International aviation emissions are not covered by the Paris Agreement but are regulated by the International Civil Aviation Organisation (ICAO).

Andrew Macintosh and Lailey Wallace (ANU Centre for Climate Law and Policy) in the study “International aviation emissions to 2025: Can emissions be stabilised without restricting demand?” concluded that “Stabilising international aviation emissions at levels consistent with risk averse climate targets without restricting demand will be extremely difficult.”²¹

Professor Alice Bows-Larkin highlights in an even more dramatic fashion in her 2015 paper, ‘All Adrift: aviation, shipping and climate change policy’²², to meet the 2 degrees Celsius climate target (the upper limit of the Paris Agreement), modelling indicates that passenger-km growth rates would need to be cut to zero from 2020, with a 4% p.a. reduction from 2025.

Bows-Larkin notes in her study conclusion:

“Ultimately, an uncomfortable and familiar conclusion for aviation remains: a moratorium on airport expansion at least in wealthy nations is one of the few options available to dampen growth rates within a timeframe befitting of the 2C target.”

Melbourne Airport²³ and the airlines industry base their business models on a near doubling of passenger kilometres travelled in the next 20 years. These business models are clearly incompatible with meeting the upper limit of Paris Agreement climate targets.

²¹Macintosh and Wallace (2009), International aviation emissions to 2025: Can emissions be stabilised without restricting demand? Energy Policy Volume 37, Issue 1, January 2009, <https://doi.org/10.1016/j.enpol.2008.08.029>

²²A Bows-Larkin (2015), All adrift: aviation, shipping, and climate change policy, Climate Policy 15 (6), 681-702 <https://www.tandfonline.com/doi/full/10.1080/14693062.2014.965125>

²³See Melbourne Airport Masterplan 2018, Section 7.0 Airport Growth Forecasts for predicted growth trends for both passengers and freight <https://www.melbourneairport.com.au/Corporate/Planning-projects/Master-plan>

The Australian Government, with responsibility to regulate domestic aviation emissions, needs to propose policy actions to restrict aviation emissions from domestic aviation to meet its international climate commitments, and advocacy through its representation at ICAO for adequate and sufficient International aviation emissions reduction and regulation.

The Sydney-Melbourne flight route in 2017 was listed as the second busiest flight route globally with 54,519 flights. The Sydney-Brisbane flight route was the 8th busiest domestic route globally with 33,765 flights. (Source: [2017 domestic flight statistics](#)²⁴)

Australia's August 2017 report on aviation carbon emissions: [Managing the Carbon Footprint of Australian Aviation](#) (PDF) outlines that the Federal Government is failing to regulate and stabilise aviation emissions²⁵. It concludes:

"In line with global predictions on growth in aviation traffic, Australia's aviation activity is expected to continue to grow. Existing airports are undertaking capacity improvements projects including the building of new runways, and major new developments such as the Western Sydney Airport are likely to increase overall traffic and thus RTK [Revenue Tonne-Kilometre] for Australia. This will increase total fuel use, which, despite increasing efficiencies across a range of measures, will result in an increase in CO2 emissions."

New airport expansion, no matter how well the facilities are carbon mitigated and energy efficient, will do nothing to mitigate aviation climate impact. It is the exponential growth in aviation, with only limited efficiencies to be gained, that is the real problem here.

Aviation is one of those sectors where other greenhouse gases need to be fully considered, as well as various chemical and physical impacts in the atmosphere during flight, especially at cruising altitude.

While short haul flights are often cited as causing most CO2 emissions, there is also a technology-driven trade-off between the reduction of NOx and CO2 emissions in jet engines. All flights need to be assessed both for their CO2 and non-CO2 emissions, and the climate impact of these emissions at various cruising altitudes. For Long haul flights "time flown on cruise level is an important factor for the climate effect of each flight. The main reason for this is that NOx being emitted on high altitudes (i. e. cruise levels) has an increased climate impact (Lee et al. (2010) and Lee et al. (2009))." argues Janina Scheelhaase, in a 2019 research paper.²⁶

24Statista: The world's busiest domestic routes in 2017, ranked by frequency of flights
<https://www.statista.com/statistics/794380/frequency-of-domestic-routes/>

25Department of Infrastructure and Regional Development (August 2017), Managing the Carbon Footprint of Australian Aviation (PDF)
<https://www.infrastructure.gov.au/aviation/environmental/emissions/files/Managing-the-Carbon-Footprint-of-Australian-Aviation.pdf>

26Scheelhaase, Janina D., 2019. "How to regulate aviation's full climate impact as intended by the EU council from 2020 onwards," Journal of Air Transport Management, Elsevier, vol. 75(C), pages 68-74.
<https://www.sciencedirect.com/science/article/abs/pii/S096969971830334X>

A low carbon price, as was implemented in Australia for two years in 2012 to 2014, had little impact on aviation demand. Markham et al (2018) found “There was no evidence that the carbon price reduced the level of domestic aviation in Australia. Carbon pricing measures to affect aviation demand may have to be levied at a greater rate to affect behavioural change, particularly given the limited potential for future aviation efficiency gains.”²⁷

For domestic aviation fuel excise is \$0.03556 per litre, while petroleum and diesel products for automotive use are charged \$0.418 per litre. Climate Action Moreland advocates that aviation fuel excise should be increased at least to parity with vehicle fuel excise rates.²⁸ We note that currently International aviation pays no fuel excise as laid down by the 1944 Chicago Convention on aviation.

Given the above assessments on aviation emissions Climate Action Moreland recommends the following Federal Government actions in addressing aviation emissions as part of its climate targets:

- increase the domestic fuel excise on aviation at least to be in line with automotive fuel excise,
- advocate in ICAO to change 1944 Chicago convention ruling on zero fuel excise for international flights
- introduce a frequent flyer levy for flights (this is an equity measure, so that the people who fly often are hit the hardest)
- moratorium on airport expansion, no new runways, or airports, until low or zero emissions commercial flight is developed.
- Develop a stringent carbon drawdown scheme to offset existing domestic aviation emissions and climate impact, so that by 2050 aviation climate impact is 100 per cent offset by carbon drawdown from other sectors.

Develop an East Coast High Speed Train Network

A High speed train network provides a low emissions passenger alternative to the high use domestic aviation routes. There have been a number of feasibility reports on developing such a network. The Beyond Zero Emissions independent report²⁹, published in 2014, gave an

This paper quotes research by DS Lee and Colleagues on impacts of non-CO2 emissions in aviation: ‘Aviation and global climate change in the 21st century’ (2009) and ‘Transport impacts on atmosphere and climate: Aviation’ (2010)

27Markham, F., Young, M., Reis, A. & Higham, J. (2018). Does carbon pricing reduce air travel? Evidence from the Australian ‘Clean Energy Future’ policy, July 2012 to June 2014. Manuscript accepted for publication in Journal of Transport Geography

28Australian Taxation Office, Excise rates for Fuel, Rates from 5 Aug 2019.

<https://www.ato.gov.au/business/excise-and-excise-equivalent-goods/fuel-excise/excise-rates-for-fuel/>

29Beyond Zero Emissions (2014), High Speed Rail Plan. <https://bze.org.au/research/transport/high->

assessment that:

- Travel times between Melbourne and Sydney, Sydney and Brisbane could be around three hours.
- 21 High Speed Rail stations connecting 11 regional centres and seven major cities
- Ten minute train frequencies are possible during peak hours at Sydney station
- Fares could be priced similar to current air fares.
- Rail could be powered by renewables for close to zero emissions.
- A High speed rail network could be delivered within 10 years
- Estimated \$7 billion fare revenue when fully operational in 2030
- The capital cost of about \$84 billion could be fully recovered from operating profits within about 40 years of operation.
- The second Sydney Airport at Badgery's Creek would become largely redundant
- Expansion of Melbourne Airport and a third runway would become redundant

Climate Action Moreland recommends that a high speed east coast rail network should be constructed by the Federal Government as part of addressing aviation emissions and limiting aviation demand. High speed regional rail routes could also enhance this service further.

[speed-rail-plan/](#)

Shipping emissions

Australia is the fifth largest user of shipping in the world with more than 11,000 vessels from 600 overseas ports visiting Australia's 65 major ports each year. About 98 per cent of Australia's exports (in particular, bulk mineral and agricultural commodities) are carried by ships.³⁰

Domestic shipping emissions are covered under the all sectorial target commitments made by Australia under the Paris Agreement. International shipping emissions are regulated by the International Maritime Organisation.

The European strategy for reduction in shipping emissions³¹ states:

“Battery powered ships offer the most efficient and immediate solution to decarbonise short sea voyages within the EU. Longer journeys will ultimately require liquid hydrogen and liquid ammonia produced with zero-emission electricity.” suggests a Transport and Environment report Published November 2018.³²

The following recommendations are suggested for the Australian shipping sector:

- Australia should set targets for transitioning its domestic coastal shipping fleet to battery power, or use of hydrogen or ammonia as fuels for longer domestic shipping journeys.
- replacing/updating Spirit of Tasmania with electric/battery power vessel
- Set targets to replace/update urban waterway passenger ferries to 100 per cent battery/electric power to replace present fossil fuel powered ferries

The Australian Marine Safety Authority should set interim targets for all shipping aiming for a 2050 target of zero emissions.

- Monitoring, reporting and verification of CO2 emissions from large ships using Australian ports
- Greenhouse gas reduction targets for the maritime transport sector
- Monitoring, reporting and reduction of Sulphur dioxide emissions both near ports and on high seas. This is in keeping with IMO rule from January 1, 2020, that the marine sector will have to reduce sulphur emissions by over 80% by switching to lower sulphur fuels.
- Monitoring, reporting and reduction of nitrogen oxides (NOx) from diesel ship engines
- Further measures, including market-based measures, in the medium to long term.
- Climate Action Moreland also calls for Australia to advocate strongly in the International

30Jo O'Brien, 2001, Impacts of Shipping, Australian Marine Parks.

<https://parksaustralia.gov.au/marine/management/resources/scientific-publications/impacts-shipping/>

31European Commission, Reducing emissions from the Shipping Sector

https://ec.europa.eu/clima/policies/transport/shipping_en

32Transport and Environment (2018) Battery, hydrogen and ammonia-powered ships by far the most efficient way to decarbonise the sector – analysis <https://www.transportenvironment.org/press/battery-hydrogen-and-ammonia-powered-ships-far-most-efficient-way-decarbonise-sector-%E2%80%93>

Maritime Organisation for a target of zero international shipping emissions by 2050