

Submission to the Commonwealth Department of Environment and Energy on the Discussion Paper “Review of Australia’s Climate Change Policy”

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Healthy planet, **healthy people.**

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Doctors for the Environment Australia (DEA) welcomes the opportunity to make a submission to the Review of Climate Change Policies conducted by the federal government. DEA is a voluntary organisation of doctors and medical students whose aims are to reduce health harms caused by environmental damage, be it of the air, water or land. Because human health is intricately bound with the health of the entire biosphere, we are particularly concerned at the accelerating damage to our planet caused by green-house gas (GHG) emissions leading to global warming and climate change. DEA is not aligned with any political party and does not receive funding from industry or organisations which may lead to conflicts of interest. DEA comments freely, positively or negatively as it sees fit, on policy which impacts on health and the environment.

Executive Summary

Doctors for the Environment Australia (DEA) is concerned about the health effects of climate change on humans and the biosphere on which humans depend. DEA is also cognisant of policies that can address both existing health problems and reduce the impact of climate change. It is in this holistic risk-co-benefit framework that DEA examines the climate change policies of Australian federal and state governments.

Climate change policies and health:

Global warming and climate change have serious implications for human health globally. It is increasingly recognised that climate change is only one facet of a planetary health crisis; deforestation, air pollution, ocean acidification and biodiversity loss all pose grave threats to health. Climate change threatens to further exacerbate problems in these domains. If the current trend continues, there is a real danger that efforts will be insufficient to prevent run-away global warming, which will have disastrous social, economic and health consequences. The mining and combustion of fossil-fuels, in particular coal, also have direct adverse effects from emission of toxic substances and pollution with particulates. The burden of repair of the environment is being passed to the next generations.

Australia's carbon emissions:

Because Australia's emissions have essentially remained static for the last 9 years and mean global temperature continues to rise, DEA believes that Australia's policies to reduce GHG emissions are inadequate to safeguard human health. The current target for 2030 cannot be regarded as sufficient. Even if the target were more ambitious, the current mechanisms (specifically, the emission reduction fund (ERF) with its safeguard mechanism, and the renewable energy certificates for large-scale renewables) would not provide sufficient incentives for GHG emission reduction. A price on carbon is considered essential. Current

policies are not consistent with our obligations under the Paris Agreement and Australia is not well-placed to keep GHG emissions under our carbon budget. To continue to open new coal mines in Australia would be a disaster in the extreme and would undermine many nations in their global efforts. Australia has additional incentive to reduce emissions because we are witnessing the demise of the iconic Great Barrier Reef. While several factors are contributing, the greatest is warmer water as oceans are the repository of the heating planet. Long-standing denial of these facts has been regrettable.

Assessment of Climate Change policies:

Considering the various sectors, policy on electricity generation is the most important source of carbon emissions. Fortunately the mechanisms to reduce emissions are readily available. Although blaming renewables for the supply problems in South Australia has been misdirected, these events should act as a catalyst and not a retardant to the uptake of grid stabilising technologies and newer software. Changing to renewables will also be a huge bonus for the electrification of all transport, both public and private, and for reduction of coal pollution.

We note

- Employment opportunities abound in the renewable energy industries and particularly in small-scale solar.
- Funding through ARENA and the CEFC are important avenues for enactment of climate policy.
- Agriculture and land-use practices need to be mindful of GHG emissions from methane.
- In cities, councils need to be encouraged to plant greenery to reduce the heat-island effect.
- More attention needs to be paid to forest and land management to restore carbon sequestration and to protect biodiversity.
- Health and repair costs to the community from disasters influenced by climate-change are enormous and will increase without effective climate mitigation.
- Emission reduction policies such as the ERF have not been sufficiently effective and are uneconomic.
- In several sectors such as energy production, public transport, health-care and land management, some states are leading by example.

Recommendations:

DEA recommends strong ERTs of 40% reduction on 2000 levels by 2025, 50% by 2035 and 95% reduction (or net-zero emissions) by 2050. For these levels to be achievable and affordable, there needs to be a price on carbon which is paid for by the big polluters. Dependence on coal and other fossil-fuels should be reduced as quickly as possible. No new coal-mines can be developed. Land clearing must cease.

The degree of urgency requires that both ERTs and RETs are ambitious and that the federal government works with the progressive states to achieve meaningful outcomes. Electrification of both private and public transport should be pursued vigorously to both reduce emissions and pollution. Government needs to include the adverse effects on health in all climate considerations as it is these which are the ultimate harms of climate change.

Background

The Discussion Paper for the Review of climate change policies examines factors which may affect Australia's ability to reach its 2030 target of reducing emissions by 26 – 28% below 2005 levels, having already made a commitment at Kyoto to reduce emissions by 128 MtCO₂ by 2020.²

Climate change policies and health

Central to DEA's submission is the threat of health harms to humans and the entire biosphere posed by global warming and climate change resulting from increasing GHG emissions. Climate change and global warming will have far reaching adverse effects for our health, some of which are already evident. The world's major public health bodies all recognise the seriousness of this situation with the World Health Organization's Dr M Chan, Director-General stating "Climate change is one of the greatest challenges of our time. Climate change will affect the most fundamental determinants of health: food, air and water. In the face of this challenge, we need champions throughout the world who will work to put protecting human health at the centre of the climate change agenda." Governments therefore need to include considerations of health in all climate change policy decisions.³ As doctors we see it as our responsibility to our patients and the collective community to manage this as a public health emergency and the government is not exempt from this responsibility.⁴

There are serious risks from climate change to the health of populations everywhere-widely documented in national and international scientific assessments. The risks include, but extend well beyond more frequent and intense cyclones, prolonged heatwaves, floods, fires and the spread of disease-bearing mosquitoes. Regional food yields and hence child and adult nutrition are at risk.⁵

Water shortages threaten the quantity and quality of drinking water, hygiene and agriculture. Infections such as gastroenteritis increase with warming, and with our ageing population there are risks of more frequent and severe outbreaks. Levels of important hazardous air pollutants also increase, and this will increase rates of respiratory disease. An outbreak of thunderstorm asthma, partly attributable to unexpectedly high temperatures, paralysed Melbourne in November 2016, leaving nine previously healthy people dead.⁶

Warming and acidification of oceans endanger the marine food chain. The Great Barrier Reef is now seriously threatened by a combination of bleaching events and massive storm damage, both of which were largely due to the effects of global-warming.^{7,8,9}

The degree of attribution of extreme weather events to global warming is now being recognised through sophisticated science.¹⁰

Adverse health outcomes related to climate change are already evident in many regions of the world. By mid-century, health risks are likely to be widespread, particularly in vulnerable communities worldwide. Australia will be at particular risk as much of our agricultural land is of marginal viability. Failed rural ventures will add to the mental health burden.^{11,12} Workloads and economic and logistical demands on the nation's health system will also rise as these impacts increase.

For a summary of medical impacts see DEA's Policy on Climate Change and Health.¹³

Health costs of continuing reliance on coal

One of the hidden costs ignored when considering the economics of continuing coal mining and burning is the cost of externalities which is borne by taxpayers. Every stage in the production of electricity from coal has the potential to threaten health. In particular coal-fired power stations emit several potentially toxic chemicals including particulates, sulphur dioxide, oxides of nitrogen, and mercury - all of which have profound adverse health effects.^{14,15}

Air pollution from coal contributes to four of the five leading causes of death in western society: lung cancer, respiratory diseases, stroke and heart disease. Even short exposures to particulate matter (a few hours to weeks) can trigger cardiovascular deaths and illness, while longer-term exposure (over a few years) greatly increases the risk for cardiovascular mortality and reduces life expectancy by several months to a few years.¹⁶

The air pollution health cost of coal burning in Australia is estimated at \$2.6 billion annually¹⁷ and if the cost of GHG damage is included, the true cost of coal-fired electricity would be close to double the nominated cost.¹⁸ Further information on health costs can be found in DEA's fact sheet on "Health impacts of coal".¹⁹

On a larger scale, the cost to the world's economies of insufficient action on carbon emissions leading to run-away global warming will be much greater than the cost of action taken now.²⁰ No country will be immune from the costs of damage repair and adaptation.²¹

Requirement for Strong Policies

It is absolutely essential that Australia makes strong efforts to reduce GHG emissions within a framework that benefits everyone, particularly the most vulnerable groups, for several reasons:

- Climate change from GHG emissions is already making its presence felt, much earlier than previously anticipated and is already leading to huge impacts in terms of lives lost and endangered, and vast economic costs from damage to infrastructure.^{22,23}
- Events overseas have been even more disastrous and costly, from powerful typhoons and record floods to ongoing devastating droughts leading to severe famine and environmental migration which has been the basis of some of the conflicts throughout the world.^{24,25} These climate impacts are just a forerunner of the expected escalation if global warming is not arrested.
- The Paris Agreement is very explicit in its purpose that Parties recognise the "need for an effective and progressive response to the urgent threat of climate change on the basis of the best available scientific knowledge...."²⁶
- In addition, Article 3 states that "As nationally determined contributions to the global response to climate change, all Parties are to undertake and communicate ambitious efforts as defined in Articles 4,...."
- Many climate scientists contend that Australia's efforts overall have not been sufficiently "ambitious" and do not constitute a fair share in the Agreement's aims to limit temperature increase to well below 2°C and to pursue efforts to keep warming below 1.5°. DEA has pointed out the inadequacy of Australia's acknowledgement of the Paris Treaty in an earlier submission.²⁷
- The global "carbon budget" is the quantity of fossil fuels which can be burnt to give the planet a 75% chance of limiting global warming to 2°C. At the current rate of usage, this budget will expire in about 11 years. Australia's share of this budget means that we must keep ~85% of our known coal reserves, ~50% of gas reserves and ~35% of oil reserves in the ground for the foreseeable future. Australia must take note of these metrics in determining its climate change policies for the future.²⁸ The fundamental outcome of recognising the carbon budget is that no new coalmines can be developed in Australia.

- Australian coal reserves are estimated to be 76 billion tonnes. If all were burned, 128 billion tonnes of CO₂ would be released into the atmosphere, which represents 19% of the entire global emissions budget from all sources.²⁹ The reserves in Queensland constitute a significant proportion of Australia's total so it would be counter to all logic and regard for our future for these to be mined.³⁰ Burning all of the coal in the Galilee Basin would release an estimated 705 million tonnes of CO₂ each year which is more than 1.3 times Australia's current annual emissions from all sources.³¹ While it could be argued that exported coal would not fall within Australia's emissions budget, the final source of CO₂ is of no relevance to the welfare of the planet. The annual emissions output from the Carmichael mine would exceed the output from total fuel combustion of many more populous countries.³² Proceeding with this mine therefore makes no sense if we are serious about reducing emissions.
- The world's coral reefs, which are extremely important feeding and breeding grounds for marine life are under serious threat of complete destruction. Australia's very own Great Barrier Reef is heading for extinction from the combination of warming oceans, toxic run-off, shipping activity and storms. The recent bleaching events would have been almost impossible without GHG-induced climate change.^{33,34}
- Australia is a wealthy country with a high standard of living. Australia has frequently displayed an attitude that we should do no more to reduce emissions than other countries even when these countries are less fortunate. We contend that Australia as a secure wealthy country should offer leadership by doing more than others.
- Australia must recognise that the world is in a vital transition to renewable forms of energy, and to not participate technologically and productively will soon confer economic disadvantage. Several forms of renewable energy already produce cheaper energy than fossil fuels when the externalities of the latter are accounted for.³⁵

Terms of Reference

This Submission will Address the Terms of Reference and in doing so will cover most of the questions posed.

As summarised in the Discussion Paper, Australia has adopted multiple measures and policies to reduce carbon emissions, the principle ones being the Emissions Reduction Fund (ERF) with its Safeguard Mechanism, the National Energy Productivity Plan (NEPP) and continuation of the Clean Energy Finance Corporation (CEFC) and the Australian Renewable Energy Agency (ARENA).

Opportunities and challenges of reducing emissions by sectors

Challenges include the voluntary nature of most of the policies which do not have major financial incentives. In this mainly free-market system, the environment cannot exert an equal market influence as the health and economic consequences of degradation are usually transferred to the next generation (inter-generational theft) and immediate health costs are transferred to other departments. We are already seeing the huge costs of storm damage which are not paid for by the major contributors (GHG emitters).^{36,37} However, in Australia there are huge opportunities to address climate change in all sectors because of our relative wealth, stable governments at local, state and federal levels, and vast land area.

Electricity:

Electricity production in Australia is responsible for 35% of carbon emissions and of these coal-fired power contributes about 80%. Since a community transition to renewable energy sources is underway, Australia is well-placed for reduction in emissions to gather pace as 2020 approaches. Already the states of South Australia, Victoria and ACT have adopted appropriate targets and policies to achieve meaningful emissions reductions. Victoria has recently enacted the Climate Change Act 2017 which includes emissions reductions of 15-20% (of 2005 levels) by 2020, and net-zero emissions by 2050.³⁸

To provide an example to others, Victoria will reduce emissions from the government sector by 30% by 2020. Victoria has declared these targets even though it currently relies heavily on coal-fired power generation in the Latrobe Valley. Recognising that the source of the energy mix will need to change, it is only by adopting strong targets that industry will have the confidence to invest in energy transition. South Australia is in a similar position with strong policies to change the mix of electricity generation in spite of repeated criticism by certain sectors in the federal government.

However uptake of renewable energy in these two states in particular has highlighted the challenges of ensuring security and reliability of supply. In SA, security was jeopardised by market manipulation and lack of understanding of wind-farm software settings, and not by the renewable energy mix.³⁹ Blaming the energy mix has been fallacious and unhelpful.

Transport:

Vehicular transport in Australia contributes about 17% of carbon emissions. Transport sector emissions are currently the subject of deliberations by the Department of Industry and Regional Development, and the Ministerial Forum on Vehicle Emissions is conducting an Inquiry into fuel quality so that both carbon emissions and air quality can be addressed.⁴⁰

Health care costs of motor vehicle air pollution-related morbidity and mortality in Australian cities are enormous and were estimated to be approx. \$2.7 billion in 2000.⁴¹

It is essential therefore that climate change policies include strong action on reducing vehicular emissions of pollutants and GHGs.

DEA has contributed to the discussion in submissions to both these Inquiries.^{42,43}

Agriculture and Land Use:

Land use and food production are critical links between greenhouse gas emissions and human health. Industrialised agricultural production is a significant contributor to climate change. In 2011, ~15% of Australia's total GHG emissions was from large-scale agriculture, 65% of which was attributable to methane emissions from livestock.⁴⁴ Land clearing accounted for at least a further 7%.⁴⁵ Nitrous oxide emissions from fertiliser use on agricultural soils were the second largest contributor, contributing 18% of total GHG emissions from agriculture. Other estimations suggest that the agricultural sector (when emissions from energy, transport and waste are included) produces 23% of national GHG emissions.

Approximately 15% of food that is purchased by households is wasted (361 kg per person, per year), along with the valuable resources used to produce, process, package, transport and store it, as well as the costs associated with the collection and disposal of waste. Food waste that goes to landfill further contributes to GHG emissions as methane is produced as the food decomposes.⁴⁶

Targets and incentives throughout the food system are required to mitigate climate change, including in production, processing, packaging, distribution, retail, consumption and waste management. Food security should be considered as a co-benefit throughout this policy development.⁴⁷

Land clearing accounts for a further 7% of national GHG emissions. Land clearing rates in Queensland have tripled since 2010. The State-wide Land Cover and Trees Study (SLATS) for 2012-2014 showed that the annual rate of clearing increased by 100% in 2013-2014. SLATS data have shown land clearing in Queensland is now releasing more stored carbon into the planet's atmosphere than at any time in the past eight years- almost 36 million tonnes each year. The 2015 World Wildlife Fund Living Forests Report identified Eastern Australia as a global deforestation front, with a projected loss of 3-6 million hectares between 2010 and 2030, with the drivers being small scale agriculture, as well as mining and unsustainable logging. It is noteworthy that Australia was the only developed country appearing in this list.^{48,49}

Stopping land clearing in recalcitrant states offers immediate reduction in GHG emissions and the federal government must take action to overrule this practice which is against the national interest.

Health Sector:

Aside from reductions in GHG emissions, there are numerous immediate and long term health “co-benefits” to be gained by action to limit climate change. For example, reducing use of fossil fuels (particularly coal) will help to improve air quality and associated respiratory and cardiovascular disease. Reducing reliance on private vehicles, and increasing active transport (walking, cycling and public transport) can reduce rates of obesity, diabetes, heart disease and some cancers, and many musculoskeletal conditions. Smart urban planning cannot only improve physical health but can improve mental health, community and use of ‘third spaces’ beyond home and work. The use of building materials with a low potential to transmit heat, and planting trees and grasses decreases the urban heat island effect, reducing the need for air conditioning, improving the quality of urban life and reducing health risks in heatwaves. These benefits are not only important for public health, but also help to reduce demands on the health system.⁵⁰ Recognising the benefits to health and climate of high vegetable – low meat based diets is increasingly seen as a key leverage point in the fight against obesity and climate change. Agriculture contributes approximately a third of global GHG emissions, and a reduction in red meat can reduce heart disease and cancer risk, particularly bowel cancer.

Beyond the urban environment, policies that protect forests and natural ecosystems will reduce atmospheric CO₂ levels by sequestering carbon, improve air and water quality, support biodiversity, and promote mental health and well-being by supporting human connections with the environment.

Social well-being is just as important as physical health for the orderly function of any society. The economic costs and long-term social impacts of natural disasters in Australia in 2015 were at least equal to the physical costs.⁵¹ Finally, the healthcare sector contributes a significant carbon footprint. In the United Kingdom, the NHS contributes approximately 25% of public sector emissions and has committed to a reduction of 34% by 2020.⁵² With committed action to climate change at the federal level, Australian health services could more confidently pursue hospital policies that would protect their viability in a carbon-constrained future.

Impact of policies on jobs, investment, trade competitiveness, households and regional Australia

Analysts are almost unanimous in their assessment that increasing renewable energy uptake and reducing reliance on coal-fired power generation will increase job opportunities, investment and trade competitiveness.⁵³ Internationally there are now more jobs in renewable energy than in the fossil-fuel industry.⁵⁴ In spite of this knowledge, there is an illogical desire to persist with promoting the huge Carmichael mine project in Queensland. Misinformation about the number of jobs alleged to be created by this mine has not helped the debate.^{55,56}

By not adopting strong emission reduction policies, we are increasing the probability that we will be facing huge health and infrastructure costs from damage caused by more intense storms and weather extremes. Globally it has been estimated that the cost of climate-related disasters has led to economic losses of over US\$2 trillion in the past 20 years. In Australia, the economic cost of natural disasters exceeded \$9 billion in 2015 alone. These costs are not paid for by the sectors contributing to the majority of GHG emissions.⁵⁷

The financial burden of damage repair will have a huge impact on investment on infrastructure throughout the country. Instead, Australia could be investing in renewable energy technologies which would promote trade opportunities and competitiveness.

While there are many schemes to encourage adoption of high energy efficiency in Australian residential homes and commercial buildings, clearly the schemes are not fulfilling their intended purpose, as Australia is considered to be lagging behind other developed countries.⁵⁸ In this mainly free-market system, the environment needs spokespeople and funds to counter the wealth of those who wish to exploit the environment for short-term gains. Otherwise the health and economic consequences are transferred to the next generation (inter-generational theft) while immediate health costs are transferred to other departments. Whether the schemes such as the NEPP and ERF are sufficiently robust or whether there is too much reliance on voluntary cooperation needs to be examined. With the expanding use of electronic devices right throughout society but especially in homes adding to our power usage, it is even more essential that we move away from fossil-fuel sources.⁵⁹

Integration of climate and energy policies incl. state-based policies

Climate policy is the paramount concern because the consequences of run-away global warming will be catastrophic. We are already glimpsing the beginning of the disastrous health and economic effects of climate change which might soon be referred to as "climate chaos". With emissions reduction as the primary aim, state-based policies reveal that it is still possible to achieve energy security and reliability. In spite of repeated comments to the contrary, the failures in electricity supply in SA have not been due to renewable energy development but to failures in managing the energy mix.⁶⁰ However one positive outcome arising from the negative claims, has been enormous interest in Australia for the insertion into the grid of mechanisms to boost reliability through increased storage and synchronisation. Such systems have been utilised overseas, some for as long as several decades.⁶¹

Because of the geographic differences between the various states and the availability of different non fossil-fuel resources, it makes more economic and logistical sense for the states to be largely responsible for their own supply. The NEM can remain as a national grid for security of distribution but essentially supply should be more state and locality based.

It is essential that consideration be given to incorporating climate policy in all federal legislation so that benefits that may be achieved in one section are not nullified by counter-action in another. Federal policy could do well to follow the example of Victoria which, with enactment of its Climate Change Act 2017, will embed action to reduce GHG emissions in multiple facets of government activities.⁶²

Emissions Reduction Fund (ERF) and its Safeguard Mechanism

This mechanism was introduced in 2014 whereby government essentially pays industries and activities to reduce carbon emissions. Carbon credits (Australian Carbon Credit Units) are awarded for emission reductions which are then sold back to the Government. The ERF is able to drive reductions in some sectors which are not reached by other policies but because of its heavy reliance on federal funding and hence budgetary allowances, lack of broad incentives to reduce emissions, and payment to, rather than by, the polluters, the scheme has been heavily criticised.⁶³ Calculations have also revealed that budgetary allocation is inadequate to achieve its objective without the support of some form of carbon pricing. In 2015, government announcements suggested the ERF would only have sufficient funds to purchase 7.5% of the reductions required by 2030 for Australia to adhere to its fair share of the carbon budget.⁶⁴ Even a government publication cast doubt on the efficacy of the ERF to achieve its goal.⁶⁵ Of the 178 million tonnes of emission reductions which have been contracted, only 18 Mt/year have been realised (ABC News 9/4/17) and this counts for little compared with Australia's annual emissions of over 500 Mt.

Safeguard mechanism:

This mechanism which was designed to ensure that emissions reductions purchased by the government are not offset by significant increases elsewhere in the economy is possibly not as effective as hoped because of the many loopholes available to industry.⁶⁶

National Energy Productivity Plan (NEPP)

There are many systems in place to improve energy efficiency by households and small to medium-sized enterprises. The cornerstone of these is the National Energy Productivity Plan which aims to improve energy efficiency of goods and appliances, and of homes and buildings. However while regulation is mainly on a voluntary basis, improvements will not reach all sectors of the community as the poor are more inclined to consider price than energy efficiency. Housing energy standards are prone to be minimised because of cost pressures but they should be strengthened with the likelihood of more climate extremes and the realisation that energy efficiency will be more economical in the longer term.⁶⁷

House energy efficiency also reduces morbidity associated with temperature extremes, including both cold and heat related deaths.⁶⁸

Research, development and innovation

Ongoing research is an essential component of any advanced nation's activities in the transition to low carbon emissions. It is essential therefore that the CSIRO and other bodies remain well-funded and completely independent. Research directions must not be influenced by government policy or commercial considerations. The CEFC and ARENA must also remain well-funded to help burgeoning ideas and industries. It is important for Australia to maintain strong climate policies to assist our standing as a progressive nation so that we do not lose expertise and investment overseas.⁶⁹

Potential role of credible international units

There is doubt that the system of international credits which was approved in the Paris Treaty process is workable. There are many scenarios in which it could be used inappropriately and it is unlikely to ever achieve meaningful emissions reduction. One of the main failings is that emissions reductions identified within this scheme would have occurred anyway and are not additional. The European Union is unlikely to continue with this scheme.⁷⁰

Long-term emissions reduction goal

Many jurisdictions both within and beyond Australia are planning on reaching net-zero emissions by 2050. Given the momentum that is now building, this is a realistic goal. Conversely if we don't aim for this target and achieve even less, we could be on a course with catastrophic consequences. The biosphere as we know it has never faced such rapid planetary warming and we cannot simply observe this phenomenon as a reversible experiment. Currently there is no practical method of extracting CO₂ from the atmosphere and it would be foolish in the extreme to rely on such a mechanism being discovered, developed and commercialised in an economic and environmentally viable manner.

In considering a long-term goal, urgency must be the over-riding factor. It will be a monumental waste of time, effort and funds if we are half-hearted in our approach and do not reduce emissions sufficiently within the limited time-frame.

With rapid advances in battery, storage and electronic hard- and soft-ware technologies, and recent changes to the manner of market operation, Australia will be well-placed to deal with intermittency of supply from renewable energy sources.⁷¹

During these next few decades, it will be essential to review progress every five years. However if emissions do not show a steady decline from year to year, it would be necessary to review more frequently. Review should be undertaken by those with environmental and energy expertise but who are independent of the fossil-fuel industry in order to avoid conflicts of interest.

Outcome of overall emission reduction policies

Given the multiplicity of mechanisms in place, and in spite of the optimistic claims made in the discussion paper (page 7) it is disappointing in the least to note that Australia's annual carbon emissions have not diminished over the last 9 years.⁷²

Emission reduction targets are therefore insufficient and at the current rate are inadequate for Australia to meet its commitments.⁷³ Even the most recent figures for 2016 estimate the annual emissions to be 534.7MtCO₂-e which is a 0.8% increase over the previous year.⁷⁴

Comparison with other OECD countries also reveals that Australia's targets are amongst the lowest.⁷⁵

It is also disappointing to note that attention is still given to emissions reduction per capita (Discussion Paper page 4) as if this has some significance in Australia's overall contribution.⁷⁶ Of course Australia should reduce its emissions per capita, and not only because of an increased denominator, but because our emissions per capita are at an unseemly level compared with other countries. However concentrating on this metric does not accord with Article 4, number 3 of the Paris Agreement which states that "Parties shall promote environmental integrity, transparency, accuracy, completeness, comparability and consistency..."⁷⁷

Renewable energy target (RET)

In 2015 Australia controversially reduced its Renewable Energy Target for large scale energy from 41,000 to 33,000 GWh by 2020 which means that renewables would then occupy 23.5% of Australian electricity production.⁷⁸ However the market-based scheme is not working as efficiently as hoped as some retailers are preferring to pay fines, which sometimes can be cheaper than purchasing and surrendering their renewable energy quota.⁷⁹ While the federal RET is not far behind Victoria's of 25% by 2020,⁸⁰ it is over the next 5 years that differences may emerge as Victoria's current target increases to 40% by 2025.

Recommendations by DEA

1. DEA believes that the emission reduction targets currently set by federal government are insufficiently strong, particularly as they have not yet led to significant emissions reduction. In an earlier Issues Paper in 2015,⁸¹ DEA urged for targets of
 - 40% reduction on 2000 levels by 2025,
 - 50% by 2035 and
 - 95% reduction (effectively net-zero) by 2050.DEA believes that targets should be ambitious to drive real results and to bring the federal aspirations into line with the states, cities and communities throughout Australia.^{82,83}

Ambitious targets are required by the Paris Agreement and to keep within our carbon budget.

2. There can be no new coal-mines in Australia. Any perceived economic benefit is outweighed by the negative effects of pollution and carbon emissions, regardless of the final site of combustion.
3. The federal renewable energy target should also be ambitious to encourage transition from fossil-fuel consumption as soon as possible. This would also encourage investment and employment opportunities and would reduce leakage of technical expertise overseas.
4. The federal government should acknowledge that states may be better placed to regulate their renewable energy mix because of different structures and geographic opportunities. However the federal government should assist the states in the integration of both emission reduction and renewable energy policies with all sectors of society. Vehicular transport is one sector where integration is important because changing to electrification supplied by renewables would reduce both carbon emissions and air pollution. Encouraging the use of public transport has additional benefits in promoting physical activity thereby reducing obesity, heart disease and diabetes.
5. Australia should adopt a price on carbon as the current evidence shows that without one, there is little chance of achieving adequate carbon emission reductions.
6. DEA urges the federal government to adopt a 'health in all policies approach'. The government must consider the adverse effects of global warming and climate change on the health of mankind and the entire biosphere in its decision making. Dealing with causation now will be far cheaper than adaptive measures. Showing climate leadership and supporting our Pacific neighbours will help our standing in the region.
7. To produce the most rapid reduction in emissions, land clearing must cease immediately.
8. DEA urges the federal government to acknowledge that global warming is the main destructive force acting on The Great Barrier Reef, in order to combat the misinformation promulgated over recent years.
9. The long-term emissions reduction goal should be nothing short of net-zero emissions by 2050. Following 2050, the world will still be faced with the daunting task of attempting to reduce atmospheric CO₂ in order to diminish the amplifier effects that will have arisen from warming to that stage. Currently there are no scientifically viable methods to economically reduce CO₂ sufficiently to prevent ongoing global warming.⁸⁴

References

- ¹ <http://www.environment.gov.au/climate-change/review-climate-change-policies/discussion-paper-2017>
- ² <https://www.environment.gov.au/climate-change/publications/emissions-projections-2016>
- ³ http://www.who.int/healthpromotion/conferences/8gchp/130509_hiap_framework_for_country_action_draft.pdf
- ⁴ <https://www.mja.com.au/journal/2014/201/5/open-letter-hon-tony-abbott-mp>
- ⁵ <https://www.dea.org.au/climate-change-and-health-in-australia-fact-sheets/>
- ⁶ <http://www.abc.net.au/news/2017-02-01/thunderstorm-asthma-in-melbourne-not-understood-review-finds/8230834>
- ⁷ https://www.theguardian.com/environment/2017/apr/10/great-barrier-reef-terminal-stage-australia-scientists-despair-latest-coral-bleaching-data?utm_source=esp&utm_medium=Email&utm_campaign=GU+Today+AUS+v1+-+AUS+morning+mail+callout&utm_term=221120&subid=15062679&CMP=ema_632
- ⁸ <http://www.climatecouncil.org.au/uploads/e3449c5187f7100528cc90c380993381.pdf>
- ⁹ <http://www.nature.com/nature/journal/v543/n7645/full/nature21707.html>
- ¹⁰ <https://public.wmo.int/en/resources/bulletin/unnatural-disasters-communicating-linkages-between-extreme-events-and-climate>
- ¹¹ <https://www.dea.org.au/climate-change-and-health-in-australia-fact-sheets/>
- ¹² http://sustainable.unimelb.edu.au/sites/default/files/MSSI_AppetiteForChange_Report_2015.pdf
- ¹³ http://dea.org.au/images/general/DEA_Climate_Change_and_Health_Policy_05-13.pdf
- ¹⁴ <http://www.smh.com.au/comment/invisible-killer--need-for-better-air-quality-standards-is-urgent-20150715-gicrxn.html>
- ¹⁵ <https://www.mja.com.au/journal/2011/195/6/mining-and-burning-coal-effects-health-and-environment?destination=node/221025>
- ¹⁶ Manucci PM. Airborne pollution and cardiovascular disease: burden and causes of an epidemic European Heart Journal Editorial, published online, 19th February 2013
- ¹⁷ The Hidden Costs of Electricity: Externalities of Power Generation in Australia. ATSE March 2009
- ¹⁸ <http://www.atse.org.au/Documents/Publications/Reports/Energy/ATSE%20Hidden%20Costs%20Electricity%202009.pdf>
- ¹⁹ <https://www.dea.org.au/fact-sheet-the-human-health-tolls-of-coal-healthy-planet-healthy-people-dea/>
- ²⁰ http://reneweconomy.com.au/apra-says-climate-change-already-poses-system-side-financial-risks-97773/?utm_source=RE+Daily+Newsletter&utm_campaign=4a2d999c7b-EMAIL_CAMPAIGN_2017_02_17&utm_medium=email&utm_term=0_46a1943223-4a2d999c7b-40333601
- ²¹ https://www.eiuperspectives.economist.com/sites/default/files/The%20cost%20of%20inaction_0.pdf
- ²² https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf (pages 7 and 8)
- ²³ https://www.washingtonpost.com/news/energy-environment/wp/2015/06/22/inaction-on-climate-change-would-cost-billions-in-economic-losses-major-epa-sponsored-study-finds/?utm_term=.72389769e1bc
- ²⁴ <https://climateandsecurity.org/2016/12/01/new-paper-navigating-complexity-climate-migration-and-conflict/>
- ²⁵ http://publications.iom.int/system/files/pdf/migration_and_environment.pdf
- ²⁶ https://www.unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english.pdf
- ²⁷ <https://www.dea.org.au/wp-content/uploads/2017/02/Inquiry-into-Treaties-Paris-Agreement-10-16.pdf>
- ²⁸ <http://www.climatecouncil.org.au/uploads/a904b54ce67740c4b4ee2753134154b0.pdf>
- ²⁹ <http://www.climatecouncil.org.au/uploads/a904b54ce67740c4b4ee2753134154b0.pdf>
- ³⁰ <http://www.cameronhepburn.com/wp-content/uploads/2016/10/1-s2.0-S0306261916302495-main.pdf>
- ³¹ https://uploads.guim.co.uk/2017/04/11/CC_Report_1.pdf
- ³² <http://www.tai.org.au/content/carmichael-vs-world>
- ³³ https://uploads.guim.co.uk/2017/04/11/CC_Report_1.pdf
- ³⁴ <https://theconversation.com/great-barrier-reef-bleaching-would-be-almost-impossible-without-climate-change-58408>
- ³⁵ <https://cleantechnica.com/2016/12/25/cost-of-solar-power-vs-cost-of-wind-power-coal-nuclear-natural-gas/>
- ³⁶ https://www.dea.org.au/wp-content/uploads/2017/03/DEA-Storms-Flood-Fact-Sheet_web.pdf
- ³⁷ <http://australianbusinessroundtable.com.au/our-papers/social-costs-report>
- ³⁸ <http://www.delwp.vic.gov.au/environment-and-wildlife/climate-change/climate-change-framework>
- ³⁹ http://www.aemo.com.au/-/media/Files/Electricity/NEM/Market_Notices_and_Events/Power_System_Incident_Reports/2017/Integrated-Final-Report-SA-Black-System-28-September-2016.pdf
- ⁴⁰ <http://www.environment.gov.au/system/files/consultations/f3f4acc3-f9e6-4cc3-8a1e-a59a6490cffd/files/better-fuel-cleaner-air.pdf>
- ⁴¹ https://bitre.gov.au/publications/2005/files/wp_063.pdf
- ⁴² https://www.dea.org.au/wp-content/uploads/2017/03/Submission-on-Better-Fuel-for-Cleaner-Air_03-17.pdf
- ⁴³ https://www.dea.org.au/wp-content/uploads/Vehicle_Emissions_Discussion_Paper_submission_04-16.pdf
- ⁴⁴ <https://www.futurefarmers.com.au/young-carbon-farmers/the-changing-climate/australian-agricultures-contribution>
- ⁴⁵ <https://www.dea.org.au/wp-content/uploads/2017/05/Action-on-the-land-submission-04-17.pdf>
- ⁴⁶ <https://www.phaa.net.au/documents/item/869>
- ⁴⁷ <https://www.phaa.net.au/documents/item/873>

48 <http://theconversation.com/land-clearing-in-queensland-triples-after-policy-ping-pong-38279>

49 World Wildlife Fund, Living Forests Report, 2015. Chapter 5: Saving Forests at Risk. Available at http://awsassets.wwf.org.au/downloads/fl022_living_forests_report_chapter5_28apr15.pdf

50 <https://www.dea.org.au/climate-change-and-health-in-australia-fact-sheets/>

51 <http://australianbusinessroundtable.com.au/our-papers/social-costs-report>

52 <http://www.sduhealth.org.uk/policy-strategy/engagement-resources/nhs-carbon-reduction-strategy-2009.aspx>

53 <https://www.climatecouncil.org.au/renewablesreport>

54 <https://irenanewsroom.org/2016/05/25/8-1-million-people-now-work-in-renewables-new-study-finds/>

55 <http://www.news.com.au/technology/environment/have-mining-job-figures-been-inflated-to-justify-reef-destruction/news-story/99ef18baefd98e34023a743898f7406b>

56 <http://www.theaustralian.com.au/business/business-spectator/fact-check-will-adanis-coal-mine-really-boost-employment-by-10000-jobs/news-story/903c1932738b1d1a1763c74e45f4d7c7>

57 <http://australianbusinessroundtable.com.au/assets/documents/Report%20-%20Social%20costs/Reports%20-%20The%20economic%20cost%20of%20the%20social%20impact%20of%20natural%20disasters.pdf>

58 <https://sourceable.net/isnt-australia-keeping-energy-efficient-building/>

59 <https://sourceable.net/the-spiralling-carbon-emissions-were-all-guilty-of/>

60 <http://www.aemo.com.au/-/media/Files/Electricity/NEM/Market Notices and Events/Power System Incident Reports/2017/Integrated-Final-Report-SA-Black-System-28-September-2016.pdf>

61 https://en.wikipedia.org/wiki/List_of_energy_storage_projects

62 http://www.delwp.vic.gov.au/_data/assets/pdf_file/0005/378041/CC-Act-2017_Fact-Sheet_General.pdf

63 <http://www.climateinstitute.org.au/articles/publications/how-much-can-the-emission-reduction-fund-really-achieve.html>

64 <http://www.climateinstitute.org.au/articles/publications/how-much-can-the-emission-reduction-fund-really-achieve.html>

65 http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/BudgetReview2014_15/Emissions

66 https://grattan.edu.au/wp-content/uploads/2015/06/239_wood_submission_DoESafeguardMechanism.pdf

67 <http://www.abc.net.au/news/2017-01-03/why-bad-housing-design-pumps-up-prices-for-everyone/8158168>

68 <http://architectureau.com/articles/australias-poor-housing-contributing-to-cold-related-deaths/>

69 <http://www.climate-transparency.org/wp-content/uploads/2016/08/Brown-to-Green-Assessing-the-G20-transition-to-a-low-carbon-economy.pdf>

70 https://insideclimatenews.org/news/19042017/carbon-emissions-credits-paris-climate-agreement?utm_source=Inside+Climate+News&utm_campaign=08901a3f3d-InsideClimate+News12_10_2014&utm_medium=email&utm_term=0_29c928ffb5-08901a3f3d-326464009

71 http://reneweconomy.com.au/new-rules-flag-big-switch-in-energy-markets-to-cheaper-smarter-grid-19663/?utm_source=RE+Daily+Newsletter&utm_campaign=4b2cccf32a-EMAIL_CAMPAIGN_2017_04_12&utm_medium=email&utm_term=0_46a1943223-4b2cccf32a-40427897

72 <http://www.environment.gov.au/climate-change/greenhouse-gas-measurement/publications/quarterly-update-australias-national-greenhouse-gas-inventory-jun-2016>

73 <https://www.theguardian.com/environment/2016/sep/21/australias-emissions-wont-fall-by-2030-without-greater-climate-action-modelling-shows>

74 <https://www.climatecouncil.org.au/what-you-need-to-know-about-today-s-emission-reduction-targets-announcement>

75 <http://www.abc.net.au/news/2015-12-01/australias-carbon-emissions-targets-compare-paris-2015/6938844>

76 <https://www.theguardian.com/environment/2015/nov/23/australia-to-claim-success-on-climate-target-with-help-of-accounting-rules>

77 https://www.unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english.pdf

78 <https://www.acfonline.org.au/australias-pollution-reduction-targets-are-woefully-inadequate/>

79 <http://www.abc.net.au/news/2017-02-23/australian-renewable-energy-target-explained/8290460>

80 <http://www.delwp.vic.gov.au/energy/renewable-energy/victorias-renewable-energy-targets>

81 <https://www.dea.org.au/setting-australias-post-2020-target-for-greenhouse-gas-emissions-submission-healthy-planet-healthy-people-dea/>

82 <http://www.climatechange.sa.gov.au/target-zero>

83 <http://www.environment.act.gov.au/cc/acts-greenhouse-gas-emissions>

84 <http://www.eea.europa.eu/articles/the-melting-arctic>