GOVERNMENT OF WESTERN AUSTRALIA

Climate Health WA Inquiry

About your submission

Are you responding on behalf of an organisation or group?

☒ No

☐ Yes

If yes, please identify the organisation:

Your contact details

The following information will not be published without your permission but enables the Inquiry to contact you about your submission if required.

First name	Michael
Surname	Fabiankovits
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Publication of submissions

Submissions will be published with the name of the submitter unless otherwise indicated below. Do you consent to be identified in the published submission?

☒ Yes, I / my organisation agree to be identified

☐ No, I / my organisation request to remain anonymous

Terms of Reference

You are encouraged to address at least ONE of the Terms of Reference as listed below. Please select which item/s you will address:

☐ 1. Establish current knowledge on the implications of climate change for health in Western Australia (WA) and recommend a framework for evaluating future implications.

☐ 2. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will protect the public from the harmful health impacts of climate change.

☐ 3. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will strengthen the preparedness and resilience of communities and health services against extreme weather events, with a focus on the most vulnerable in the community.

☐ 4. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will reduce the contribution of WA health services to climate change and other detrimental impacts.

☐ 5. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will enable WA Health services to implement change, including energy efficiency, to a more sustainable model.

☐ 6. Evaluate the likely benefits (health and wellbeing, social and economic) arising from climate change mitigation strategies, with a focus on WA health services.

☒ 7. Define the role of the Department of Health in leading public policy on climate change and health.

☐ 8. Recommend the Terms of Reference, scope and preferred methods for undertaking a climate change vulnerability assessment for the health sector.

☐ 9. Recommend the Terms of Reference, scope and preferred methods for developing a Climate Change Adaptation Plan for the health sector.

Submissions response field

Please type your response to the item(s) selected above into the field below. Alternatively you may provide your submission as a separate attachment (suggested maximum 5 pages).

I would like to address and inform the following term of reference:

- **define the role of the Department of Health in leading public policy on climate change and health;**

My purpose is to try to to engender the sense of urgency in enacting policies that reduce emissions markedly and increase current ambitions and targets. I would hope that the Department of Health will use its influence to advocate for increased targets in emissions reductions and serious policy outcomes at the local, state and federal level.

My focus here will be on the concept of a carbon budget. To understand the carbon budget you need to understand the Equilibrium Climate Sensitivity (ECS). This figure tells us how much the Earth's surface temperature would warm under a doubling of CO2. The IPCC AR5 has this as a range of 1.5 to 4.5 degrees Celsius with a most likely figure of about 3 degrees Celsius. Important to understand here is that the full effects of emissions are not immediate as lags in the system (especially the oceans) mean it will take several decades, if not longer, to realise the full effect of current emissions.

CO2 in the pre-industrial era was approximately 280 parts per million (ppm). It has cycled between 180 and 280ppm for the last 400,000 years at least. The measurement for July 2019 was 411ppm.
So roughly we have increased CO2 levels in the atmosphere by 40%.

So with all of the above information we can estimate how much more CO2 we can

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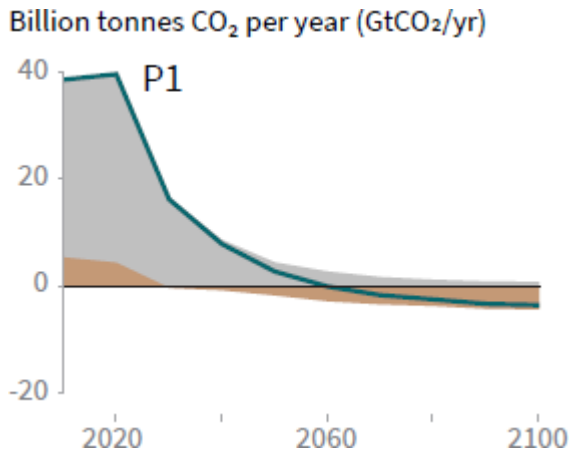
emit for any given temperature target. This figure is the Carbon Budget. Obviously though this is a planet with many interacting processes and feedbacks so any figure will come with a probability and a range.

The IPCC 1.5 Report of 2018 gives us a carbon budget of 420Gt CO2 for a 66% chance of limiting warming to 1.5ºC. This was based on 2017 figures and rising emissions at 42Gt CO2 pa.

This figure as of July 2019 leaves us a carbon budget of approximately 350Gt CO2 and at current rate of emissions will be met in just over 8 years.

To have any chance of staying within 1.5ºC the IPCC report offers various pathways. The only one that does not involve technologies that are not even available yet is pathway one. To get there requires deep cuts to emissions and a huge increase in renewables. As said previously emissions are currently still increasing.



- CO2 emissions reductions of 58% by 2030 and 93% by 2050 (relative to 2010)
- Renewables share in electricity of 60% by 2030 and 77% by 2050
- Coal's share in electricity generation reduced by 78% by 2030 and 97% by 2050 (relative to 2010)

The graph to the left gives you some indication of how deep the cuts need to be. Currently in Australia we are still talking about increasing coal use and exports and building new power plants with lifetimes of 30 to 40 years.

Why is the 1.5 degrees Celsius target so crucial.
A sample of the differences in consequences between 1.5 and 2 degrees Celsius. Taken from the peer reviewed science and the IPCC report.

Consequence	**At 1.5 Degrees**	**At 2 Degrees**
Increase in global marine heatwave days per year	x16	X23

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Ocean Acidity (relative to 1986-2005 median)	17% increase	29% increase
Sea ice free Arctic in summer	At least once every 100 years	At least once every 10 years
Global population exposed to at least one severe heatwave every 5 years	14%	37%
Increase in frequency of warm extremes over land	129%	343%
Amount of Earth's land area that will shift to a new biome.	7%	13%
Amount of Arctic permafrost that will thaw potentially accelerating climate change by methane release.	4.8 million km2	6.6 million km2
Reduction in maize harvests in tropics	3%	7%
Further decline in Coral Reefs	**70-90%**	**99%**
Increase in hot days above the 90th percentile of daily max temps (1981 – 2010 average)	16%	25%
Increase in the length of the longest streak of 6 or more hot days	17 days	35 days
Increase in average drought length	2 months	4 months
Increase in population exposed to water scarcity	271 million	388 million
Increase in global population exposed to severe drought	132.5 million	194.5 million
Annual flood damage losses from sea level rise	$10.2 trillion	$11.7 trillion
Increase in suitability of drylands for malaria transmission	19%	27%

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What are some of the changes that have already occurred at only 1 degree Celsius

- Globally the last 5 years have been the hottest on the instrumental record
- Sea level is currently rising at twice the rate of the 20th century average with the rate increasing
- Minimum ice extent in the arctic has fallen by about 50% in the last 40 years
- The bushfire season has increased by 19% since 1979 globally. https://www.ncbi.nlm.nih.gov/pubmed/26172867
- Extreme Weather is 5 times more likely now than in the 1970's

http://www.wmo.int/pages/prog/drr/transfer/2014.06.12-WMO1123_Atlas_120614.pdf

- Antarctica's melt rate has tripled in the last decade to 200 billion tons per annum https://www.nature.com/articles/s41586-018-0179-y
- Parts of the West Antarctica ice sheets have crossed a tipping point for irreversible collapse

http://svs.gsfc.nasa.gov/4168

- Record-breaking hot temperatures in Australia outnumber cold records by a factor of 12 to 1

https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1002/2015GL065793

- Ocean acidification has increased by 30% https://www.pmel.noaa.gov/co2/story/What+is+Ocean+Acidification%3F
- Bleaching events to various reefs since the 1980's have gone from every 25 to 30 years to every 6 years

https://science.sciencemag.org/content/359/6371/80

- Phytoplankton has fallen by 40% since 1950. https://www.scientificamerican.com/article/phytoplankton-population/
- More than 95% of Tasmanias Kelp forests are gone due to warming oceans http://e360.yale.edu/features/as-oceans-warm-the-worlds-giant-kelp-forests-begin-to- disappear
- 18 percent of heavy precipitation events and 75% of daily hot extremes over land can be attributed to global warming

https://www.nature.com/articles/nclimate2617

- Extreme precipitation events are up by 7% per degree of warming http://phys.org/news/2013-02-extreme-rainfall-linked-global.html
- 20% increase in the maximum intensity of cat 5 level storms
- http://www.pnas.org/content/early/2017/10/03/1703568114
- 21% increase in frequency of extreme storms for every 1 degree Celsius rise in ocean temps.

https://climate.nasa.gov/news/2837/warming-seas-may-increase- frequency-of-extreme-storms/

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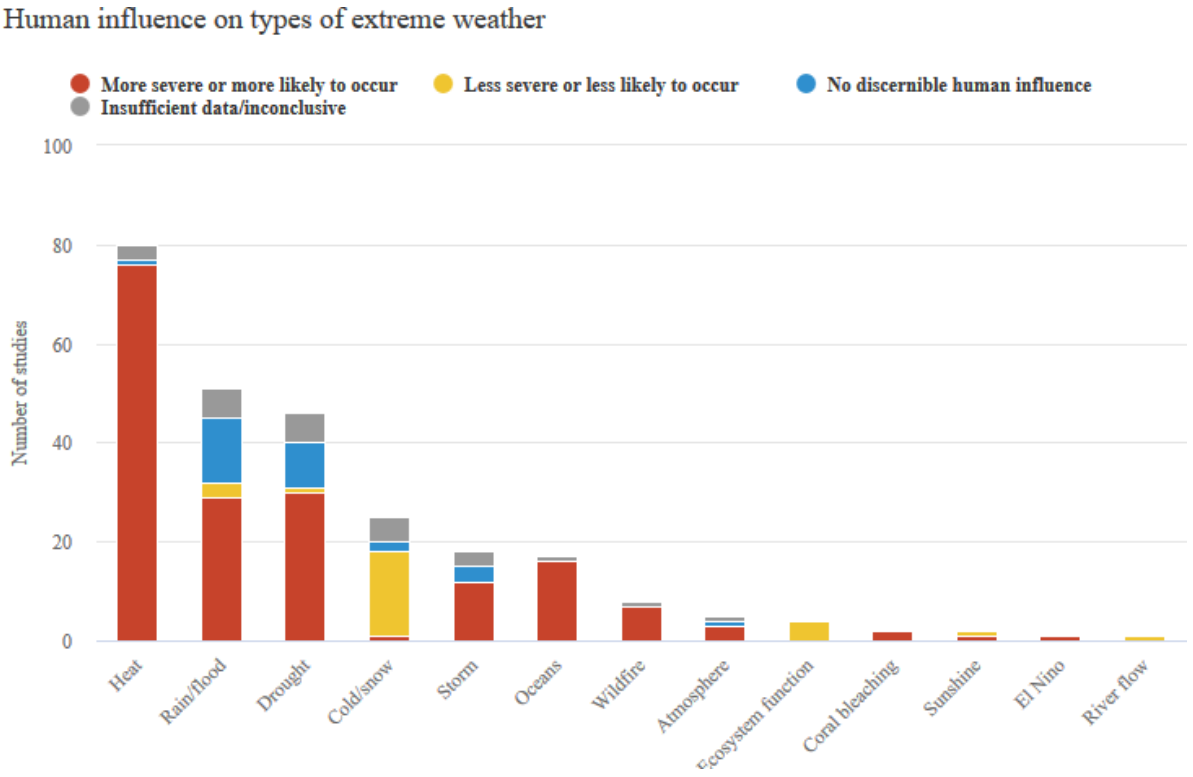
A new area of science has been attempting to determine how much of extreme weather can be attributed to the human influence on climate. An analysis of 230 peer reviewed attribution studies found that of all of the extreme weather studied thus far 68% were made more likely or more severe by the human influence on climate. This increased to 95% when only looking at heatwaves.



https://www.carbonbrief.org/mapped-how-climate-change-affects-extreme-weather-around-the-world

How are we doing?

In a recent study of the climate change actions of 60 countries Australia came 55th , and it was noted that we had become “an increasingly regressive force in international negotiations, attempting to weaken climate finance obligations and dismissing the IPCC 1.5°C report.” https://www.climate-change-performance-index.org/country/australia-2019

Another study found that our current target of 26 to 28% reductions is consistent with a 2 to 3 deg C target. But our current policy initiatives would see our emissions increase and not fall by 2030. **This is the same target that the Western Australian Government has just adopted.** If all countries followed Australia's current policy trajectory the climate would warm between 3 – 4 degrees Celsius. In fact on current global policies that is exactly the track we are on.

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https://climateactiontracker.org/countries/australia/

Keep it in the ground

Now the real clincher. Their is more than 3,000Gt CO2 in known reserves, in fact there are approximately 940Gt CO2 in developed reserves. This is currently operating fossil fuel fields and mines. This means that we need to keep over half of the fossil fuel in currently operating fields and mines in the ground and nearly 90% of known reserves. But the industry are still exploring for more. https://www.nature.com/articles/nature14016 http://priceofoil.org/2016/09/22/the-skys-limit-report/

Summary

- For a doubling of CO2 the most likely temperature rise is 3 deg Celsius
- CO2 concentration in pre-industrial times was 280ppm
- Current CO2 concentration is ~410ppm (around 40% increase)
- To avoid the more catastrophic consequences of climate change we need to stay within 1.5 deg C above pre-industrial. We are already at 1 degree.
- Carbon Budget calculations say that we can only emit another 350Gt CO2 for a two thirds chance of staying within 1 degree, and we are currently emitting about 42Gt CO2 per year.
- This gives us just over 8 years at current emissions.
- We need to reduce CO2 emissions by at least 58% by 2030 and 93% by 2050
- Australia's (and Western Australia's) current 2030 target is 26 to 28%
- Our actual policies are not in line with this inadequate target and emissions continue to increase.
- The world is headed towards a 3 to 4 degree C increase in temperatures on current policies.
- We need to keep at least half of developed fossil fuel and 90% of known reserves in the ground, and not discover or develop any new ones.
- Most consequences already occurring are worse than expected and most of the predicted consequences outlined above are likely to be underestimated going on past IPCC performance.

Please consider strongly advocating for increased targets in emissions reductions and serious policy outcomes at the local, state and federal level in your new role definition.

Additional Resources

ECS: https://www.environment.gov.au/system/files/resources/d3a8654f-e1f1-4d3f-85a1- 4c2d5f354047/files/factsheetclimatesensitivitycsiro-bureau.pdf
Latest CO2 Measure: https://climate.nasa.gov/vital-signs/carbon-dioxide/ Carbon Budget and Consequences: https://www.ipcc.ch/report/sr15/

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Carbon Budget Clock: https://www.mcc-berlin.net/en/research/co2-budget.html
1.5 to 2 degree impacts: https://interactive.carbonbrief.org/impacts-climate-change-one-point-five- degrees-two-degrees/
NOAA National Centers for Environmental Information, State of the Climate: Global Climate Report for Annual 2018, published online January 2019, retrieved on August 29, 2019 from https://www.ncdc.noaa.gov/sotc/global/201813 .

Please complete this sheet and submit with any attachments to: Climate Health WA Inquiry