Submission Opposing the Narrabri Coal Seam Gas project

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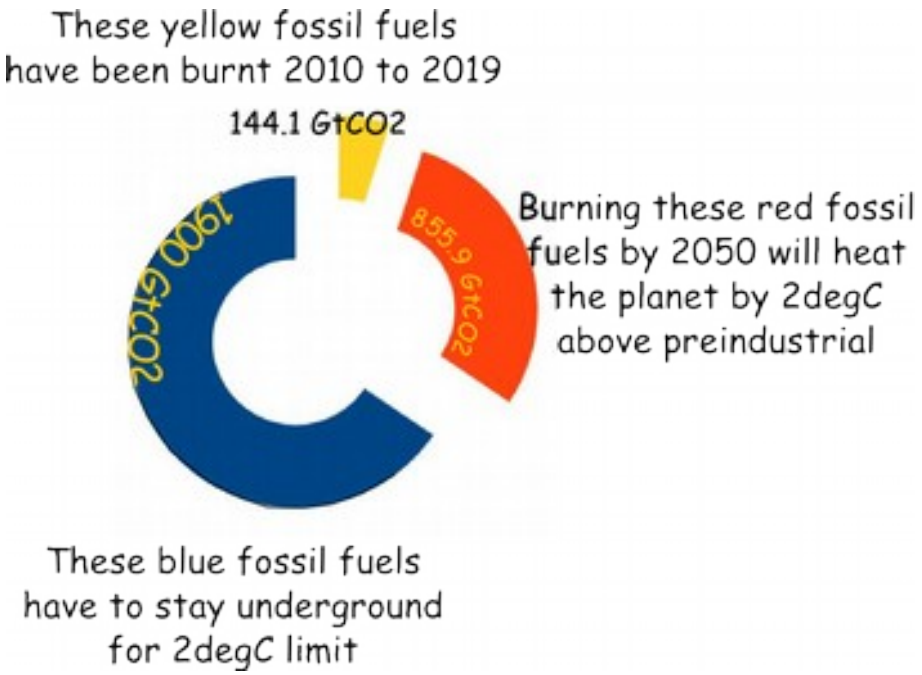
To limit global warming to 2degC above pre-industrial, I will show that the Narrabri coal seam gas has to stay Underground.

In 2010 there was 3 times more economically mineable fossil carbon underground than could be burnt for a 50/50 chance of keeping global warming to 2degC. These were proven and probable (2P) reserves.
Since humans cannot extract it all as well as keeping Earth below 2degC of warming, then what quantities and where in the world is the oil, gas and coal we can extract for "well under" 2degC of warming?
As an analogy we could simplify the problem by taking one resource, say mangoes which could not all be harvested before a cyclone hit, so you would work out how to get the best and easiest in the time available. Then extend the same problem to 3 crops say mangoes, litchis and bananas.
In the case of too much underground fossil carbon for the atmosphere the problem becomes how do we get the most usable energy for the least fossil carbon exhausted to the atmosphere?

The answer is in a letter to Nature in Jan 2015 by Christophe McGlade[1] & Paul Ekins called:

"The geographical distribution of fossil fuels unused when limiting global warming to 2 degC"

(doi:10.1038/nature14016) which shows you where, and how much, fossil carbon has to stay underground (is unburnable) and hence out of the atmosphere for the 2degC limit. The critical importance of the 2degC limit I will come to later.
Fig 1. below shows the world's fossil carbon reserves in 2010, updated to 2019 with fossil CO2 emissions since, from the 2020: http://www.bp.com/statisticalreview



Next McGlade & Ekins partitioned the unburnable fossil carbon reserves amongst coal, gas and oil as shown in Fig 2.

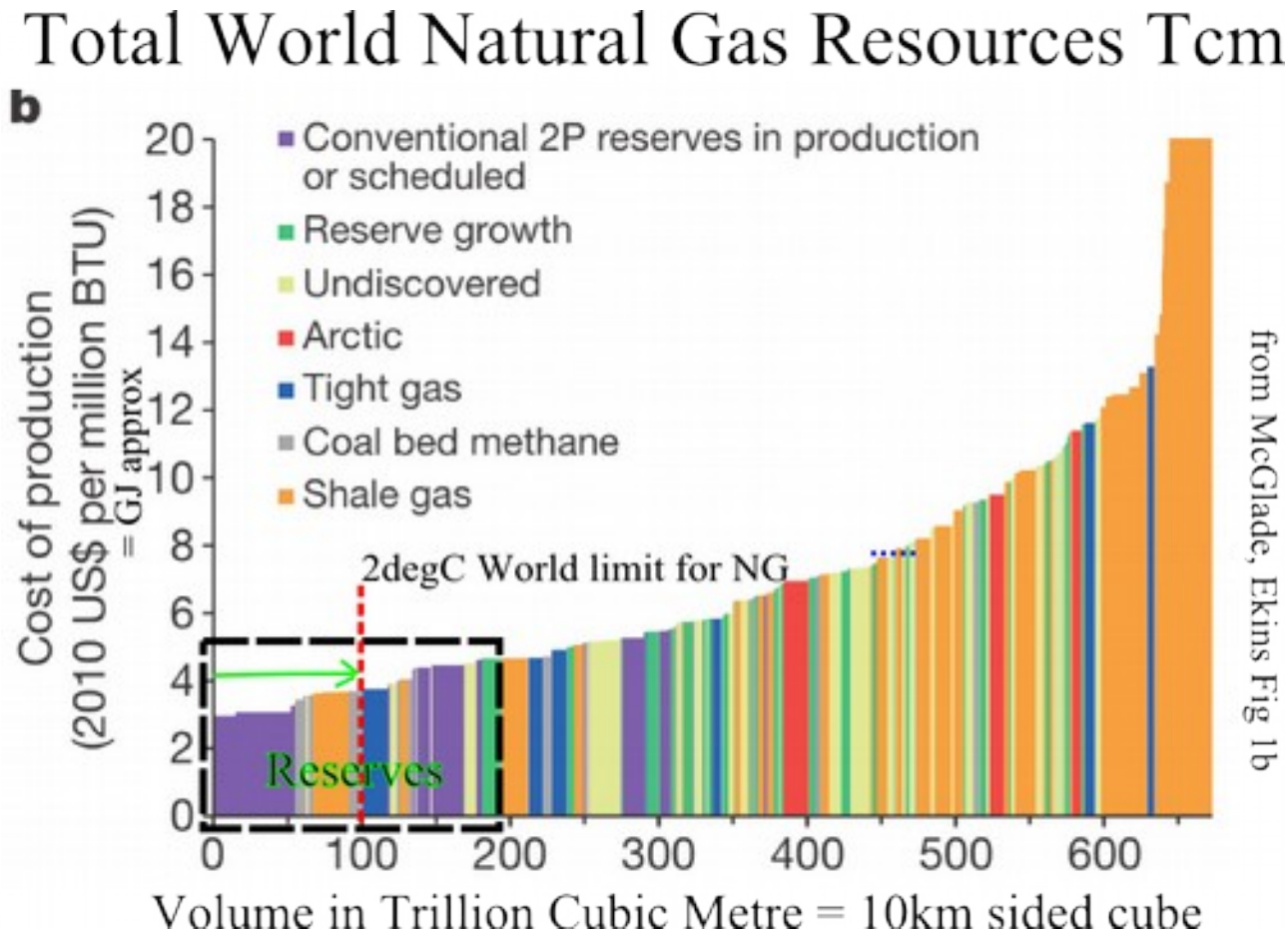
Next their geographical analysis shows how much of Australia's fossil carbons, counting from the end of 2010, have to remain underground for 2degC global warming without CCS, is:
The 5% of Australia's coal that can be burnt for a 50/50 chance at 2degC is 4474Mt or 125263 PJ
The 49% of Australia's gas that can be burnt for a 50/50 chance at 2degC is 1.92Tcm or 72635PJ

The 54% of Australia's oil that can be burnt for a 50/50 chance at 2degC is 3.2Gb or 19334PJ
(Mt is million tonne, Tcm is trillion cubic metre, Gb is Giga barrel (billion), PJ is Peta Joule)

But counting from the end of 2010 only half of these 2degC fossil carbons can be mined before breaching our 1.5degC aspiration limit. For Australia here in Fig 3 is how much of our fossil carbon has to stay underground for a 50/50 chance at 1.5degC global warming:

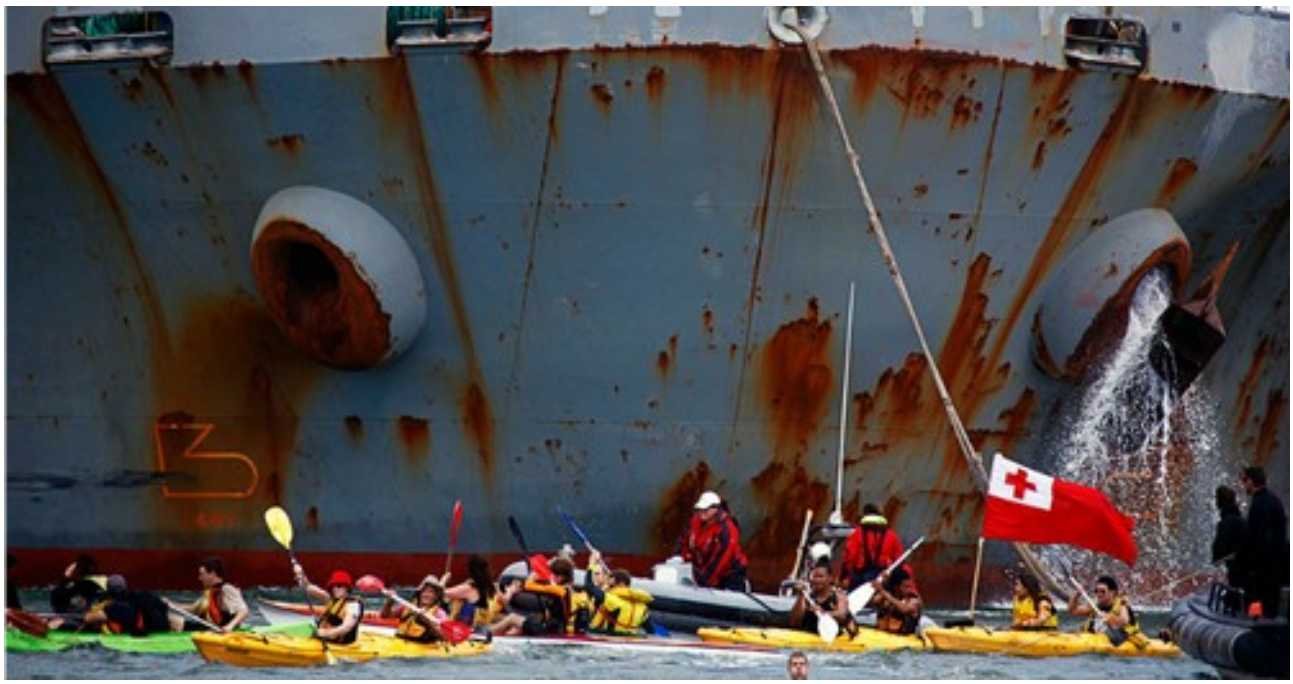
The 2.5% of Australia's coal reserves that can be burnt for a 50/50 chance at 1.5degC is 2237Mt or 62632PJ
The 24.5% of Australia's gas reserves that can be burnt for a 50/50 chance at 1.5degC is 0.96Tcm or 36318PJ
The 27% of Australia's oil reserves that can be burnt for a 50/50 chance at 1.5degC is 1.6Gb or 9667PJ

As an example of how McGlade & Ekins have done this analysis we'll use gas. First they order all of the planet's gas resources by ease of extraction (using $cost/GJ of gas as a proxy) and the volume of gas at that price. Note that gas resources includes all the world's gas whether or not it is currently economically extractable. Reserves are the portion that are economically extractable shown in the black rectangle in Fig 4. below. And the amount of gas the world can burn under the 2degC limit is up to the red line shown by the green arrow. 1Million BTU = 1.055GJ so the vertical scale is approximately in $/GJ.



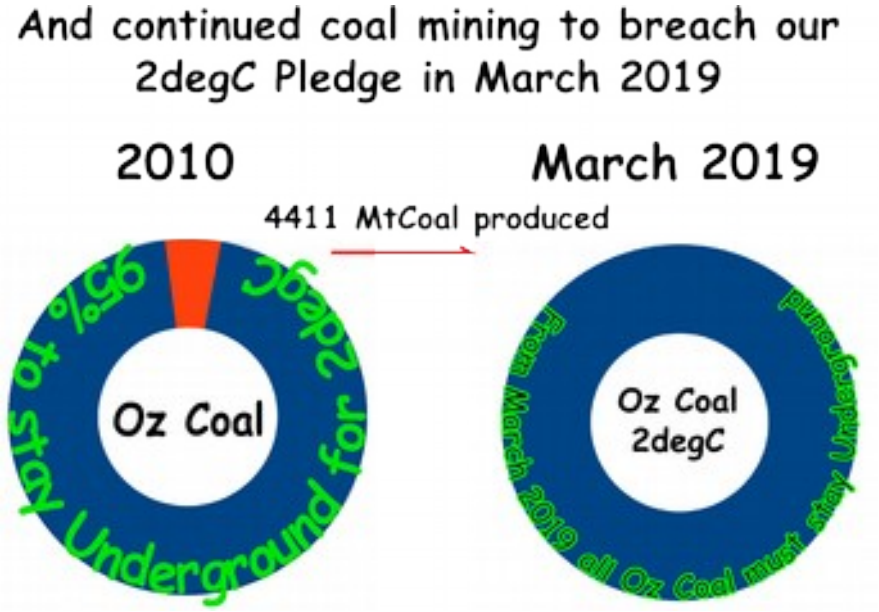
Failed Aspirations and Breached Pledges

Since 2010 the Australian digging and sucking juggernaut has continued, undeterred by catastrophic bushfires, droughts and floods and record high global temperatures, to exhaust so much more fossil carbon into the atmosphere that we expired our Paris aspirations for 1.5degC and our Paris 2degC pledge. By October 2014, coinciding with the Pacific Islander blockade of the Newcastle coal port, Australia passed its 1.5degC limit on coal and thus failed to leave enough coal underground to avoid drowning our friends – our Pacific friends who gave us such a great lesson on how to fight.

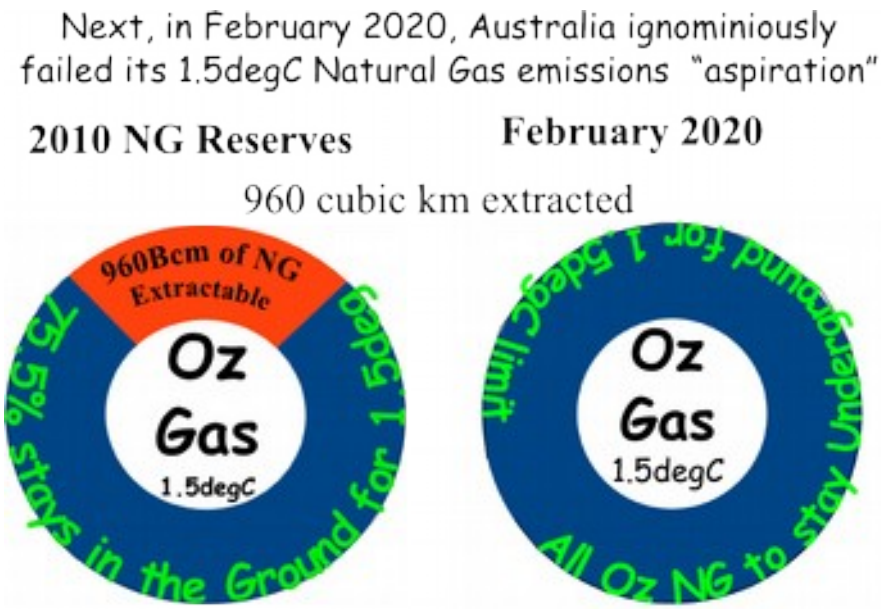


Pacific Islanders Blockade Newcastle coal port to protest rising sea levels
Fri 17 Oct 2014
The main action was a pitched battle between water police and Pacific Islanders 1km ahead of this photo.
https://www.theguardian.com/environment/2014/oct/17/pacific-islanders-blockade-newcastle-coal-port-to-protest-rising-sea-levels

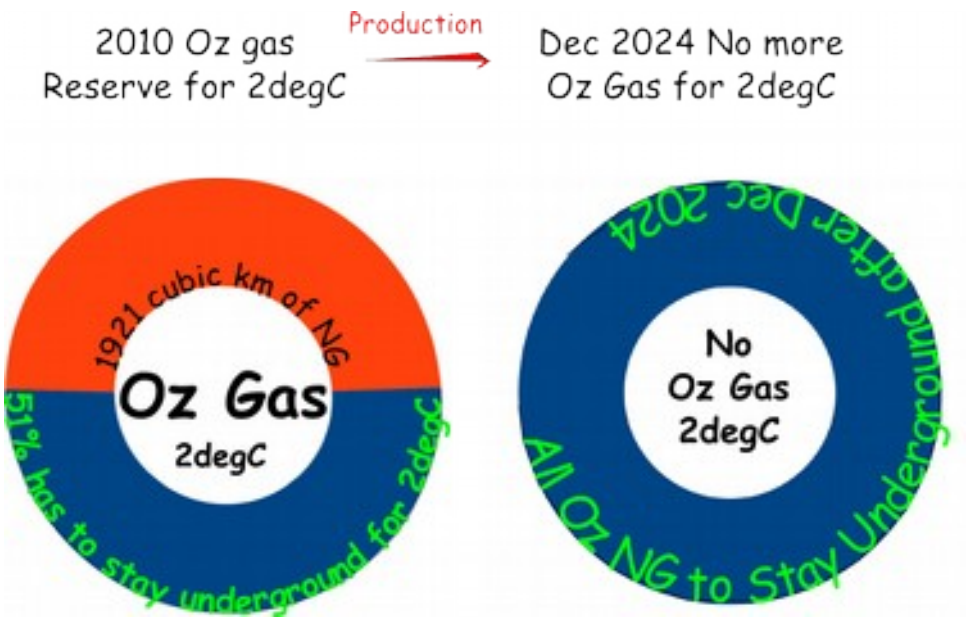
As the McGlade, Ekins analysis only came out 3 months after the blockade, it is only in retrospect that we realise that the blockade and breach coincided!
Nonetheless Australia kept on digging coal so that by March 2019 we had broken our 2degC pledge on coal.



And kept on sucking gas such that by February 2020 (this year) our 1.5degC gas aspiration expired.



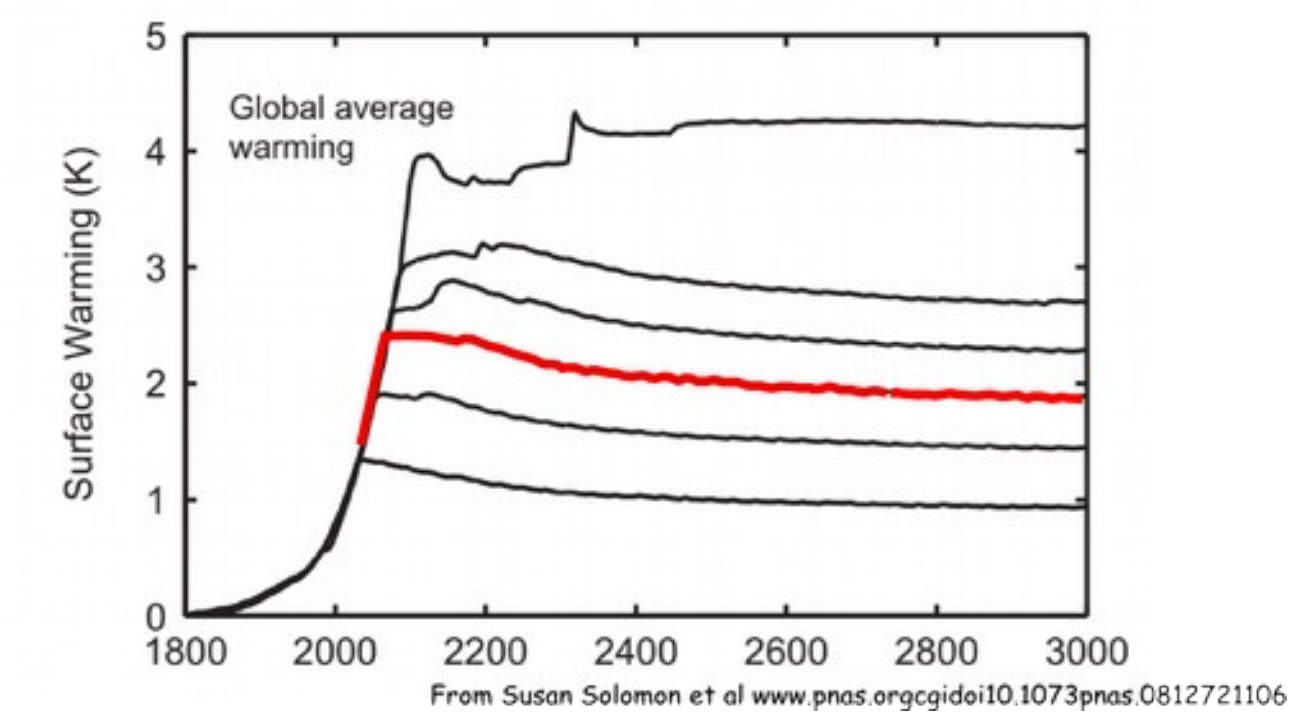
And if we continue sucking at the 2019 growing rate then by December 2024 we'll have breached our 2degC Paris pledge for gas. Or if the gas sucking rate plateaus at the 2019 rate then it will take until 2027 to breach the 2degC pledge for gas – neither of which dates permit the Narrabri gas project to go ahead.



The climate we get to is for 1000 years

One aspect that the DPIE is heedless of to the point of negligence is that the climate we've reached when we finally stop fossil carbon emissions is the climate we've got for 1000 years.
As you can see in the graph below and the Susan Solomon et al paper from which it came that the global warming temperature only decreases very slowly as the heat trapped by the greenhouse gases continues to pour into the oceans. So even if we stop emitting ghg's now that's 1000 years of catastrophic bushfires, prolonged droughts, floods etc that we're leaving for all future life.

The climate we've got when we stop emitting ghg gases is the climate for 1000 years. If we stop now that's 1000 years of catastrophic bush fires, droughts and floods we've bequeathed ....

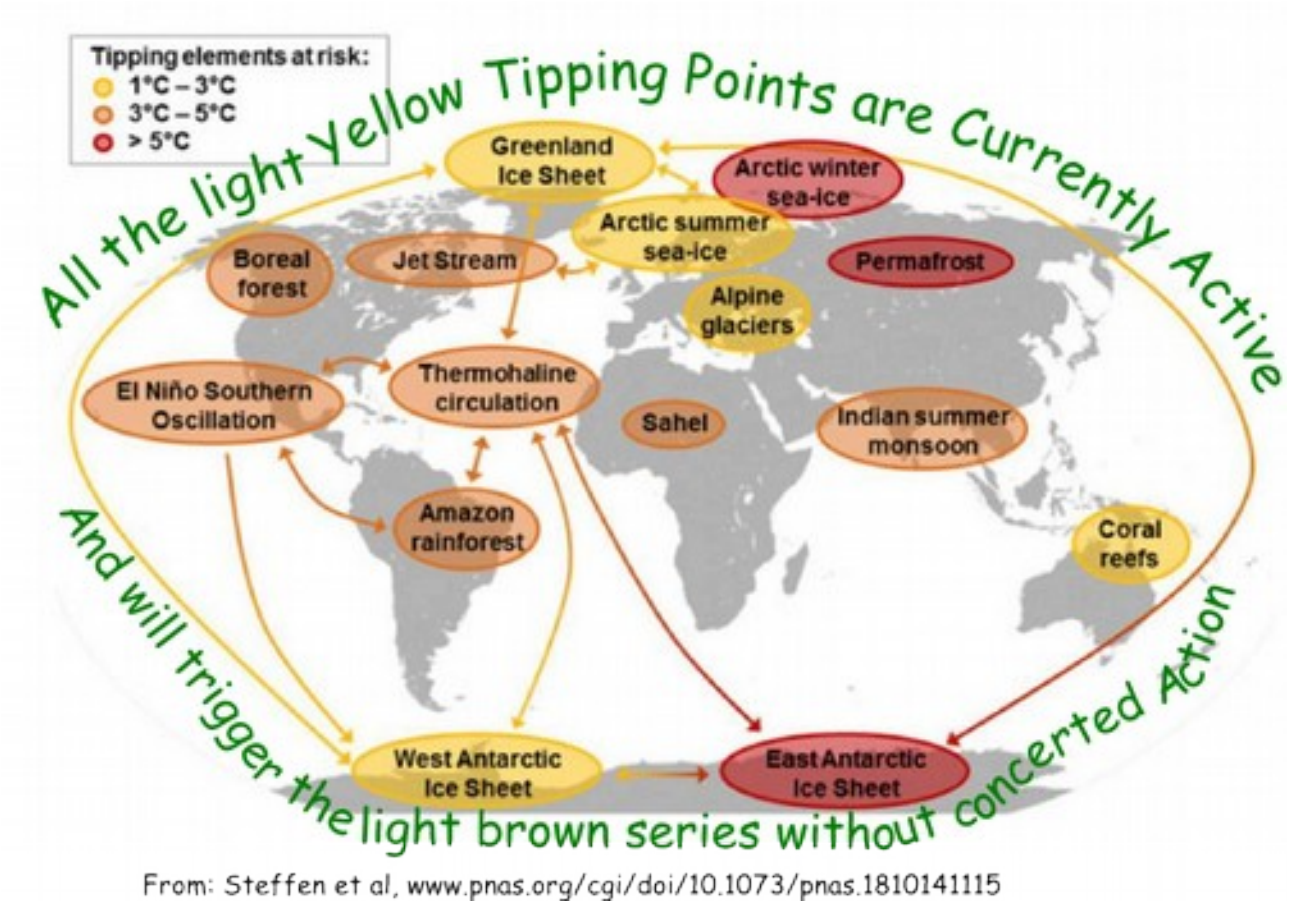


Worsening Droughts for Australia

Anna Ukkola et al using the latest climate models found that even on a lesser emissions intensive trajectory than the higher one we are currently on that for Australia droughts by 2050 will be longer by up to 2.4 months even though the average rainfall increases see: https://www.smh.com.au/environment/climate-change/australia-among-global-hot-spots-as-droughts-worsen-in-warming-world-20200601-p54ydh.html?btis and underlying paper at https://science.sciencemag.org/content/365/6448/76 is behind a paywall but the supplementary information is free and useful

Be Very Wary of Triggering the Tipping Point Cascade

As they tip, tipping points such as Arctic summer sea ice, heat the Earth making it more probable that other climate tipping points will tip leading to a domino cascade.
Now at 1.1degC of warming the light yellow series of tipping points in the chart below are clearly active and the fear is that once we reach 2degC of warming the yellow series will be strong enough to trigger the light brown series and continue to the darker reddish brown series thereby making the Earth into an unliveable hothouse.
Hence all new fossil carbon mines have to be cancelled, especially those like the Narrabri gas project with damaging environmental impacts on the Pilliga ecology.



Out of the Holocene into the Anthropocene, Trying to Avoid Hothouse Earth

By heating the planet we humans have destabilised Earth out of the Glacial-Interglacial cycle to a hotter Earth unable to return to the Glacial-Interglacial cycle for 100,000years and in danger of degenerating into the Hothouse Earth state.

Humanity has now become a critical, integral, interacting component of the system and now is the only time to act as the door closes on the opportunity to avoid Hothouse Earth.

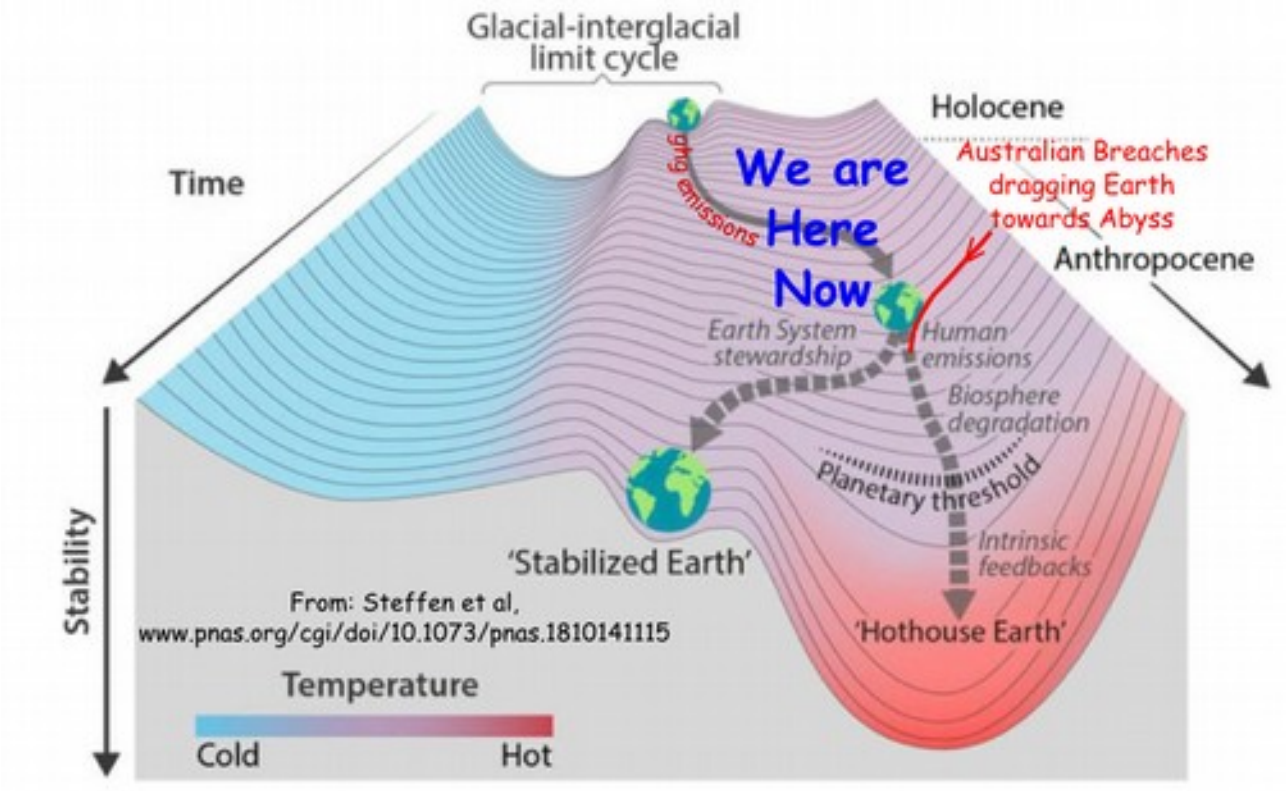
Will Steffen says “Evidence shows we will also lose control of the tipping points for the Amazon rainforest, the West Antarctic ice sheet, and the Greenland ice sheet in much less time than it’s going to take us to get to net zero emissions”. And adds:

> “Given the momentum in both the Earth and human systems, and the growing difference between the ‘reaction time’ needed to steer humanity towards a more sustainable future, and the ‘intervention time’ left to avert a range of catastrophes in both the physical climate system (e.g., melting of Arctic sea ice) and the biosphere (e.g., loss of the Great Barrier Reef), we are already deep into the trajectory towards collapse,”

The following Figure from Will Steffen et al with added notes depicts this dilemma:

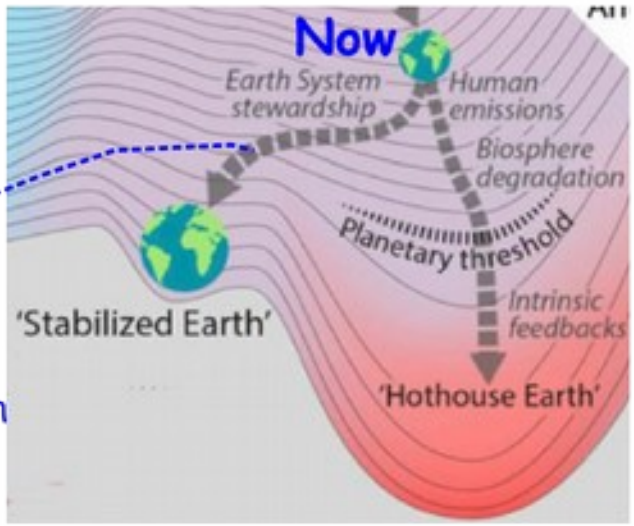
Our New Climate stability landscape

Human emissions have taken Earth out of the previous Glacial-interglacial cycle to a new Earth stewardship scenario relying on global human co-operation to avoid Hothouse Earth



We're now well into the Anthropocene where Humans and Earth are one interacting Entity.

Only strict Global Human management of Earth's climate and biosphere can traverse the slippery slope to Stabilised Earth without sliding into the Abyss.



The Main Elements of the Action to stabilise the Earth/Human system are:

1. Eliminate fossil carbon emissions 2. Enhance Earth's carbon sinks

3. Inculcate Global Human co-operation to manage Human-Earth systems

Here's some of what we must do to stablise our hotter Earth between the prior Glacial-Interglacial cycle and avoid the Hothouse earth state:

1. Eliminate fossil Carbon Emissions

- Stop fossil carbon greenhouse gas emissions as quickly as possible
  - No new fossil fuel mines anywhere
  - Close down Australian coal and gas mines now that they've breached the 2degC pledge
- Allocate resources and people power to Renewable Energy infrastructure

2. Manage and Enhance Earth's Carbon Sinks:

- Protect all native forests - Biodiverse native forests are the richest carbon stores.
- Establish new areas of native forest
- Organic farming techniques to increase soil carbon
- Possible fertilisation of ocean waters to enhance CO2 uptake by phytoplankton but being careful to avoid eutrophication

3. Global Human Co-operation to manage the Integral Human-Earth systems, requiring widespread, rapid, and fundamental transformations in:

- behaviour - demographics, consumption, attitudes, education
- technology and innovation,
- governance,
- and values.

We are describing here a completely new way of thinking globally. It should not be new – we've had at least 50 years to think and act on it whilst simultaneously being aware that time was shrinking and the concomitant effort required ballooning.
After 50 years of procrastination now the planetary rescue effort requires a complete change of global culture virtually overnight when instead the present calamity was predicted and foreseeable and change could have been gradual.
In this submission I am describing only one aspect of why this Santos Pilliga coal seam gas mine must not go ahead – namely that we've reached that critical time when no new fossil fuel mines are permissible and that Australia has already breached its coal Paris pledge and is only 3 to 5 years away from fully breaching its gas Paris pledge.
On top of this it is bizarre that this already environmental disaster and uneconomic proposal could even reach this stage, 10 years on, without being euthanised.
So I insist that the IPC does not permit this Narrabri coal seam gas project for the overwhelming reasons I've outlined.
Alan Roberts