

**Supplementary  
Submission  
No 215b**

## **SUSTAINABILITY OF ENERGY SUPPLY AND RESOURCES IN NSW**

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## Where on Earth is humanity heading: Pliocene or Miocene climate?

On 17 November 2018, Professor H. J. Schellnhuber CBE, then Director Emeritus of the Potsdam Institute for Climate Impact Research, Member of the Pontifical Academy of Sciences, and Member of the German Advisory Council on Global Change, presented his Aurelio Peccei Lecture in Rome, Italy, titled “Climate, Complexity, Conversion”.<sup>1</sup> At the beginning of his lecture, Professor Schellnhuber refers to a co-authored scientific paper titled *Trajectories of the Earth System in the Anthropocene*<sup>2</sup> that he described as a “**landmark paper**” and a “**game-changer**”. From about time interval **0:23:23 through to 0:26:45**, Professor Schellnhuber outlines two (2) Earth climate state possibilities that **humanity could experience within this century**, dependent upon the global human-induced greenhouse gas (GHG) emission trajectory path that ensues within this decade (i.e. the 2020s), namely Options:

- A. A harsher climate state paradigm may be like in the **Mid-Pliocene age**, that occurred **3–4 million years ago**, where atmospheric CO<sub>2</sub> levels were in the range of **400–450 parts per million (ppm)**, mean global temperatures were **+2.0–3.0°C** (above pre-industrial age), and sea levels were **+10–22m higher than today** (stabilised over centuries), but requires humanity to rapidly reduce human-induced global GHG emissions now (i.e. >50% reduction by 2030, and to zero by 2050).<sup>3</sup>
- B. The alternative highly undesirable climate state may be like in the **Mid-Miocene age**, that occurred **15–17 million years ago**, atmospheric CO<sub>2</sub> levels were in the range of **300–500 ppm**, mean global temperatures were **+4.0–5.0°C**, and sea levels were **+10–60m higher** (stabilised over centuries), **which is likely with our current global GHG emissions trajectory**.

**Humanity and human civilisation might adapt to Option A – Mid-Pliocene climate like conditions, but human civilisation is highly likely to collapse in Option B – Mid-Miocene climate like conditions**, with a global population likely declining below one billion people before 2100.<sup>4</sup>

A 1°C global mean temperature rise (above pre-industrial age) means the emergence of dangerous climatic conditions; 2°C means the onset of “*extremely dangerous*” climatic conditions; 3°C means “*outright chaos*”; and 4°C means “*incompatible with organised global community*”.<sup>5</sup>

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<sup>1</sup> **Keynote Debate Can the Climate Emergency Action Plan lead to Collective Action\_ (50 Years CoR)**, from about time interval 0:05:31 through to 0:40:20, <https://www.youtube.com/watch?v=QK2XLeGmHtE>

<sup>2</sup> **Trajectories of the Earth System in the Anthropocene**, by 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, Richarda Winkelmann, and Hans Joachim Schellnhuber, published in the *Proceedings of the National Academy of Sciences of the United States of America* (PNAS), vol. 115, no. 33, pp8252-8259, online on 6 Aug 2018, <http://www.pnas.org/cgi/doi/10.1073/pnas.1810141115>

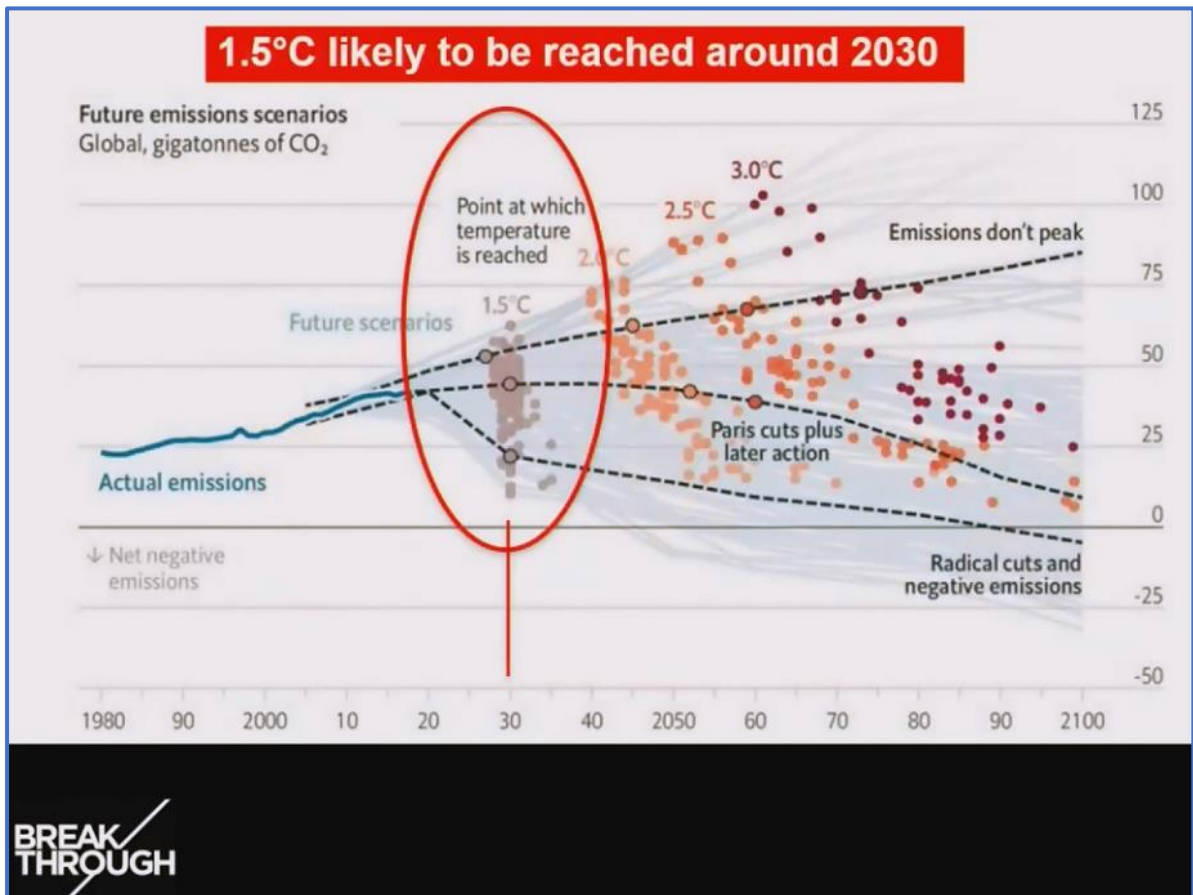
<sup>3</sup> **Existential climate-related security risk: A scenario approach**, by David Spratt and Ian Dunlop, published by Breakthrough – National Centre for Climate Restoration, May 2019 (updated 11 June 2019), <https://www.breakthroughonline.org.au/papers>

<sup>4</sup> <http://www.climatecoded.org/2019/08/at-4c-of-warming-would-billion-people.html>

<sup>5</sup> *Ibid.* 1, presentation by Ian T. Dunlop from about time interval **1:32:55 through to 1:42:20**

## 1.5°C temperature rise likely to be reached around 2030

On 14 February 2020, David Spratt, Research Director at Breakthrough – National Centre for Climate Restoration, made a presentation to the opening plenary, “The New Climate Reality Check”, at the National Climate Emergency Summit 2020 at the Melbourne Town Hall.<sup>6</sup> Spratt highlighted that the world has a short-run problem, where a 1.5°C temperature rise above pre-industrial age is likely to be just a decade away, as a consequence of past GHG emissions already in the atmosphere.



**Figure 1: Future emissions scenarios, temperature rise and timings up to 2100<sup>7</sup>**

1.5°C is dangerous, close at hand (see Figure 1 above), and now practically impossible to avoid, as there is no carbon budget remaining for 1.5°C.

To stay below 2°C, itself far from safe, requires global emissions to be more than cut in half in the next ten years, and much more in the high-emitting rich nations like Australia.

Climate disruption is now an existential threat to our civilisation as we know it today. This is an emergency requiring everyone making climate the primary priority of economics and politics, because slow, incremental change now means we are losing.

<sup>6</sup> <https://www.climateemergencysummit.org/full-program/>

<sup>7</sup> <http://www.climatecoded.org/2020/02/a-climate-reality-update-at-2020.html>

## All coal capacity will be uncompetitive with renewables by 2030

Analysis recently published by Carbon Tracker indicates renewables are already cheaper than new coal-fired power stations in all major markets, exposing almost a trillion dollars of new investments and depressing Australia's coal exports, and that by 2030 at the latest, new wind and solar farms will be cheaper to build than existing coal plants.<sup>8</sup>

It makes undeniable economic sense for governments to cancel all new coal-related projects immediately and rapidly phase out existing thermal coal mines and coal-fired power plants while encouraging rapid and effective deployment of renewable generation and energy storage solutions together with transmission upgrades.

## Climate change mitigation responses

Professor Andrew Blakers indicated at a recent 100% renewable energy workshop at ANU<sup>9</sup> that an effective climate change mitigation response requires:

- Renewable electrification of nearly everything – electricity generation, land transport, heating/cooling, and heavy industry;
- Zero oil, gas, and coal – this means 85% GHG emissions reduction;
- Meeting targets building new solar and wind generation at a build rate of:
  - **2.5 GW/year** (Government projections) means completion by about **2200**;
  - **6 GW/year** (current rate) means completion by about **2100**;
  - **15 GW/year** means completion by about **2050** – **Not Fast Enough**;
  - **21 GW/year** means completion by about **2040** – **Barely Adequate**.

Professor Blakers says there are two federal electorates in NSW which would be ideal locations for renewable energy zones:

- **Calare** – currently held by Andrew Gee MP, National Party; and
- **Hume** – currently held by Angus Taylor MP, Liberal Party.

Both are ideal for wind and solar generation, and pumped-hydro energy storage, and both have good transmission corridors. Blakers reportedly said:

- ***“We’re talking about tens of billions that could come into these electorates.”***
- ***“It’s unbelievable that the local federal and state members aren’t all over this.”***

There’s ***“nothing to invent”*** to switch the energy grid to 100% renewables.

**Why are governments delaying what must be done to mitigate the escalating existential risks of dangerous climate change that would likely extinguish billions of people’s lives in future, yet are willing to accept and promptly act on scientific advice, whatever the cost to economies and disruptions to people’s lives, to mitigate non-existent risks to most of humanity from COVID-19?**

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<sup>8</sup> <https://carbontracker.org/reports/how-to-waste-over-half-a-trillion-dollars/>

<sup>9</sup> <https://www.solarquotes.com.au/blog/transmission-renewable-energy/>

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## COVID-19 delivers another blow to embattled US shale oil producers

Figure 2 below shows that US tight (shale) oil production ramped-up when oil prices were around \$100 per barrel but peaked in March 2015 and then declined as oil prices dropped to \$50 per barrel. Production began recovery in September 2016 but almost half of the production, mainly from Bakken, Eagle Ford, Niobrara and Anadarko, has already peaked again in October 2019. The other half of the production, from the Permian (in Texas) is still growing but monthly growth rates have declined from 180 kb/d in mid-2018 to 40 kb/d now. Recent data are preliminary.

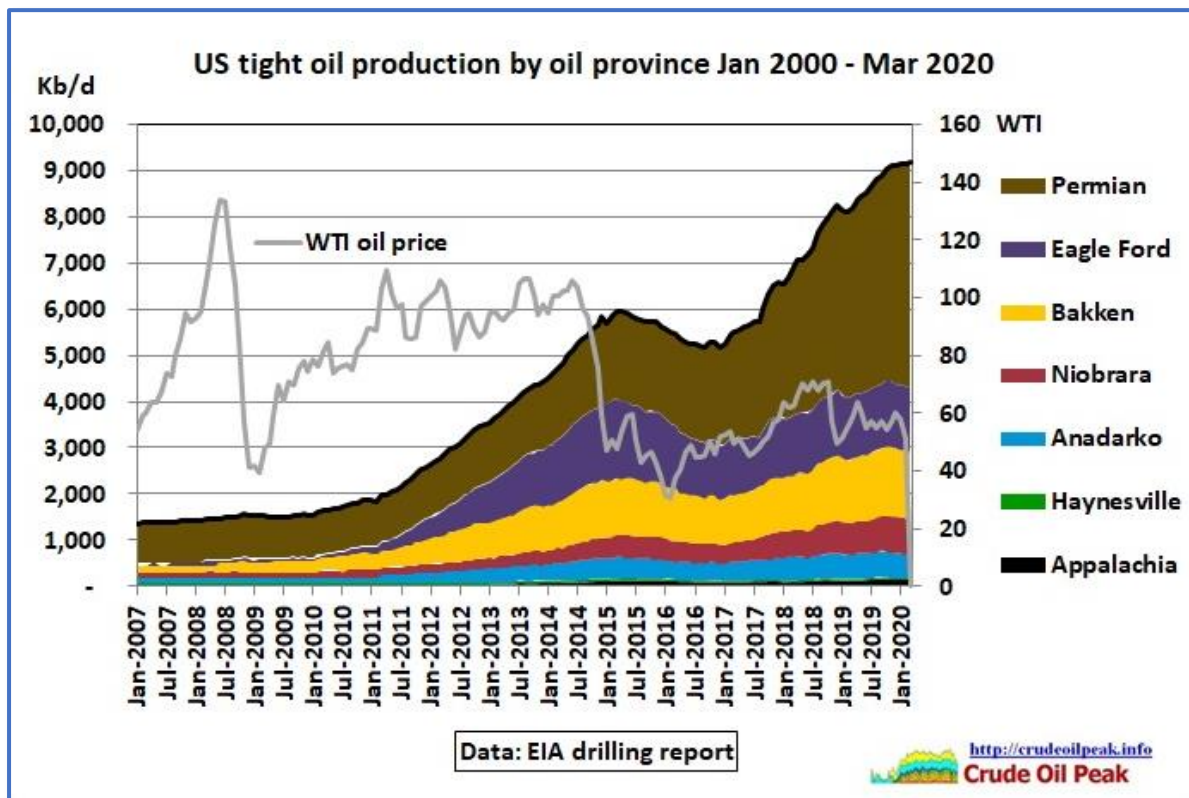


Figure 2: US tight oil production by oil province – Jan 2007 to Mar 2020<sup>10</sup>

US tight oil producers were already facing a tough 2020, but effects of the COVID-19 crisis on world economies is putting them under even more financial stress. Amid an oversupply of oil and gas, and an oil price-war stoked by Russia and Saudi Arabia, plus cuts to spending to appease investors over dismal returns, greater challenges are being imposed on a business sector where many firms are already saddled with debt.

Since the 2008 oil price shock, a problem has emerged that **oil prices must be both affordable to consumers AND high enough for the oil industry to be profitable to survive** while the transition to low-emissions solutions progresses. The COVID-19 crisis is battering global economies and financial systems riddled with accumulated debt incurred during the high oil price period and after the end of the low-cost oil era.

Will an oil and gas glut quickly flip to global shortages when the COVID-19 crisis ends?

<sup>10</sup> <https://crudeoilpeak.info/impact-of-corona-virus-similar-to-some-earlier-peak-oil-scenarios>