

IMPACTS OF CLIMATE- MITIGATION MEASURES IN AUSTRALIA



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Globally, in 2009, humankind emitted 30,303 million metric tons of carbon dioxide (mmtCO₂: EIA, 2011a), of which emissions from Australia accounted for 418 mmtCO₂, or a 1.38% (EIA, 2011a). The proportion of manmade CO₂ emissions from Australia will decrease over the 21st century as the rapid demand for power in developing countries such as China and India rapidly outpaces the growth of Australia's CO₂ emissions (EIA, 2010).

During the past 10 years, global emissions of CO₂ from human activity have increased at an average rate of 2.8%/yr (EIA, 2011a), meaning that the annual year-over-year *increase* of anthropogenic global CO₂ emissions is twice as large as Australia's *total* emissions. This means that even a complete cessation of *all* CO₂ emissions in Australia will be completely subsumed by global emissions growth in about than 6 month's time! In fact, China adds alone adds a bit more than one Australia's-worth of *new* emissions to its annual emissions total each and every year.

It is possible to estimate the impact that Australia's CO₂ emissions will have on the projected rise in global average temperature and sea level rise using a methodology established in the scientific literature (Wigley, 1998). Such an analysis reveals that an immediate and complete cessation of *all* Australia's CO₂ emissions will result in a projected temperature "savings" of only about 0.02°F (two one-hundredths of a degree Fahrenheit) by the end of this century. The resultant sea level rise "savings" will amount to less than one-tenth of an inch. Such amounts are environmentally irrelevant and virtually impossible even to scientifically detect.

Analyses such as these firmly establish that regulations prescribing a *reduction*, or even a complete cessation, of Australia's CO₂ emissions will have *absolutely no meaningful effect* on global climate.

METHODOLOGY FOR ESTIMATING GLOBAL TEMPERATURE AND SEA LEVEL RISE "SAVINGS" FROM EMISSIONS REDUCTIONS

Wigley (1998) examined the climate impact of adherence to the emissions controls agreed under the Kyoto Protocol by participating nations, and found that, if all developed countries meet their commitments in 2010 and maintain them through 2100, with a mid-range sensitivity of surface temperature to changes in CO₂, the amount of warming "saved" by the Kyoto Protocol would be 0.07°C by 2050 and 0.15°C by 2100. The global sea level rise "saved" would be 2.6 cm, or one inch. A complete cessation of CO₂ emissions in Australia is only a tiny fraction of the worldwide reductions assumed in Dr. Wigley's global analysis, so its impact on future trends in global temperature and sea level will be only a minuscule fraction of the negligible effects calculated by Dr. Wigley.

We now apply Dr. Wigley's results to CO₂ emissions in Australia, assuming that the ratio of Australia's CO₂ emissions to those of the developed countries which have agreed to limits under the Kyoto Protocol remains constant at about 3.0% throughout the 21st century. We also assume that developing countries such as China and India continue to emit at an increasing

rate. Consequently, the annual proportion of global CO₂ emissions from human activity that is contributed by human activity in the Australia will decline. With these assumptions, we generate the following table derived from Wigley’s (1998) mid-range emissions scenario (which itself is based upon the IPCC’s scenario “IS92a”):

Table 1
Projected Annual CO₂ Emissions (mmtCO₂)

Year	Global Emissions (Wigley, 1998)	Developed Countries (Wigley, 1998)	Australia (3% of developed countries)
2000	26,609	14,934	448
2025	41,276	18,308	549
2050	50,809	18,308	549
2100	75,376	21,534	646

Note: Developed countries’ emissions, according to Wigley’s assumptions, do not change between 2025 and 2050: neither does total Australian emissions.

In Table 2, we compare the total CO₂ emissions saving that would result if Australia’s CO₂ emissions were completely halted by 2025 with the emissions savings assumed by Wigley (1998) if all nations met their Kyoto commitments by 2010, and then held their emissions constant throughout the rest of the century. This scenario is “Kyoto Const.”

Table 2
Projected Annual CO₂ Emissions Savings (mmtCO₂)

Year	Australia	Kyoto Const.
2000	0	0
2025	549	4,697
2050	549	4,697
2100	646	7,924

Table 3 shows the proportion of the total emissions reductions in Wigley’s (1998) case that would be contributed by a complete halt of all Australia’s CO₂ emissions (calculated as column 2 in Table 2 divided by column 3 in Table 2).

Table 3
Australia’s Percentage of Emissions Savings

Year	Australia
2000	0.0%
2025	11.7%
2050	11.7%
2100	8.2%

Using the percentages in Table 3, and assuming that temperature change scales in proportion to CO₂ emissions, we calculate the global temperature savings that will result from the complete cessation of anthropogenic CO₂ emissions in Australia:

Table 4
Projected Global Temperature Savings (°C)

Year	Kyoto Const.	Australia
2000	0	0
2025	0.03	0.0035
2050	0.07	0.0082
2100	0.15	0.0123

Accordingly, a cessation of all of Australia’s CO₂ emissions would result in a climatically-irrelevant global temperature reduction by the year 2100 of a bit more than one one-hundredths of a degree Celsius (about two one-hundredths of a degree Fahrenheit). Results for sea-level rise are also negligible:

Table 5
Projected Global Sea-level Rise Savings (cm)

Year	Kyoto Const.	Australia
2000	0	0
2025	0.2	0.02
2050	0.9	0.11
2100	2.6	0.22

A complete cessation of all anthropogenic emissions from Australia will result in a global sea-level rise savings by the year 2100 of an estimated 0.22 cm, or less than one tenth of an inch. Again, this value is irrelevant.

**Further Analysis of Carbon Dioxide Emissions Reductions in Australia
and Potential “Savings” in Future Global Temperature and Global Sea Level Rise**

If Australia as a whole were to stop emitting all carbon dioxide (CO₂) emissions immediately, the ultimate impact on projected global temperature rise would be a reduction, or a “savings”, of approximately 0.015°F by the year 2050 and 0.022°C by the year 2100—amounts that are, for all intents and purposes, negligible.

The impact of a complete and immediate cessation of all CO₂ emissions from Australia on projections of future sea level rise would be similarly small—a reduction of the projected sea

level rise of only 0.04 inches by 2050 and 0.09 inches (that is, less than one-tenth of an inch) by the year 2100.

The current growth rate in CO₂ emissions from other countries of the world will quickly subsume any reductions in Australia's CO₂ emissions. Based on trends in CO₂ emissions growth over the past decade, global growth will completely replace an elimination of all CO₂ emissions from Australia in just 6 months, while growth in emissions from China alone will replace an elimination of all Australia's emissions in just under a year. Subsuming a proposed reduction (rather than a complete cessation) of Australia's emissions will occur even more quickly.

Table: Analysis of Carbon Dioxide Emissions (for 2009) and Potential "Savings" in Future Global Temperature and Global Sea Level Rise

	2009 Emissions (million metric tons CO ₂)	Percentage of Global Total	Time until Total Emissions Cessation Subsumed by Foreign Growth (days)		Temperature "Savings" (°F)		Sea Level "Savings" (inches)	
			Global Growth	China Growth	2050	2100	2050	2100
Australia	418	1.38	178	323	0.015	0.022	0.04	0.09

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Cover photo of a sunrise in Western Australia posted by aussiebluesman on wunderground.com.



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