Statement regarding human CO₂ emissions and the atmospheric CO₂ reservoir

I have been approached by environmental scientist Dr Haydn Washington, a Visiting Fellow at the Institute of Environmental Studies at UNSW, for comment in regard to statements made in the Coalpac Environmental Assessment. These are:

The quoted figure on p. x of the Exec Summary of the EA refers to:

‘estimated current global emissions of 3000 gigatonnes of carbon dioxide equivalent per annum’.

In section 4.4.8 (p. 45) of the ‘Coalpac Response to Submissions’ it states:

The submissions regarding a ‘hundred-fold error’ in calculating the percentage of GHG emissions from the Project in terms of the world’s current carbon dioxide load (3,000 Gt of CO₂-e) is incorrect. The calculation is as follows:

7 Mt / 1,000,000,000 = 0.0007 Gt
That is, 0.007 Gt (Project’s estimated contribution)/3,000 Gt (world’s current carbon dioxide load) * 100 = 0.00023% (rounded to 0.0003% in the AQIA for conservatism).

Assuming these are correct, my comment is purely in regard to the climate science involved.

There appears to be a confusion in these statements between human emissions of CO₂ and the reservoir of CO₂ in the atmosphere. In fact, global anthropogenic emissions are 7.7 Gt of C or 7.7 x 3.67 = 28.2 Gt CO₂ (see: http://www.nasa.gov/images/content/544800main_globe-CarbonCycle-hi.jpg ) or possibly an upper limit of 36.8 Gt CO₂ (http://co2now.org/Current-CO2/CO2-Now/global-carbon-emissions.html ). Data on anthropogenic emissions are available from the Carbon Dioxide Information and Analysis Centre (http://cdiac.ornl.gov/ftp/ndp030/global.1751_2008.ems).

The reservoir of CO₂ in the atmosphere is of course much larger at around 750 Gt carbon or 2752 Gt CO₂ (http://www.nasa.gov/images/content/544800main_globe-CarbonCycle-hi.jpg ) or 720 Gt C and 2642 Gt CO₂ (Falkowski et al, 2000). The Appendix G to the Coalpac report lists the atmospheric reservoir (unreferenced) as 3,000 Gt.

Human CO₂ emissions are not the same as the CO₂ reservoir in the atmosphere. The former can be rounded off to around 30 Gt CO₂/ yr while the atmospheric reservoir is around 3000 Gt – a hundred times larger. It is important not to confuse these two separate aspects of climate science. For an overview of some common misconceptions regarding the carbon cycle, see Cawley (2011).

Yours faithfully,

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[Redacted]
Reference
