Senate Standing Committee on Economics
ANSWERS TO QUESTIONS ON NOTICE
Innovation, Industry, Science and Research Portfolio
Budget Estimates Hearing 2010-11
31 May 2010

AGENCY/DEPARTMENT: COMMONWEALTH SCIENTIFIC AND RESEARCH ORGANISATION

TOPIC: State of the climate snapshot

REFERENCE: Written Question–Senator Eggleston

QUESTION No.: BI-63

1. In answers at the Budget Estimates Hearing on 31 May 2010, Dr Clark stated that the State of the Climate Snapshot was designed to present information "at the five-decade level in a way that was clear, across a number of areas". Why, then, are not all of the figures provided "at the five-decade level"? Five of the eight figures in the publication begin at 1960 but there are three that don't. One begins in 1975, another in 1870, and another in the year 1000.

2. Especially in light of the controversy over the Atmospheric Carbon Dioxide and Methane graph on page five in particular, why has that graph not been confined to the 1960 to 2009 period (like the figures for rainfall and temperature elsewhere in the document) too?

3. Why is the source for the Atmospheric Carbon Dioxide and Methane graph on page five noted as "CSIRO 2007" when the Budget Estimates Hearing on 31 May 2010 was advised that the graph includes atmospheric carbon dioxide and methane figures up to 2009?

4. Why does the snapshot say "global CO2 concentrations have risen rapidly over the last century? Methane, which is another greenhouse gas, has shown similar increases" when there actually appears to have been a substantial difference between them since 1990?

5. On page three of the Snapshot, it says that "total rainfall on the Australian continent has been relatively stable". Why have the words "relatively stable" been used when a graph on the Bureau of Meteorology's website titled 'Annual Rainfall Anomaly – Australia' clearly shows it has increased – by around 6mm a decade over the last 100 years? Given that longer timeframes were used for other components of the report, why was a graph that implied the reverse of what has actually taken place since the early twentieth century presented?

ANSWER

1. The graph of carbon dioxide begins in 1976 as this was when direct measurements commenced; hence the record was not able to be shown from 1960. These direct measurements were shown in the context of the 1000-year record of carbon dioxide and methane from measurements on air trapped in Antarctic ice and firm to highlight that recent concentrations are higher than the earlier natural range of concentrations. CSIRO also has sea-level data extending into the nineteenth century. There is no reason to restrict CSIRO discussion of sea-level or carbon dioxide data to the same period as shown for the Bureau of Meteorology's rainfall and temperature.

2. CSIRO has two sources of information on the past carbon dioxide levels in the southern hemisphere atmosphere: direct measurements which commenced in 1976 (as shown in the Figure at the bottom of page 5) and from measurements of air trapped in Antarctic ice (included in the Figure at the top of page 5). There is no reason to restrict CSIRO discussion of carbon dioxide data to the same period as rainfall and temperature. Recent concentrations were shown in the context of the past 1000 years to highlight that these are higher than the earlier natural range of concentrations.

3. The CSIRO source of these data is the following peer-reviewed, published research paper: MacFarling Meure, C., Etheridge, D., Trudinger, C., Steele, P., Langenfelds, R., van Ommen, T., Smith A. and Elkins J. W. (2006). Law Dome CO2, CH4 and N2O ice core records extended to 2000 years BP, Geophysical Research Letters, 33 (14), 10.1029/2006GL026152.

The Cape Grim carbon dioxide data are regularly reported. The latest peer-reviewed paper publishing CSIRO Cape Grim carbon dioxide data is: Francey et al., Differences between trends in atmospheric CO2 and the reported trends in anthropogenic CO2 emissions, Tellus B, accepted (May 2010)–reports data up to the end of 2009. The data was updated for the Snapshot using CSIRO data from 2006 to 2009. Hence the Source has been corrected to CSIRO 2009.

4. The overall longer-term trends in atmospheric methane concentration have been presented rather than a detailed analysis of very recent patterns, for message simplicity and consistency with the multi-decadal perspective in the rest of the Snapshot. This statement is an interpretation of the graph in lay terms over the majority of the record for the purpose of the summary document.
A more detailed analysis of recent methane concentrations in lay terms is available on the CSIRO website at <http://www.csiro.au/news/Has-Methane-Stabilised.html>. This analysis explains that "following almost a decade with little change in global atmospheric methane, new measurements show renewed atmospheric growth starting in 2007, continuing through 2008 and starting to wane in 2009."

5. The rainfall and temperature data in the Snapshot relate only to the last 50 years. The Bureau of Meteorology, which has responsibility for collecting Australia's rainfall observations, advise CSIRO that over this fifty year period, when annual rainfall is averaged across the entire Australian continent, the increase of approximately 5mm per decade for the last fifty years is not statistically significant, i.e. it is quite small compared with year-to-year changes. This point is made on page 3 of the Snapshot (immediately under the heading 'Rainfall') followed by the point that the 50-year trend is also regionally variable – with a trend of increasing rainfall in northern Australia and decreasing rainfall in the south, above background year-to-year variation.