Narrabri Gas Project,
Australian Air Quality Group, Submission, May 2017

Summary

The Paris Agreement committed all countries to an overarching goal of "*holding the global average temperature increase to well below 2℃*" and "*pursuing efforts to keep warming below 1.5 ℃ above pre-industrial levels.*"

Climate models show that this goal will not be achieved without significant efforts to reduce emissions of short-lived-climate-pollutants (SLCP, also called greenhouse super-pollutants) that account for about half of current warming.

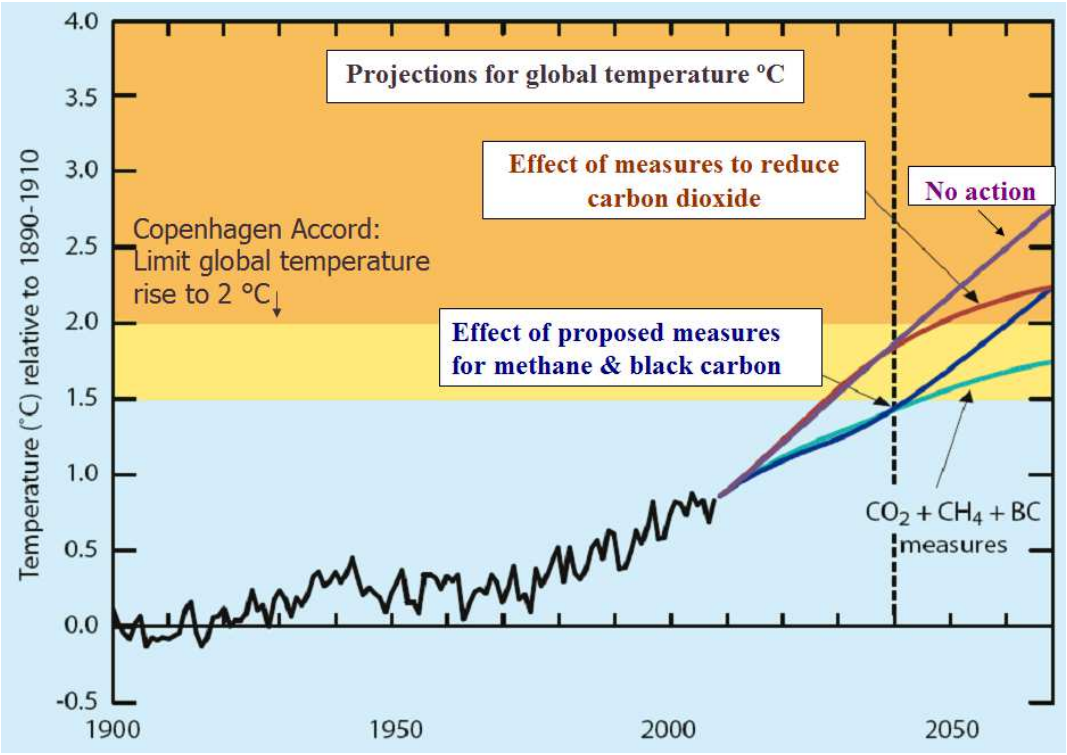
Rapidly increasing temperatures threaten to devastate on our coral reefs. The Arctic and Antarctic are warming at twice the global average rate. When polar ice melts, it absorbs radiation instead of reflecting it back into space, leading to increased future warming. When permafrost and undersea ice melt, the powerful greenhouse gas, methane, is released, adding to future warming. Prof Carlos Duarte, Director, Oceans Institute, University of WA, warned that the amount of greenhouse gas locked away in the Arctic is several times the total CO_2 release since the industrial revolution. The increasing numbers of methane blowholes discovered in Siberia also demonstrate the need for urgent action.

Because SLCP stay in the atmosphere for much shorter periods of time than CO_2, highly cost-effective measures could drastically reduce the 50% of the global temperature rise due to emissions of SLCP such as methane, black carbon, HFC, CO and other ozone precursors. These cost-effective measures include preventing methane leaks from mines, pipelines and fracking, providing developing countries with clean cook-stoves, cleaning up diesels, avoiding open burning of biomass waste, and phasing out log-burning stoves in developed countries.

Alarming studies in the United States have detected methane emissions in coal seam gas fields of 2-17%. Preliminary investigations show that there are significant leaks in Australian coal seam gas installations. Under the Precautionary Principle, the Narrabri gas project should not go ahead until a full greenhouse gas (GHG) assessment has been conducted of its climate impact over the next 20 years – the critical time period if we want to meet the Paris agreement of keeping the global temperature rise well below 2 degrees.

This assessment should be based on new methodologies developed after detailed measurements of trial wells in the Pilliga and other gas facilities, e.g. the Surat Basin, where methane spikes have been detected of up to 6.5 parts per million (nearly 4 time higher than background concentrations). Until recently, it was presumed only tiny quantities of gas leaked from onshore fields. In the light of the new knowledge, it would be grossly negligent to allow this development to go ahead, based on a false assessment under an incorrect presumption that methane leaks will be negligible.

As a result of the Paris Agreement, global action will be needed to implement the most cost-effective strategies to minimize the global temperature rise by reducing both SLCP and CO_2 emissions. The new assessment of the Narrabri Gas Project should consider its impact on the global temperature rise over the next 20 years as well as the next 100 years. All current and gas projects need comprehensive monitoring for fugitive emissions. The results of Santos' assessment should also be subject to critical scrutiny, in the light of the admission in May 2017 that Santos' business plans are based on accepting a global temperature rise of 4 degrees centigrade.



In the next 10-20 years, solar, wind and pumped hydro will be much cheaper than fossil fuel power, so there will be no little or no market for non-renewables and the financial benefits of this project are questionable. However, the financial implications of allowing SLCP super-pollutant emissions to continue at current rates for another 20 years could be disastrous. By that time, it will be too late to save the reef. As polar ice melts, releasing the super-pollutant methane and creating even more warming, there will be no chance of keeping the global temperatures rise well below 2 degrees.

Figure: UN Environment Program model showing critical role of SCLP in keeping the global temperature rise well below 2° C

Details

Under the Paris Agreement, all countries committed to an overarching goal of keeping the global average temperature rise well below 2 degrees and pursuing efforts to keep warming below 1.5 degrees above pre-industrial levels.

As shown by the graph above (from UNEP/WMO, 2011)[1] this goal cannot be achieved without efforts to reduce emissions methane and black carbon - short-lived-climate-pollutants (SLCP, also called greenhouse super-pollutants) that account for about half of the heat being trapped by man-made greenhouse gas emissions. An immediate reduction in warming from tackling super-pollutants would buy us time to implement a cost-effective transition to wind, solar, pumped and conventional hydro, together with renewable technologies such as efficient heat pumps that can deliver 5 or 6 times as much heat as they use in electric power, and growing trees or other biomass to absorb CO_2 from the atmosphere.

Need for new methodologies. New greenhouse methodologies are needed to assess both long-term and short-term impacts of all emissions on global temperatures, including the effect of feedback mechanisms that increase future warming. Current warming is melting polar ice, so radiation is absorbed instead of reflected back into space, leading to increased future warming. When permafrost and undersea ice melt, the powerful greenhouse gas, methane is released, adding to future warming.

Prof Carlos Duarte, Director, Oceans Institute, University of WA warned that *the amount of greenhouse gas locked away in the Arctic is several times the total CO_2 release since the industrial revolution*.[2] The need for urgent action is demonstrated by the discovery of increasing numbers of methane blowholes (see picture left), and a new 5 square km lake that appears to have been formed from an eruption of a cluster of blowholes, the largest of which appears to measure 100m by 50m.[3]

Melting Siberian Permafrost is producing methane blow-holes. [3]

Deep mystery ... One of the larger Siberian blowholes. Source: Siberian Times

Future reviews of emissions targets should be based on a process that evaluates the impact on the global temperature rise. International agreements are needed on developing new methodologies to replace out-of-date emissions inventories based on manifestly incorrect assumptions that ignore feedback mechanisms and make unjustified assumptions about fugitive emissions from gas wells and other facilities. Nobel prize-winner Mario Molina, renowned climate scientist V. Ramanathan and sustainability expert Durwood Zaelke warn: "*Unless we rapidly slow down these self-amplifying feedback mechanisms (by reducing super-pollutant emissions), we could lose the first major battle of climate change and face worse problems in the future.*"[4]

Alarming studies in the United States have detected methane emissions in coal seam gas fields of 2-17%. Preliminary investigations show significant leaks in Australian coal seam gas installations.[5] Under the Precautionary Principle, the Narrabri gas project should not go ahead until a full greenhouse gas (GHG) assessment has been conducted of its climate impact over the next 20 years – the critical time period if we want to meet the Paris agreement of keeping the global temperature rise well below 2 degrees.

The greenhouse gas emission predictions in Chapter 24 and Appendix R of Santos' EIS are based on loss factors and formulae from guidelines that emanated from North America a decade ago, and national assessment guidelines that take

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[1] UNEP/WMO. 2011. Integrated Assessment of Black Carbon and Tropospheric Ozone. Summary for Decision Makers. UN Environment Program & World Meteorological Organization. www.unep.org/dewa/Portals/67/pdf/Black_Carbon.pdf

[2] Duarte, C. and Huertas, A. D. (2012). "Methane hydrates: a volatile time bomb in the Arctic " The Conversation. Available at: http://theconversation.com/methane-hydrates-a-volatile-time-bomb-in-the-arctic-9891.

[3] http://www.news.com.au/technology/environment/climate-change/more-siberian-methane-blowholes-found-in-permafrost/news-story/1b33108a8b6a4c6aaf5f09d2f1b68f08

[4] Molina, M., Ramanathan, V. and Zaelke, D. (2016). "Paris Deal's Carbon Cuts Miss Critical Warming Target. The Energy Collective. www.theenergycollective.com/durwood-zaelke/2376628/paris-deals-carbon-cuts-miss-critical-warming-target."

[5] http://www.abc.net.au/news/2017-02-28/methane-emissions-from-coal-seam-gas-climate-change/8310932

no account of actual emissions from Australian coal seam gas production. The proponents should be required to provide a much more thorough assessment of likely emissions and warming over both the 20-year and 100-year time frames, using the current IPCC GWP of 88 for fossil methane (20 years) and 35 (100 years). Other greenhouse emissions such as CO and black carbon should also be included. Future greenhouse inventories will use updated methodologies based on the latest scientific information. It would therefore be negligent of this government to accept an assessment based on what we now know to be incorrect and out-of-date GWP and emissions factors.

The new assessment should use methodologies developed after comprehensive measurements of leaks using new high-sensitivity equipment at Santos' trial wells in the Pilliga and other Australian gas production facilities such as in the Surat Basin, where methane spikes have been detected of up to 6.5 parts per million (nearly 4 time higher than background concentrations). Until recently, it was presumed only tiny quantities of gas leaked from onshore fields. In the light of the new knowledge, it would be grossly negligent to allow this development to go ahead, based on a false assessment under an incorrect presumption that methane leaks will be negligible.

Reducing Short-Lived Climate Pollutants in California. California's strategy to reduce SLCP establishes a goal of reducing fugitive methane emissions from oil and gas by 40% percent below current levels in 2025 and a minimum 45% in 2030, similar to the US federal government's goal of reducing methane emissions from oil and gas operations by 40–45 percent below 2012 levels by 2025. California's strategy notes that the Air Resources Board is required, in consultation with the local air districts, to monitor and measure high-emission methane hot spots in the State. These efforts will continue, and are critical to the success of detecting leaks and reducing fugitive methane emissions from all sectors. The strategy also notes that *"Ultimately, to eliminate fugitive methane emissions, the State needs to transition away from its use of oil and natural gas.*" - www.arb.ca.gov/cc/shortlived/shortlived.htm

In the next 10-20 years, solar, wind and pumped hydro will be much cheaper than fossil fuel power, so there will be little or no market for non-renewables. But if super-pollutant emissions continue at current rates for the next 20 years, this transition will not save the reef, nor avert the substantial costs of global warming. As polar ice melts, increasing amounts of heat will be absorbed instead of reflected back into space and so much super-pollutant methane will be released to add to future warming that there will be no chance of keeping the global temperatures rise well below 2°C.

Renewables + storage have surpassed gas as the cheapest source of new peaking power (see the recently-released Vic government tender document - www.delwp.vic.gov.au/__data/assets/pdf_file/0006/381282/Energy-Storage-Initiative-FAQs.pdf). The Australian Energy Market Operator (AEMO) is undertaking a trial that uses demand response as an alternative to peaking gas plants. The head of the AEMO, Audrey Zibelman notes that trials are a good way to show a "proof of concept" that can then be used to bring in new market mechanisms and rules. "*I know it will work. This is a good way to go forward to provide the proof of concept.*" - http://reneweconomy.com.au/aemo-looks-at-smarter-ways-to-deal-with-extreme-peaks-and-heatwaves-40094/

These new developments suggest that the benefits of the new gas wells will be lower than expected, and that the risks to the climate will be substantially greater. The new assessment should take all these factors into account, especially the need to keep global warming well below 2 degrees and Santos' admission in May 2017 that its business plans are based on a global temperature rise of 4 degrees centigrade - www.theguardian.com/environment/2017/may/05/santos-admits-business-plan-based-4c-global-temperature-rise?

In conclusion, the project should not go ahead unless the new assessment shows that it is compatible with achieving the target set at Paris of "*holding the global average temperature increase to well below 2℃*" and "*pursuing efforts to keep warming below 1.5 ℃ above pre-industrial levels.*"