



# NEGLECTED TRANSFORMATIONAL RESPONSES TO CLIMATE CHANGE

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Gerard Wedderburn-Bisshop worked until 2010 as a Principal Scientist with the Queensland Government Department of Environment and Resources Management Remote Sensing Centre.

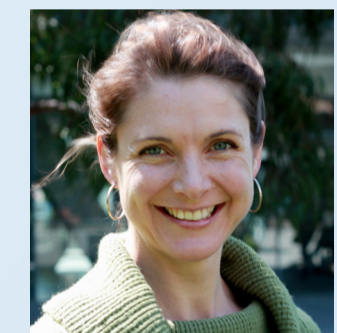
After 37 years in government, he now works on Beyond Zero Emissions' Land Use Plan, a plan to take Australia's land use and agriculture emissions beyond zero, and with NGO World Preservation Foundation, focussing on deforestation, land degradation and biodiversity loss.

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Andrew Longmire is a research fellow at Melbourne Sustainable Society Institute, working in collaboration with Beyond Zero Emissions to analyse feasible pathways towards net zero – or negative-emissions from Australian land use in a timeframe relevant to the threat of anthropogenic climate change.

Lauren Rickards  
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Lauren Rickards is a Research Fellow at the Melbourne Sustainable Society Institute at the University of Melbourne. A Rhodes Scholar, Lauren has an ecology and critical cultural geography background and is involved in a range of work on the Anthropocene and transformational climate change adaptation. With a CSIRO team, Lauren was recently a finalist in the Australian Museum Eureka Prize for Sustainable Agriculture research.

Prior to joining academia in 2011 Lauren was Associate Partner with RM Consulting Group (consulting primarily to government) and Vice-Principal of Janet Clarke Hall. Lauren is also a Visiting Research Associate at the University of Oxford School of Geography and the Environment.

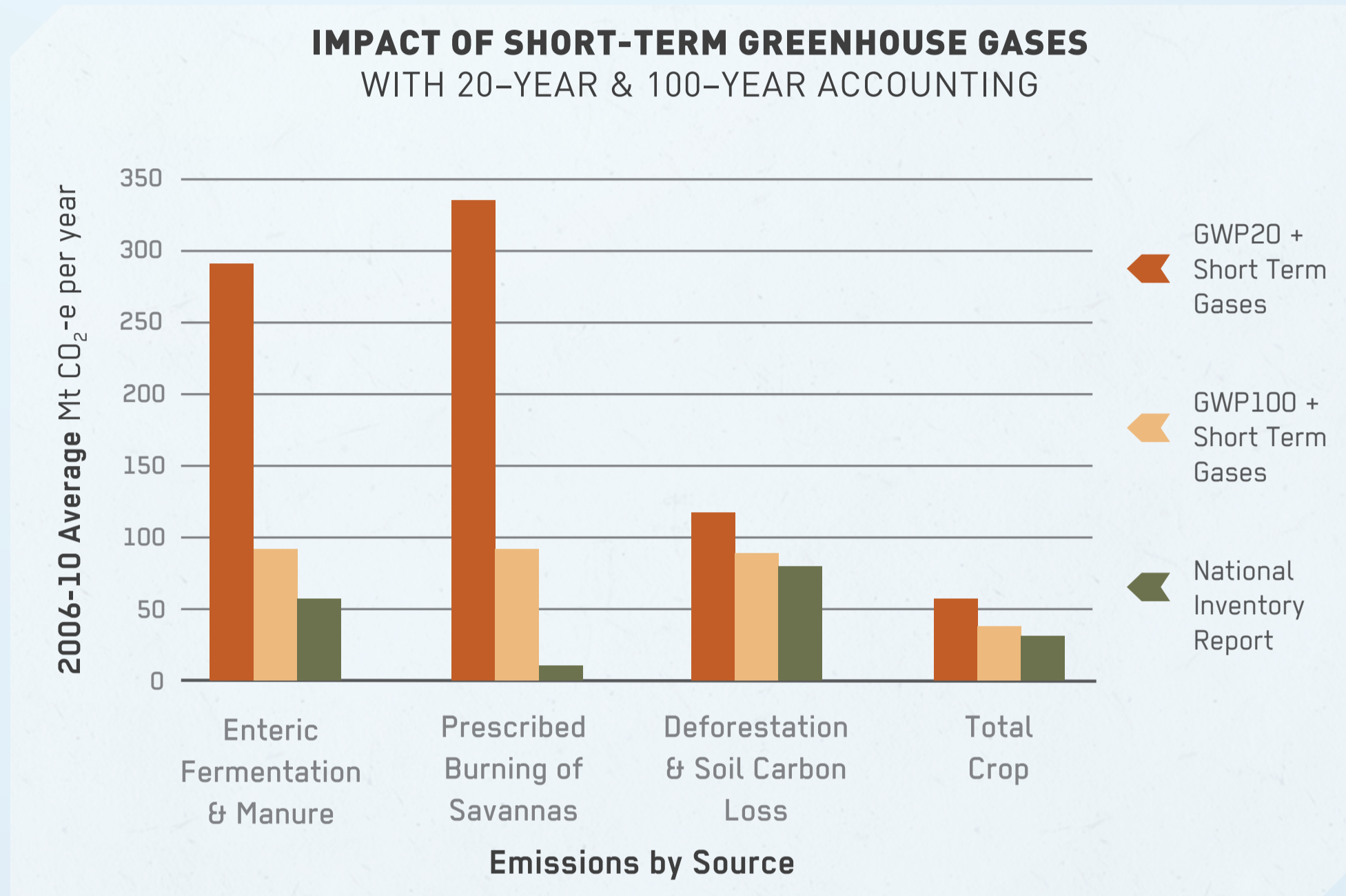
## IMPLICATIONS OF EXCLUDING SHORT LIVED EMISSIONS AND NEAR TERM PROJECTIONS IN GREENHOUSE GAS ACCOUNTING

### ABSTRACT

We re-calculated Australian national emissions to include short term gases carbon monoxide and subsequent tropospheric ozone, and with 20 year global warming potentials (GWPs) that reflect our proximity to dangerous warming thresholds. Agricultural emissions amounted to 54%, and livestock production 50%, of 2006-2010 national emissions. This leads to new, powerful mitigation targets, but also exposes how arbitrary warming timeframes and language has had a strong framing effect, hindering global mitigation debate. Our multi-disciplinary approach has identified transformational mitigation opportunities that can be driven by demand but requires adaptation challenges for consumers, producers and government.

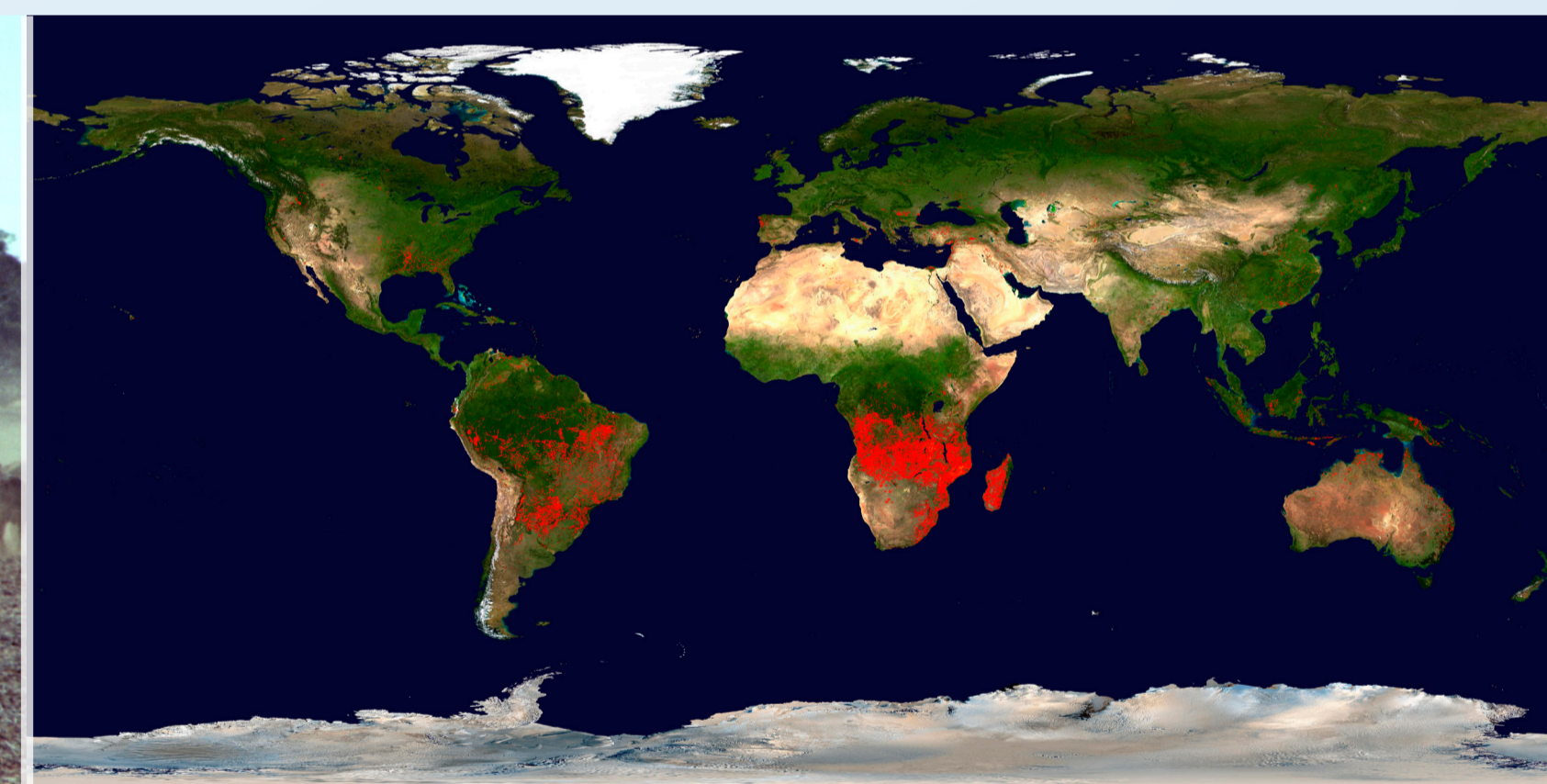
### CONSEQUENCES

- Total GHGs are underestimated.
- Serious near-term warming from shorter lived emissions is obscured.
- Rapid emission reduction opportunities overlooked.
- Potent short term GHG sources neglected (eg. livestock production).
- Assessing warming over coming decades more accurately addresses 2°C dangerous warming threshold.



### SHORT LIVED EMISSIONS

Short-lived emissions have long term importance. Globally, warming from carbon monoxide (CO) and tropospheric ozone O<sub>3</sub>(T) (which last for days) has caused 19% of human-caused warming since 1750. Ignoring short-term emissions therefore causes significant under-reporting. (Forster et al., 2007, Changes in Atmospheric Constituents and in Radiative Forcing). Mitigation of long lived gases is still of critical importance. Most Australian shorter lived emissions (CO, CH<sub>4</sub> and subsequent O<sub>3</sub>(T) ) are from agriculture.



### FRAMING

Arbitrary IPCC adoption of 100 year GWP and exclusion of short-lived emissions from national inventories has had powerful framing effects on mitigation debate.

Beyond Zero Emissions is a Climate Change solutions think tank based in Melbourne, Australia with offices in Sydney, Brisbane and Canberra. [www.bze.org.au](http://www.bze.org.au)

This poster includes work from the forthcoming Zero Carbon Australia Land Use Plan, a research project within BZE conducted in conjunction with the Melbourne Sustainable Society Institute [www.sustainable.unimelb.edu.au](http://www.sustainable.unimelb.edu.au)

### NEGLECTED RESPONSES

- An extreme but instructive proposition is that ceasing ruminant (red meat) production in Australia would reduce real national emissions by half. This response would have a transformative impact on warming in coming critical decades.
- Lot fed beef enteric fermentation (EF) is just 3.5% of total EF, therefore diet interventions are ineffective. Selective breeding and hormone growth promotants are most effective, but already in use.

- The prime mitigation target is northern beef production, responsible for the majority of deforestation, prescribed burning and EF from low digestibility C4 tropical pastures.

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### ADAPTATION

Optimal solution is bottom-up, consumer-led change, also has health and environmental benefits.

Producers must be supported. Alternative incomes from carbon farming, biofuels, alternative protein.

Including agriculture in carbon pricing would assist market transition.

Governments can adopt full GHG accounting with timeframes more relevant to dangerous warming.

### AUSTRALIAN CASE STUDY

We tally all GHGs and use NASA 20 year global warming potentials for CO and CH<sub>4</sub> that include their role as tropospheric O<sub>3</sub> precursors (Shindell et al., 2009, Improved Attribution of Climate Forcing to Emissions). Australian 2006-2010 average yearly emissions increase to 1497Mt CO<sub>2</sub>-e (GWP20) and 756Mt CO<sub>2</sub>-e (GWP100). Agricultural emissions increase to 693Mt CO<sub>2</sub>-e, or 54% of the national total (GWP20), and 319Mt

CO<sub>2</sub>-e, or 42% of the national total (GWP100). Ruminant emissions (enteric fermentation, manure, deforestation, soils, prescribed burning of savannas) make up half Australia's yearly emissions.

This is relevant to other countries with large ruminant livestock herds, extensive grazing lands and prescribed burning for pasture maintenance, such as those in Africa, the Americas and Asia, and to countries that import these products.