

Fact sheet #1

Climate, Clearing & Cows ^{logging}

Labor's jobs in land carbon opportunity



These fact sheets should be read with the campaign brochure. They are an attempt to arm you with a bit more information to increase your confidence as you explain these issues and to provide some background to some of the questions or challenges you might receive.

FACT SHEET 1: The Climate Change duo - fossil fuels and the land

Key messages:

- While fossil fuel use is the biggest challenge facing us, the way we continue to degrade nature is also a huge generator of carbon emissions. Healthy ecosystems store carbon, disturbing natural systems releases this carbon.
- Protecting and restoring healthy ecosystems not only reduces emissions, it is the only proven technology for drawing carbon out of the air. To have any chance of staying below 1.5 degrees we need not only to stop emitting greenhouse gases but to start drawing down the backlog of emissions in the atmosphere.
- You could try and explain the basics of the way natural ecosystems both store and absorb carbon, but you don't need to be an expert! It is enough to explain that photosynthesis is the process by which trees grow, and it relies on taking carbon from the atmosphere. This carbon is then stored and released when trees are destroyed.

Labor is already acting on climate change

The Albanese Government is acting to address the biggest source of climate pollution: fossil fuel use across our economy. As Labor people, we can be very proud. This is the first real action in a decade. Action so far (January 2023) includes:

- Ambition: a more ambitious 2030 emissions reduction target and a beefed up Climate Change Authority that will provide transparent expert advice on future targets, like 2035.
- Decarbonising electricity: commitment to deliver 82%+ renewable energy by 2030; Rewiring the Nation will provide \$20 billion to build the transmission lines we need; emissions reductions are now in the National Electricity Objectives; and protection against future energy crises with Australia's first renewable storage target.

- Reducing pollution from major industrial emitters: The Safeguard Mechanism will make our biggest carbon polluters reduce emissions every year.
- Transport emissions: Labor is about to release Australia's first genuine national Electric Vehicle Strategy
- Buildings: The 2023 Budget will contain major measures on emissions and energy efficiency in the housing sector

But there are two big sources of greenhouse gas emissions – energy use in all the sectors above, and the land.

The way in which Australia presents its greenhouse gas accounts makes it difficult to separate land sector emissions, as they are presented together with the emissions the land sector is storing (called sinks).

- In the year to June 2022, emissions from forest logging and clearing and agriculture together were around 120 million tonnes¹ of carbon emissions², which was three quarters of the emissions from the entire electricity sector (157 million tonnes), or around 6 of Australia's largest coal-fired power plants.³
- Excluding sinks (from regenerating forests), Australia's total greenhouse gas emissions in the year to June 2022 were around 566 million tonnes, so the land sector accounted for around 20% of total Australian emissions.
- This is similar to the estimated 22% of global greenhouse emissions from the land sector for 2019, published by the Intergovernmental Panel on Climate Change, the international experts who support the UN climate processes.⁴
- Unlike other sectors (notably electricity) where emissions are decreasing, Australia's land sector emissions rose 3.3% in the year to June 2022.
- A McKinsey/World Economic Forum report⁵ from 2021 estimates that nature-based solutions globally can contribute one third of cost-effective solutions to stabilise warming within the 1.5 degree threshold.

How does land carbon work?

1. Carbon is stored in trees, soils and healthy ecosystems. So logging and clearing emits lots of carbon. So does disturbing natural systems through intensified agriculture.

¹ Quarterly Update of Australia's National Greenhouse Gas Inventory: June 2022, Australian Government Department of Climate Change, Energy, the Environment and Water,

² When we use the term "Carbon emissions" it is shorthand for "CO₂ equivalent (Mt CO₂-e)"

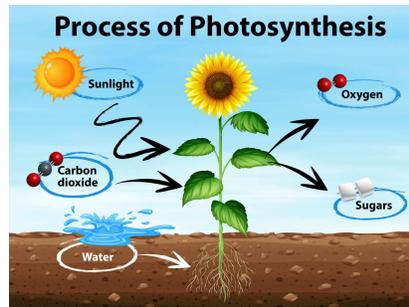
³ Based on a 2,000 kW coal-fired power plant emitting an average of 0.9kg CO₂ per kWh generated. The estimated emissions are from the Energy Council of Australia, 'Will coal play a role in the NEM', February 2017, <https://www.energycouncil.com.au/analysis/will-coal-play-a-role-in-the-new-nem/>

⁴ IPCC, 2022, *Climate Change 2022, Mitigation of Climate Change*. Working Group III contribution to the sixth assessment report, sourced from https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_SummaryForPolicymakers.pdf

⁵ World Economic Forum in collaboration with McKinsey and Co, Nature and Net Zero, 27 May 2021 www.weforum.org/reports/nature-and-net-zero

How the trees do it: Photosynthesis

The process of photosynthesis takes carbon dioxide and sunlight and transforms them into sugars and oxygen. It is how plants 'breathe' and grow. The carbon is then stored in trunks, roots and soils.



Source: Science Sparks <https://www.science-sparks.com/what-is-photosynthesis/>

Healthy, diverse ecosystems store more carbon than human-planted monocultures. A study in China found that species-rich forests stored around 32 tonnes of carbon per hectare after 8 years, compared with an average of 12 tonnes per hectare in plantation monoculture.⁶ A 2008 Australian study suggested even greater differentials between the carbon storage of natural forests and plantations.⁷

A carbon store

Australia's forests store 22,000 million tonnes of carbon⁸. This is around 44 times Australia's annual emissions and yet we are clearing this store-house at a rate of over 500,000 ha per year⁹. This is the equivalent of about 680 MCGs per day. We log around 70,000 ha of publicly owned native forests each year.¹⁰

Growing trees and plants is the only proven way to remove carbon from the atmosphere at scale

Right now, the only proven way to remove carbon from the atmosphere at scale is to grow trees and other vegetation, including native grasslands, wetlands, mangroves and seaweed forests.

So developing a strategy for land carbon will both reduce emissions (by stopping logging and clearing) *and* draw down carbon, helping to off-set emissions from other activities.

⁶ Science Daily, Species-rich forests store twice as much carbon as monocultures, 4 October 2018, <https://www.sciencedaily.com/releases/2018/10/181004143905.htm>

⁷ B Mackey et al, 2008, Green Carbon: The role of natural forests in carbon storage, <https://www.jstor.org/stable/j.ctt24hcnf>

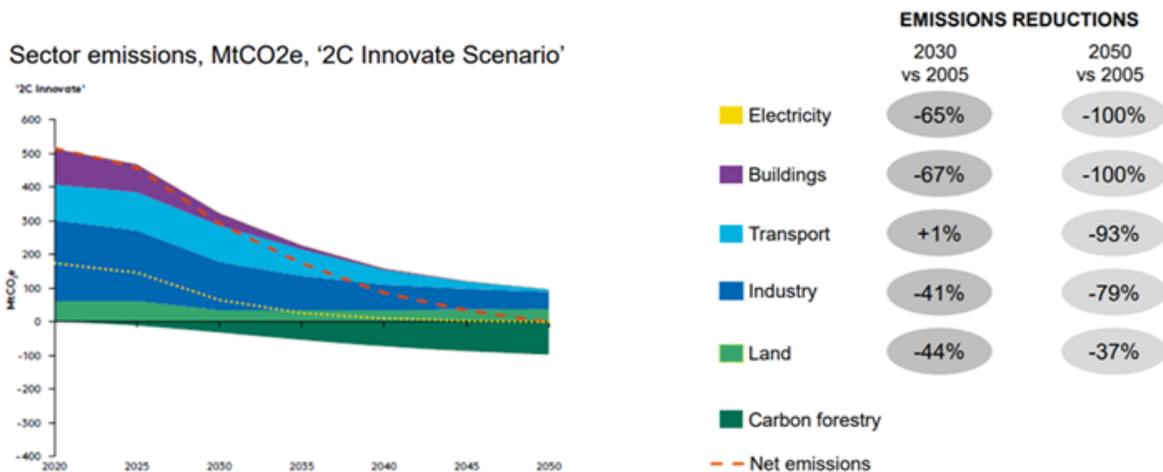
⁸ Australian Government, Department of Agriculture, Forests and Fisheries, State of the Forest Report 2018, p313

⁹ QLD Gov. SLATS data 2018-21 and NSW clearing figures

¹⁰ ABARES, State of the Forests 2018

ClimateWorks has modelled a pathway for the Australian economy to reach net zero by 2050.¹¹ The dark green is “carbon forestry” and sits in the negative space as it draws carbon out of the atmosphere to off-set activities that have technological barriers to reaching zero emissions.

All sectors can achieve very significant emissions reduction; the pace of reduction is aligned with technology maturity



And it's a win-win for the environment

Protecting healthy ecosystems has additional benefits in protecting biodiversity and reducing the threat of extinctions. Between 2000 and 2017, an estimated 7.7 million hectares - more than the area of Tasmania - of threatened species habitat was cleared,¹² contributing to Australia's dubious honour of having the highest number of mammal extinctions in the world.¹³

Natural ecosystems provide important services including purification of air and water, detoxification and decomposition of waste, regulation of climate, and regeneration of soil fertility. Forests play a critical role in regulating the water cycle, including mitigating floods and droughts, and protection against erosion.¹⁴

There's a catch - the Carbon Cycle is complex

Try not to get sucked into the complexity of the carbon cycle, but here is some background on it.

¹¹ Climate Works, Decarbonisation Futures, 2021 pg 13, Briefing Slide Pack, <https://www.climateworkscentre.org/resource/decarbonisation-futures-solutions-actions-and-benchmarks-for-a-net-zero-emissions-australia/>

¹² Ward MS, Simmonds JS, Reside AE, Watson JEM, Rhodes JR, Possingham HP, Trezise J, Fletcher R, File L & Taylor M (2019). *Lots of loss with little scrutiny: the attrition of habitat critical for threatened species in Australia*. Conservation Science and Practice 1(11):e117.

¹³ Murphy H & van Leeuwen S (2021). *Australia state of the environment 2021: biodiversity*, independent report to the Australian Government Minister for the Environment, Commonwealth of Australia, Canberra, DOI: 10.26194/ren9-3639, <https://soe.dcceew.gov.au/overview/environment/biodiversity>

¹⁴ Daily, Gretchen C et al, *Ecosystem Services: Benefits Supplied to Human Societies by Natural Ecosystems*, Issues in Ecology No 2, Spring 1997, <https://www.esa.org/esa/wp-content/uploads/2013/03/issue2.pdf>

We must also improve our fire management. Fires are getting hotter and more frequent with climate change. Australian innovation is working on this problem, with technology to put fires out quickly before they get out of control. First Nations people had sophisticated fire management systems in pre-colonial times. There are job opportunities in building our understanding of fire management and implementing it.

The good news is that natural ecosystems are much more resilient to fire.¹⁵ Forests are more flammable for up to 70 years after they are logged and regenerated - raising the risk of still more carbon emissions if they burn.¹⁶ However, it is also critical to understand that even in the event of major bushfires, most of the carbon still remains in a burnt forest. A study of forests before and after the 2009 Black Saturday bushfires in Victoria showed that just 6-14% of the total carbon stock was lost - the remaining carbon stayed in the forest.¹⁷

Aren't carbon credits (that is planting or protecting trees) an excuse for corporations not to reduce emissions directly in their operations?

We need to do everything to save ourselves from catastrophic global warming. We need to reduce emissions from fossil fuels as well as protect and restore the land. Without arresting deforestation and emissions from agriculture we won't stay within 1.5 or even 2 degrees. So it's not either/or.

Clearly companies must reduce emissions at their source, and government regulation must facilitate this. But carbon credits have an important role to play in the transition. They will probably still have a role, albeit much less significant, in the long term as some activities will be really hard to switch off fossil fuels, so we will need to plant trees to absorb that carbon.

Transitioning toward zero: Governments have to walk the line of regulating to reduce emissions while also keeping the economy strong and easing the transition for workers in the old (carbon-intensive) economy to jobs in the new (low emissions) economy. Moving to net zero will require planning and technological upgrades, and this takes time.

Many companies have voluntarily signed up to net zero commitments. Many are designing this pathway by complying with the Science Based Targets Initiative (SBTI) which guides emission reductions and puts controls on the use of offsets. Furthermore, many of Australia's largest companies will need to reduce their emissions in order to meet the requirements of the new Safeguard Mechanism.

¹⁵ Thompson, I., Mackey, B., McNulty, S., Mosseler, A. (2009). *Forest Resilience, Biodiversity, and Climate Change. A synthesis of the biodiversity/resilience/stability relationship in forest ecosystems*. Secretariat of the Convention on Biological Diversity, Montreal. Technical Series no. 43, 67 pages

¹⁶ Nicholas Wilson, Ross Bradstock, Michael Bedward, *Comparing forest carbon stock losses between logging and wildfire in forests with contrasting responses to fire*, Forest Ecology and Management, Volume 481, 2021, 118701, ISSN 0378-1127, <https://doi.org/10.1016/j.foreco.2020.118701>.

¹⁷ Keith H, Lindenmayer DB, Mackey BG, Blair D, Carter L, McBurney L, et al. (2014) *Accounting for Biomass Carbon Stock Change Due to Wildfire in Temperate Forest Landscapes in Australia*. PLoS ONE 9(9): e107126. <https://doi.org/10.1371/journal.pone.0107126>

While there is disagreement about the details, the Safeguard Mechanism will drive emission reductions at source particularly as new investment decisions are made - like for instance, a new energy efficient boiler or other equipment. The Safeguard Mechanism allows the use of off-sets to allow these companies to plan for these major changes to their emissions profile. The other important feature of the Safeguard Mechanism is that it will have a total carbon budget across the mechanism - that is a total number of emissions all the large companies can emit in an aggregated total. That budget is immovable and carbon offsets cannot deliver these reductions alone. Carbon credits however will play a role in allowing companies to get on the path toward decarbonisation.

Net zero: For some activities it will take longer to develop viable technologies that are carbon neutral or better. For example, a number of industrial processes where concentrated heat is needed rely on gas. Some industrial processes in themselves release greenhouse gases regardless of energy source, such as cement production. While commercially viable alternatives are already much closer than they looked even a year ago, we are not quite there yet. Australia and the world are simply not going to suspend making concrete or steel until further notice. This activity will need to be offset with carbon credits while we invest in finding and deploying better low carbon or zero or better technologies (concrete that is better than carbon neutral for example is a real prospect but not yet a widely commercially viable reality).

Going negative - drawdown: The Intergovernmental Panel on Climate Change (IPCC) says that to keep global heating below 1.5 degrees we have to remove carbon from the atmosphere, as well as reducing our emissions: “All pathways that limit global warming to 1.5°C with limited or no overshoot project the use of carbon dioxide removal (CDR) in the order of 100 –1000 Gt CO₂ over the 21st century.”¹⁸ This is because the world - particularly Australia under the Coalition - was slow to start transitioning to clean energy, and actions taken now will take some time to have an effect, so we need to be removing carbon from the atmosphere too.

LEAN believes carbon credits have an important role to play. We also need to develop other financial mechanisms to fund the carbon benefits of nature protection and repair in their own right.

¹⁸ IPCC Special Report on Global Warming of 1.5 degrees, 2018