Land Use and Forestry

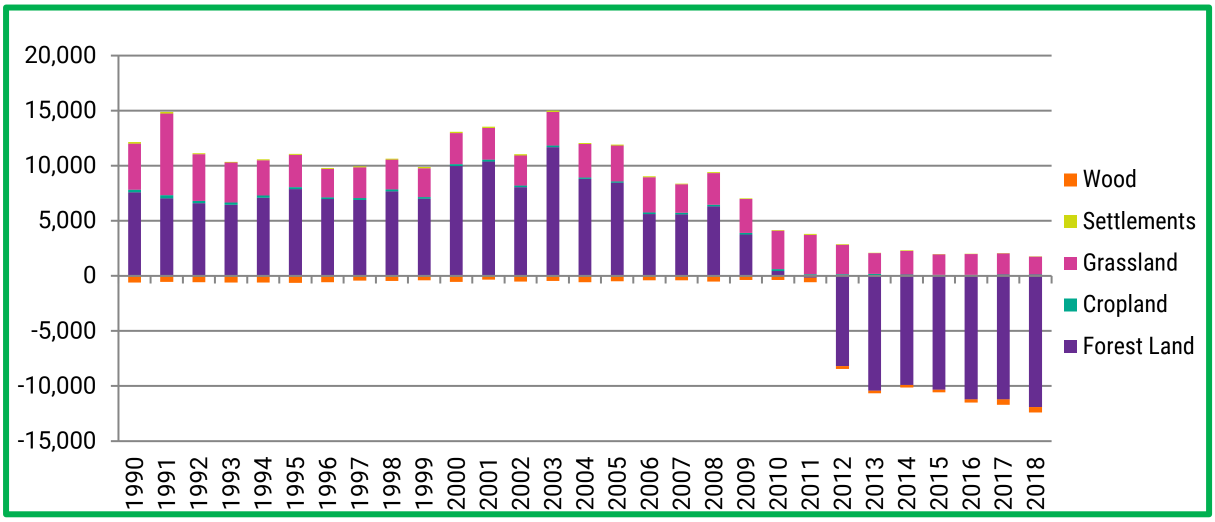
Background

Land Use, Land Use Change and Forestry (LULUCF) has offset more than 100% of Tasmania's emissions in 2018. The offsets are driven by the forest land subsector, with a large proportion of sequestration coming from forested land, remaining forested land, and a smaller portion from grassland converted to forested land.

Proponents of the native forestry industry often argue that forestry enables the storage of carbon from a growing tree into wood products. Figure 1.5.1 illustrates the very small role the carbon in wood products plays in the sector's emissions profile.

The positive emissions profile in LULUCF is mostly driven by forested land converted to grassland.[1] In 2018, land conversion resulted in 1,370 kt $C0^2$-e of emissions. This is a significant contributor to emissions, and equates to 16.7% of the total 8,198 kt of the Energy, Industry, Agriculture and Waste sectors.

Figure 1.5.1: Land Use, Land Use Change and Forestry emissions (kt $C0^2$-e)[2]



Forests

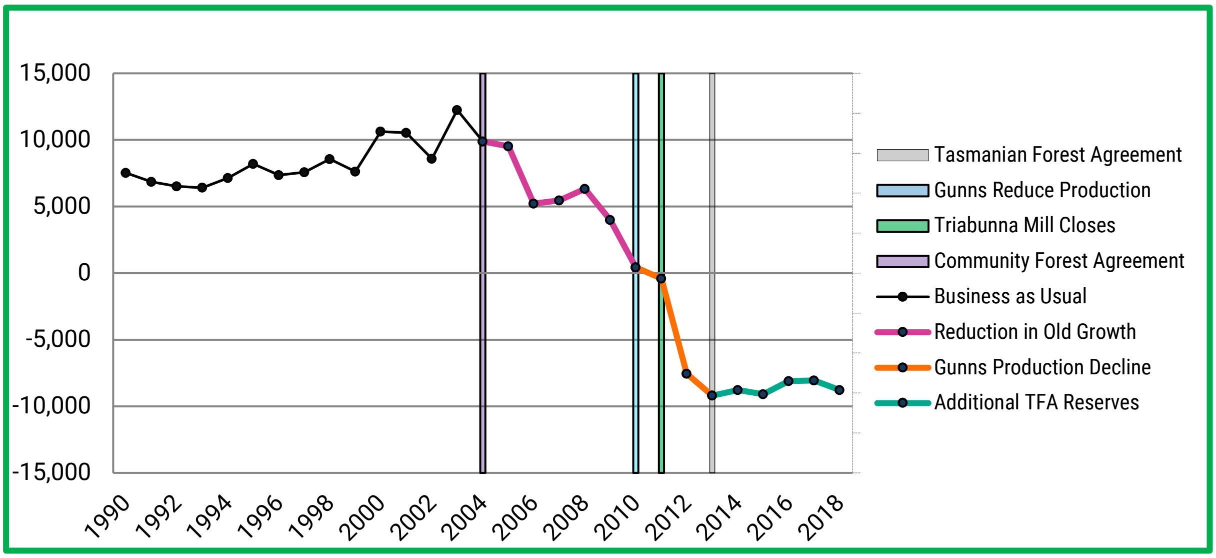
As figure 1.5.2 demonstrates, the forest land subsector has undergone a significant shift between 1990 and 2018. Forest land has gone from the highest net contributor to emissions in the LULUCF sector, to the basis of our net negative emissions profile.

This shift has coincided with several significant events in the forestry sector, including the Community Forest Agreement in 2004, the decline in Gunns' forestry production, the closure of the Triabunna mill, and the cessation of logging on more than half a million hectares

[1] Data Source: http://ageis.climatechange.gov.au/NGGITrend.aspx
[2] ibid

through the Tasmanian Forest Agreement. These events resulted in changes to forest practices, and to a substantial decline in wood harvest volumes.

Figure 1.5.2: Forest carbon stock change (kt CO^2-e) and significant forestry events[3]



Commissioned by the Greens' Minister for Climate Change, the 2012 Forest Carbon Study compared the potential for sequestering carbon through a range of forestry scenarios.[4]

The study found that ending native forest logging has by far the highest potential for sequestration. This retains more of the carbon stored by the tree, and does not require post-clearfell logging burns.

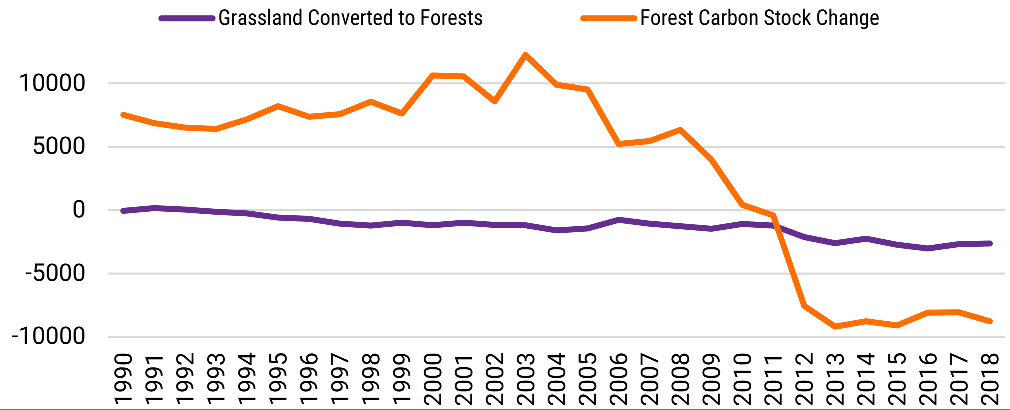
These very hot logging burns (which destroy the existing seedbank of a native forest prior to a coupe being reseeded with plantation trees) produce substantial emissions from the burning of logs left on the forest floor and the carbon stored in the soil.

End native forest logging and burning
We will end the logging and post-logging burning of native forests on public lands.

The other contributor to emissions reduction is grassland converted to forest land. In 2018, this was a more modest 2.63 kt C02-e, compared to 8.77 kt for forest carbon stock changes.[5] These emissions offsets have slowly been trending upwards since 1990.

[3] Data Source: http://ageis.climatechange.gov.au/NGGITrend.aspx
[4] May, Barrie, Bulinski, James, Goodwin, Adrian, and Macleod, Stuart, Tasmanian Forest Carbon Study, CO^2 Australia Limited, 2012, p.96.
[5] Data Source: http://ageis.climatechange.gov.au/NGGITrend.aspx

Figure 1.5.3: Sequestration trends (kt CO^2-e)[6]



While more modest than the contribution from carbon stock changes in established forests, grassland converted to forest land is enough to offset the emissions of any single sector alone, other than energy. This is also occurring without a significant government program to drive reforestation, suggesting untapped potential for substantial sequestration.

Reforesting Tasmania

We will institute a program of reforestation in Tasmania to increase sequestration activities. This program will be aligned with ecosystem restoration programs and objectives to maximise public and environmental benefit.

Soils

Agricultural soil data is 'commercial in confidence'.[7] That said, Soil Organic Carbon (SOC) levels in topsoils in certain pasture and cropland in Tasmania have declined over the past 13 years.[8]

Soil Carbon Monitoring and Restoration

We will institute an on ongoing program of soil carbon monitoring and develop targets to restore soil carbon levels, particularly on agricultural land, supported by incentives.

One option for soil carbon restoration is *biochar*. Biochar is made by heating carbon-rich organic materials like wood and other green waste in a low-oxygen environment (pyrolysis).[9]

Biochar is versatile and can improve soil health through improved carbon and nutrient storage,[10] soil structure, water-holding capacity, mycorrhizal fungi abundance,[11] and reducing

[6] Data Source: http://ageis.climatechange.gov.au/NGGITrend.aspx
[7] Ibid.
[8] Cotching, WE, Organic matter in the agricultural soils of Tasmania, Australia – A review, Geoderma, Vol. 312, 2018, p. 174.
[9] Australian Government Department of Agriculture, Biochar, 2015.
[10] Mekuria, W, Noble, A, The Role of Biochar in Ameliorating Disturbed Soils and Sequestering Soil Carbon in Tropical Agricultural Production Systems, Applied and Environmental Soil Science, Vol. 2013.
[11] Ibid.

pollutant mobility.[12] It has even been shown to reduce methane levels from cattle when included in feed.[13]

Research has suggested biochar has significant potential for improving crop yield,[14,15] assisting with land remediation,[16] as well as improving reforestation[17] and other ecosystem restoration.[18]

The take up of biochar has been slow, and the right policies need to be in place to make the establishment of this industry viable.[19]

Supporting a viable Biochar industry

We will create a legislative impetus for soil carbon restoration, and fund revegetation and land remediation. This will provide a market for biochar and enhanced green waste collection, and for by-product from the plantation sector.

We will put capital grants on offer for the establishment of a biochar plant, and provide ongoing funding earmarked for biochar research.

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[12] Beesley, L, Moreno-Jiménez, E, Gomez-Eyles, JL, Harries, E, Robinson, B, Sizmur, T, A review of biochars' potential role in the remediation, revegetation and restoration of contaminated soils, Environmental Pollution, Vol. 159, no. 12, 2011, pp. 3269-3282.
[13] Winders, TM, Jolly-Breithaupt, ML, Wilson, HC, MacDonald, JC, Erickson, GE, Watson, AK, Evaluation of the effects of biochar on diet digestibility and methane production from growing and finishing steers, *Translational Animal Science*, Vol. 3, No. 2, 2019, pp. 775–783.
[14] Australian Government Department of Agriculture, Biochar, 2015.
[15] Agegnehu, G, Bass, AM, Nelson, PN, Bird, MI, Benefits of biochar, compost and biochar–compost for soil quality, maize yield and greenhouse gas emissions in a tropical agricultural soil, Science of the Total Environment, Vol. 543, 2016, pp. 295-306.
[16] Beesley, L, Moreno-Jiménez, E, Gomez-Eyles, JL, Harries, E, Robinson, B, Sizmur, T., A review of biochars' potential role in the remediation, revegetation and restoration of contaminated soils, Environmental Pollution, Vol. 159, no. 12, 2011, pp. 3269-3282.
[17] Thomas, SC, Gale, N, Biochar and forest restoration: a review and meta-analysis of tree growth responses, New Forests, Vol. 46, no. 5-6, pp. 931-946.
[18] Ohsowski, BM, Klironomos, JN, Dunfield, KE, Hart, MM, The potential of soil amendments for restoring severely disturbed grasslands, Applied Soil Ecology, Vol. 60, 2012, pp. 77-83.
[19] Pourhashem, G, Hung, SY, Medlock, KB, Masiello, CA, Policy support for biochar: Review and recommendations, GCB Bioenergy, Vol. 11, no. 2, 2019, pp. 364-380.