WA Agriculture’s carbon-neutral challenge

Prof Ross Kingwell
Mission statements about emissions...

“The Australian red meat and livestock industry has set the ambitious target to be Carbon Neutral by 2030.” (MLA, 2020)


“The SA grains industry will pursue carbon neutral status by 2030.” (SA Blueprint, 2020)

The state government has committed to working with all sectors of the WA economy to achieve net zero greenhouse gas emissions by 2050. (DWER, 2019)

“Australia’s peak farm body has thrown its weight behind an aspirational economy-wide target of net carbon zero by 2050.” (NFF, 2020)
Western Australia’s agricultural region greenhouse gas emissions by source: 1990 – 2020e

- Manure N on to soil
- Manure methane
- Urine N on to soil
- Urea
- Indirect N leaching
- Direct soil N
- Enteric Emission
- Liming

'000t CO2-e

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Graph showing emissions for each source from 1990 to 2020, with a decrease over time.
TOTAL GREENHOUSE EMISSIONS FROM WESTERN AUSTRALIA
AGRICULTURAL SHIRES IN 1990

Legend
- Agricultural clearing line
- Local Government Authority

Total Emissions ('000 tonnes CO2-e) from shires in 1990
- 135 or more ('000t CO2-e)
- 100 to 135 ('000t CO2-e)
- 70 to 100 ('000t CO2-e)
- 40 to 70 ('000t CO2-e)
- Less than 40 ('000t CO2-e)
TOTAL GREENHOUSE EMISSIONS FROM WESTERN AUSTRALIA
AGRICULTURAL SHIRES IN 2015

Legend
- Agricultural clearing line
- Local Government Authority

Total Emissions ('000 tonnes CO2-e) from shires in 2015
- 135 or more ('000t CO2-e)
- 100 to 135 ('000t CO2-e)
- 70 to 100 ('000t CO2-e)
- 40 to 70 ('000t CO2-e)
- Less than 40 ('000t CO2-e)
ONLY 9 out of 80 shires recorded increases in emissions
What if we reforested to abate the region’s emissions and became carbon neutral?
Cost of generating ACCUs through reforestation of arable land ($/t of CO2-e)
Marginal cost of generating ACCUs based on constrained reforestation of farmland in WA ($ per tonne of CO2-e sequestered annually)
Marginal cost of generating ACCUs based on constrained reforestation of farmland in WA ($ per tonne of CO2-e sequestered annually)
Caveats

• Cheaper ways of reducing or offsetting emissions are NOT considered.

• Farmland prices are assumed to NOT be impacted by reforestation.

• Consumers premium payments for carbon-neutral products are NOT included.

• Government payments for reforestation environmental services are NOT included.

• Relative impacts on different farm enterprises and sub-regions are NOT considered.
Implications

- WA agriculture is often very profitable which leads to high land values that raise the cost of switching out of agriculture.

- Investing in methane-reducing innovations is potentially a more cost-effective pathway than reforesting farmland.

- If consumers truly pay premiums for carbon-neutral products and if governments pay for environmental services associated with reforestation then farmers will be more willing (and able) to shift entirely or partially out of agriculture in some shires.

- The carbon price needs to double before most WA farmers would see any financial merit in diversifying their farm enterprises to include reforestation.

- To fulfill current government and industry body ambitions for agriculture to be carbon neutral will impose serious financial costs on most farmers in the short and medium term.
Thank You