Pricing agricultural emissions

Scion input to the consultation

Scion is a Crown Research Institute with the core purpose to "enhance New Zealand's prosperity, well-being and environment through trees – *kia piki te ora, te tāiao me te whai rawa o Aotearoa mā to ngāhere*". We have 75 years of experience in biology of forests and other terrestrial vegetation. Our Strategy to 2030 aims to help New Zealand transition to a circular bioeconomy through three impact areas that aim to:

- grow healthy, resilient forests that are planted primarily for their standing forest benefits;
- develop products, manufacturing, high-value trees and healthy, resilient forests that capture an increasing share of the global high-end market for timber; and
- develop products, processes, manufacturing, trees, other biomaterials and healthy, resilient forests to replace petrochemicals and non-sustainable materials.

Scion has expertise in land use and climate change science and has been involved in the development of the Land Use and Carbon Assessment System (LUCAS) and the design and implementation of the New Zealand Emissions Trading Scheme. Our science has helped develop the underpinning science for estimating carbon sequestration by native as well as exotic tree species. We have developed models for productivity (a proxy for carbon sequestration) for *Pinus radiata* from the individual tree up to full regime management planning at a national scale, which have been used to inform the ETS 'look up' tables and are helping to develop similar models for other forestry species including through the use of remote sensing and artificial intelligence (AI) methods.

Scion's submission focusses on sequestration of carbon by on-farm vegetation

Given our history and expertise, our brief submission focusses only on those parts of the consultation document that relate to sequestration of carbon by vegetation. During internal consultation for this submission it was clear, given our history in science and innovation in the primary sector, that individuals in our organization have views on other parts of the proposal. We have not included those here as we are confident that they will be expressed by other submissions, including from some of our key partners, stakeholders, and other CRIs.

In general, we support the core principles for the approach to pricing agricultural emissions set out in the consultation document and agree that any pricing system needs to be *effective* in supporting behaviour change that reduces net emissions, *practical* to implement, and *equitable* in its impact.

System design principles should reward additionality of effort and include equivalent disincentives for vegetation clearance

Based on Scion's experience in the science of carbon dynamics of terrestrial vegetation we would add two more. First, in a system that rewards action to increase sequestration, any sequestration should be *additional* to that which would have

occurred had the system not be introduced. In that regard we support the points made in Appendix 5 to the consultation document.

Second, and relatedly, as well as encouraging additional uptake and storage of carbon by vegetation (either through increases to the area of forest, or increases in carbon uptake by existing forest, through (for example) preventing stock and other animals from eating vegetation), any system should also discourage emissions from the clearance of forests and other vegetation.

With that last principle in mind, we are concerned that the approach of having grant-based payments outside of the levy system does not adequately disincentivize vegetation clearance. While ETS forestry participants face a surrender obligation for clearing forests that are not subsequently replanted, it is not clear how a similar 'surrender obligation' would work outside of the levy system proposed in the consultation document.

As we have understood the proposal, a landowner can apply for payment for additional sequestration, but there does not seem to be an equivalent penalty should that vegetation subsequently be cleared once the payment contract period ends. Similarly, there are no liabilities for clearance of vegetation that otherwise meets eligibility for the system if the farmer chooses not to account for it. We see risks that this could undermine behaviour changes that aim to increase sequestration.

In terms of the potential to recognise carbon sequestration from riparian planting, the value of this approach would depend on the type of vegetation, how long it is grown for, and the amount of the payment. Carbon sequestration in riparian areas is likely to be moderate in scale and temporary (i.e. sedges, flaxes and shrubs will reach a maximum carbon stock relatively quickly), and is largely a minor co-benefit of other benefits in water quality and biodiversity.

Payments for management of pre-1990 indigenous vegetation would need to be carefully monitored. Benefits from fencing could easily be reversed if stock is allowed in to graze during a drought, and where fences do exclude goat and deer there may be no additional carbon sequestration compared with prior to fencing.

Finally, we would note that any uptake and storage should be reliably measurable. This is particularly challenging for small areas of vegetation, and other vegetation types where short-term changes in sequestration are large relative to the amount of carbon stored, or where mature vegetation (e.g. mature indigenous forest) has reached a steady state where carbon uptake via photosynthesis is more-or-less balanced by carbon lost to decomposition and respiration.

Our researchers are actively working on applying methods of remote sensing and artificial intelligence to the detection of changes in vegetation that have potential to allow estimation of carbon stocks in vegetation currently excluded from the NZ ETS. Reliable methods are still some way from being practically reliable, and Scion stands ready to further assist in developing the sequestration component of any agricultural emissions pricing system.

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