The impact of carbon price & cost effectiveness in incentivising mitigation & carbon credit creation

An interview with Dr Vera Eory, Climate Change Researcher at SRUC

You have worked on developing the MACC (Marginal Abatement Cost Curves) for policy in the last few years. Can you explain the link between the price of carbon, cost-effectiveness, and the likelihood of climate reduction or sequestration actions on-farm?

In theory, simple – idea that like any market, in that there is a market price and a cost of production; those that can produce efficiently will make a profit, those that won't will operate at cost or at a loss and go out of business. It works the same, theoretically, with reducing greenhouse gases, if GHGs are treated as an economic product, or a 'good'. People will start producing the reduction until it makes a profit for them; therefore for those who can reduce their emissions for a lower cost than what the carbon price would pay, they will do as much as they can while it is still profitable for them. This is what determines how much mitigation occurs on farm.

If carbon price increases, then for those to whom it wasn't previously possible to start reducing emissions, which increases the scope of mitigation possible, and those who were already reducing emissions will do more.

This is the economic theory. In reality there are different carbon prices, different carbon markets, and the price is volatile. VCMs are particularly volatile compared to, e.g. the ETS, and the VCM carbon price is not very high, so there is little incentive under this to reduce emissions. This is even before incorporating the costs of implementation and transaction costs, which must be deducted from the carbon price when considering the breakeven point and viability.

How does the MACC inform public policy on decision making about targeting schemes or subsidies around carbon on farm?

By doing rough comparison of cost for farmers implementing a mitigation practice as opposed to counterfactual (i.e. if they didn't implement it), divided by the amount of CO2e reduced, you get the cost-effectiveness. You then get an approximate ranking of the cost-effectiveness of each measure, including those that are cost saving to the farmer (one you overcome the initial cost burden in establishment). This ranking assists policymakers to make a judgement of priorities for scheme and subsidy funding, as has been the case for over a decade. As well as costings, the MACC also includes discussion of the level of scientific evidence, practical and technical feasibility for implementation, current and likely level of uptake, technology and investment needed etc., therefore the MACC is just one piece in the jigsaw of industry consultation in developing climate change plans.

The private sector seems to be more interested that money lent is used for sustainable purposes, and to understand the viability and return of investment. While this is still a niche it is a growing trend. In the EU there is a sustainability taxonomy[1] for financial institutions to check out and prioritise the viability and risk of investments. Therefore, the process of assessing cost-effectiveness of financial investment is a lot more indirect and less accountable to stakeholders as it would be for public finance.

To date, the role of financial institutions in agriculture is relatively small, although this might increase as the trend is showing. This is partly as it is much more difficult to quantify how sustainable a farm is versus other farms, in comparison to alternative forms of investments, e.g. quantifying sustainability of oil extraction is simpler.

Should public finance focus on financing less cost-effective measures to increase uptake (leading the market), or focusing on the low-hanging fruit for value for money (following/waiting on the market)?

Realistically, the total implementation of all measures for reducing agricultural emissions could be as little as 10%, or optimistically 20%, so it is important that all measures are implemented (even the most expensive of things). In the grand scheme of net zero this is still relatively small. In theory, high to medium cost-effective measures will be prioritised and low cost-effective measures postponed until cost of implementation comes down (i.e. as the carbon price rises); this, at least, is where policy is and is most logically focused at present. There is also the consideration that as farms are so diverse, the cost effectiveness of measures is also very heterogenous, which makes it difficult to prioritise measures by this reliably across all farms. i.e. what is expensive on one farm may be quite cheap on another.

With regards to the scope of the private sector filling the gap of financing higher cost measures as an investment opportunity, this would depend on if the price of carbon increased over time, which is not necessarily the case. Net zero policies and obligations are for governments, not for the private sector, so net zero compliance and a scramble for carbon credits in the private sector will only happen if legislation changes. Therefore, any company that sells carbon credits into VCMs jeopardises themselves in the long term, as they undermine their ability to use said credits to meet compliance targets as these are more forcefully implemented (and they may have to buy back carbon assets at a higher price in future). Also, another reason would be that carbon credits in developing countries would make a more attractive investment as a) there is a lower cost of production, and 2) there are less likely to face as stringent carbon reduction targets as developed countries.

[1] *https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en*

So, if the carbon price increases, measures will become more cost-effective. What impact is that likely to have on public spending – greater investment and wider impact, or a retreat from support and instead implementing regulation for those measures and leaving to the market?

This would depend on what and how the measure is funded, and there must be caution around how funding is targeted. Public funding could distort the real price of implementing the measure, if, for example, payments were made to encourage uptake of a particular product (e.g. methane inhibitors), which may result in a higher retail price for the product, therefore not actually removing barriers to uptake, and decreasing the cost effectiveness of carbon reduction. On the other hand, subsidies and investment from public will be necessary to increase economic viability of implementing emissions reduction measures, and gradually withdraw as and when options become more competitive in the marketplace.

Outside of public spending, there is a lot of private investment in Research & Development in agriculture (which may result in greater economic viability of emissions reduction options), though not necessarily from investors, but rather from supply chains. This is both upstream and downstream in supply chains from the farm, as companies see it as important to reduce emissions linked to products (such as seen through the increased interest in Scope 3 emissions in supply chains), and an investment in the future economic sustainability of the business.

From a theoretical point of view, investment in R&D in agriculture is likely to help reduce costs of implementation and therefore increase uptake of technologies and practices on farm. From a private investor's perspective, these kinds of investment would be much more similar to the type of investments they are used to, and would not require the detailed level of MRV as for a direct investment in carbon credit creation projects on farm; the investment would still be in agricultural carbon reduction, though indirectly so.

What role would a carbon price guarantee from government play in cost-effectiveness of measures and barriers to uptake at an early market stage?

To make such a scheme operational if would require a very sophisticated carbon scheme that doesn't just cover farmers, but supply chain players that government wishes to support, which would be extremely complicated. A robust assessment framework would be needed for it to be operational, to ascertain which methods and products are suitable for reductions-related investment (i.e. enhanced methodologies in MRV). This is advancing at farm level, but further down the supply chain these checkpoints need considering carefully as the link to the actual reduction is further away and more tentative.

However, a carbon price guarantee would definitely improve investment into low carbon technology and reduce risk for investment, which would likely have an indirect impact on cost of implementation. A high level of trust would be needed between the investor and government (particularly that government would honour the scheme long-term), and the recent political turmoil in Westminster may make that difficult at present. However, it is a good idea in principle, to act as an insurance policy for investors to minimise risk and leverage investment. A mixture of private investment through voluntary carbon markets and government funding may also prove

problematic, with clashes of carbon accounting principles, as indicted in the earlier response to question 3.

What areas relating to carbon markets do you feel should be key targets for further research?

The practicalities of how carbon reduction measures can be implemented on farm (and most efficiently), how to give farmers information they really need to help with and optimise uptake, and how to measure and prove what is being done.

Increasing data integration as much as possible, which draws in issues of ethics, data ownership, disclosure etc. for example, developing an ethical, practical and legislative framework to allow for the sharing of data for public/societal benefit and government monitoring, without infringing data protection or ownership.

Also, further research into the economic viability of VCMs in high income countries who pledge net zero, e.g. how long will they remain viable, or will they continue booming.

How to increase trust of investors and farmers in any scheme/policy/contract – what are the important aspects for stakeholders that are involved, and how to integrate trust into the VCMs.

Lastly, we are getting there with farm & soil carbon MRV, but a different type of MRV is needed in supply chains which can be hard to quantify, and which will again link into big data and trustworthy, rigorous frameworks.

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