

Written evidence submitted by CCm Technologies

Background

[CCm Technologies](#) is a UK clean tech company established in 2011 and based in Swindon. CCm's unique fertilisers were developed here in the UK and within the fertiliser space, CCm's technology is unique in using captured CO₂ from industrial power generation to stabilise a wide variety of materials, such as ammonia and phosphates, from agricultural and industrial waste streams. This means our new fertiliser products have **significantly lower than usual Carbon and resource footprint. Given this fertiliser process is a waste solution, addresses emissions and provides food and energy security benefits there is enormous opportunity for growth both here in the UK and globally as we scale production.**

CCm's fertiliser harnesses four different waste streams – concentrated ammonium and phosphorus from sewage water and food waste, carbon dioxide from the combustion of anaerobic digester biogas, waste process heat, and organic fibre, in the main sourced from varied anaerobic digestion by-product "cakes," amongst others from treated sewage sludge, cattle slurries and chicken litter.

CCm's technology can reduce by more than 90% the Carbon footprint associated with conventional fertiliser use. As our fertiliser products are cost-competitive with conventional fossil-fuel derived options and have been demonstrated to ensure comparable yields, they offer enormous potential in terms of the decarbonisation of the end-to-end food sector, which currently accounts for nearly a third (27%) of the UK's total greenhouse gas emissions.

Climate change and food security: projected effect, risks, and mitigation

1) What are the main risks posed to future UK food security from projected climate change and biodiversity loss pathways?

As country's look to reach net zero targets and move away from gas reliance there is a risk to food security if there is not an urgent scale up of alternatives to fertiliser. We have already seen this food security risk become apparent through the invasion of Ukraine and the significant impact on UK fertiliser availability as the bulk of the world's fertiliser (30%) comes from Russia and Ukraine. The Government must not miss this critical moment and opportunity to ensure the UK does not suffer from food insecurity while also revolutionising the fertiliser industry to help meet net zero.

CCm's product is de-linked from reliance on gas because we use captured waste CO₂ and materials from industrial processes to create fertiliser. If we can scale rapidly, not only could such a move reduce costs for farmers, retailers and consumers it would also cut the need for imported fertilisers by 30%. As our fertiliser is not linked to the fortunes of gas, it has a competitive price point, contributing to greater fertiliser and food security while also supporting farmers financially through this transition.

2) Where does the UK's food come from? On the current climate change trajectory, how will these regions be affected by climate change and what will the impact on UK food security be?

30% of the world's fertiliser comes from Russia and Ukraine, with the UK importing 60% of its fertiliser needs meaning that our food security and supply is affected by geopolitical events out of our control. By scaling up UK's domestic fertiliser manufacturing, the UK can help protect itself from global events and the impact on food security as country's transition to net zero, as there is no reliance on gas for this technology.

3) How do existing UK food production, import and export practices contribute to climate change and biodiversity loss?

Current agricultural processes produce around 10% of all UK greenhouse gases and conventional fertiliser production has massive carbon footprints. CCm's technology can meaningfully tackle this issue and contribute to reaching net zero as every two tonnes of CCm product sequesters one tonne of carbon. Carbon savings result from: direct capture and utilisation of waste CO₂, avoidance of primary carbon use, and carbon storage in soil.

4) How self-sufficient is the UK in producing food? What practices could the UK adopt to become more self-sufficient while reducing the emissions associated with agriculture?

There is an opportunity for the UK to become significantly more self-sufficient in producing food, given the current reliance on imported fertiliser which is not sustainable in the face of the current geopolitical and climate landscape. Technologies like CCm's can be a real success story for the Government to improve the UK's food security by cutting the need for imported fertilisers by at least 30%.

Furthermore, CCm's technology has the capability to transform agricultural production from a massive greenhouse gas source into a major tool for emissions reduction and carbon storage. The technology can have a significant impact on reducing emissions associated with agriculture. 50 standard CCm units could result in emissions avoidance equivalent to removing around 375,000 cars from the road each year. By switching to biogenically derived alternatives for agricultural resourcing the UK would save over half a billion tonnes of CO₂ emissions by 2050. There is significant global potential for this technology to contribute to emissions reduction, CCm's technology permanently sequesters CO₂ in the soil to the effect of the 1 tonne per tonne of fertiliser (185 million tonnes of fertiliser are used globally per annum).

UK preparedness: Government and market

5) How effective would the market be at securing the UK's food supply in a situation of major food insecurity worldwide? To what extent could Government intervention be needed?

We have faced a major food insecurity over the past year with the invasion of Ukraine as 30% of the world's fertiliser comes from Russia and Ukraine. This has been coupled with the closure of one of the UK's main fertiliser producer's (CF Industries) two plants, which represents 30% of the country's domestic fertiliser manufacturing capacity.

Technologies like CCm's have the capability to transform agricultural production from a massive GHG source into a major tool for emissions reduction and carbon storage. If we can scale rapidly, not only could such a move reduce costs for farmers, retailer and consumers but it would also cut the need for imported fertilisers by at least 30%. We are almost there in terms of securing access to the pipeline of nutrients necessary to scale at speed and welcome any efforts across Government departments to help create the best regulatory framework to facilitate this innovation into mainstream use.

Securing a sustainable food supply

6) Is there research and development the Government could be funding to provide food security solutions?

CCm's technology, for example, is financially viable without reliance on government subsidies. However, the Government can support rapid expansion of such technologies through demonstrating public support for innovative, low carbon fertilisers and by underwriting finance needed to meet demand of this solution that can help tackle food insecurity and gas reliance.

