

The Role of Collective Intelligence in Social Co-Production of Greenhouse Gas Removal Development and Scale-Up: A Case Study Leeds-Yorkshire

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Abstract

Removing greenhouse gases from the atmosphere at a giga-tonne scale is expected to be necessary in the coming decades if the Paris climate target of 2°C or less is to be achieved. The UK's Committee on Climate Change, the US National Academy of Sciences and European Science Academies have all highlighted the need to the deploy Greenhouse Gas Removal (GGR) technologies by mid-century. At present no more than a few ktCO₂ is removed from the atmosphere in negative emissions value chains¹ - so they will need to scale at an unprecedented rate and stand to be as large as some of the world largest industries such as the Oil and Gas sector within the next 30 to 80 years. If done right, they can augment and enhance existing climate action.

Most research on GGR has explored techno-environmental potential. However, the practicalities of deploying them and how they are perceived by broader audiences beyond academia and the climate policy community is largely unknown and will inevitably greatly influence the role they will play in securing a zero-net carbon future. The aim of this project is to open-up the issues of social acceptability in GGR value chain creation and provide learning that will be of value to subsequent projects in this space. Indeed, it might provide the opportunity to develop tools to allow rapid scale up for engagement with communities across the UK and the realisation of a dialogue around the deployment of GGR technologies that is so glaringly needed for scale up and yet so glaringly absent.

The project will employ a Collective Intelligence (CI) process to develop this dialogue. There are many ways to harness CI. In its basic form, it might involve inputs from distributed (often online) users and then aggregate these inputs to generate a deeper understanding of an issue and to formulate more intelligent decisions and actions that represent wide-ranging perspectives on the problem. However, the question of how and where to implement GGR technologies requires the input of local communities to understand opportunities for value creation is subtle. It is challenging because of: (a) significant information asymmetries - limited local knowledge about GGR - and (b) strong, polarised views that may or may not be based on evidence. A resolution requires active collaboration between stakeholders, dialogue and exploration, or what Arniani et al.² refer to as "*Contested Collective Intelligence*". Our project will be the first to test "SWARM"³ to generate and synthesise stakeholder views promoting the integration of diverse perspectives. SWARM, by design, has a unique set of features that will make it ideal for this purpose, but it has never been tested under such relatively challenging conditions. Our primary evaluation will be on platform engagement and user experience, and secondly on the quality and social acceptability of the outputs that are generated by platform users.

SWARM will assess these crucial areas from a case study being undertaken in the Leeds-Yorkshire, UK. Leeds is the UK's third largest city, surrounded by a mix of land-use types and large energy infrastructure, including the UK's largest power station, Drax, which is developing Carbon Capture and Storage with biomass co-firing and a regional hydrogen scheme. The City has its own Climate Commission and leads on Inclusive Growth for the UK Core City group. This makes the city uniquely suitable for a pioneering study, which will be applicable to other metropolitan areas in the UK and globally.

The initial phase, scheduled to take place in Q2 2020, will involve recruiting a number of groups of 25 to 35 individuals, representing different stakeholder groups within local communities. This will be crucial to ensure development of collective insights that are representative. This proof of concept project will seek to identify how the CI process might scale in elucidating fundamental, bottom-up enabling issues, by conducting engagement activities around GGR technologies within real communities across the UK.

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¹ Carbon Capture and Storage attempts to capture emissions from the combustion of fossil fuels and seeks to be as close to carbon neutral as the process allows whereas Greenhouse Gas Removal technologies attempt to result in a net negative emission from the atmosphere along its value chain.

² Aggarwal, I., Woolley, A. W., Chabris, C. F., Malone, T. W. (2015, May). Cognitive diversity, collective intelligence, and learning in teams. Paper presented at the 2015 Collective Intelligence Conference, Santa Clara, CA

³ <https://www.swarmproject.info/>