Progress in pilot, large-scale projects as an inducement for CCUS deployment

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In the first issue of Greenhouse Gases: Science and Technology (Feb 2011), the Editors pointed out the urgent need to accelerate progress in CCS. Two years later, and in line with this, many other CCS advocates have alerted to the danger of CCS not moving fast enough.[1] For instance, the Union of the Electricity Industry, EURELECTRIC, has prompted the need for Europe to move beyond discussing carbon capture and storage (CCS) and to start demonstrating the technology through concrete projects.[2] Despite these and many other warnings, the response to the first call of the European Commission NER300 funding programme, issued on 18 December 2012, was rather disappointing as no carbon capture and storage project was awarded. Nonetheless, 275 M€ will remain available to fund projects under the second phase of the programme.

CCUS (it is advisable to include the U, as utilisation will, in many cases, be the driving force behind CCS, at least in the case of enhanced oil recovery, EOR) is proceeding at a slow pace, hampered amongst other reasons by the lack of political support (e.g. Jänschwalde 300 MW CCS demonstration project, Germany), the economic crisis or simply by policy makers reluctant to enforce a greater commitment and more restrictive legislation to reduce carbon emissions, at least until certain other countries implement such schemes first (i.e., China – U.S.). Nevertheless, the effort to deploy CCUS continues, and the IEA will still retain in its roadmap, as an achievable goal, the implementation of 120 commercial scale industrial and power generation projects by the end of this decade in order not to exceed the 2 degree Celsius goal.

As good news one could cite, amongst many other CCUS projects, the recent commissioning of the world's first integrated SO_2 and CO_2 capture pilot plant at RWE Aberthaw Power Station in Wales, which has captured its first tonne of CO_2 [3] , the CFBC of Ciuden, Spain, and the pf Callide, Australia, oxyfuel projects (the Callide project entered the demonstration phase in December 2012), the first world pre-combustion pilot plant ELCOGAS IGCC, Spain, and a series of projects in the U.S. and other parts of the world [4, 5].

Scientists all around the world are contributing with innovative ideas and, in many instances, underacknowledged efforts, to achieve higher standards of living. And research on CCUS is undoubtedly one of the most urgent needs in order to ensure the welfare of mankind in the near future. Both the public and private sectors, are pushing hard to find new and optimised materials, technologies and processes, that will contribute to the main goal of reducing the cost of CO_2 capture to less than 15-30 $/ton.

However, the recent news regarding the cancellation of pioneering large scale CCUS projects, the decline in CCUS investment compared to other low-carbon technologies, or the pace of progress in CCUS, which is frustratingly slow, is causing disappointment within the CCUS community. Thus, when innovative large-scale projects based on the development of relatively new technologies emerge, researchers feel a new sense of optimism regarding CCUS deployment and are encouraged to continue the fight against the threat of climate change.

Adsorption with solid sorbents could be cited as an example of the technologies just referred to. Large-scale projects are being conducted in this area (the Port Arthur steam methane reforming plant, in Texas, retrofitted with vacuum swing adsorption), and frequent claims of discoveries of cheaper methods of solid adsorption for post-combustion carbon dioxide capture (compared to the benchmark technology absorption with solvents) have been made. [6,7]

It is for this reason that we as researchers, would like to see more frequent submissions of papers to scientific journals in relation to the progress, achievements, and global results of pilot, large-scale, demonstration, and commercial CCUS projects. Success stories related to carbon capture, utilisation and storage would be a welcome contribution as they would act as an inducement for the general acceptance and deployment of CCUS.

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