# EPSRC supported EngD. Advancing modular computational fluid modelling techniques to aid the rapid development and scale-up of carbon dioxide removal (CDR) technologies

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**Origen Carbon Solutions - Origen Power**

**Tax free bursary of £25,000 p.a. plus fees paid**

In a world facing climate crisis, it is vital to develop new ways to mitigate climate change. This project, funded by Origen Carbon Solutions, focuses on the modelling and optimisation of innovative Carbon Capture and Storage (CCS) and Direct Air Capture (DAC) technologies. DAC is a developing technology for removing CO2 from the atmosphere where the CO2 concentration is low. It is aimed at removing sufficient CO2 from the environment to compensate for otherwise difficult-to-decarbonize sectors such as aviation.

Origen’s solution employs a novel approach using lime (CaO) derived from limestone (CaCO3) for CO2 removal and sequestration. The method not only captures CO2 but also facilitates its permanent storage, significantly reducing environmental impact. The goal of the project is to develop a detailed Computational Fluid Dynamics (CFD) model of Origen’s system, coupled with advanced AI techniques, with the aim of further developing and optimising its efficiency. In particular, the project aims to model Origen’s multiphase flash calcination process, including combustion, heat transfer, and chemical components, using free to use, open-source software. The models will be validated and iteratively improved using experimental data acquired on-site.

Project Outline: To recreate our existing multiphase flash calcination CFD model, including combustion, heat transfer, & chemical components, using free to use & open-source software and to compare results between models & experimental data.

To be eligible for EPSRC funding candidates must have at least a 2(1) in an Engineering or Scientific discipline or a 2(2) plus MSc.

To apply please email your cv to [cdt-formulation@contacts.bham.ac.uk](mailto:cdt-formulation@contacts.bham.ac.uk). This project is open to UK and international students. For details on the Engineering Doctorate scheme visit the [homepage](http://www.birmingham.ac.uk/schools/chemical-engineering/postgraduate/eng-d/index.aspx).

**Deadline: 31st May 2024**