

Feasibility of small-scale direct air carbon capture

Direct Air Capture (DAC) is a process of capturing carbon dioxide (CO₂) directly from the air by channeling air through a wind tunnel equipped with a specific CO₂-removal filter. It is seen as a promising technology to extract CO₂ from the atmosphere and thereby contribute to the mitigation of climate change.

Most applications to date are based on large carbon-removing plants like the one sketched below:



<https://www.nature.com/articles/d41586-018-05357-w>

The aim of the proposed project is to explore the feasibility of **small-scale carbon capture**. By small-scale we mean a **tabletop DAC wind tunnel**.

Required steps:

- Literature review on DAC technology and existing DAC filters
- Estimation of the carbon-removing potential of small-scale DAC filters
- Conceptual design of a small-scale DAC wind tunnel
- Computation of the required energy consumption

We are looking for a motivated and autonomous student equipped with the following skills:

- Basic fluid mechanics, thermodynamics, and heat transfer
- Interest in carbon capture
- Capability to sort through and summarize relevant literature
- English spoken and written

Interested applicants should contact **Prof. Julien Weiss** (julien.weiss@tu-berlin.de)