Motivation

- Interdisciplinary ENZo doctoral students project
- CO2 concentration is steadily increasing
  [International Energy Agency, "Net zero roadmap: A global pathway to keep the 1.5 °C goal in reach - 2023 update."]
- If 2050 concentration overshoot → second half of the century with negative Emission Technologies only
- Large increase in CO2 concentrations in closed rooms (e.g. Offices and apartments)

Proposed Solution

- Decentralized approach
- Small, modular and easy to use unit for home use
- On-site extraction of CO2 for use or trade

Current State of Development

- Vacuum Temperature Swing Adsorption
- Typical SmartHome integration with e.g. MQTT
- Monitoring and data acquisition
- Possibility of process control of the user through simple dashboard

Further Ideas

- Direct coupling with the end application e.g. sparkling water or air purifier
- Higher degree of automation
- Integration in EMS for peak shaving functionality
- Trading system for industrial CO2
Sparkling DAC
Decentralized, modular and flexibly operated
Direct Air Capture Prototype

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