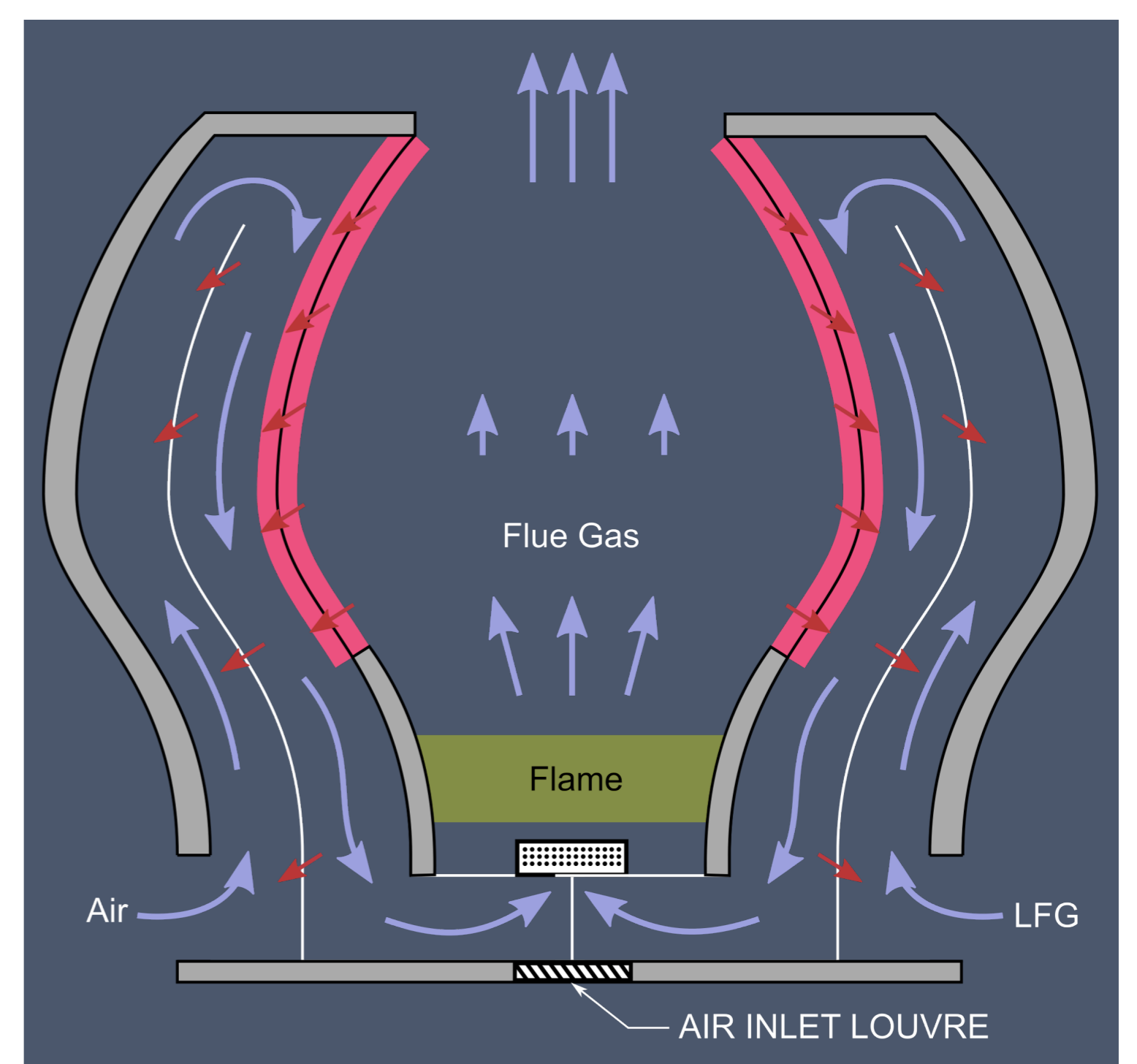
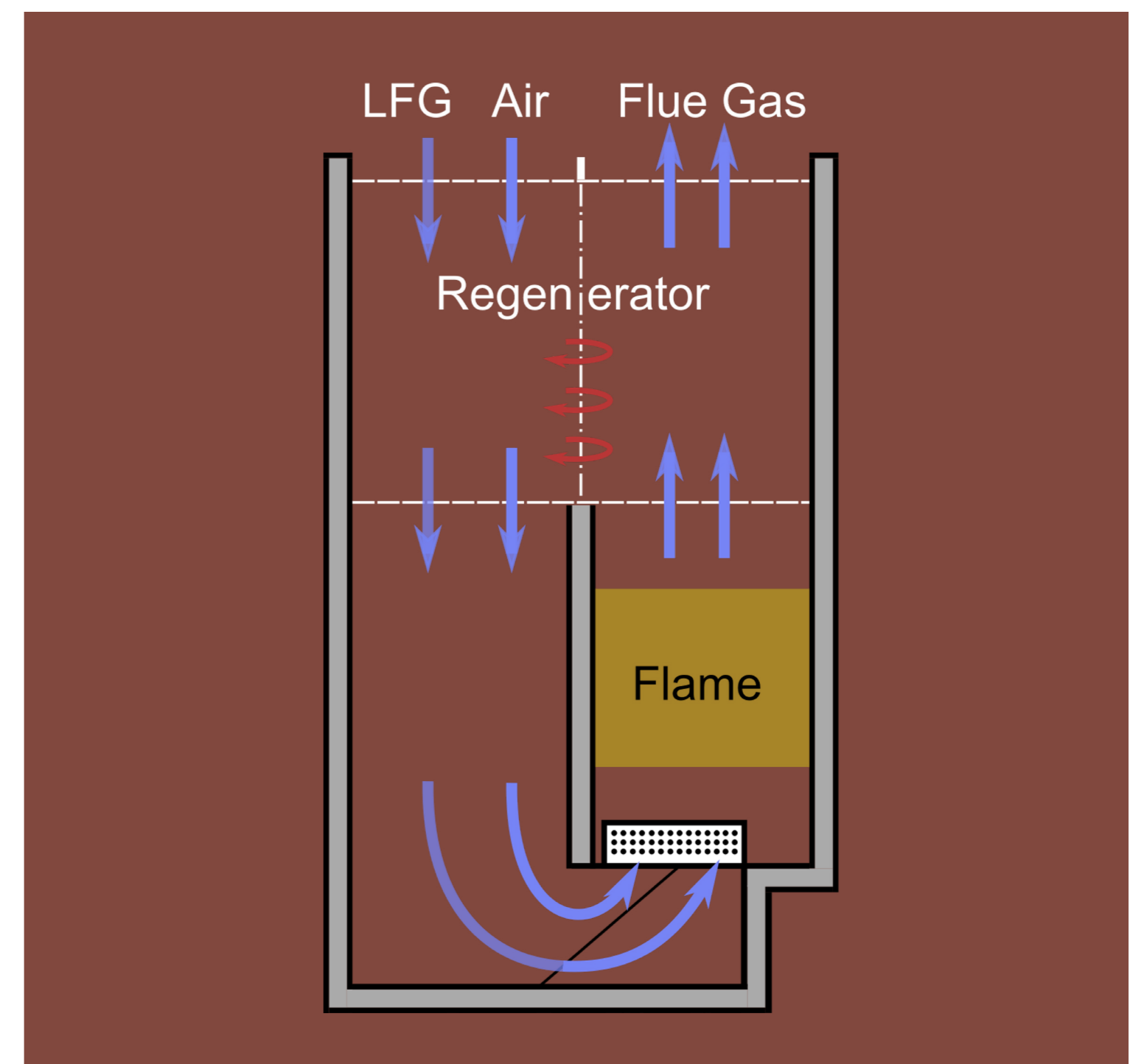


Modification to a flare to burn landfill gas with low methane content



Design and dimensioning of a modification to a flare to burn landfill gas with low methane content

Landfills are major emitters of the greenhouse gas methane, and the most popular mitigation method is combusting the flammable landfill gas to turn the methane into CO₂. However, as landfills age, the methane content decreases, and a flame cannot sustain itself.

The aim of the project is to develop an economically viable flare which can burn landfill gas with a methane concentration of 6% to 10% without the need for a new system in partnership with Hofstetter Gastechnik AG.

The barriers to combusting such low calorific fuels required research into flame temperature, chemical kinetics, and flame mechanics. In addition, a brief survey was provided on technologies to combust low

calorific fuels. Two designs were created based on a rotating regenerator and a recuperator, and modelled using a self-made calculation tool. Optimal parameters were calculated in regards to excess air ratio, operating temperature, optimal insulation and volume flow and turn down ratio. In addition, the capacity of the two designs to combust landfill gas with a methane concentration of 6% to 10% was calculated.

The rotating regenerator was successful and dimensioned, but the recuperator was unsuccessful.

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