



CO2 concentration in the air breached the 400 PPM



Backbone of an industrial size chemical plant



Detail H₂ buffer of CNC-milled prototype

Urgency

Time is limited, global temperature and CO₂ concentration are rising in a society where only 1/3 of the global energy consumption is electric. More than 50% of the industry still relies on fossil fuels. This means there is a strong need for renewable fuels. This solution must be directly applicable, feasible and cheap to guarantee a successful implementation in current infrastructure.



Reinventing the Chemical Industry

Zero Emission Fuels (ZEF)

Zero Emission Fuels (ZEF) is a startup which focuses on the design of a solar powered microplant located in desert. The plant produces renewable MeOH based on subtracting CO₂ and H₂O from the air. Mass-manufacturing is approached as an alternative strategy to enable cheap mass production of renewable MeOH. Every solar panel in a solar farm has its own fully automated microplant. In a nutshell, reinventing the chemical industry.

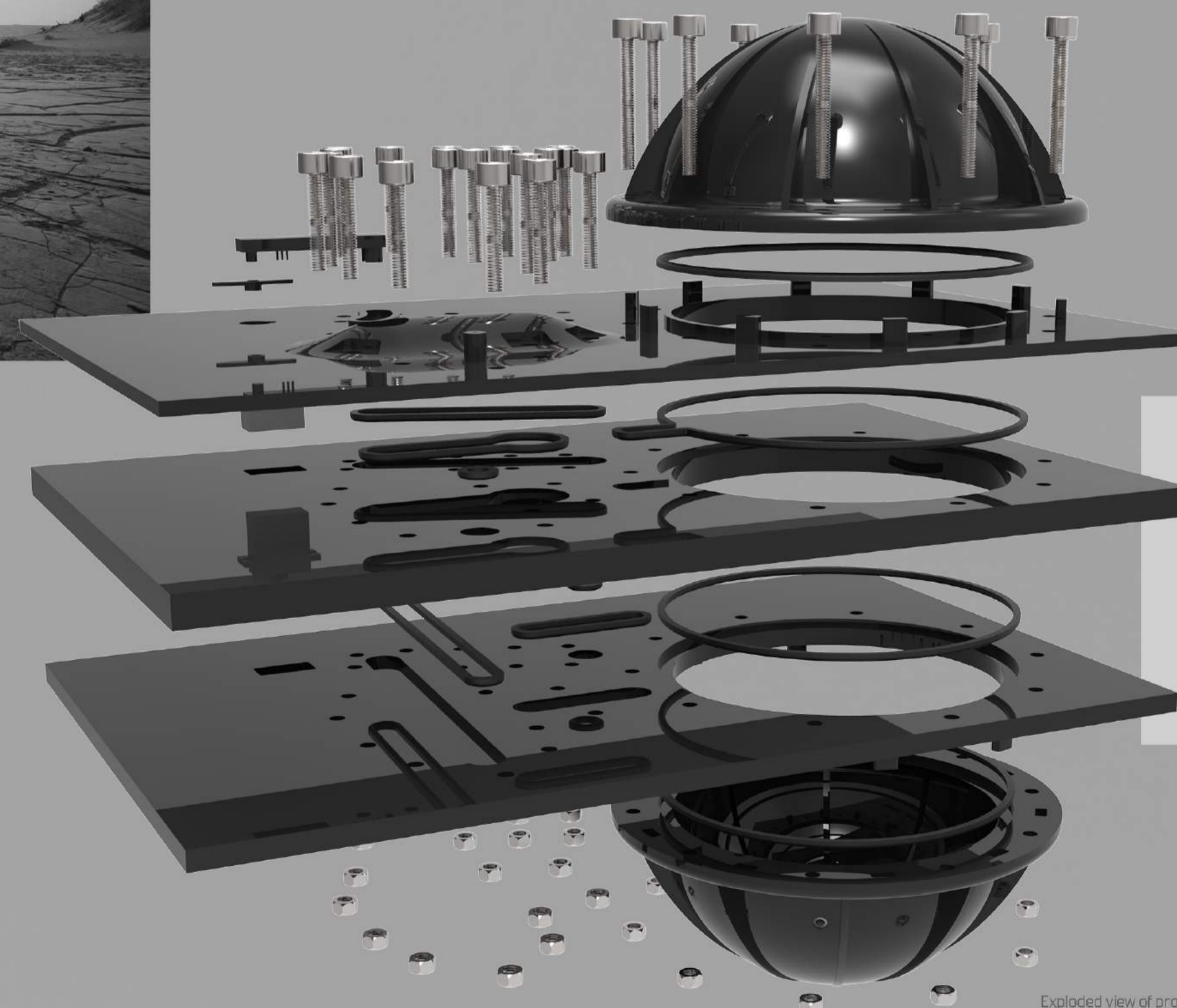


Desert as a production location



Project

The first thing which pops into mind when picturing a chemical plant is the huge spaghetti of shiny piping in different sizes. ZEF aims at mass manufacturing. Therefore, a design is required which reduces this spaghetti into one part. Hence, the amount of parts, risks and costs are reduced significantly. This project is about a feasibility study which researches whether the mass manufacturing aspect of this part is realistic in terms of the involved technical and financial challenges.



Exploded view of prototype built

Design

The backbone is the connection between all microplant subsystems. Hence, exposure to aggressive chemicals, high pressures and temperatures challenge the design in terms of material choice, mass-manufacturing and final cost target.

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Zero Emission Fuels

