

As part of the COCPIT project, a **laboratory-scale continuous hydrotreatment unit** was built at the Department of Energy at Aalborg University (AAU Energy). Developed under the guidance of Dr. **Daniele Castello**, the unit was specifically designed to support early-stage catalytic testing using small amounts of both feedstock and catalyst, making it ideal for rapid screening and process optimization during fundamental research.



Small hydrotreater unit
Source: Aalborg University

The system is used to perform **catalytic hydrotreatment**, a key upgrading process for converting bio-oils, and specifically hydrothermal liquefaction (HTL) biocrude derived from microalgae, into ready-to-use fuels suitable for the aviation and marine sectors. The process involves passing the bio-oil through a fixed-bed catalyst in the presence of hydrogen under elevated temperatures and pressures.

This "mini" unit complements the AAU's existing pilot infrastructure and fills a critical gap in enabling rapid and flexible testing prior to scaling up to larger systems. Special recognition goes to **Anders Høndrup Andersen** for the precision in building and commissioning the unit, including the automation and process control software, which ensures high reproducibility and safe operation under high-pressure conditions.

The unit is now operational and will be managed by doctoral researcher **Ahmed Al-Dubai**, who will conduct experimental campaigns focused on evaluating different hydrotreating catalysts and operating conditions. His research aims to generate comparative performance data to support the design of optimized conversion pathways for **sustainable aviation fuels** (SAF) and renewable marine fuels, key objectives of the COCPIT project in its mission to decarbonize hard-to-abate transport sectors.

This new capability represents a key step in accelerating the development of next-generation biofuels through enhanced process integration and robust techno-economic validation, as envisioned in the COCPIT project approach for fuel production from microalgae-derived [HTL] biocrudes.