

1. Summary and objective

The project develops and tests an innovative Power-to-Liquids (PtL) technology route for sustainable aviation fuel (SAF) from renewable electricity, water and captured CO2. It integrates three advanced technology blocks: co-electrolysis in a solid oxide electrochemical cell (co-SOEC), CO2 membrane separation and Fischer-Tropsch synthesis. The pilot is intended to validate the integrated process, identify technical risks and provide evidence for future scale-up options. The project is carried out by Shell Global Solutions International B.V. at the Energy Transition Campus Amsterdam (ETCA).

Please refer for a more extensive summary and objectives to: [Power-to-Liquids Test program based on Second generation conversion technologies - Topsector Energie](#).

2. Activities and results per work package

Work package (WP)	Status	Activities and results in this period	Outlook / application perspective
1. Detailed technical design of an integrated pilot plant	Ongoing	One of the project's most important achievements in its first year was completing the Basis for Design. This established the technical blueprint for the pilot plant, defining the process configuration of the different technology blocks, feedstock and utilities requirements, equipment specifications, safety measures, performance targets, layout definition and integration with ETCA site. Completion of this milestone allowed the project to move from concept development into detailed engineering, procurement of key equipment and has delivered key input for the permitting activities. By now, the co-SOEC stack modules have been procured, and relevant Factory Acceptance Tests have been completed. Significant progress has been made on procurement of CO2 separation membranes and the compressor. Detailed engineering activities are ongoing. Permit application has been submitted to the local authorities. ETCA site is preparing for utilities and integration of the Pilot Project into the existing ETCA infrastructure.	Completing WP1 will enable the installation and commissioning phase in WP2. The design work targets an integrated pilot that can produce syngas and connect to the existing Fischer Tropsch (FT) pilot set-up at ETCA.
2. Installation and commissioning of the Pilot Project	Not started (as per plan)	Installation and commissioning has not yet started within this reporting period.	Current planning is to progress the system towards commissioning readiness around late 2027, subject to permit outcome, procurement completion and integration readiness.
3. Operation of the Pilot Project	Not started (as per plan)	No operational test campaign started in the reporting period.	Operation is expected to generate data on dynamic behaviour, FT off-gas recycling, membrane performance and integrated control, supporting technology de-risking.
4. Data collection and de-risking conclusions	Not started (as per plan)	Not yet applicable; this milestone follows pilot operation.	Results will be used to support simulations, cost estimates and scale-up scenarios for future PTL / e-SAF applications.

3. Bottlenecks and mitigations

Bottleneck	Status	Mitigation / current action
Permit decision timing	On the 29 th of June 2026, the environmental authority requested a six-week extension of the decision period.	The permit application was submitted early, on 4 th May 2026. The project continues parallel work while awaiting the decision and remains in close contact with the environmental authority.
Procurement and integration complexity	Procurement of the CO2 membrane and compressor was not yet fully completed due to unforeseen technical hurdles related to the integration of these systems with the co-SOEC stack module. Compressor integration requires careful management of pressure differences between the co-SOEC and the adjacent CO2 membrane and FT unit; this to stay within the strict and small range of pressure differences that the co-SOEC can accommodate, versus the broader range of the adjacent FT unit.	The Basis for Design has clarified the technical route. Additional schedule contingency is included to avoid rework and protect overall test objectives.

4. Contribution to the DEI+ objectives and spin-off(s)

DEI+ supports companies that test or demonstrate innovative techniques aimed at reducing CO2 emissions in the Netherlands. This project contributes by maturing an integrated PTL technology route that converts renewable energy, water and CO2 into syngas for synthetic aviation fuel production; thereby enabling a route for sustainable aviation fuels that support decarbonization of the aviation sector. The first year of work has focused on moving from project definition into engineered pilot design, procurement readiness and permitting. Based on the results of the entire test program, simulations, cost estimates and scale-up scenarios will be developed. The project therefore represents an essential step towards large-scale, low-carbon fuel production in the Netherlands and globally, and makes a tangible contribution to the decarbonisation of the aviation sector.

- Spin-off(s) within and outside the sector: lessons learnt across the entire project lifecycle, from design to permitting, execution and operation, can help reduce technical uncertainty for future e-SAF projects. Insights from operation of the integrated PTL unit, such as electrolyzer performance and potential for SAF production cost reduction will be shared via publications in scientific journals, conference presentations and relevant proceedings: these learnings can support other power-to-molecules and industrial decarbonization projects.

5. Publicity and publications

A public project summary is available on the Topsector Energie project page for 'Power-to-Liquids Test program based on Second generation conversion technologies'. No separate project-specific media coverage or public technical publication was reported in the yearly progress report for this period. Publicity is planned for in the second reporting period.

6. Acknowledgement

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