



ETN Annual General Meeting & Workshop

ETN CCUS Working Group Round Table

Minutes of the meeting

Wednesday, 26 March 2025, Bergen, Norway

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1. Introduction

Jens Walter (BASF, Chair of the ETN CCUS Working Group) started the roundtable by describing the objectives of the new CCUS Working Group. It will focus on post-combustion capture using amine-based technologies as these are available for deployment now. Nevertheless, other novel technologies with lower technology readiness level (TRL) will also be tracked.

It was mentioned that there is already significant information available publicly, including reports by the IEAGHG Programme on gas turbines with carbon capture, boundary conditions, reference cases and benchmarking.

2. Report on CO₂ optimal transportation for CCS-GT

Jens Walter mentioned the current work on the evaluation of transport options for gas turbines fitted with carbon capture plant. The audience recognised that comparison between different options would be difficult because of the large number of factors influencing the selection (e.g. geographical location of the CO₂ source and storage site, amount of CO₂ captured, type of turbine and operational regime).

3. Applications

The group agreed that there are multiple applications for gas turbines, including refineries, CCGT, and co-generation plants, which all have different requirements. It was concluded that understanding capture technology for gas turbines is essential for further understanding of GT-specific capture technologies due to the complexity of tailoring them for a specific power plant, which requires rigorous consideration of various external factors. A scenario of CO₂ utilisation instead of CO₂ sequestration can also be considered. The objectives of the CCUS working group are to identify efficient solutions, accounting for a variety of boundary conditions.

Regarding full CCS chains, it was mentioned that it would be desirable to provide a holistic solution to policy makers. To do so, it would be useful to collect information in a consistent manner to help future projects. Jens Walter stated that further participation in the CCUS working group is encouraged.

4. Master thesis on “Uncovering the economic tipping point between H₂-based GTs and CCS-enhanced GTs”

Jean Bériot presented the results from his master thesis on CAPEX and OPEX so far based on the LM6000PC gas turbine. The study does not include H₂ storage costs nor CO₂ transport and storage costs. It was stated that burning H₂ will result in GT modification along with CCS, with a possibility to affect the integration between them. At present, there are uncertainties regarding publicly available costs and Jean Bériot requested help from the CCUS Working Group members to reduce them. The group noted that while it is challenging to obtain relevant data, some organisations are publishing some data. These data may include rough estimates and values which can be beneficial for Jean Bériot to justify his results.

At present, the carbon tax is not sufficient to deploy carbon capture commercially.

The group mentioned that even though there is no existing 100% H₂ ready GT, GE Veronova has unveiled a 100% Hydrogen-fuelled Aero-derivative Gas Turbine solution and secured its first customer¹.

There is a significant variation between hydrogen produced from steam methane reforming (SMR) and electrolysis, where the green hydrogen costs are twice as expensive. Jean Bériot was advised by the group to compute the marginal pricing of the plant with respect to merit order.

The main conclusion so far is that the cost of producing H₂ is the most important factor determining the economic viability of turbines combusting this fuel.

5. Conclusion

Jens Walter mentioned that the CCUS working group is open to any topics of interest from the members. This involves defining technologies, reference systems, and other relevant subjects to collect results for future considerations. The preferred form of contact for further inquiries and suggestions is via email

6. Actions list

#	2025 Objectives	Actions
1	CCS CapEx and OpEx	<ul style="list-style-type: none"> To be covered under Master Thesis on "Uncovering the economic tipping point between H₂-based GTs and CCS-enhanced GTs"
2	CCGT efficiency penalty	<ul style="list-style-type: none"> To be defined by June
3	Database on the CCS-gas turbines projects	<ul style="list-style-type: none"> To continue on a regular basis
4	Master thesis on "Uncovering the economic tipping point between H ₂ -based GTs and CCS-enhanced GTs"	<ul style="list-style-type: none"> Working Group members to support Jean Bériot (UMons student) with cost information. Jean Bériot to provide a "shopping list" for distribution to all members.
5	Report on CO ₂ optimal transportation for CCS-GT	<ul style="list-style-type: none"> Decision to keep or discontinue this activity to be taken at the next WG Meeting (25.04)
6	CCS taskforce webinar series	<ul style="list-style-type: none"> Proceed with the webinar series (next episode planned for June 2025)

¹ <https://www.governova.com/news/press-releases/ge-vernova-announces-first-100-percent-hydrogen-aero-derivative-gas-whyalla>