

## ConsenCUS: Carbon Capture, Usage and Storage

Dear ConsenCUS community,

We're excited to bring you another newsletter packed with exciting updates! Our third and final demo site is now in full swing at the Yerakini Mine in Greece, where our innovative CO<sub>2</sub> capture unit is in operation. We spoke with Dr Haris Yiannoulakis from Grecian Magnesite about the installation and its impact.

This edition also highlights our participation in key events, including the LANDMARC Horizon2020 Final Event and the GHGT Conference, where our partners shared groundbreaking research on CO<sub>2</sub> capture and storage. Plus, don't forget to **register for the ConsenCUS End Conference on 14-15 May**—we can't wait to share our final results with you!

Enjoy the updates, and stay tuned for more as we approach the final phase of the project!

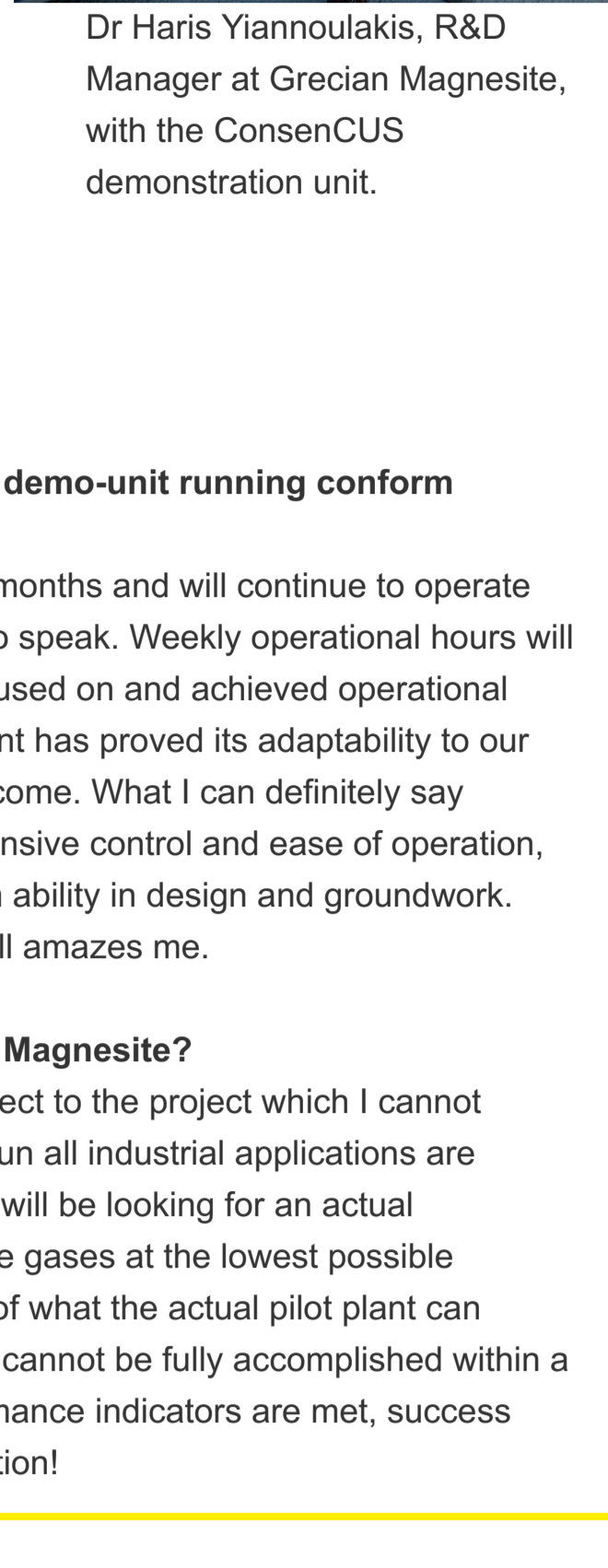
On behalf of the ConsenCUS team,  
Dirk Koppert, Project Manager

### ConsenCUS third and final demo site in full swing

3 months ago, our innovative demo-unit was successfully transferred from [OMV Petrom's Petrobrazi Refinery in Romania](#) to the Yerakini Mine in Chalkidiki operated by [Grecian Magnesite](#). The installation is now in full swing and we asked Dr Haris Yiannoulakis, R&D Manager at Grecian Magnesite, some questions about the project and the installation.

#### The ConsenCUS project has developed such an innovative way of capturing CO<sub>2</sub>. What made Grecian Magnesite decide to join this international project?

First of all, it was the overarching necessity of addressing the reduction of our CO<sub>2</sub> emissions. The magnesia sector is energy intensive, and much like the cement sector, we have to significantly reduce our carbon footprint to align with EU's energy transition strategy. We have turned of course our attention to renewable fuels but in the long run there will still be the geogenic emissions from our process which are unavoidable. These will have to be captured and stored or utilized. To this end, we have been participating in several research projects, but ConsenCUS had an extra appeal: it promised to make CC possible by cleverly regenerating the absorbent and utilizing the captured CO<sub>2</sub> with a net consumption of only electricity and water. We have been investing in solar power so it seemed like a very nice fit.



Dr Haris Yiannoulakis, R&D Manager at Grecian Magnesite, with the ConsenCUS demonstration unit.

#### The demo-unit was installed at the end of 2024. Is the demo-unit running conform expectations?

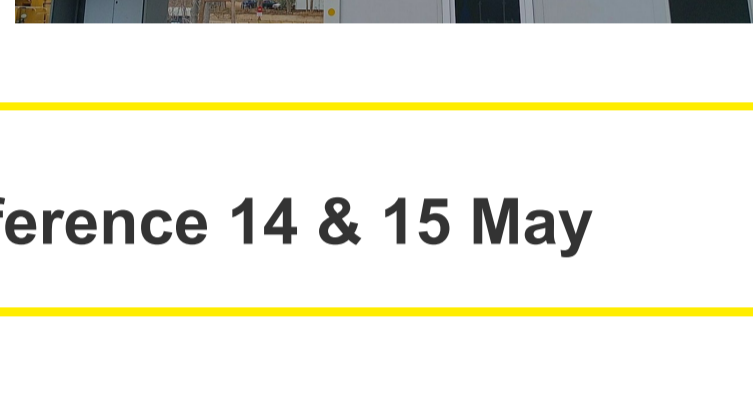
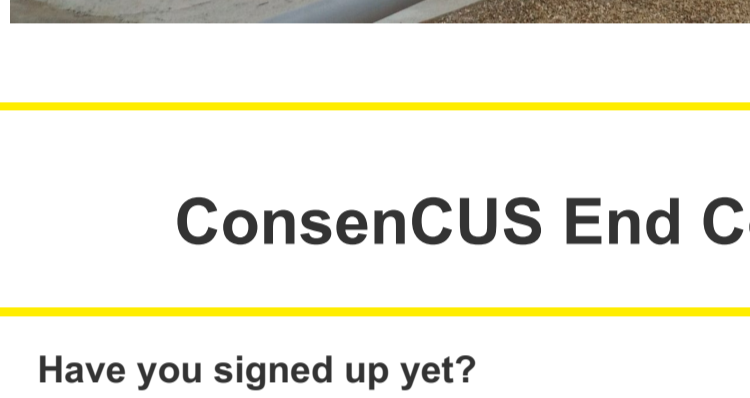
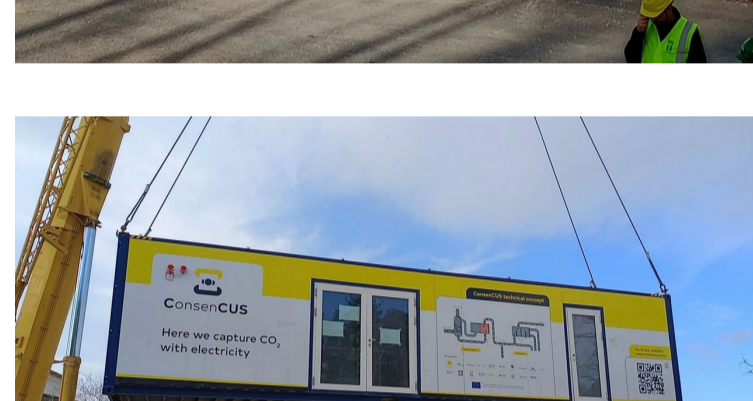
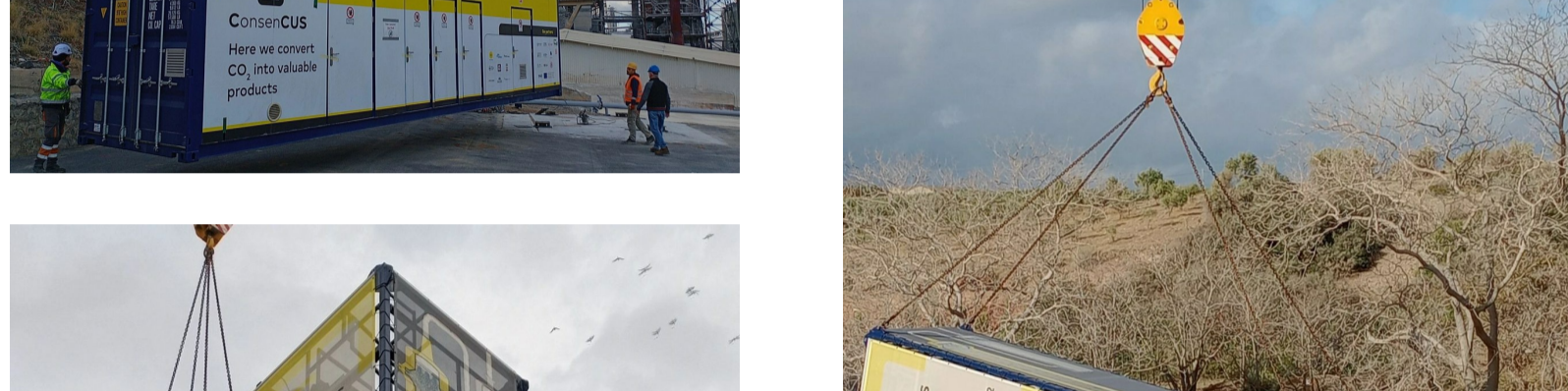
The demo unit has now been in operation for almost two months and will continue to operate for at least another two months so the jury is still out, so to speak. Weekly operational hours will also go up during the next period. Up to now we have focused on and achieved operational stability under various flue gas characteristics and the plant has proved its adaptability to our process, but the bulk of the more "exciting" runs is yet to come. What I can definitely say however, is the robustness of the pilot plant, its comprehensive control and ease of operation, greatly thanks to the ConsenCUS project's technical team ability in design and groundwork. What has been achieved in such a short period of time still amazes me.

#### When would the demo-unit be successful for Grecian Magnesite?

There is definitely an exciting academic and scientific aspect to the project which I cannot overlook and this will be a great success, but in the long run all industrial applications are judged by two things: efficiency and cost. In our case, we will be looking for an actual demonstration of high CO<sub>2</sub> capture efficiency from our flue gases at the lowest possible specific electrical energy consumption, possible in terms of what the actual pilot plant can accomplish. Mind you, commercialization of a technology cannot be fully accomplished within a single Horizon project, so even when our project's performance indicators are met, success also has to do with laying a clear path for further optimization!

### Installation of the demo-unit

By now, the technical team from [DTU](#) is pro when it comes to moving the unit from one location to another. They developed the unit and has had its first test run at [Aalborg Portland's Rørdal cement production site](#). After which they moved the unit from Aalborg Portland to OMV Petrom's Petrobrazi refinery. Now the unit is installed at the Yerakini Mine in Chalkidiki, Greece. DTU is also in charge of the measurements of the results at the three locations. Below are some photos of the construction of the demo unit at the Grecian Magnesite. We also filmed a time-lapse there!



### ConsenCUS End Conference 14 & 15 May

#### Have you signed up yet?

Over the past 4 years, we have demonstrated innovative electrochemical CO<sub>2</sub> capture and conversion technologies in industries, with the aim to build on Net-Zero industry clusters. We are eager to share the results with you!

#### Practical information

**Date:** 14 & 15 May  
**Location:** BIP Meeting Center  
**Address:** 2-4 Koningsstraat, 1000 Brussel

#### About the programme

We have split the programme into two days.

#### Topics of day 1

- Vision on CCUS in EU net-zero industry clusters
- The building blocks for net-zero industry clusters
- Social acceptance & and challenges and opportunities for CCUS in EU

This day will also provide an opportunity for networking and the chance to visit the CCSA EU conference, also taking place that day in Brussels.

#### Topics of day 2

- Technological Innovations and demonstration results of ConsenCUS
- Techno-economic performance and next steps

We will update you this month on the schedule, our speakers and tell you a bit more about the programme content. No need to wait, though: registration is open!

[Register now!](#)

### Other news

### Publication: Oxidative degradation of glycine in aqueous KOH/K<sub>2</sub>CO<sub>3</sub> solutions for CO<sub>2</sub> capture

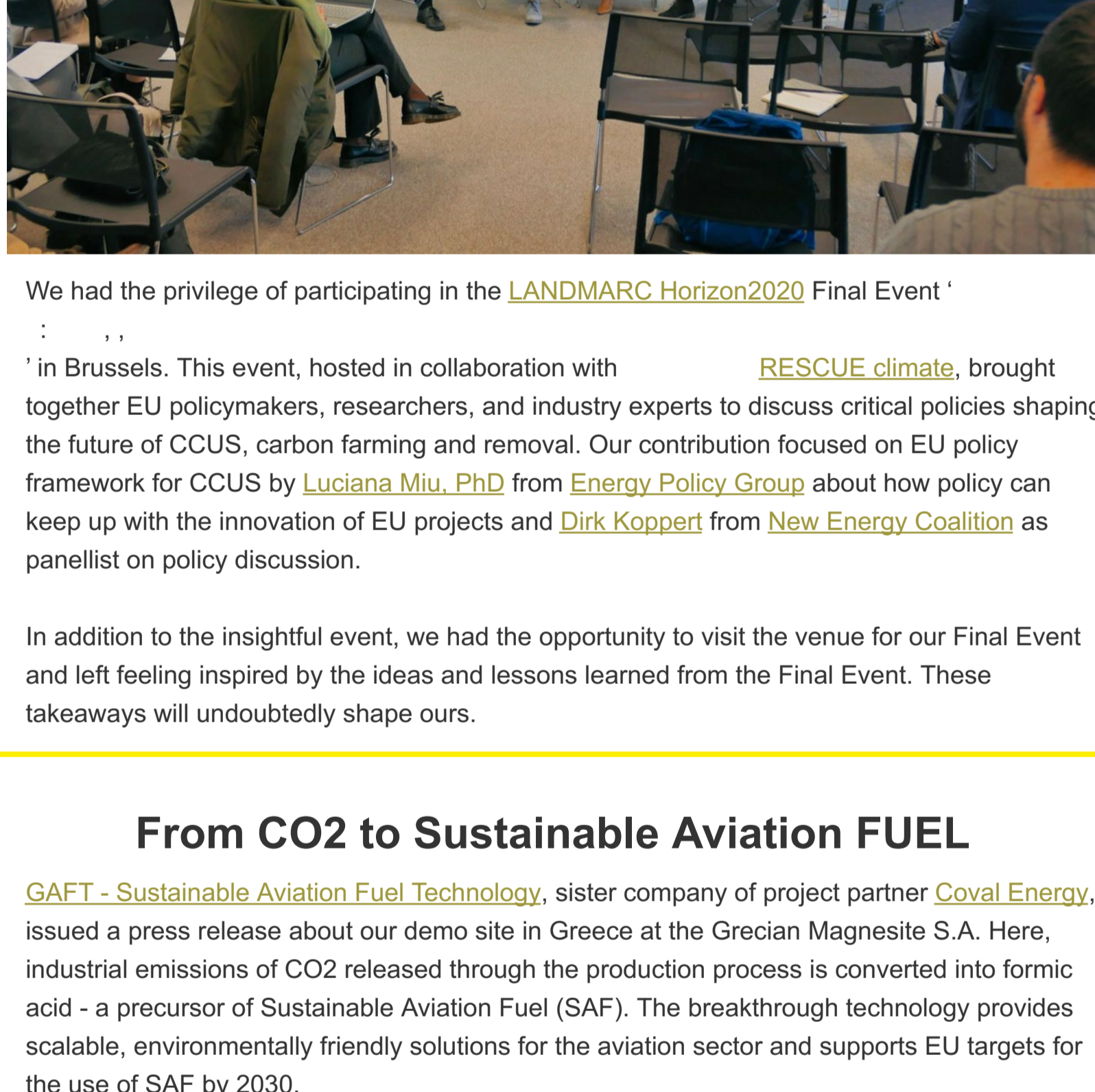
We are investigating the use of potassium hydroxide (KOH) and potassium carbonate (K<sub>2</sub>CO<sub>3</sub>) as cost-effective and environmentally friendly solvents for carbon capture. A critical challenge is their slower absorption kinetics, which increases the size and cost of equipment. To address this, [Friday Ochedi](#), John Andresen, and [Mijndert Van der Spek](#) from [Heriot-Watt University](#) are exploring potassium glycinate as a promoter to enhance absorption rates.

#### Highlights of the research:

- The challenge of potassium glycinate: susceptible to oxidative degradation, potentially impacting performance and costs.
- The study identifies degradation products and mechanisms, offering solutions to enhance stability.
- The findings provide valuable insights on the stability and performance trade-offs of using glycine as a promoter in the potassium-based carbon capture solvents.

[Read research](#)

### ConsenCUS participated in LANDMARC Horizon2020 Final Event



We had the privilege of participating in the [LANDMARC Horizon2020 Final Event](#) ' in Brussels. This event, hosted in collaboration with [RESCUE climate](#), brought together EU policymakers, researchers, and industry experts to discuss critical policies shaping the future of CCUS, carbon farming and removal. Our contribution focused on EU policy framework for CCUS by [Luciana Miu, PhD](#) from [Energy Policy Group](#) about how policy can keep up with the innovation of EU projects and [Dirk Koppert](#) from [New Energy Coalition](#) as panellist on policy discussion.

In addition to the insightful event, we had the opportunity to visit the venue for our Final Event and left feeling inspired by the ideas and lessons learned from the Final Event. These takeaways will undoubtedly shape ours.

### From CO<sub>2</sub> to Sustainable Aviation FUEL

[GAFT - Sustainable Aviation Fuel Technology](#), sister company of project partner [Coval Energy](#), issued a press release about our demo site in Greece at the Grecian Magnesite S.A. Here, industrial emissions of CO<sub>2</sub> released through the production process is converted into formic acid - a precursor of Sustainable Aviation Fuel (SAF). The breakthrough technology provides scalable, environmentally friendly solutions for the aviation sector and supports EU targets for the use of SAF by 2030.

[Read more](#)

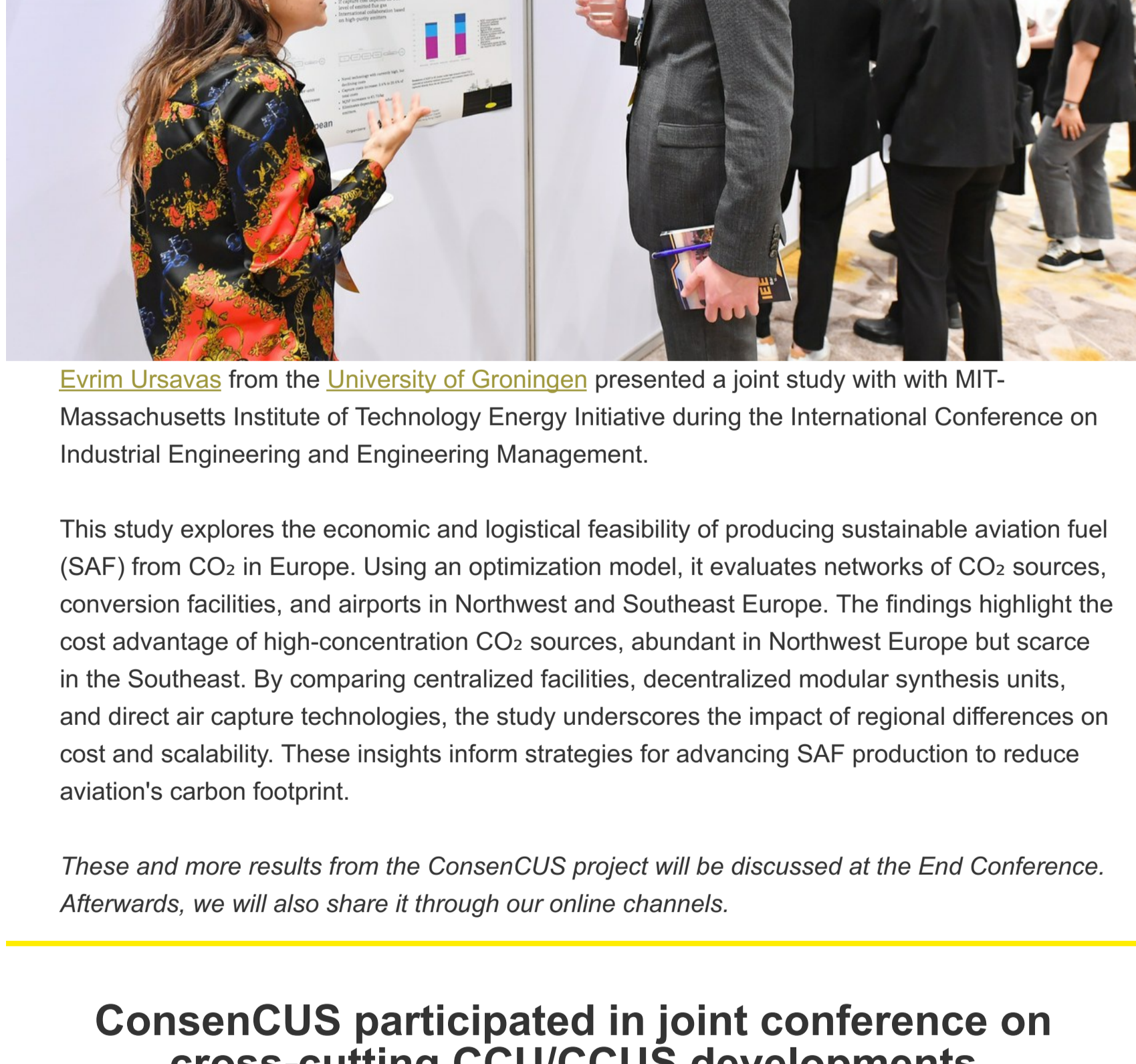
### ConsenCUS at conferences

In October, we were well represented at the GHGT Conference by project partners [CERTH](#), [Heriot-Watt University](#) and [GEUS](#).

Where [Akis Antonoudis](#) and colleagues from CERTH & Heriot-Watt University presented outcomes of the technical performance of the ConsenCUS CO<sub>2</sub> capture technology using their validated process models while showcasing the costs associated with its large-scale deployment. Data from Aalborg Portland's cement plant were used.

[Read more](#)

Project partner GEUS presented the results of their research ' **Uncertainty Quantification of CO<sub>2</sub>-Brine Saturation Functions from Experimental Data** ' where they history-matched experimental data to refine our fluid model and assess uncertainties. This helped them obtain probability distributions for key parameters, revealing that some have multiple highly probable values. A fast forward solver was essential, and a feedforward neural network showed reasonable accuracy. This helps by understanding CO<sub>2</sub> storage capacity requires uncertainty characterisation through probability distributions rather than single values and thereby helps the EU since they must invest in subsurface characterisation and maintain expertise in numerical modelling, following FAIR principles, to advance CO<sub>2</sub> storage solution.



[Evrin Ursavas](#) from the [University of Groningen](#) presented a joint study with MIT-Massachusetts Institute of Technology Energy Initiative during the International Conference on Industrial Engineering and Engineering Management.

This study explores the economic and logistical feasibility of producing sustainable aviation fuel (SAF) from CO<sub>2</sub> in Europe. Using an optimization model, it evaluates networks of CO<sub>2</sub> sources, conversion facilities, and airports in Northwest and Southeast Europe. The findings highlight the cost advantage of high-concentration CO<sub>2</sub> sources, abundant in Northwest Europe but scarce in the Southeast. By comparing centralized facilities, decentralized modular synthesis units, and direct air capture technologies, the study underscores the impact of regional differences on cost and scalability. These insights inform strategies for advancing SAF production to reduce aviation's carbon footprint.

These and more results from the ConsenCUS project will be discussed at the End Conference. Afterwards, we will also share it through our online channels.

### ConsenCUS participated in joint conference on cross-cutting CCU/CCUS developments



We participated in the joint conference on cross-cutting CCU/CCUS developments with 7 partnering projects [C4U Project](#), [Cal-by2030 project](#), [HERCCULES project](#), [INITIATE project](#), [ELECTRA project](#), [The ENCASE project](#), and the EMPHATICAL project. Addressing the challenges in the field of CCUS from multiple angles to create net-zero strategies for our industry. Project partners DTU - Technical University of Denmark and [Wetsus](#) were there to represent our project and shared our findings.

### ConsenCUS was/will be present at...

- 30 April 2025: Podcast episode(s) on results of strategic narratives analysis in the 3 demonstration countries by EPG.
- 14-15 May 2025: [End Conference ConsenCUS](#) in Brussels, Belgium.
- 16-19 June 2025: [TCCS Conference](#) in Trondheim, Norway.

### Deliverables & other publications

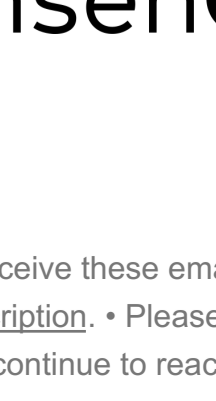
We are working on our final sprint. We will of course share all our findings at our End Conference and then share the deliverables on our online channels. [Click here](#) for a full list of our previous papers.



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