



THREADING-CO₂

Results of the third year of implementation

As THREADING-CO₂ enters a decisive phase, the project is accelerating from laboratory breakthroughs to real-world impact. From building our pilot electrolyser and producing the first CO₂-based MEG converted into polyester, to fine-tuning fibre production, advancing life-cycle modelling, scaling our educational reach, and engaging Europe's innovation community - the past months have been packed with progress.

The 6^o issue of the THREADING-CO₂ newsletter brings you inside this momentum: a closer look at how we are transforming captured carbon into sustainable materials, preparing industrial-scale demonstration, and shaping a more circular future for textiles.

Explore this newsletter to discover the progress made by the consortium, and stay updated with the latest news by following THREADING-CO₂ on [LinkedIn](#) and [Twitter](#).

Scale-up of MEG production process and set-up of industrial demo plant (TRL7)

Our project has reached several significant milestones as we move closer to demonstrating an innovative pathway for producing sustainable materials from carbon dioxide.

The pilot-scale electrolyser has been built and will be installed in January 2026. This equipment will produce several kilogrammes of carbon monoxide from CO₂ as feedstock for subsequent chemical reactions.

Our pilot-scale development team has optimised the carbonylation and hydrogenation reactions to boost production efficiency whilst reducing costs. The purification processes have also been enhanced, enabling us to produce ethylene glycol that meets the standards required for polymerisation. Several kilogrammes of mono-ethylene glycol have already been successfully converted into polyester.

To support these advancing activities, our team is rapidly growing with new members joining between now and early 2026. Meanwhile, simulations for the demonstration plant have been completed, providing preliminary designs and cost estimates for scale-up.

Polymers and fibres production trials, fine tuning (w final users)

In WP3 PET is synthesized from ethylene glycol (MEG) and purified terephthalic acid (PTA) and transformed into PET fibers and textiles. After the successful feasibility study on synthesis, melt-spinning and texturing of PET from CO₂-based monomer DITF, TLC and FAU were mainly focused on determining and achieving the desired specifications for polymers and yarns for car seats and clothing with commercial monomer. The resulting optimum processing parameters for reactors, melt spinning and texturing lines will be the base for the subsequent production with CO₂-based monomer from the pilot and demo plant.



Life Cycle Sustainability Assessment

The overall objective of WP4 is to assess the environmental, economic, social, and political sustainability of Threading-CO₂ technology and products by performing LCSA. The progress in this WP continues steadily. TECNALIA has almost completed the Life Cycle Inventories (LCIs) of all partners, with only a few points pending clarification. In addition, the two benchmarks for comparison with the THREADING technology have been defined: a bio-based MEG and a fossil-based MEG. The inventories for both benchmarks are already prepared, although some economic data for the fossil-based equipment is still missing. Another important step forward is that TECNALIA has started modeling the partners' inventories in SimaPro, a specialized software for Life Cycle Assessment. This process consists of structuring all collected data on inputs and outputs of each process into the tool, enabling the calculation of environmental impacts. The work in the coming months will focus on completing the remaining details of the partners' inventories and fully modeling all flows in SimaPro. This will allow obtaining preliminary results of the environmental, economic, and social analysis.

Development of Modular Learning Resources

The development of online learning tools in 2025 was built on the success of the first MOOC, "*Climate Action – The Role of Digital Transformation in the Process Industry*", launched in October 2024. We have reached an important milestone: to date, more than 250 students have completed the course and 88% of them would recommend it to others. To improve accessibility, we are adding new videos, graphics, and translations, aiming offer the course in six languages. Looking to the future, the launch of the second MOOC, "*Polyester Production: Transitioning from Fossil Fuels to Sustainable Alternatives*", is scheduled for early 2026. This course will cover the current state of recycled polyester, bio-based polyester, and CO₂-based polyester in the textile industry. In 2025, we shared our ideas on digital learning at the international SEFI 2025 Annual Conference, held in Finland in September, focusing on higher education in engineering. The work is available at <https://doi.org/10.5281/zenodo.17631544>. We also promoted our online learning tools at LUT University events, including the LUT Summer School in July and DuuniDay in December.



Dissemination, Communication and Exploitation

Threading-CO₂ took part in ECOMONDO, Europe's leading event for green and circular economy innovation, held in Rimini from 4–7 November 2024. On Wednesday, 5 November, the project was presented to key stakeholders and major players in the bioeconomy sector during the session *"Industrial Symbiosis in the Twin Transition Era:*

A daily tool for systemic competitiveness, innovation and resource efficiency." Threading-CO₂ was also featured at the PNO Innovation Italy project hub, where PNO - leader of the project's Exploitation and Dissemination activities - shared more information and engaged with visitors at its booth. On Thursday, 6 November, the project hosted its first official symposium, bringing together industrial stakeholders, EU project representatives, and sector experts to discuss the latest advancements in CO₂ capture, utilization, and clean energy technologies.

The event featured high-impact contributions from:

- Bruno Marengo (Fairbrics) – Turning CO₂ waste streams into sustainable polyesters for the textile industry.
- Javier Ivañez Castellano (AIMPLAS) – Presenting innovative technologies for CO₂ capture and reuse.
- Luigi Ranza & Chandra Gracia Anweta (PNO Innovation Italia) – Showcasing how EU-funded innovation scales from lab to market.
- Alexander Wentzel (PyroCO₂) – Demonstrating microbial pathways that convert CO₂ into acetone.
- Albert Guisasola Canudas (VIVALDI H2020 project) – Highlighting bio-based routes to transform CO₂ into high-value organic acids.

It was a powerful exchange of ideas - and a clear step forward on Europe's path toward decarbonization and circular innovation. A huge thank you to everyone who joined us, connected, and contributed to these inspiring conversations.





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**Would like to join our network for collaborative
Dissemination and Communication activities?**

Contact our designated team below:

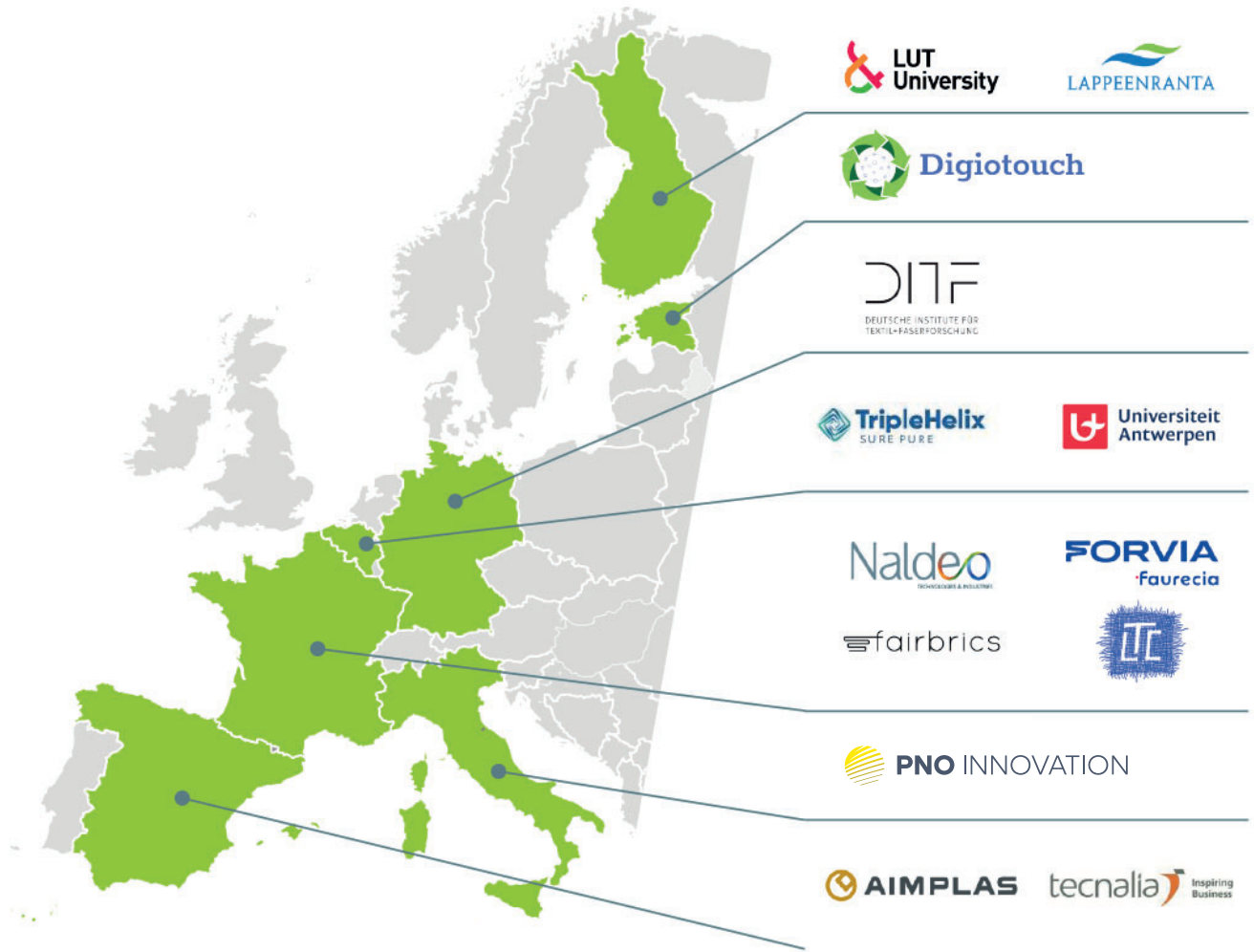
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to be always updated on the latest news
and the project progress!

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CONSORTIUM



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