NextFuel

News & Updates
07/2026

Advancing Renewable Mathanol for Maritime Decarbonisation

As **NextFuel** enters Month 32 of its 60-month journey, the project is moving steadily from ambition to tangible progress in reshaping the future of sustainable fuel production for shipping. With the maritime sector urgently seeking low-emission alternatives, **NextFuel** is advancing an innovative pathway for biomethanol production by electrifying the steam methane reforming process and supporting the development of the first electrified SMR plant in Norway. This second edition of the **NextFuel newsletter** brings together the project's latest technical advancements, from simulation-driven process optimisation to sustainability assessment through life cycle analysis and life cycle costing. It also **highlights** recent events and activities that demonstrate how the consortium is working to assess ecosystem and logistical impacts and support the broader deployment of biomethanol as a future low-emission shipping fuel.

Included in this issue:

- **Technical progress:** Updates from framework conditions, process simulation, plant design, and scaling and impact assessment.
- **Events and outreach:** Highlights from EUBCE 2026 in The Hague and ESCAPE 36 in Sheffield.
- **Looking ahead:** Next steps for process optimisation, sustainability assessment, value-chain evaluation and stakeholder engagement.

Project at a glance:

- **Main goal:** To revolutionize sustainable methanol production by electrifying the steam methane reforming process.
- **Maritime relevance:** Biomethanol is intended to decarbonize the maritime sector as a low-emission shipping fuel.
- **Demonstration ambition:** Design and develop the first electrified SMR plant in Norway.
- **Assessment approach:** Apply simulation tools, LCA and LCC to assess sustainability and optimize the value chain.
- **Deployment focus:** Evaluate ecosystem and logistical impacts to support the widespread deployment of biomethanol as a shipping fuel.

Work Package updates

WP2 Framework conditions & incentives

An important part of successfully building a project plant is to set the foundation right, which has been the topic in **work package 2**, through selecting the appropriate plant site, size and configuration. We developed a framework to support analysis and development of the plant sites. The work included mapping the infrastructure systems, off-take systems, operational requirements and so on for each site. As we discovered substantial permitting risk, especially related to grid access, we extended the plant development to several sites. In collarboration with work package four, this also extended to securing the actual electricity and permits to build the plant.

Another key task is to understand the carbon contribution schemes. FuelEU's pooling mechanism means that you do not have a fixed tax, but you have a market for solutions that cost less than the carbon penalty. Even if individual ships are not compliant, they can join pools of dozens of ships, and share the carbon reducton emission of other ships. This means that you optimize for pools of ships, where the natural strategy is to include vessels that operate on the fuels with the lowest cost paths. Understanding the tax impact then becomes about understanding the cost and price structures of other alternative fuels, which has been key to pricing our off-take agreements. We have also done a LCA and LCC analysis of the different plant configurations. For the ones that utilise a grid connection, the specifics of the biogas certificates will be the major impact on the emissoin factors. One of the interesting findings in our LCC analysis was that for our site, there was limited value in adopting production to electricity pricing. The electricity element of our cost is much less than e.g. an electrolysis plant, due to more than 80% lower electricity use.

WP3 Simulation & Optimization

In **WP3**, simulation models have been developed in Aspen PLUS for the conversion process from biogas to methanol, including electrified steam methane reforming, synthesis gas adjustment, methanol synthesis and purification. Models have been developed for cases with different feed composition, with the purpose of determining the requirements for hydrogen and/or carbon dioxide addition or removal to maintain the desired stoichiometric number. Exergy analysis has been applied in order to understand how the thermodynamic process performance can be improved. In addition to the reformer section, heat exchangers with large heat duties and larges temperature differences have been identified as potential improvements.

Preliminary results have been presented at European Symposium on Computed Aided Process Engineering (ESCAPE 36). As part of WP3, a student completed her Master's Degree in Mechanical Engineering spring 2026, with a thesis related to NextFuel. The thesis focused on heat integration and cost analysis. The next steps of WP3 will focus on process optimization and integration.

During FEED some 25,000+ engineering hours were spent by Topsoe and the engineering carried out during FEED has enabled Topsoe to also present a firm bid proposal for the plant.

WP4 Plant design & Optimization

Work Package 4 – Plant Design & Optimization, led by Topsoe, is largely complete. In WP 4.1, Topsoe together with Flexfuels have fixed framework conditions and plant capacities. Underlying cost considerations have been worked out. In WP 4.2 the Design Basis has been laid out and frozen. In WP 4.3 Topsoe completed the Process Design encompassing both Basic Engineering and FEED. In WP 4.4 a process module design has been carried out, resulting in 12 process modules for the methanol plant plus 2 stick-built structures to be erected on site. In addition, for the power supply unit, demin water unit and compressors skid-mounted units have been designed. For the whole methanol process island mechanical drawings and a 3D model has been created and issued to Flexfuels and integrated in the overall 3D model.

Plant Design & optimization is largely complete, except for potential minor updates or necessary adjustments subject to site-specific requirements once Final Investment Decision is about to be made for the specific job site, for which Topsoe is awaiting notice to proceed.

WP6 Scaling & Impact

In the framework of **WP6**, CERTH has already completed some Life Cycle Assessment (LCA) simulations, using the SimaPro software and the Ecoinvent database to analyse the environmental performance of different plant capacities and identify how scale variations may potentially affect overall sustainability. In addition, different feedstocks and logistics solutions were evaluated from an environmental perspective. Specifically, the simulations included the small biomethanol plant in Greece, investigating different scenarios, such as the utilization or not of the byproducts. Likewise, simulations regarding the small plant in Norway have been conducted, where again the utilization and non-utilization of the byproducts were evaluated. Also, the cases of a medium and a large plant in Norway were investigated, studying both the utilization and non-utilization of the by-products. In all cases, various environmental impact categories were assessed, such as the acidification, climate change, particulate matter formation, ecotoxicity, etc. In addition, Life Cycle Costing (LCC) analysis, for the aforementioned cases was carried out. Specifically, a conventional LCC approach was used, aligned with the LCA system boundaries and assumptions. In this way, the identification of potential trade-offs between environmental performance and economic feasibility was enabled, along with the selection of the best business cases.

Generally, at this stage, some quantitative results, for the different case studies – scenarios have been obtained, but during the progress of the project (next steps), more quantitative results will be generated; and since the LCA and LCC frameworks are flexible, they will be continuously updated as more detailed data become available. WP6 begun on the 13th month and will be completed in the end of the project (on the 60th month). Thus, the Deliverables and Milestones required for WP6 are due by the end of the project (55th month or later).

Events, outreach and stakeholder engagement

NextFuel Participated in a Synergetic Maritime Decarbonisation Workshop at EUBCE 2026, in Hague

On 19 May 2026, the NextFuel project participated in a synergetic action with four EU-funded sister projects — M2ARE, COCPIT, SEA FAIRER, and POSEIDON — during the European Biomass Conference & Exhibition (EUBCE 2026), held in The Hague.

The joint workshop, titled “Decarbonizing the Seas”, took place at the Exhibition Forum from 16:15 to 18:30 and brought together leading Horizon Europe projects working on innovative solutions for the decarbonisation of the maritime sector. NextFuel was represented by CERTH, which presented the project’s progress and contribution to the development of advanced biofuels and sustainable marine fuel pathways.

The workshop provided a valuable platform for exchanging knowledge, presenting recent achievements, and exploring synergies among projects that share a common ambition: supporting the transition of the global shipping sector towards a carbon-neutral future.

During the session, the participating projects showcased their latest developments in areas such as the use of biogenic CO_2 and renewable hydrogen for methanol production, thermochemical waste-to-value conversion, and the development of credible pathways for the large-scale uptake of methanol and other sustainable fuels in shipping.

Following the project presentations, a panel discussion and Q&A session enabled an open exchange between project representatives, stakeholders, and the audience. The discussion focused on key technological and market challenges, including current Technology Readiness Level progress, feedstock innovation, decision-support tools, and the steps needed to bridge the gap between cutting-edge research and large-scale industrial implementation.

A central message of the workshop was the importance of collaboration and cross-project synergies. Maritime decarbonisation requires coordinated action across technologies, value chains, infrastructure, regulatory frameworks, and industrial stakeholders. By working together, projects such as NextFuel, M2ARE, COCPIT, SEA FAIRER, and POSEIDON can strengthen the impact of their innovations, address shared challenges linked to FuelEU Maritime and the EU ETS, and contribute to the development of integrated supply chains for future sustainable marine fuels.

Through its participation in this joint workshop, NextFuel reinforced its commitment to knowledge sharing, stakeholder engagement, and collaborative action towards a net-zero emissions future for shipping.

NextFuel at Synergetic Workshop, EUBCE 2026

NextFuel at EUBCE 2026: A Successful Showcase of Innovation in Renewable Methanol Production

The NextFuel project was proud to participate as an exhibitor at EUBCE 2026, presenting its innovative approach to renewable methanol production and engaging with the wider biomass, bioenergy and renewable carbon community.

During the event, visitors had the opportunity to learn more about how NextFuel is demonstrating the use of electrically heated chemical catalysis for improved production and consumption figures. Through the application of the eREACT™ approach, the project aims to enable the production of methanol from biogas, or other combinations of methane and CO_2, bringing renewable methanol production closer to cost competitiveness with fossil-based alternatives and supporting its future scale-up.
NextFuel's presence at Stand 54 attracted strong interest from researchers, industry representatives, technology providers and stakeholders working towards cleaner and more sustainable energy solutions. The event provided an excellent opportunity to share the project's objectives, present its progress, exchange

knowledge, and explore new perspectives for future collaboration.

We would like to warmly thank our CERTH partners for representing the NextFuel project at EUBCE 2026 and for their excellent contribution to the project's presence as an exhibitor. Their active engagement with visitors, stakeholders and the wider bioenergy community helped showcase NextFuel's innovative work and made the event a real success for the project.

Participation in EUBCE 2026 was an important moment for NextFuel, strengthening the project's visibility and highlighting the potential of renewable methanol as part of the transition towards more sustainable fuels and energy systems.

A sincere thank you to everyone who visited the NextFuel stand, shared their insights and showed interest in the project. We look forward to continuing the conversation and sharing more updates as NextFuel progresses.

NextFuel project at EUBCE 2026

NEXTFUEL Partners from NTNU Present Research at ESCAPE 36

NEXTFUEL was pleased to be represented by its partners from NTNU at ESCAPE 36 – European Symposium on Computer Aided Process Engineering, which took place in Sheffield, UK, from 21 to 24 June 2026.

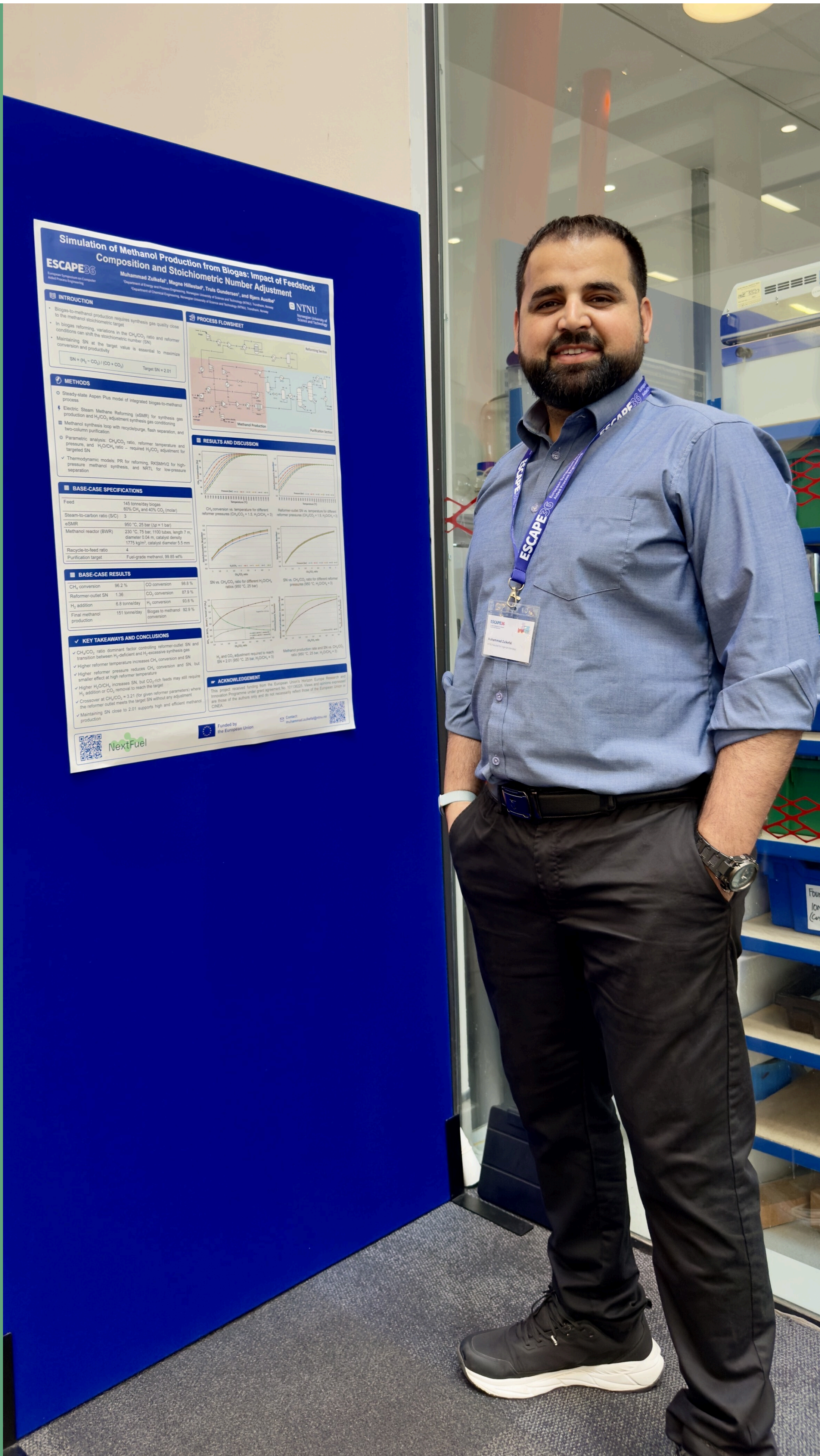
During the event, the NTNU team presented the paper “Simulation of Methanol Production from Biogas: Impact of Feedstock

Composition and Stoichiometric Number Adjustment”, contributing to discussions on renewable methanol production and sustainable fuel pathways.

The work focuses on the use of biogas as a promising biogenic carbon source for renewable methanol. In particular, it examines how variations in biogas composition and reformer operating conditions can influence the syngas stoichiometric number and the adjustments required to meet methanol synthesis targets.
This research supports NEXTFUEL’s broader efforts to advance innovative and sustainable solutions for the future fuel value chain.
We warmly thank our NTNU partners for their valuable contribution and for representing NEXTFUEL at this important international event.

The full paper is available for download on the NEXTFUEL project website.

A poster was also prepared.



NTNU present research at ESCAPE 2026

Looking ahead

As the project progresses through Month 32, the consortium will continue advancing process optimisation and integration, refining sustainability and cost assessments, and strengthening the evidence base for renewable methanol deployment. Future updates will continue to present the project's technical progress, engagement activities and contributions to the deployment of biomethanol as a low-emission fuel pathway for the maritime sector.

Find out more on our website

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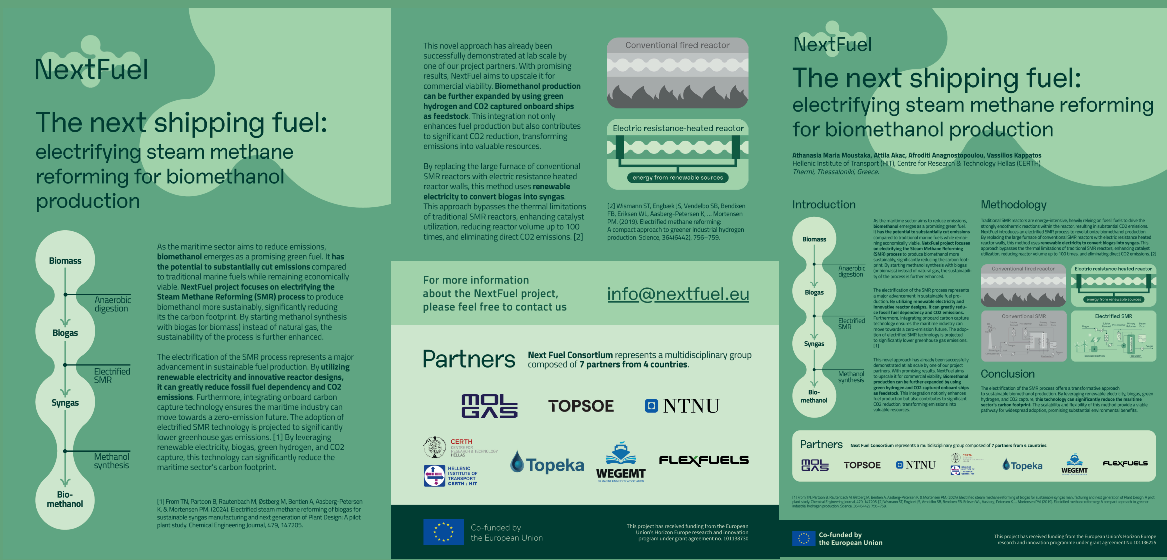

Switching to eREACT™ has the potential of reducing total global emissions by 1%

Project updates

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info@nextfuel-project.eu

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