EBIO Concludes Bringing Electrochemical Innovations in Biorefinery Processes

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Final Achievements and Integration into Existing Value Chains

After four years of intense research and collaboration, the EBIO project has successfully concluded. This EU-funded project had the objective of advancing electrochemical technologies for upgrading bioliquids. By doing so, it offered an alternative to traditional, resource-intensive processes based on fossil-fuels and eliminated the need for high-pressure hydrogen—a costly and environmentally taxing component of traditional methods for bioliquids treatment.

EBIO's path was characterized by scientific breakthroughs and demonstrated how international collaboration can drive innovation by re-thinking processes through a circular perspective.

The final event of the EBIO project, held in Örnsköldsvik, Sweden, as a side event of the Nordic Wood Biorefinery Conference, highlighted the challenges EBIO overcame to integrate electrochemical stabilization technologies into industrial value chains.

Dr. Roman Tschentscher reflected on this during his presentation*: "Our goal was not to produce a fuel directly in the electrochemical cell but to stabilize bioliquids, improving their long-term stability, energy content, and distillability. This allows for easier fractionation and integration into existing refinery processes and biofuel value chains".*

The event included detailed presentations from all partners, showcasing their contributions to the project and answering the main questions from the attendees, including students, industry representatives and researchers.

Figure 1 The last consortium meeting took place in Örnsköldsvik, Sweden, in conjunction with the final event.

Commitment to Sustainability

The final webinar, held on November 26th during the last days of the project, summarized the benefits of the project by focusing on three main aspects: process design, techno-economic analysis, and life-cycle assessment (LCA). These analyses validated the feasibility of EBIO's approach, offering both economic and environmental advantages. Indeed, the development of an electrochemical pathway capable of upgrading pyrolysis oils and black liquor—two challenging feedstocks—has demonstrated compatibility with co-processing in refineries.

Commenting on the project's impact, Jurjen Spekreijse, LCA consultant at BTG, noted:

"The screening LCA showed a reduction of up to 90% in greenhouse gas emissions compared to conventional gasoline, which makes it a promising technology to produce biofuels, which typically achieve reductions of 50–80%."

Looking ahead, EBIO project has laid the foundation for further advancements in renewable technologies, demonstrating the viability of electrochemical upgrading as a cleaner alternative for bioliquids processing. As the project concludes, its findings lead the way for further projects and exploitation opportunities that will build on its success.

Final event and webinar recordings can be found on YouTube channel:

EBIO project - Final Event - YouTube

Webinar #4 – YouTube

About EBIO:

EBIO – *Turning low value crude bio liquids into sustainable road transport fuels* started on the 7th of December 2020 and runs for 48 months.

The consortium, coordinated by Sintef AS (Norway), counts **9 beneficiaries** from **7 countries:** B.T.G. Biomass Technology Group BV – BTG (The Netherlands), Johannes Gutenberg-Universitat Mains – JGU (Germany), Universiteit Twente - UT (The Netherlands), Condias GMBH (Germany), Turkiye Petrol Rafinerileri Anonim Sirketi – TUPRAS (Turkiye), Poyry Sweden AB – AFRY (Sweden), ETA – Florence Renewable Energies (Italy), Agencia Estatal Consejo Superior Deinvestigaciones Cientificas – CSIC (Spain).

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Contact:

Ph.D. Roman Tschentscher, Senior Research Scientist Process Chemistry, Sintef
Project coordinator, e-mail: roman.tschentscher@sintef.no
Project email: info@ebio-h2020.eu

www.ebio-h2020.eu