

Development of an Efficient Microwave System for Material Transformation in energy Intensive processes for an improved Yield



DESTINY GOES ON!

Along with the latest technical progresses gained by the consortium, the project has also started a collaboration with other [SPIRE](#) projects, with the aim to boost their visibility and to share interesting results to maximize their impacts and their exploitation.

The collaboration began with a cross media follow activity on each project website, LinkedIn and Twitter accounts, continued with the first joint newsletter and an online webinar.

Let's take a look at this journey with [LIBERATE](#), [PERFORM](#) AND [SIMPLIFY](#) projects and remember to follow DESTINY [LinkedIn](#) and [Twitter](#) accounts to be always updated on the latest news!

PROJECTS PRESENTATION!

DESTINY and the other initiatives of the SPIRE-02-2018 collaboration address the same challenge: *processing of material feedstock using non-conventional energy sources*.

Non-conventional energy sources have already been applied in process intensification, mainly at lab scale, such as microwave, plasma, ultrasound, as well as electrochemical and photochemical processes, showed significant improvements in process performances (e.g. improved selectivity, crystal nucleation, reaction speed easing raw material demand) and in increasing the energy efficiency of the overall process.

The processes powered by non-conventional energy sources developed by the SPIRE projects, aim at the electrification of the industrial production processes and are suitable for connection to the electrical grids. Indeed, these processes are characterized by an increased flexibility of the energy input, thus perfectly fitting to the next generation renewable based electricity grid allowing variable throughputs to better address the market demand and enable leaner production paradigms (e.g. decreased stock, production on demand). Moreover, such technologies are suitable for downscaling and continuous processing, where they can also be coupled with real-time monitoring allowing finer control of the transformations.



The [LIBERATE](#) project will use selective electrochemistry to depolymerize the lignin into value added products, delivering a fully characterized continuous electrochemistry-based biorefinery system for lignin valorization. The system will use Kraft and Organosolv lignin as feedstocks and derive to vanillin, biogenic adipic acid analogues and bio-phenols which are high value and of high industrial interest. Liberate will model and physically integrate renewable energy sources to deliver a process that is capable of synthesizing chemicals with zero CO₂. The renewable energy integration will open up new business models for biorefinery operators to utilize peak renewable energy at discounted rates.



SIMPLIFY aims at enabling the electrification of the chemical process industry – and in particular the specialty chemicals industries – by moving from batch to continuous production with flexibility being ensured by the application of alternative energy forms (microwave, ultrasound). At the core of the SIMPLIFY project are the three case-studies, serving as representatives for process classes of high importance in the chemical industry: one in the domain of reactive extrusion (class of processes involving viscous streams), the other two in the domain of reactive crystallization (class of processes involving suspensions). Each of these case-studies is of interest to one industrial end-user in the project.



PERFORM Project aims to develop highly efficient and integrated electrochemical systems for the improvement of sustainable production of valuable building blocks from biobased feedstocks. The project will demonstrate electrochemical production processes of biobased chemicals at a technology readiness level 5-6. Two demonstration lines are under development to establish potential for selective and efficient production of biobased chemicals via electrochemical routes. The first showcase covers electrochemical production of maleic acid from furfural paired with the production of valeric acid from levulinic acid; while the second showcase deals with adipic acid production from glucose. The development and innovation in the PERFORM program will target two global trends that are drivers of a major transition within the European chemical industry: 1) electrification and 2) a shift towards bio-based feedstocks.

JOINT NEWSLETTER SPIRE-02-2018

The [first joint Newsletter](#) of DESTINY, SIMPLIFY, PERFORM and LIBERATE was released in April 2021, providing the latest advancements and key technologies developed by the projects.



The issue offers details on:

- LIBERATE pilot plant: Installation and commissioning in Trondheim (Norway).
- Insights on the Industrial Stakeholder Meeting organized by SIMPLIFY.
- PERFORM system designed and reactor constructed.
- DESTINY innovative Business Model that will ease the launch of its solutions into the market.

“ORGANIC ELECTROCHEMISTRY: TOWARDS THE ELECTRIFICATION OF THE EUROPEAN CHEMICAL INDUSTRY IN 2030” WEBINAR

PERFORM and LIBERATE joined forces at the “[Organic Electrochemistry: Towards the electrification of the European Chemical Industry in 2030](#)” webinar, held online on June 10th, 2021.



The event gathered experts from several organizations at the forefront of research and development of organic electrosynthesis. The attendees received powerful insights on the latest innovations achieved by PERFORM and LIBERATE consortia.

Invited speakers shared their vision on the electrochemical industry challenges has to face in the nearby future. Among the speakers, Angels Orduna, Executive director of ASPIRE, Prof. Dr. Siegfried Waldvogel from the Department of Chemistry of Johannes Gutenberg University Mainz and representatives from Evonik, SINTEF, TNO, Avantium, VITO, University of Graz, and the University of Messina showcased their state-of-the-art technologies and innovative developments towards a greener industry.

Take a look at the [recorded session](#)!

HORIZON RESULTS BOOSTER



During a joint meeting, DESTINY, SIMPLIFY, PERFORM and LIBERATE projects discussed and agreed on the opportunity of tackling their shared goals benefiting from a special tool, the [Horizon Results Booster](#) (HRB). The HRB is an initiative of the European Commission consisting of a package of specialized services provided free of charge to FP7 and H2020 projects (ongoing or closed), to maximize the impact of R&I projects and increase the exploitation potential of their research results.

The HRB offers services to both individual and groups of projects. The goal of the PERFORM, LIBERATE, SIMPLIFY and DESTINY group would be to strengthen its capacity of spreading awareness about their work, maximising the dissemination of their results and offer a wider and more complete view to interested stakeholder about the potential of the collaboration of these four EU funded projects. In addition, the group will also consider the possibility of requesting Go-To-Market Services, which aim to make project results ready for commercialisation, to explore the factors related to the Intellectual Property Rights involved in the collaboration, to boost the potential of joint exploitations of the projects' results.

The Group of Projects joint application to the HRB services has been submitted under the lead of PERFORM project and it has been approved. Stay tuned!

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For more info about project visit the DESTINY website at: www.destinyh2020andbeyond.eu



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