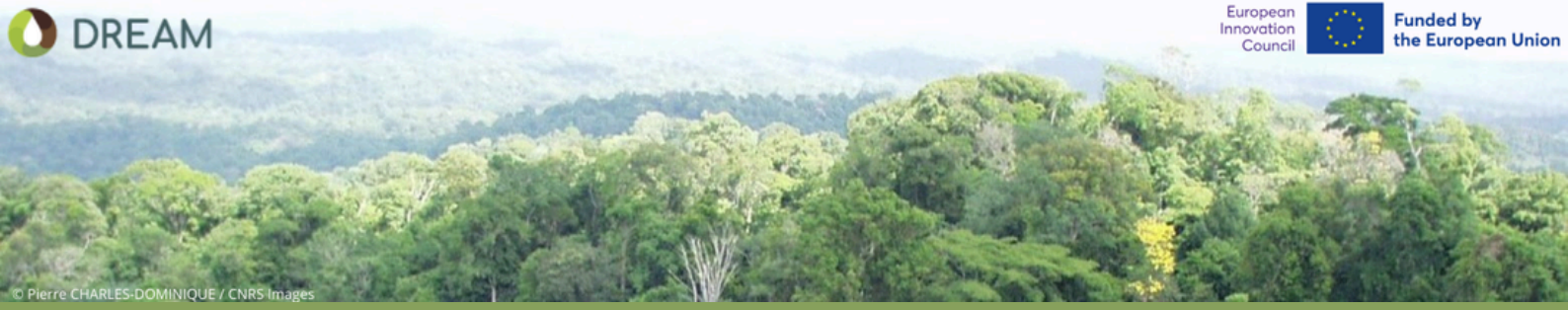

DREAM

European Innovation Council

Funded by the European Union

DREAM NEWS

NEWSLETTER OF THE HORIZON EUROPE PROJECT DREAM

NEWSLETTER N°1, FALL 2024

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DREAM PROJECT:

PROCESSING COMPLEX MATRICES: DESCRIPTION, REACTION-SEPARATION, MODELLING

Transforming complex matrices for the future chemical industry

The use of new feedstocks derived from renewable or waste resources is essential for the future of the chemical industry. There is a need for a better understanding of these materials and their transformation from a chemical and engineering point of view.

Funded by the European Innovation Council (EIC), the DREAM project aims to address the transformation of complex matrices in the chemical industry. It will use Kraft black liquor as a case study to develop new processes that combine reaction and separation in parallel and sequential mode to produce valuable products. Online monitoring coupled with the design of original modelling and simulations will be elaborated. Interdisciplinarity, as the core of the project, will be explored with approaches borrowed from philosophy and social science.

The Horizon Europe DREAM project (Processing Complex Matrices: Description, Reaction-Separation, Modelling) is a project composed of 7 European partners and funded by the European Union for the EIC Pathfinder Open call for proposals, under the grant agreement N°101130523.

Writer: Sivane Mosenego (CNRS)

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Meet the consortium

CP2M (Catalysis, Polymerisation, Process & Materials) will study catalytic processes and reactive distillation, and will coordinate the development of analysis methods. Léa Vilcocq works on biomass valorization with catalytic processes for more than ten years and will coordinate the DREAM project.

ICRCELYON (Catalysis and Environment Research Institute of Lyon) will work in synergy with CP2M on catalytic processes and analytical methods. IRCELYON will also participate in the interdisciplinary study on the exchanges between the chemical and chemical engineering communities and the social sciences and humanities actors.

LRGP (Laboratory Reactions & Process Engineering) brings to the project a global expertise on biomass characterization, thermodynamic studies of solvent (DES), biomass conversion by liquefaction and pyrolysis as well as membrane science.

CP2M, IRCELYON and LRGP are all research units of the CNRS: the French national center for scientific research.

LNEG (Portuguese National Laboratory of Energy and Geology), specifically the Bioenergy and Biorefineries Unit (UBB), will bring important knowledge and skills on biomass characterization an deconstruction with its technological and R&D infrastructure.

NIC (National Institute of Chemistry) Department of Catalysis and Reaction Engineering, focuses on the valorization of biomass and its transformation into useful building blocks. In the DREAM project, NIC will work on chemical engineering aspects of biomass conversion and multiscale modelling and simulation of complex systems.

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NEREUS is a French company founded in 2013. It develops and commercializes eco-friendly water and effluent filtration technologies and specialized in dynamic filtration on ceramic discs to extract high-quality water and recover valuable ingredients from waste streams.

Twente University is a public university located in Enschede, Netherlands. It will lead the interdisciplinarity parts of the project and tasks related to philosophy and sociology with expertise on Philosophy of Science.

Kick off meeting

DREAM consortium members at the kick off meeting, 11th April 2024 in Villeurbanne, France.

The DREAM project's kick off meeting took place on the 10th and 11th April 2024 in Lyon, France, it gave the consortium the opportunity to meet each other and define the objectives of the project. The kick off meeting gathered 18 participants from the 7 research teams involved in the project.

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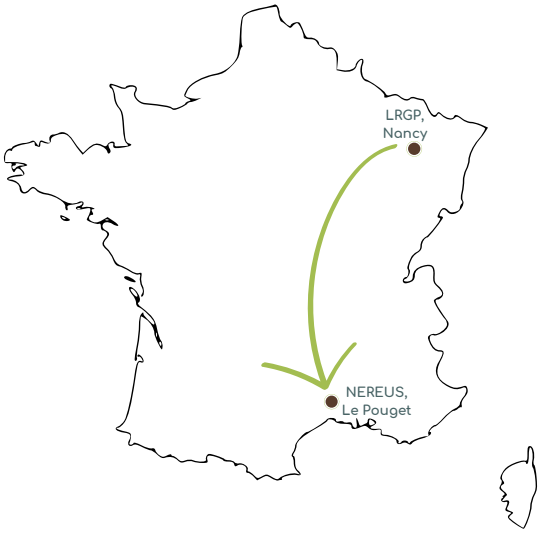
First steps of the project

Procurement of biomass feedstock and kraft black liquor

LNEG and CP2M started the project with the procurement of kraft black liquor and biomass feedstock which will be used for the project activities by LNEG, CP2M, LRGP and NIC. The kraft black liquor will be delivered at LRGP (Nancy, France) where it will be distributed among the partners working with the liquors. Fines samples are currently stored at LNEG (Lisbon, Portugal) where they have been conditioned to get homogeneous lots (see picures).

Biomass fines samples stored at LNEG before and after conditioning

Cooperation between the partners



On the 23rd May 2024, Yann Le Brech (LRGP) and Laetitia Cesari (LRGP) visited NEREUS in Le Pouget, France and met with Emmanuel Trouvé (NEREUS) and Guillaume Nourrit (NEREUS). This meeting was the opportunity for members of our consortium to present the teams working on the DREAM project and to know each other better. During this meeting, Guillaume and Emmanuel presented thoroughly the technology of filtration on ceramic rotative discs. Both teams worked together on ultrafiltration process design and on practical aspects of its implementation.

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Our young researchers

About me: Henk-Jan van den Brink, PhD candidate at the University of Twente, the Netherlands.

This is me at the door of my office at the University of Twente, the Netherlands. Outside of work I spend my time with family and friends, reading, tinkering with cars, doing odd jobs around the house, taking a walk through the woods and biking between the farm fields. I guess some people will consider my life rather dull but I really like it.

Henk-Jan van den Brink at the University of Twente (NL)

In my work as a doctoral researcher in the DREAM project, I investigate interdisciplinarity. Before, I studied biotechnology at Wageningen University (Netherlands) and Research and philosophy at the University of Twente. My PhD research project in the philosophy of science allows me to combine both of these. Specifically, I will research what sets scientific disciplines apart, how these differences lead to difficulties with interdisciplinary collaboration and what strategies are effective for overcoming such hurdles.

Although I miss lab work or programming in MATLAB, what I love about philosophy of science is that you think through the foundations and logic of different branches of science as well as their coherence within the overall scientific endeavour. Personally, I have experienced philosophy of science to enrich and deepen my understanding of science. I look forward to contributing to the DREAM project, especially the collaborations and the interactions with researchers that come with it.

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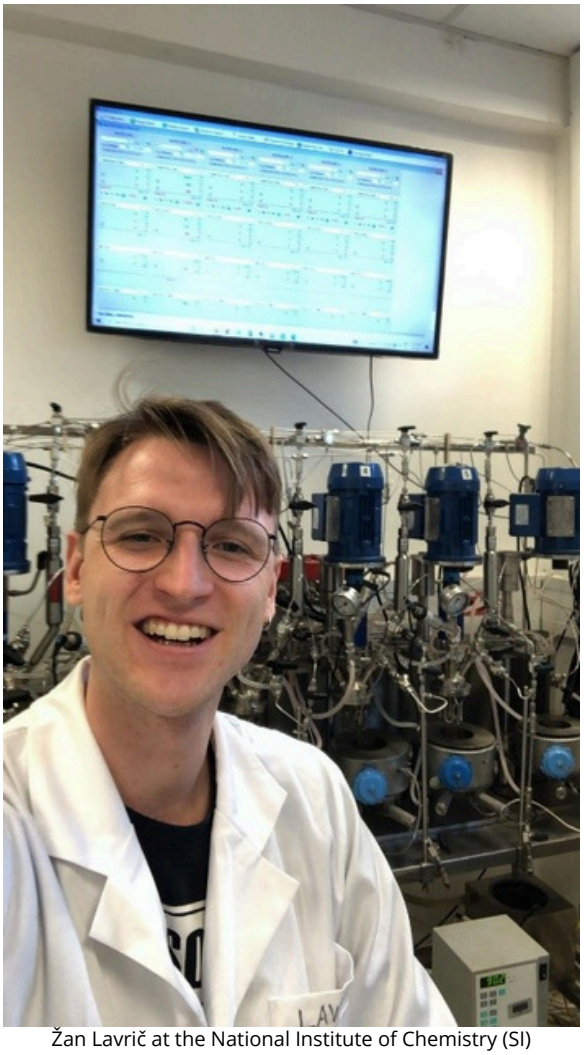
About me: Žan Lavrič, PhD candidate at the National Insitute of Chemistry (NIC).



Žan Lavrič at the National Institute of Chemistry (SI)

In the picture on the left, I am working in the lab, conducting parallel batch reactions. What excites me most about my work environment is the opportunity to experiment and uncover new phenomena in the world around us. As a process engineer, I have a passion for hands-on experiments and in-depth analysis. But the true highlight for me is the kinetic modeling of the processes we investigate in the lab. This allows me to formulate hypotheses, test them in real time, and mathematically validate them, potentially even predicting new trends.

I am particularly eager to develop kinetic models and integrate them comprehensively into the DREAM project. This will not only demonstrate the power of mathematical descriptions based on first principles but also provide others with a digital overview of the data generated throughout the project.

Outside of work, I love spending time with family and friends. I am also an avid basketball fan and enjoy road cycling.

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