flexby

Flexible and advanced biofuel technology through an innovative microwave pyrolysis & hydrogen-free hydrodeoxygenation process

Objectives

Flexby´s overall objective is to significantly advance the development of cost-effective solutions to minimise carbon waste and inhibit biogenic effluent gas emissions in sustainable biofuel production processes.

10 PARTNERS

5 COUNTRIES

4€ MILLIONS

48 MONTHS

Concept & Methodology

Flexby addresses the critical need for sustainable energy solutions by converting waste materials into valuable biofuels. The feedstock, derived from microalgae and industrial sludge, undergoes microwave-assisted pyrolysis to produce three distinct fractions: solid, liquid, and gas. These fractions are then valorised through non-carbon emitting technologies to produce advanced biofuels which will then be utilised to generate electricity in fuel cells.

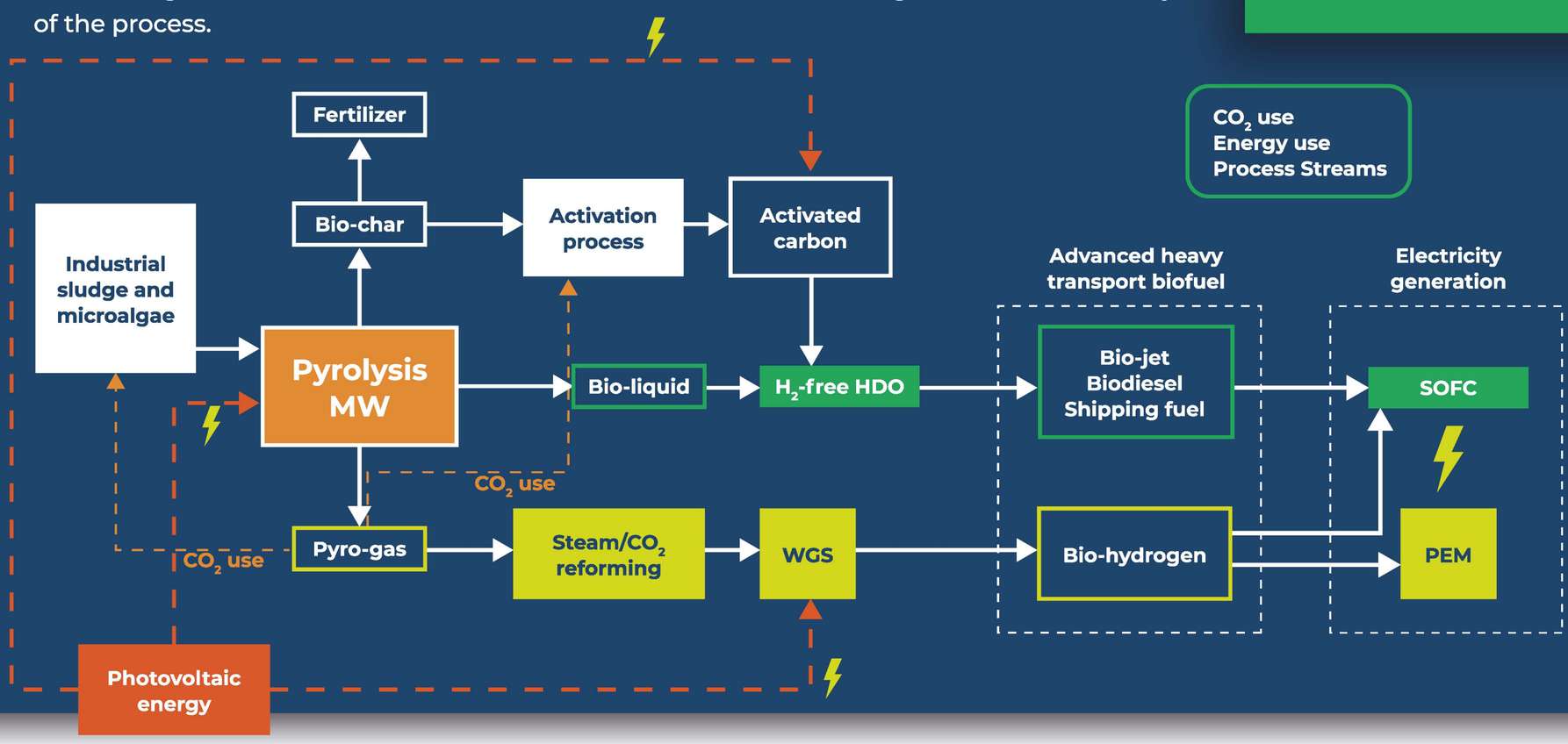
- The hydrogen-free hydrodeoxygenation (HDO) process will convert the liquid fraction into heavy transport biofuels without the use of hydrogen, leveraging water from the feedstock for significant process advantages.
- The gaseous fraction will be directly valorised to produce bio-hydrogen, contributing to the project's commitment to circular economy principles and low-carbon emissions.
- The solid fraction will be transformed into biochar fertiliser, proven to reduce soil biogenic emissions, and used as activated carbon to support the catalysis process.

Flexby includes a strong digitalisation component to enhance cost-efficiency. Artificial intelligence will be employed in data processing to improve efficiency, reduce costs, and move closer to a near-zero carbon emission process.
By promoting a circular economy, recycling biomass residues, and utilising photovoltaic renewable energy, Flexby aims to achieve a comprehensive sustainability assessment. A series of LCA analyses will be conducted to establish an inventory of Flexby flows and their impacts, considering environmental and socioeconomic factors and scrutinising the carbon neutrality of the process.

Dissemination & Communication

The Flexby project's key communication and dissemination activities, led by KNEIA, will include maintaining a dedicated project website, utilising social media, producing informative videos, and engaging stakeholders through clustering activities, newsletters and press releases. Publishing research in open-access journals, presenting at conferences and trade shows, and organising workshops and a final conference will ensure results are disseminated to a wide audience and provide opportunities for exploitation.

Scan the QR code to visit the Flexby website



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