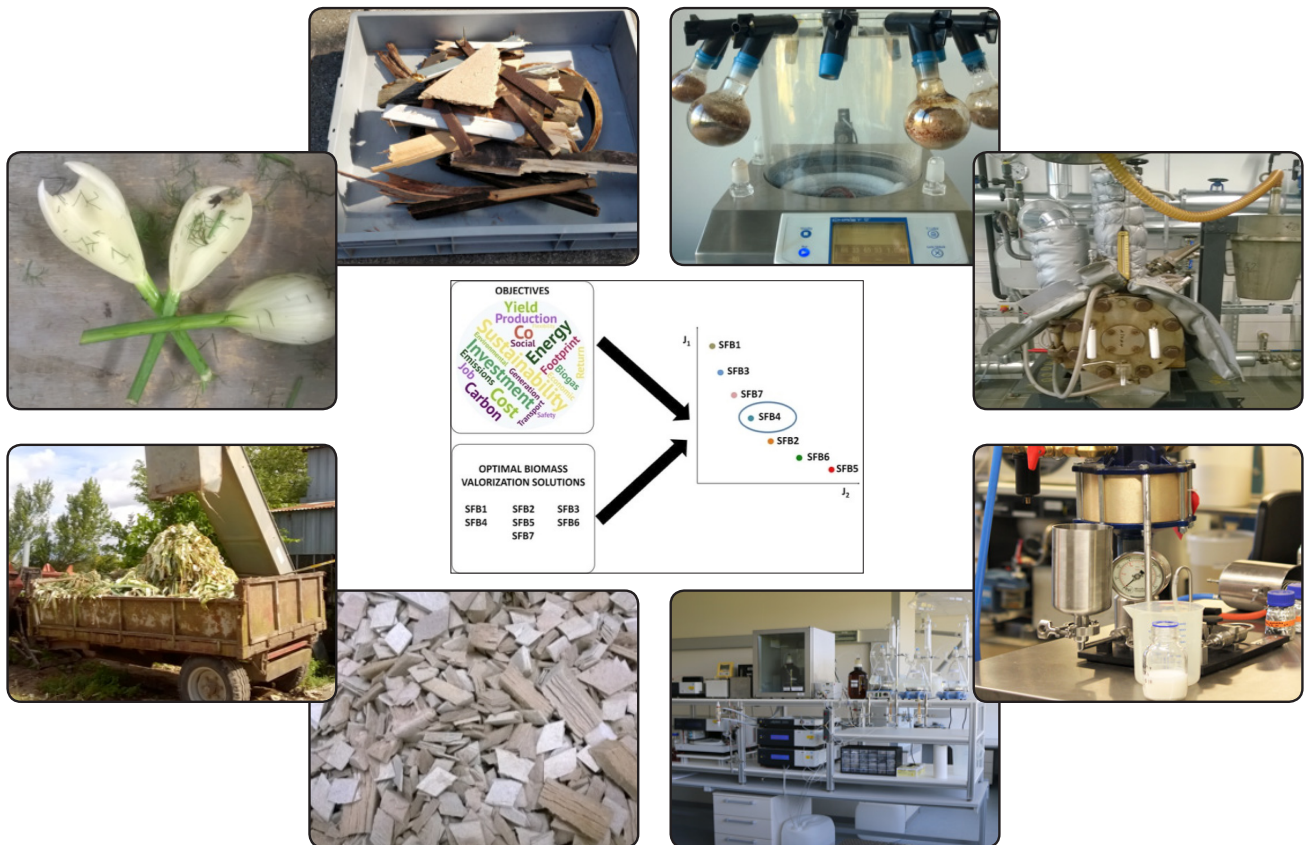


# FLEXIBI

SMALL-SCALE FLEXI-FEED BIOREFINERIES : EXPERIMENTAL EVALUATION AND DEVELOPMENT OF A DECISION SUPPORT TOOL DEVOTED TO AGRICULTURAL AND INDUSTRIAL URBAN AND PERI-URBAN WASTES



- 1° Call:** 2017
- Project period:** 03/2018 - 02/2021
- Topic:** FLEXIBI targets the evaluation of biomass wastes and their mixtures for biobased materials production and local energy generation via different biorefinery processes. FLEXIBI will integrate the whole process chain, including feedstock generation and collection, biorefinery processes and final product end-uses (including innovative biobased materials). Experimental data and expert knowledge collection will feed quantitative process modelling and knowledge engineering approaches to set-up decision support tools and value-creation oriented schemes for under-valorized biomass. These will be used to provide support for SFB design for specific regional/local level configurations. Three locations, Nantes, Hamburg, Leuven have been selected for real case studies.
- Keywords:** Small scale biorefinery, waste, modelling, biobased materials
- Coordinator:** **Mr. Bernard Cathala** (INRA, France)  
Email: [bernard.cathala@inra.fr](mailto:bernard.cathala@inra.fr)
- Project partners:** National Institut for agronomic research (INRA), **France**; University of Hamburg (UHH), **Germany**; Hamburg University of Technology (TUHH), **Germany**; Groupe Ecole Supérieure du Bois (ESB), **France**; University of Helsinki (UHE), **Finland**; KU Leuven - University of Leuven, **Belgium** - Flanders
- Total funding:** 1.222.000 €
- Website:** <https://www6.inra.fr/flexibi>  
[facceturplus.org/research-projects-2nd-call/flexibi/](https://facceturplus.org/research-projects-2nd-call/flexibi/)

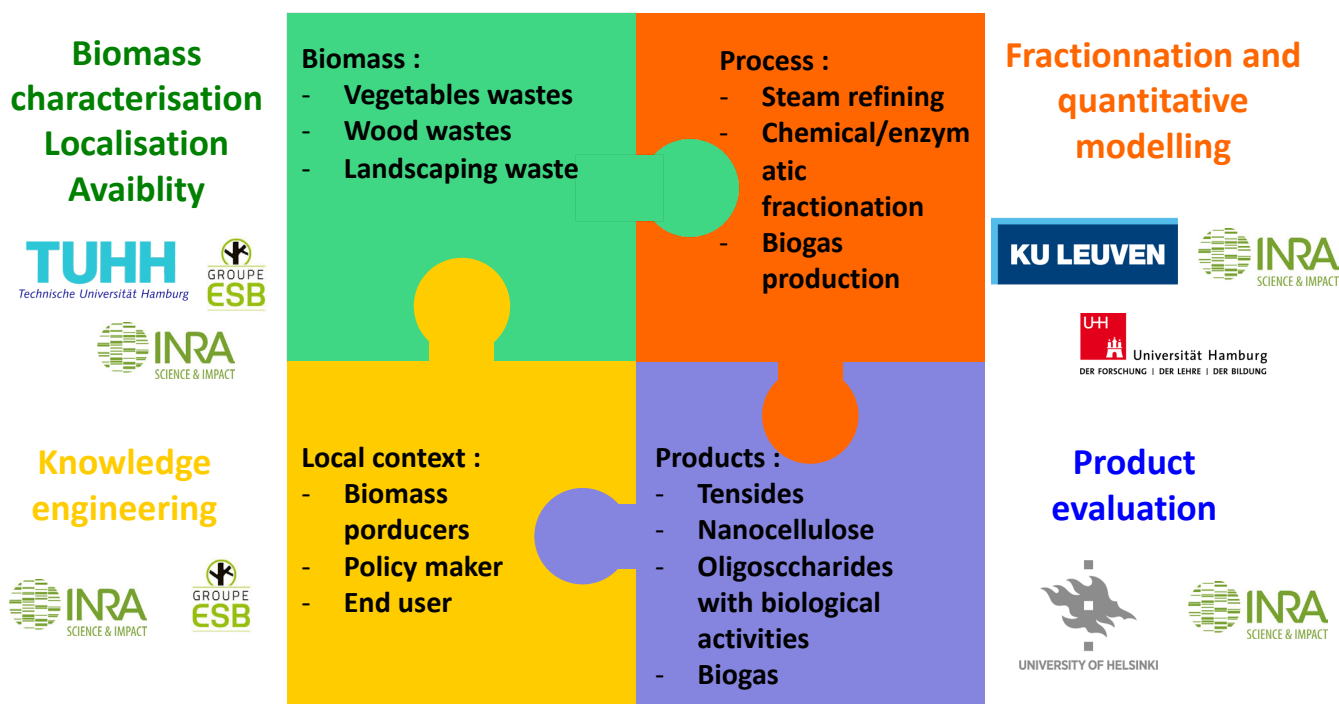
## BACKGROUND

Urban or peri-urban agricultural, agro-industrial and city activities generate sources of biomass wastes still underexploited offering a feedstock for biorefinery. Implementation of small-scale biorefineries have to answer critical challenges to present benefits compare to large scale solutions:

- Adaptation of processes;
- Predict biorefining efficiency with respect to local context;
- Improve sustainability;
- Integrate SFB in local socio-economical context.

## OBJECTIVE

As main driver of the project Flexi-Feed Biorefineries (FLEXIBI) propose to use local and all-year available feedstocks to limit transportation and logistics issues. Thus FLEXIBI will address the challenge to process mixture of different type of biomass (agriculture, landscaping, agro-food industries and post-consumption plant biomass waste) to smooth seasonal effect and narrow the biomass supply to urban or peri-urban area. FLEXIBI will develop a decision support tool to promote Small-scale Flexi-feed Biorefineries (SFB). Integrated experimental and modelling approaches (including process modeling and knowledge engineering approaches) will be implemented to acquire technical data and develop a decision support tool.



## METHODOLOGY

To address these challenges, FLEXIBI will follow an integrated and multidisciplinary approach including experimental and modelling works as well as actions to connect with stakeholders from production, transformation and policy sector.

- Quantitative process modelling;
- Knowledge engineering;
- Experimental assessment.

## RESULTS AND KEY FINDINGS

**Science/technology:** FLEXIBI will develop a unique reference knowledge on the performance of different biorefinery processes in standardised conditions for various biomass sources. Based on experimental results a reliable decision tool will be developed which will enhance the use of underexploited waste as a source of biobased molecules.

**Environmental impact:** New high value outputs from underexploited waste will save natural resources by using and recycling organic matter. This will increase the current valorisation of biomass wastes and thus limit current landfilling (i.e. medium density fibreboards that have currently no efficient re-use).

**Socio-economy of territories:** FLEXIBI will contribute to the green economy in urban areas in coordination with local territory economies with the support of an advisory board composed of companies, local authorities, and all local promoters of SFB. The implementation of FLEXIBI will help to validate SFB approach through the use of a decision-support tool that will allow to determine the most appropriate technical pathway, to size the process scale or to define an efficient network of processing units.