

# BIOBASED BATTLE

COMPETIÇÃO INTERNACIONAL DE BIOECONOMIA

October 2021

## INTRODUCTION

The Biobased Battle is a model for an educational development. During the battle, Dutch and Brazilian students with different backgrounds work together to solve environmental issues from the industrial sector. Throughout the week, the teams receive an assignment, and must build innovative solutions rooted in biobased economy concepts. The battle ensures that students must quickly tackle a complex issue, and that they work together with students with different backgrounds. This ensures that students learn to recognize each other's field of expertise and use it to achieve valuable results at the end of the week.

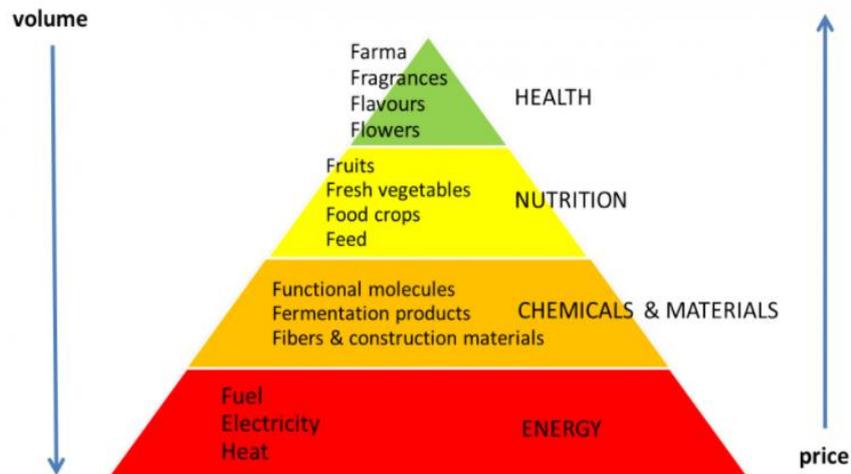
The Biobased Battle is a product of Living Lab Biobased Brazil, hosted by Universidade Federal de Ouro Preto (UFOP) and Avans University of Applied Sciences. This program is organized in cooperation with the Centre of Expertise Biobased Economy (Breda, the Netherlands).

## THE ASSIGNMENT

The circular economy concept emphasizes the need to minimize the usage of fresh resources via the 3R strategies: reduce, reuse, and recycle. Usage of water in domestic and industrial activities contributes to more than 44% of the total consumption in Brazil (FAO, 2016). Typically, any process that uses water will generate wastewater. As the wastewater can be regenerated for subsequent reuse, a **resource recovery** step can be conducted simultaneously to recover or extract any valuable elements or compounds in it. These processes can be anaerobic and aerobic, and the recovered compounds can include, for example: cellulose, biogas, phosphorus, nitrogen, heavy metals, and bioplastics.

Anaerobic digestion has been widely used as a biobased conversion technology to digest the excess residual streams, in which hydrogen ( $H_2$ ) and methane ( $CH_4$ ) are the main biogas products that can be recovered.  $CH_4$  is used in various industries such as automotive, chemical, electrical, and aerospace due to its applications as fuel, natural gas, liquefied natural gas, liquid methane rocket fuel, and raw material in chemical industries. On the other hand,  $H_2$  also has a variety of applications, for example, in metal processing, glass industry, edible fats and oils, energy, and others.

This year, the challenge is to think of different single or combined processes of wastewater recovery to maximize the recuperation of products depending on residual composition and scale (i.e.: small to large population equivalent). The groups can choose from: domestic sewage, pulp and paper effluent, and/or brewery wastewater.



## YOUR GOAL

Your goal is to generate a feasible idea (financial, technical, social) to for the re-use of **one or more** of the following residual streams: domestic sewage, pulp and paper effluent, and/or brewery wastewater.

## LEARNING GOALS

The goal of this week is to get a broad understanding of the possibilities to process and reuse the residues that can be used in the production of biomass. At the end of the project, you can expect to have acquired the following:

- ✓ Knowledge of brainstorming techniques and idea prioritizing.
- ✓ Knowledge about techniques & methods to reuse and process wastes that can be used in the production of biomass: wood, sugarcane bagasse, malt bagasse, olive bagasse and rice husk.
- ✓ Improved literature search, writing and critical thinking skills.
- ✓ Knowledge about how to make a poster and do a presentation.
- ✓ Knowledge about the integration of students from different areas of knowledge.
- ✓ Knowledge about international cooperation between students from the Netherlands and Brazil.
- ✓ Strengthen entrepreneurship culture in Avans University of Applied Sciences and Universidade Federal de Ouro Preto (UFOP) to stimulate the development of technological innovation.
- ✓ Knowledge about networking among students, lecturers/professors, universities, and industries.

## PROJECT RULES

The following rules apply to the project:

- The communication of each student group will be online, and the tutor should also be part of this group. We advise students to bring a computer for the sessions, at least one for each group/country. For sharing documents, we suggest Microsoft Teams.
- Being absent from compulsory project activities (workshops, meetings, practical, presentation) more than once can result in the student being removed from the event.
- If, for some urgent/meaningful reason, you cannot attend a given activity, you must inform your tutor and your fellow students before the meeting.

## SCHEDULE

Monday 18 October		
Ouro Preto	Breda	Activity
08:30 – 09:00	12:30 – 13:00	Opening and explanation of the Biobased Battle ( <i>Bruno Bastos / Thais Castro</i> )
09:00 – 09:45	13:00 – 13:45	Introduction of the assignment ( <i>Andre Santos</i> )
09:45 – 10:15	13:45 – 14:15	Definition of the groups, meet & greet project group (including intercultural differences)
10:15 – 10:30	14:15 – 14:30	Break
10:30 – 11:10	14:30 – 15:10	Discussing the assignment and brainstorming to form 20 ideas
11:10 – 12:20	15:10 – 16:20	Prioritizing ideas (from 20 to 3 ideas) & discuss selection with tutor
12:20 – 12:30	16:20 – 16:30	Wrap-up/Closing ( <i>Bruno Bastos</i> )

Tuesday 19 October		
Ouro Preto	Breda	Activity
08:30 – 08:40	12:30 – 12:40	Kick-off ( <i>Bruno Bastos / Thais Castro</i> )
08:40 – 10:00	12:40 – 14:00	Desk research on 3 ideas (technical, financial, marketing)
10:00 – 10:20	14:00 – 14:20	Break
10:20 – 11:30	14:20 – 15:30	Set-up MCA to score 3 ideas + discuss MCA with tutor
11:30 – 12:25	15:30 – 16:25	Score MCA and choose best idea based on outcome MCA
12:25 – 12:30	16:25 – 16:30	Wrap-up/Closing ( <i>Bruno Bastos</i> )

Wednesday 20 October		
Ouro Preto	Breda	Activity
08:30 – 09:00	12:30 – 13:00	Training on how to build pitches
09:00 – 09:10	13:00 – 13:10	Kick-off ( <i>Bruno Bastos</i> )
09:10 – 10:00	13:10 – 14:00	Detailing of best idea (technical, financial, marketing)
10:00 – 10:20	14:00 – 14:20	Break
10:20 – 12:25	14:20 – 16:25	Further detailing of best idea + start with pitch presentation
12:25 – 12:30	16:25 – 16:30	Wrap-up/Closing ( <i>Bruno Bastos</i> )

Thursday 21 October		
Ouro Preto	Breda	Activity
09:00 – 09:10	13:00 – 13:10	Kick-off ( <i>Thais Castro</i> )
09:10 – 10:30	13:10 – 14:30	Work on pitch presentation
10:30 – 11:10	14:30 – 15:10	Pitch of the groups for jury
11:10 – 11:20	15:10 – 15:20	Short break
11:20 – 11:50	15:20 – 15:50	Pitch of the groups for jury, continued
11:50 – 12:10	15:50 – 16:10	Break + define results
12:10 – 12:30	16:10 – 16:30	Award ceremony

## FINAL PITCH

Each group will make a pitch presentation of maximum 5 minutes that presents their idea. The groups will give their pitch in front of a jury on Friday. The jury will score the pitches and decide who has the best idea to what to reuse biomass residues.

The pitch has to contain the following topics:

- **Solution:** What is your innovative solution
- **Technology:** What is the technology/idea that underlies your concept
- **Market:** What is the market and its size
- **Value Proposition:** How you create value for one or more of the participants of the whole proposed chain
- **Feasibility:** Why is the concept technically and economically feasible

The jury will judge every pitch on the following criteria:

- **Suitability to the Challenge:** Does the team presented a concept related to the challenge's principle of biobased and/or circular economy?
- **Innovation degree:** is the concept innovative?
- **Market Potential:** Is there a clearly identified market opportunity?
- **Environmental Impact:** What is the environmental impact generated by the solution?
- **Feasibility:** How much effort is needed for the solution's implantation?
- **Presentation:** Was the presentation strong and convincing?

The top-rated group will be the winner of the competition!