

BIP Circularity of Polymers - Project description

Teams

Each team has 5-6 members, preferably from different countries. From the below, it is clear that in the preparation phase as well as the consolidation phase different specific tasks can be assigned to individual team members, and we recommend to do so.

Each team is supervised by one-two lecturer(s).

Project aims

- to become familiar with issues related to specific polymer recycling and the challenges encountered in this field,
- to understand the recycling processes and the importance of these activities,
- to acquire basic knowledge about individual recycling processes,
- to become familiar with a specific method of recycling polymeric materials outlined in the project.

Process

A **first part of the assignment should be executed before the physical mobility period**, i.e. during the virtual preparation. You will work in teams, whereby evidently you could convert the various deliverables below into individual tasks/responsibilities. If possible, in this part some basic experiments should be carried out by chosen participants and supervisors.

During the in-person mobility, a team's **presentation** is expected, on which you will get **feedback** from your project supervisor(s). After the in-person mobility, we advise you to **focus on the next four deliverables**, in preparation of your final **paper** and **presentation**.

Deliverables

A team **paper** as well as an **intermediate and final presentations** are expected from each team.

Intermediate presentation: During the in-person mobility
Focusing on your preparations, predominantly on the **four first bullet points below + presentation of the experimental results (if any)**
10 minutes per team + 5 minutes Q&A
date: **21 of March 2024**

Paper: Containing all aspects below
Length of a technical/scientific paper, i.e. approx. 5000 words
deadline ca. 14 of April, 2024

Final presentation: During virtual collaboration period after the in-person mobility
Focusing on all aspects below
Virtually organized
15 minutes per team + 15 minutes Q&A
date: **20-24 of May 2024**

Practical project components

- Introduction and theoretical exploration of the topic of polymer recycling.

- The practical component encompasses material analysis.
- Analyse data, perform calculations, and model.
- The conclusions pinpoint the position of the discussed topic within the field of polymer recycling

Focus points for the project (in a logical order):

- Study the properties of the polymer, also experimentally/analytically
- Check the market for this polymer: applications, quantities (in EU), compositions/structures and trends
- Check the current waste management technologies for this polymer (and in which waste fractions are they present/collected)
- Make a material flow analysis of the (most important) current polymer value chain
- Identify possible bottlenecks/weaknesses in the current value chain
- Inventorize the state-of-the-art in terms of recycling strategies/technologies (what's new?)
- Assess how new technologies can be implemented for the existing waste streams, or what needs to change to overcome the bottlenecks/weaknesses of the current value chain
- Identify at least one (or multiple) important market trend that could influence the circularity of the polymer you are studying
- What is the limit regarding circularity; in terms of number of cycles as well in terms of yield or energy expenses?

Evaluation

Criteria based on the above bullet points.