



**Innovative
polymers
for innovative
applications**





THE AACHEN–MAASTRICHT INSTITUTE FOR BIOBASED MATERIALS (AMIBM)

Maastricht University and RWTH Aachen University have established a European cross-border research institute focusing on the development of advanced and sustainable biobased materials to replace those derived from fossil resources.

The Aachen–Maastricht Institute for Biobased Materials (AMIBM) is located on the Chemelot Chemical Innovation Campus in the Dutch Province of Limburg, and strives for excellence in applied and translational research by creating synergies between academia and industry.

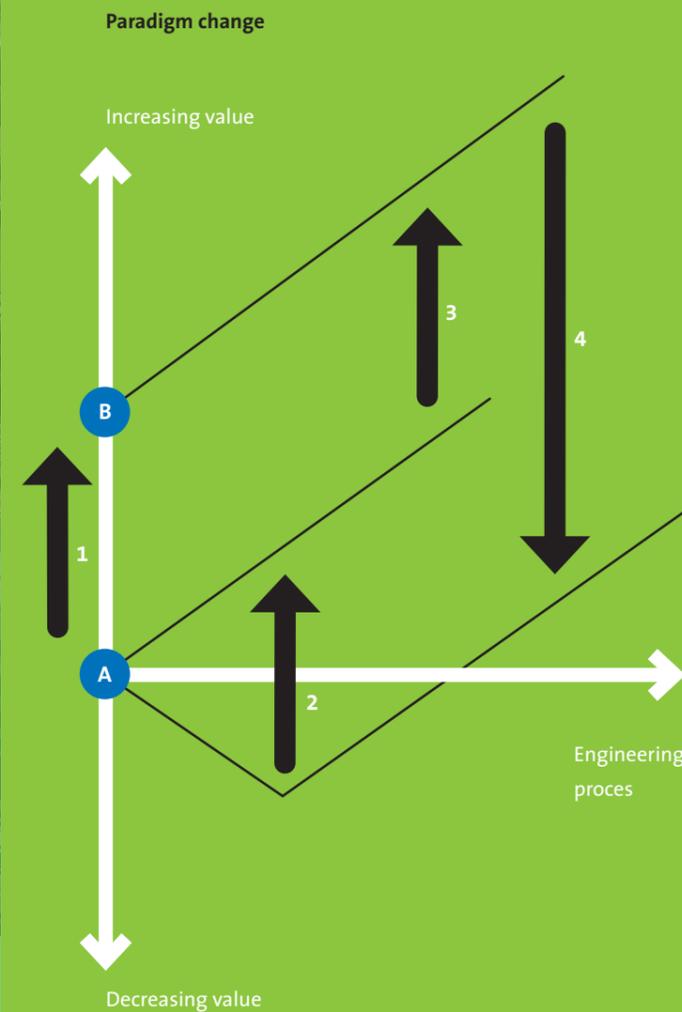
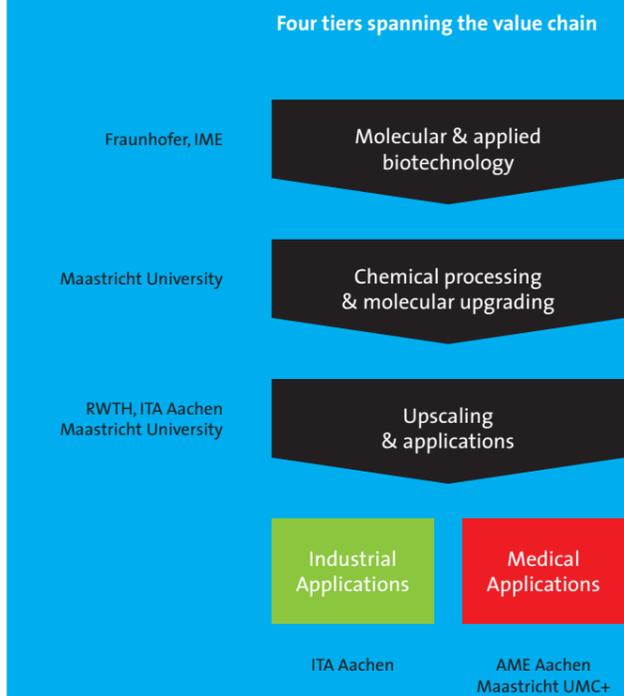


Figure 2 The AMIBM paradigm change involves the use of biotechnology to upgrade raw materials before extraction and processing, i.e. changing from starting point A to starting point B (1). This contrasts with the current approach of extracting materials, downgrading them (and thus creating 'negative value' and then upgrading them to achieve a comparable level of complexity (2). Even greater value can be achieved by upgrading the more advanced building blocks (3) or by converting advanced polymers produced directly in plants into more valuable building blocks (4).

BIOBASED MATERIALS

Biobased materials are derived sustainably from living organisms – materials such as starch, rubber and cotton – which can be replaced in a few months or years. Unfortunately, industry today tends to rely on materials that are not sustainable, based on fossil resources such as oil, which are finite and dwindling. The demand for new materials with diversifying functionalities is however growing, and it is up to us to meet this demand in a sustainable manner, making use of the wide functionality potential of natural resources.

OUR VISION

AMIBM's vision is to provide the missing link between fundamental and applied research and the market in the field of biobased materials, by changing the relationship between the production of biobased materials and the value chain. We aim to achieve this by developing an integrated, interdisciplinary research programme focusing on new strategies to produce advanced biobased materials and chemical building blocks in a sustainable and economical manner, and to develop these novel materials into innovative products with high added value for technical and medical applications.

Our vision also entails an important paradigm change. Currently, the field of biobased materials is dependent on downgrading and upgrading, i.e. the conversion of natural polymers into building blocks, the chemical conversion of these building blocks, and their assembly into novel polymers – all of which demands a great deal of energy. At AMIBM, we intend to directly produce enhanced building blocks and polymers in plants, thus achieving in vivo downgrading and/or upgrading using the energy provided by photosynthesis.

OUR APPROACH

We offer a unique approach covering the entire biobased materials value chain, including building blocks (feedstock), polymers (raw materials) and the end products derived from them (applications). We aim to:

- develop plants as factories for the production of advanced biobased building blocks and polymers
- develop novel chemical processing methods using biobased additives
- integrate materials synthesis and soft-matter nanoscience
- carry out applied research focusing on the many downstream applications of biobased materials in medicine, agriculture, environmental protection and industry.

OUR LOCATION

AMIBM is housed on the Chemelot Chemical Innovation Campus in the Dutch Province of Limburg, part of the Meuse–Rhine Euregion. Here, we benefit from the Chemelot open innovation ecosystem and strategic alliances with regional universities, research institutes, industry and hospitals, providing fertile ground for collaborative research and innovative applications. AMIBM will also be well integrated into the wider academic, governmental and industrial network of Germany, the Netherlands and Belgium.

WHAT WE OFFER

RESEARCH

AMIBM research projects cover four tiers spanning the biobased materials value chain, integrating seven major technology platforms already available at RWTH Aachen University, Maastricht University and participating companies.

Biobased nanocellulose materials / Novel biobased starches /
Biobased additives / Novel biobased rubber and latex polymers /
Biobased high-value small-molecule building blocks / Polymer engineering / Biobased materials for medical applications.

EXPERTISE

Maastricht University and RWTH Aachen University are internationally renowned academic institutes with complementary fundamental and applied research programmes focusing on biobased materials. We offer a combination of expertise and infrastructure that provides the ideal environment for the development of innovative, industry-focused research under the flagship AMIBM concept.

ENTREPRENEURSHIP

AMIBM will bring together young and ambitious scientists from RWTH Aachen University, Maastricht University and industry partners based on the Chemelot Campus to develop innovative joint research programmes in the entrepreneurial environment of the Chemelot Campus. The goal is to expand the technology frontier using 'push-pull' innovation; that is, by combining innovative research that promotes the rapid translation of fundamental research into applications and application-driven research based on market demands.

EDUCATION

AMIBM will offer high-quality and industry-focused educational programmes in collaboration with Maastricht University and RWTH Aachen University. AMIBM research projects with specific industry partners will be connected to the Maastricht Science Programme (BSc) and Biobased Materials master's and PhD programmes. The participants will benefit from an extended range of industrial placements with partners on the Chemelot Campus offering excellent prospects for future employment.



FOR MORE INFORMATION

To learn more about the exciting developments under the flagship AMIBM programme, please contact our Business Developer:

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