



Innovation Space

BIOBALL

*Promoting technologies for regional material use
of biogenic by-products and waste streams*

<https://urban-bioeconomy.de>

THE FRANKFURT RHINE-MAIN METROPOLITAN AREA



Population density

- 5.7 million inhabitants



Excellent Infrastructure

- High energy availability
- Good logistics
- Favorite location for data centers



Innovative strength

- Professional training
- Research & Teaching
- Financial strength
- Skilled workers



High Material turnover

- Raw materials
- Residual and waste materials

BIOBALL FOCUSES ON INNOVATION, ENVIRONMENTAL SUSTAINABILITY AND VALUE CREATION



Environmental compatibility

- Increase resource efficiency & reduce emissions
- Combining climate protection and value creation



Utilizing biogenic carbon sources

- Developing new products and technologies to recycle residuals, waste and CO₂
- Closing material cycles



Contributing to the transformation of the FRM metropolitan region

- Inspire society, business, academia, administration & politics in the region
- Accelerate the transformation to a circular bioeconomy



- Duration 2020 to 2025
- 10 joint projects (Nov. 2023)
- 41 partners and associated partners from inside and outside the metropolitan area

Type	Partners
Companies	21
Universities	8
Research Center	8
Municipal utilities	3
Societies	1
Sum	41



Initiating of R&D&I-Projects

- To establish new value chains in the region
- Compliance with sustainability criteria is ensured



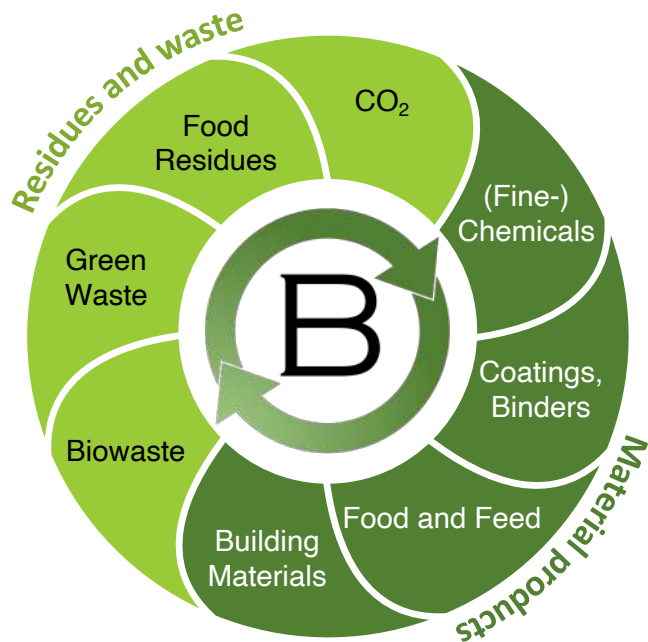
Communication and networking

- Networking events and webinars
- Podcast series "BioBall in conversation" (in German)
- Mission statement for the bioeconomy in the metropolitan region (in progress)
- community management platform (in progress)



Framework conditions

- Funded by BMBF (2020 – 2025) with up to € 20 millior
- Continuation of the BioBall innovation space is in preparation





Projects in the BioBall innovation space: value-adding closure of biogenic material cycles





BioBall projects using
Food Waste

INFeed / InA

Customized feed for shrimp farming

Objectives:

- Antibiotic-active animal feed for shrimp farming
- Increase of disease resistance
- Development of a sustainable (no-waste) aquaculture process
- Construction and operation of a smart aquaponic pilot plant

Cocoa shells / Apple pulp



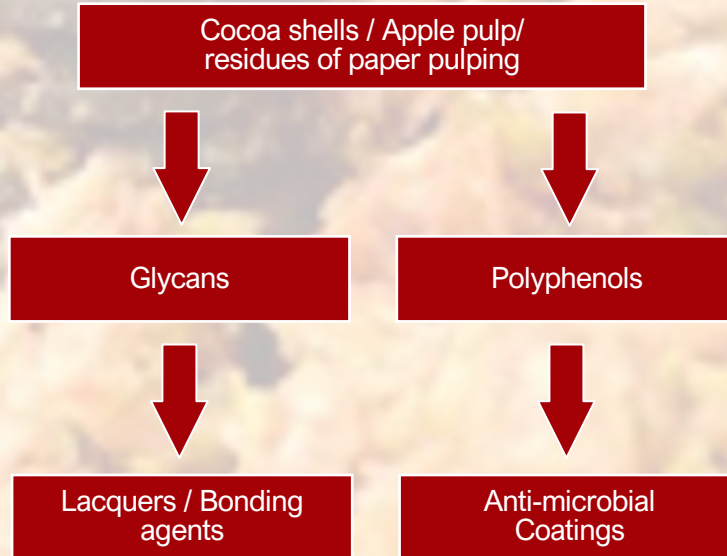
Insect farming (Black Soldier Fly)



Shrimp farming

GlyChem

Glycans and co-products as biogenic recyclables



Targeted Products:

- **Glycans as binders and adhesion promoters** in coatings, inks and composites
- **Non-polar carboxylic acids**
- **Polyphenols as antimicrobial additives** in coatings, plastics and biocompatible materials

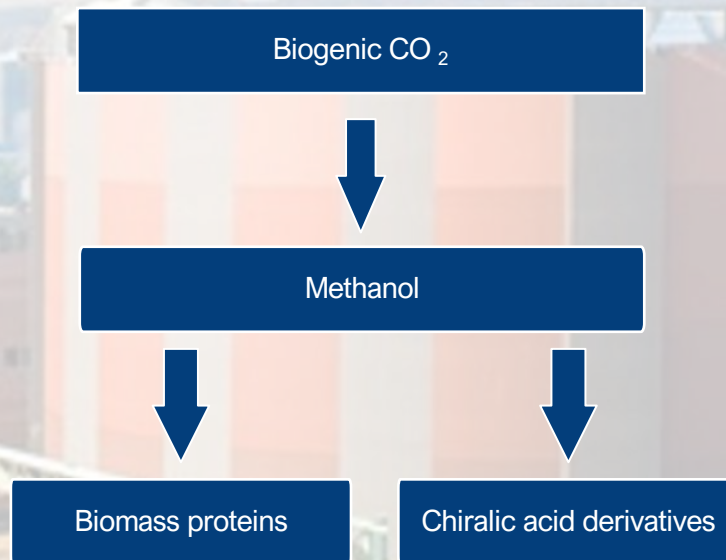
BioBall projects using
Flue Gas

SynBioTech

Adding value to decentralized C1 material streams

Objectives:

- **2-(S)-methyl succinate as a chiral fine chemical**
- **Biomass protein for animal feed**



CtC

Carbohydrate wastes to Chemicals

BioBall projects using
Wood Waste

Sugar of the second generation



Sugar alcohols



Glycols

Objectives:

- Production of glycols for polymers (e.g. PET) of high purity



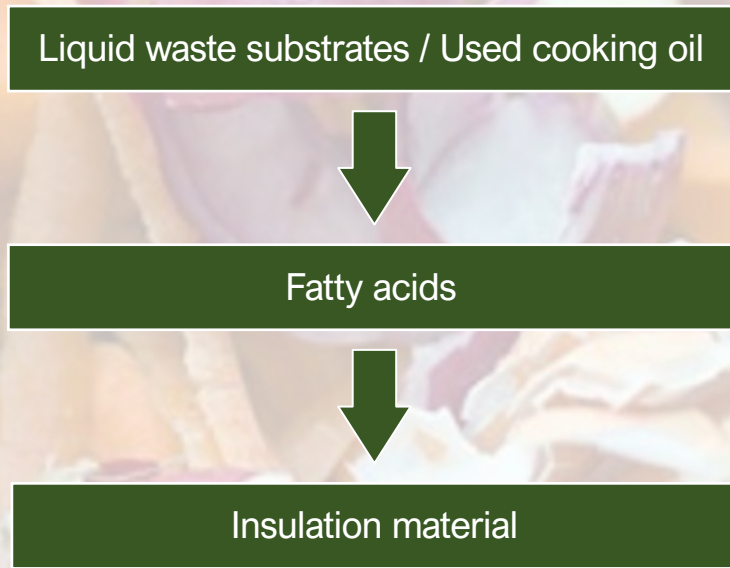
BioBall projects using
Biowaste

BIOTESS

Phase change materials for insulating systems

Objectives:

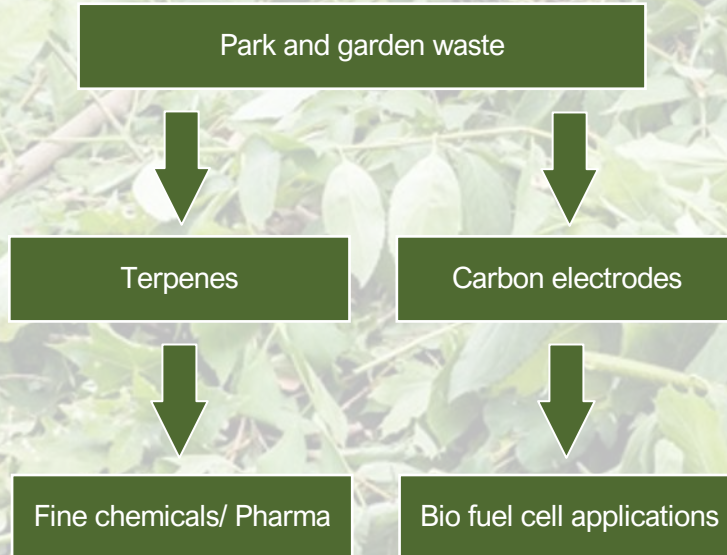
- Production of fully biobased phase change material (PCM)
- Integration of Bio-PCM into a mineral insulation material



GreenToGreen

Green cuttings as the basis for green chemistry

BioBall projects using
Green Waste



Objectives:

- Development of microbial and enzymatic electrosynthesis for material production
- Development of microbial electrodes for fuel cells
- Production of fine chemicals and feeds (e.g. amino acids, carboxylic acids)



BioBall projects using
Food Waste

AMP Food

Antimicrobial peptides as food and feed ingredients

Project Objectives:

- Production of AMPs, protecting food and feed against microbial spoilage
- Application tests in different food matrices

Cocoa shells / Apple pulp



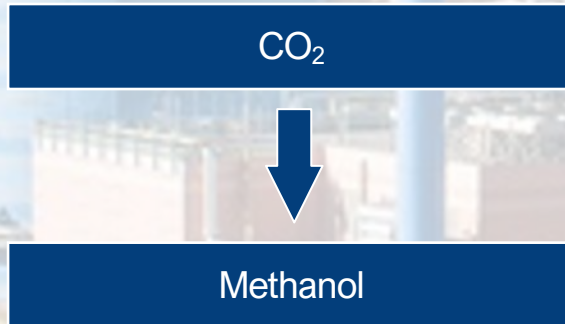
Insect farming (Black Soldier Fly)



Antimicrobial proteins

AbZuMeOH

Utilization of CO₂ and green hydrogen
for the synthesis of methanol



Objectives:

- Methanol of purity according to IMPCA specification
- Integration of the technology in chalk production and waste burning
- Marketing concept

POLITICAL SUPPORT IS NEEDED TO ACCELERATE THE CIRCULAR BIOECONOMY

Identified Fields of Action:



Encourage technology transfer by

- Scaling research results into practice
- Comprehensively transforming value chains to biobased



Develop infrastructure

- Adapt public and private infrastructure for energy, logistics and recycling



Define framework conditions

- Give priority to the material utilization of biomass
- Include biogenic CO₂ in emissions trading
- Open up waste legislation for upcycling



Create implementation plan

- Long-term planning of public & private measures
- Monitoring the progress of the transformation



Position Statement



Many thanks for your attention



We are looking forward to your contact:

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