

Regional circular bioeconomy
at :metabolon living lab

Dr. Himanshu

Research & Transfer

Circular Economy

Lifelong Learning & Community Engagement

Kindergarten
Schools
Public

Business & Value creation

Bergisches Energy Competence Center

Industrial biogas plant

Industrial Compost plant

Landfill waste water treatment plant



:metabolon – Research & Transfer

Area Resources Pretreatment Utilization Products

Agriculture & Forestry

Water Management

Waste Management

Commercial & Industrial

Organic Materials
(Leftover wood, Green waste, Short rotation plantations, bio waste, manure etc.)

Inorganic substances, composite & plastics
(Construction debris, rust ash, slag, sewage sludge, electric scrap)

Pretreatment

Combustion

Gasification

Anaerobic Digestion (Biogas)

Hydrothermal Carbonization (HTC)

Pyrolysis

Process Water Treatment

MicroAlgae

Electricity

Heat

Fuels

Chemical Raw Materials

Biochar

Metallic Recyclables

Secondary Raw Materials

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Biogas production

- Throughput: 75.000 t/a
- Biogas production: 80~180 m³/t, 55 – 65 % CH₄
- Energy: el. 140~32 kWh/t
therm. 220~480 kWh/t
- Annually: 8 GWh/a el. and 9,5 GWh/a therm.
- Completely self sustained

Green Waste Composting

- Throughput: 8.000 ~ 10.000 t/a
- Vendition of 4.500 t compost



Selected Horizon Europe Calls & Desired Partners

HORIZON-CL6-2027-01-CIRCBIO-01-two-stage

- Deploying circular systemic solutions through living labs in cities and region:
 - *(Deadline: 08 April 2027)*
 - Support for networks of living labs demonstrating circular solutions at city/regional scale.

HORIZON-MISS-2027-04-CIT-CCRI-04

- Circular logistics solutions for cities (Climate-Neutral Cities Mission):
 - *(Deadline: 01 December 2027)*
 - Advances **circular urban logistics** models – for example, optimizing reverse logistics for reuse/refill systems, improving collection of recyclable goods, and reducing packaging waste in last-mile delivery.
 - Demonstrations will take place in Cities Mission pilot cities to cut emissions and waste in urban supply chains.



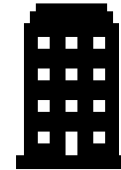
Academic & Research Partners

- Applied research institutes and universities
- Social science and design researchers



Public Sector / Government

- Cities and regional authorities
- Public utilities and waste management agencies



Industry & SMEs

- Logistics and reverse supply chain
- Circular economy startups and solution providers
- Retail and consumer goods

➤ **Our experience:**

- Consortium leader and WP leader for multiple EU Projects
 - EIC Pathfinder Open
 - Horizon Europe
 - EFRE
 - Horizon 2020

➤ **Current and Past EU projects**

- 2026-2028 Bergische Rohstoffschmiede (EFRE.NRW), Budget: 12,400,000 €
- 2021-2022 Pilot Pilot Bergische Rohstoffschmiede (EFRE.NRW), Budget: 3,960,000 €
- 2017-2020 :metabolon IIb - Innovative Processes for a Circular Economy (EFRE.NRW), Budget: 3,640,000 €
- 2013-2018 ENERWATER Standard method and online tool for assessing and improving the energy efficiency of waste water treatment plants, Budget: 1,700,000 €
- 2013-2017 ATBEST Advanced Technologies for Biogas Efficiency Sustainability and Transport (Marie Curie People ITN), Budget: 3,800,000€
- 2009-2015 :metabolon I und IIa - From Waste to Resource (EFRE) Budget: 25,000,000€
- 2011-2015 RENEW REsource Innovation Network for European Waste (Interreg IVb) Budget: 4,859,329€