

**Biocircularcities Trilogy – Ep. 1:
Supporting local players with the
transition to circular bioeconomy,
and lifting the current barriers**



BIO CIRCULAR CITIES

Challenges and solutions to unlock local circular bioeconomy

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 **Bio-based Industries
Consortium**



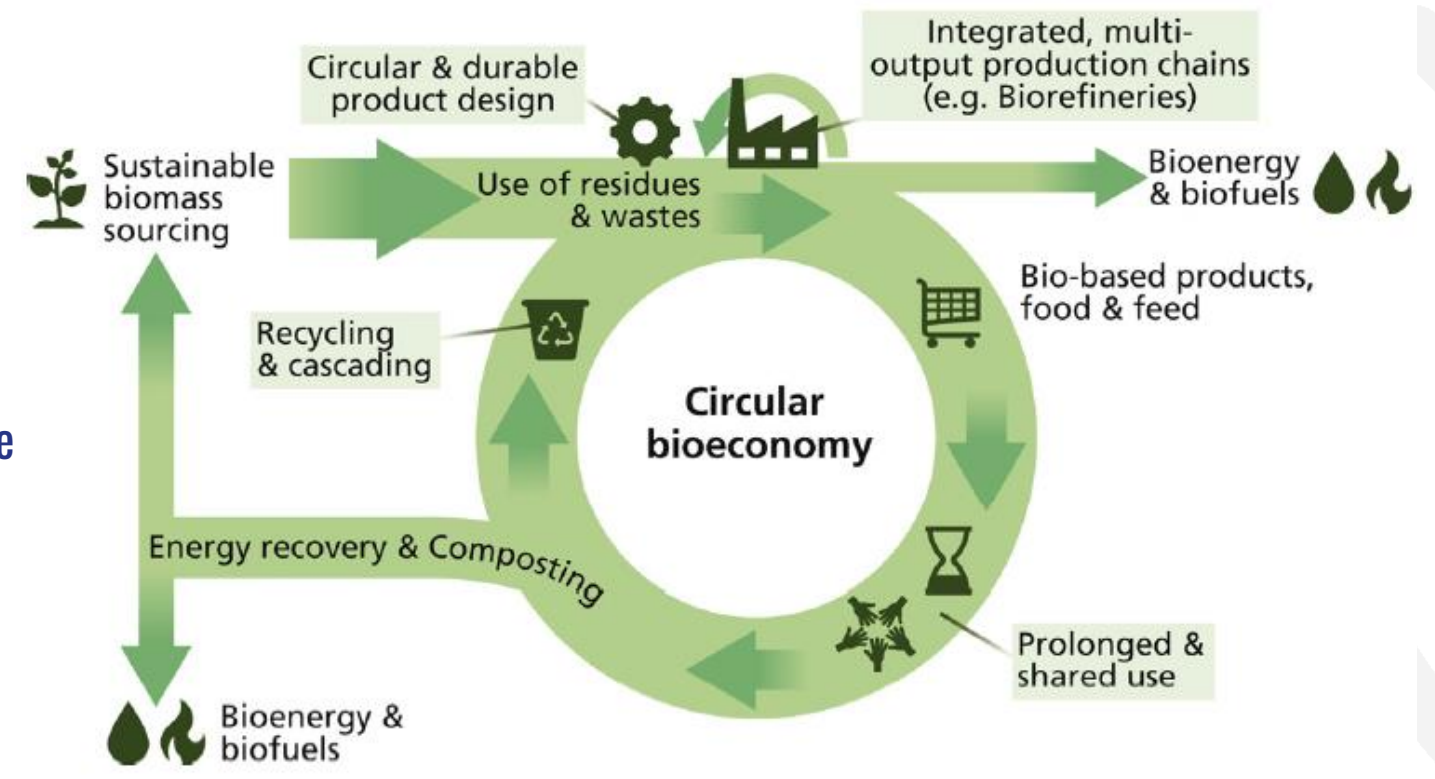
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Introduction: Circular Bioeconomy

- Replacing non-renewables with biological resources
- Resource-efficiency; Minimising organic waste
- Sustainability
- Cascading use of biomass

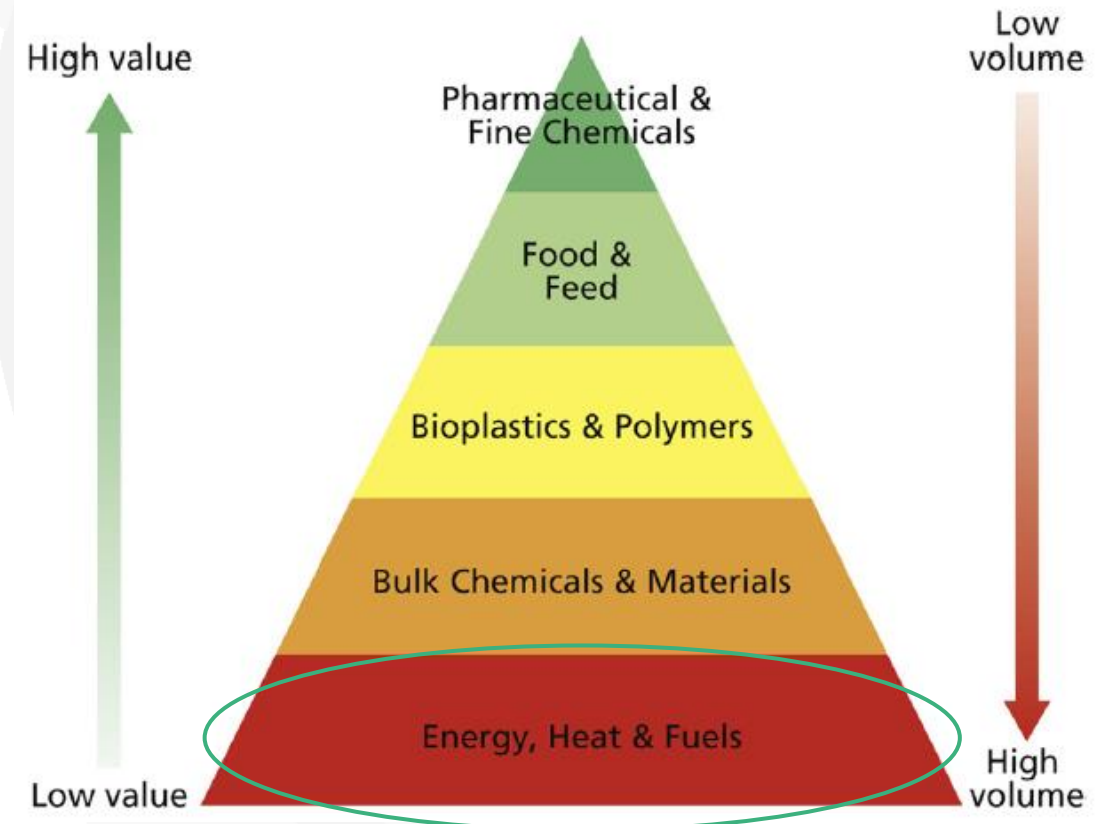


Source: Stegman, P., Londo, M., & M. Junginger (2019): The circular bioeconomy: Its elements and role in European bioeconomy clusters. Resources, Conservation & Recycling: X 6 (2020) 100029

The cascading use of biomass principle

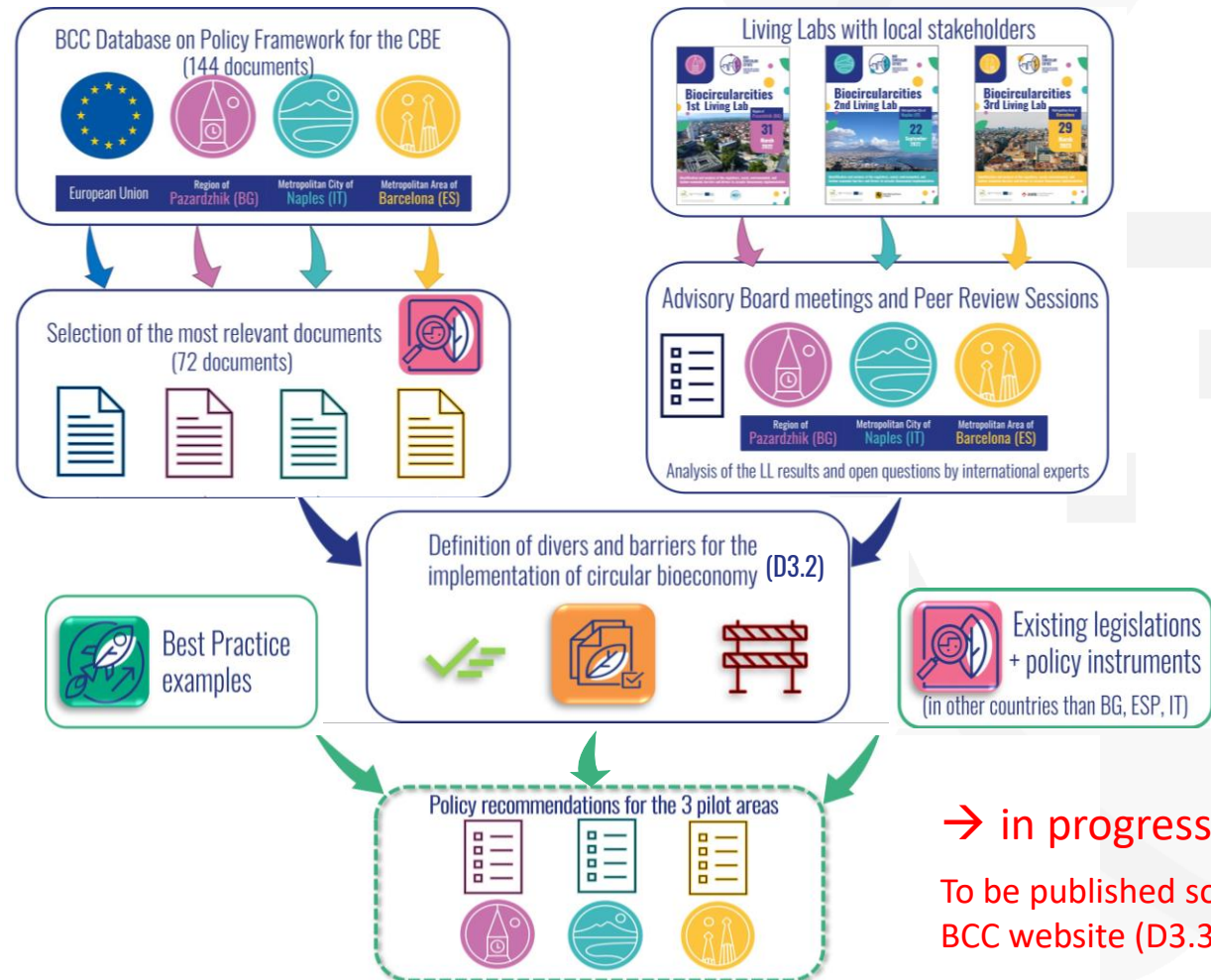
(EU Forest Strategy for 2030, COM/2021/572 final)

- At the European level, support is mainly given to **biorefineries** that process secondary raw materials (organic waste, residues, by-products) instead of primary raw materials (e.g., stem wood) into a range of marketable bio-based products.
- **Bioenergy** (especially from primary biomass) is the **least favoured** bio-based product type
- Priority should be given to long-lived products over short-lived products, including single-use products.



Source: Stegman, P., Londo, M., & M. Junginger (2019): The circular bioeconomy: Its elements and role in European bioeconomy clusters. Resources, Conservation & Recycling: X 6 (2020) 100029

Methodology: Policy Recommendations



→ in progress!

To be published soon on the BCC website (D3.3)

Examples of the BCC provisional policy recommendations

Topics of the policy recommendations relevant to all three pilot areas

- Data management
- Organic waste treatment and sustainable biorefineries
- Market for bio-based products
- Public awareness and support
- Stakeholder involvement

Some specific examples relevant to different pilot areas

- Forestry residues (for biochemicals/bioenergy production)
- Novel food (coffee silverskin as functional ingredient)
- Separate biowaste collection (as feedstock for anaerobic digestion, AD)
- Biomethane (upgrading of biogas from AD)

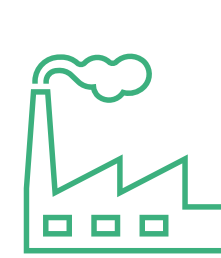


Data management



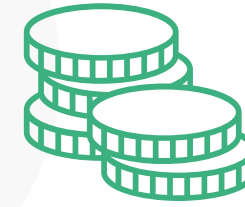
- At EU level: **Introduction of standardised guidelines for data assessment for all types of organic waste and residues to facilitate data exchange, comparison of results, and meaningful benchmarking.**
- At national and regional level: **Introduction of a legal requirement of annually updated, comprehensive, and transparent databases on municipal biowaste flows** (quantity, quality, destination) using EU standardised guidelines.
- At EU and national level: **Introduce more funding for public administration + research cooperation** to support the analysis of environmental impacts of different biowaste collection and treatment technologies. Support for public administrations by researchers with data assessment, monitoring and analysis, including the use and interpretation of LCA and LCC results.
- At EU and national level: **Introduce more funding for BBI + research cooperation** to support the choice of the most sustainable biorefineries and bio-based products (e.g. with LCA), especially where there is uncertainty about the environmental benefits of certain bio-based products such as bioplastics (mostly linear life cycle).

Organic waste treatment and sustainable biorefineries



- At national level: Introduce financial incentives and administrative and technical support for companies to use their by-products (e.g. coffee silver skin) internally for the production of new products (e.g. functional food) to avoid classification as waste. In addition, incentivising industrial symbiosis, i.e. the physical exchange of resources, energy and/or by-products among different industries.
- At regional level: Extend the tender + subsidy intervals (at least 10 years) and provide a clear vision for the legal framework to create more planning security for investments in new technologies. Also, the supply of bio-based feedstock must be ensured for at least 15-20 years.
- At regional level: Introduce financial incentives for the technical improvements of existing biowaste treatment plants, the use of BAT and the construction of new (decentralised) biorefineries. The focus should be on job creation in rural areas.
- At regional and local level: Simplify permitting and administrative procedures for new biorefineries, especially the upscaling of research pilot plants to industrial scale.
- At national level: Introduction of economic incentives (e.g. tax exemptions or reductions, support schemes for renewable energy) for the use of renewable energy in treatment and production processes (according to Dir, (EU) 2018/2001).

Market for bio-based products



For bio-based products with a clear environmental benefit, based on consolidated LCA studies:

- At national, regional and local level: **Support Green Public Procurement according to the EU Bio-based Products Sector Group** to drive the market towards more sustainable products and processes, considering the full lifecycle.
- At EU or national level: **Introduce VAT reductions for bio-based products** (e.g., novel food) compared to products made from fossil raw materials.
- At EU level: **Introduce financial incentives for bioenergy (e.g. biomethane) based on carbon footprint assessment** (according to the International Sustainability and Carbon Certification, ISCC): The lower the carbon footprint (g CO₂e/MJ), the higher the price/incentive should be for this product.
- At EU level: **Linking carbon footprint-based incentives for bioenergy (carbon footprint avoided) to the emission commitments of industry or other sectors** (i.e., those subject to the EU Emissions Trading System, ETS) to reduce greenhouse gas emissions.
- At EU level: **Introduce a quality certification for bio-based products** and advertise it to the public to encourage their purchase.



Public awareness and support

- At regional level: **Involvement of employees in the prevention of food waste** as e.g. anchored in the "Law 3/2020 on the prevention of food loss and waste in Catalonia".
- At regional and local level: **Funding well-developed, continuous awareness-raising campaigns and monitoring their results.** Topics: separate collection, food waste prevention and anti-littering. Also include the tourism sector.
- At regional and local level: **Support education campaigns to promote the benefits of locally produced bio-based products compared to conventional alternatives.** For (novel) food and feed, the focus should be on ensuring health safety and **reducing consumer aversion to products made from organic waste.**
- At EU level: **Investing in education to develop a skilled and competent workforce,** to strengthen the competitiveness of the European bioeconomy, including businesses and public authorities, and to create jobs at the same time.



Stakeholder involvement

- **Anchoring stakeholder participation in regional or local legislation.** Example: Since March 2006, the Vienna Waste Management Act has stipulated that the **Waste Management Plan** of the City of Vienna must be subjected to a "**Strategic Environmental Assessment**" (SEA), which involves citizens, NGOs and other stakeholders in the assessment of the environmental, social and economic impacts of decisions such as the construction of a new (bio-)waste treatment plant, the modification of the collection system etc.
- **At EU and regional level:** Promote transnational and transregional exchange of experiences and best practices as well as future cooperation by creating specific **networking platforms and organising round tables** between policy makers, researchers and market players with a focus on supporting innovative start-ups to address all relevant aspects of new value chains.
- **At national level:** **Support universities, research institutions and bioeconomy networks to provide capacity building programmes and workshops on the bioeconomy** targeting policy makers and industry representatives. Facilitate knowledge exchange and networking. Support the dissemination of research results on the sustainability of proposed bio-based value chains (e.g. with LCA).

Some examples for BCC bio-based products

Forestry residues (for biochemicals/bioenergy production)

- At national level, introduce **funding for environmental impact analyses for forestry residues collection** (soil erosion, biodiversity losses, additional transport compared to fire risk reduction); Assessment of the maximum percentage of forestry residues to be collected in a certain area.
- Where the margin of collectable forestry residues is high enough: **Introduction of a national fee and incentive scheme to promote the pre-treatment and collection of forestry waste for biorefineries** (especially in difficult terrain).



Novel food (coffee silverskin as functional ingredient)

- At national level, **provide financial support to SMEs for laboratory analyses in support of EFSA's mandatory health risk assessment** of novel foods with a view to granting market authorisation (minimum 2-year process).
- At national level, **advising start-ups on market approval procedures for novel foods** (e.g., via webinars).



Some examples for BCC bio-based products

Separate biowaste collection (as feedstock for anaerobic digestion and post-composting of digestate)

- At national level, **introduction or increase of incineration and landfill taxes** to promote separate collection and valorisation and use this taxes in environmental funds to further improve the collection system.
- At national level, a **mandatory change of the existing local waste taxation towards "pay-as-you-throw" (PAYT) systems** should be introduced, charging on the basis of the actual amount of waste generated and providing incentives for biowaste source separation.
- Introduce **economic incentives** for regional and local authorities for **changing from open container biowaste collection to door-to-door or smart bin collection** in order to achieve higher biowaste collection rates.
- **Introduce stricter limits for bio-waste contamination** in national legislation and clearly communicate sorting obligations to citizens. Enforcement by **introducing inspections** of source-separated biowaste and the organic fraction in residual waste.



Biomethane (upgrading of biogas from AD)

- At national level: Introduction of **financial incentives for the conversion of MBT plants into anaerobic digestion plants** treating only source-separated biowaste.
- At EU level: **Introduce harmonisation measures** between Member States regarding **access to the gas grid, financial incentives and fixed biogas/biomethane prices.**





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Exploring the circular
bioeconomy potential
in cities

Thank you
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