

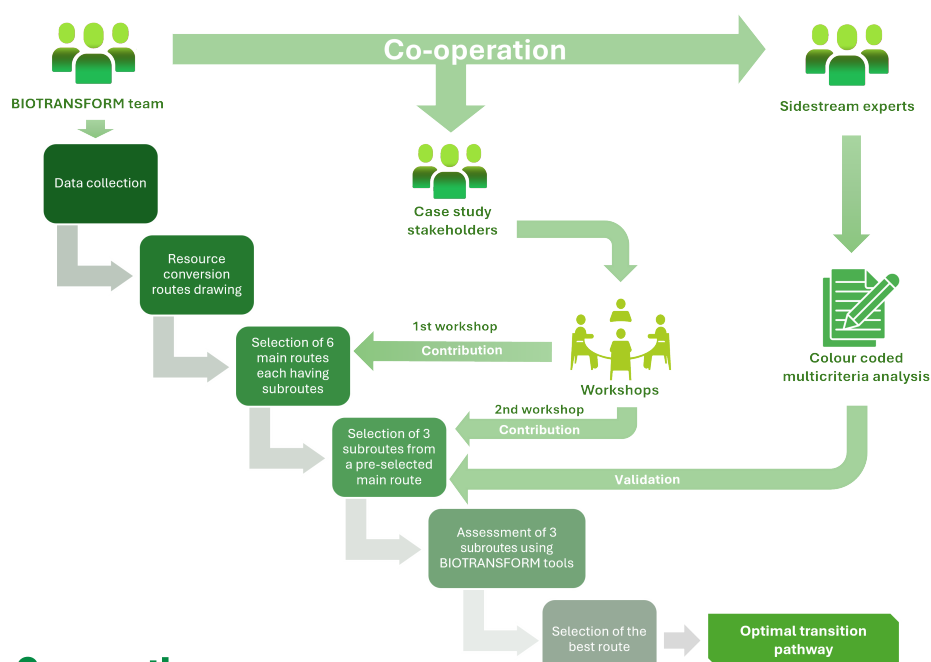
In a nutshell

BIOTRANSFORM supports European decision- and policymakers as well as businesses by offering a comprehensive assessment and policy development framework. The project provides a robust knowledge base and an expert support network designed to facilitate the transition from linear fossil-based to circular bio-based systems. BIOTRANSFORM bridges the gap between circular economy and bioeconomy transitions, contributing to the development of sustainable and resilient ecosystems across Europe.



Methodology of starting a circular bioeconomy transformation

1. Conduct background research to map secondary streams
2. Engage stakeholders in discussions about potential side-streams
3. Analyse and explore viable pathways for selected side-streams
4. Present and discuss these transition pathways with stakeholders
5. Assess the impacts of the green transition across different sectors



Consortium



Circular BIOeconomy TRANSFORMaTion for regions by enabling resource and governance networks

Project objectives



- Identify and understand the drivers and barriers to integrating circular bio-based scenarios
- Develop and deliver an assessment package that focuses on comparing impacts between circular and linear economies
- Validate, compare, and optimise the proposed assessment package through collaboration with real stakeholders from six diverse case-study regions
- Provide actionable governance guidelines and policy recommendations for policymakers, as well as suitable financing strategies for circular bioeconomy projects
- Ensure the efficient exchange of best practices, foster peer-learning programmes, and conduct awareness-raising campaigns to maximise global impact
- Drive the global impact of the project through effective dissemination, communication, and exploitation activities

Case study resources

SEE MORE

<https://www.biotransform-project.eu/case-studies>



OLIVE PROCESSING WASTE

Olive pruning and pomace generated during olive oil production are currently used primarily for low-value applications, such as energy generation. High-value applications, such as biocomposites, polymers, and antioxidants, are being pursued as more sustainable alternatives.

FOOD WASTE

Significant amount of food waste is generated by the hospitality sector, which, when combined with household organic waste, presents an opportunity for sustainable biogas and compost production. This effort promotes improved waste management and circular resource utilisation.

LAKE BIOMASS

Lake biomass and sediments are currently underutilised resources. Their potential applications in construction, soil enhancement, and biocomposites could substantially improve regional resource efficiency and create new development opportunities.

LIGNIN

Lignin, a byproduct typically incinerated, is being researched for its conversion into valuable products such as anode materials, adhesives, and concrete plasticizers. This process could significantly reduce waste while creating high-value bio-based alternatives.

SEWAGE SLUDGE

Sewage sludge can be processed in anaerobic digesters to produce biogas, which is then converted into green hydrogen. This hydrogen can be used to fuel waste management systems and municipal service vehicles, reducing reliance on fossil fuels.

SUGAR BEET RESIDUES

The fermentative production of lactic acid from sugar beet pulp adds an important step in the cascade valorisation of biomass. It provides a key bio-based feedstock for the chemical and polymer industries, enhancing the value chain for bio-based products.

Tools – the methodological backbone

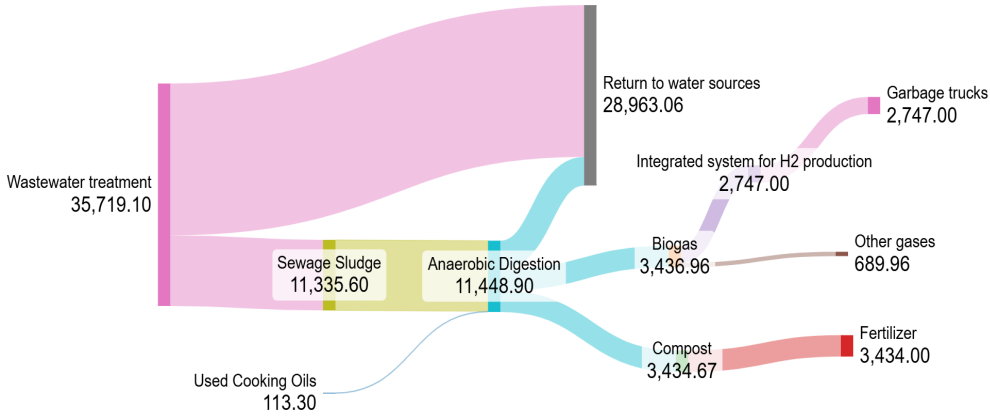
Use case examples

SEE MORE

<https://www.biotransform-project.eu/about/work-plan>

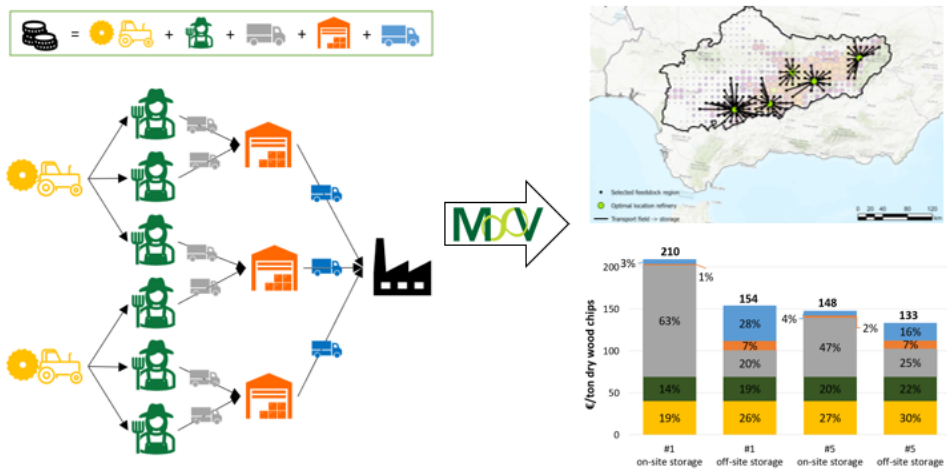
Sankey – Mass Flow Analysis

This tool s a visualisation of changes of resource amounts through processing at different stages. BIOTRANSFORM uses Sankeys to visualise existing underutilised resource flows and compares them with possible higher valorisation pathways and circularisation of flows.



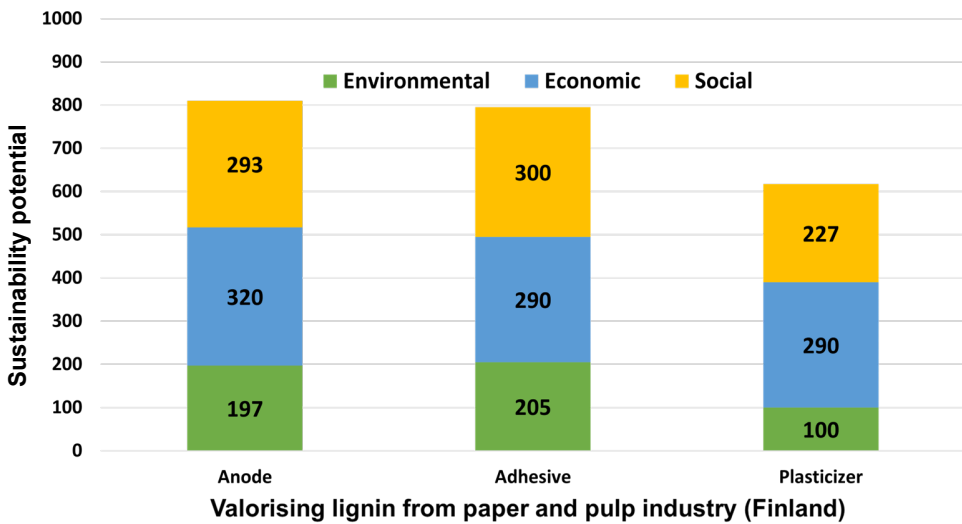
MooV – Logistics Optimisation

MooV optimises the design of circular & biobased supply chain configurations - reducing costs and increasing efficiency. Two regional cases were analysed, addressing food waste logistics & wood chip valorisation.

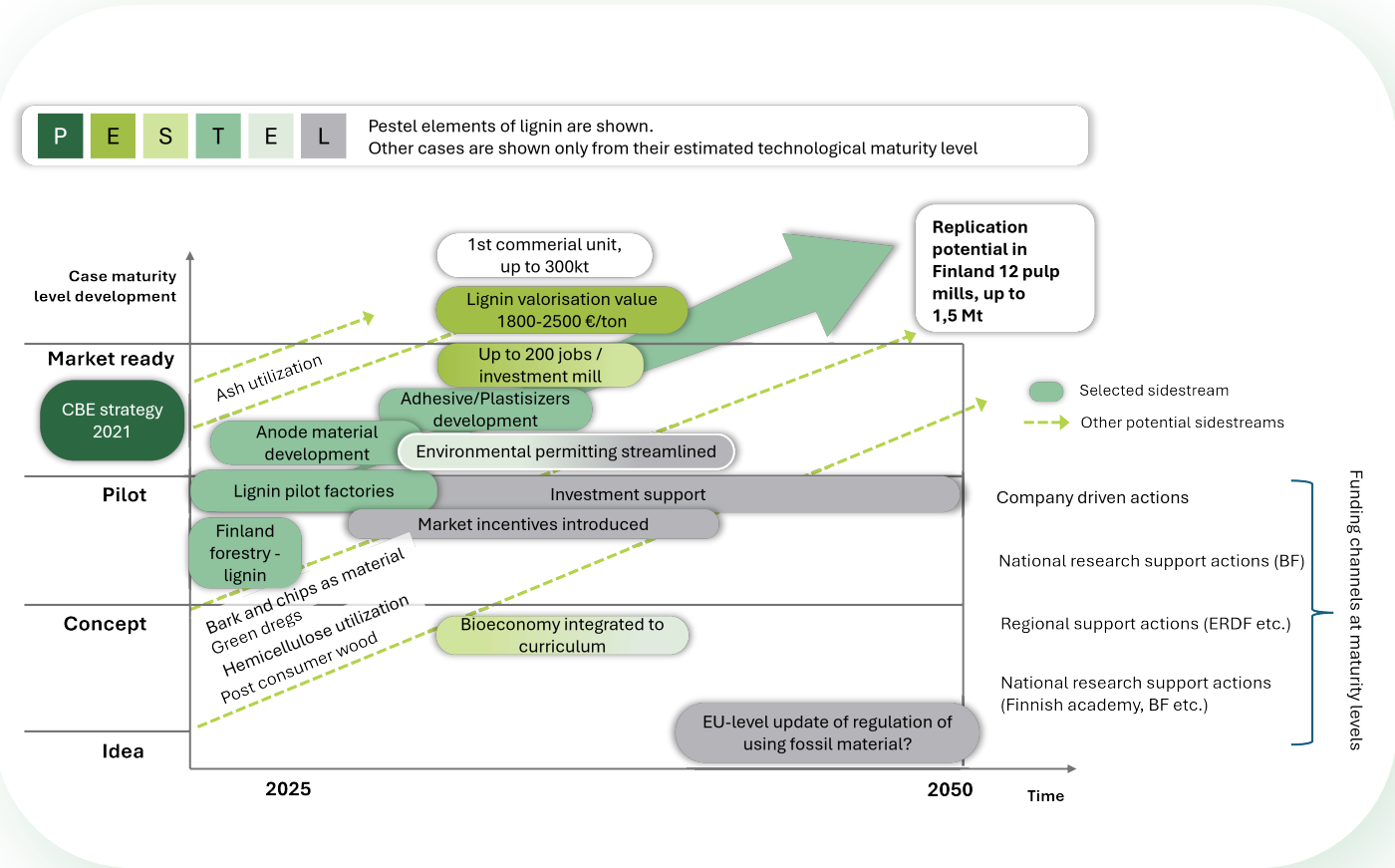


Impact Assessment – Multi-Criteria and LCA

Impact assessment is a procedure to evaluate the potential effects of activity in environmental, social and economic aspects. Here it is used to predict the impacts of circular transition demonstrated through case studies to ensure minimisation of environmental burden, growth of economy and the future life satisfaction.



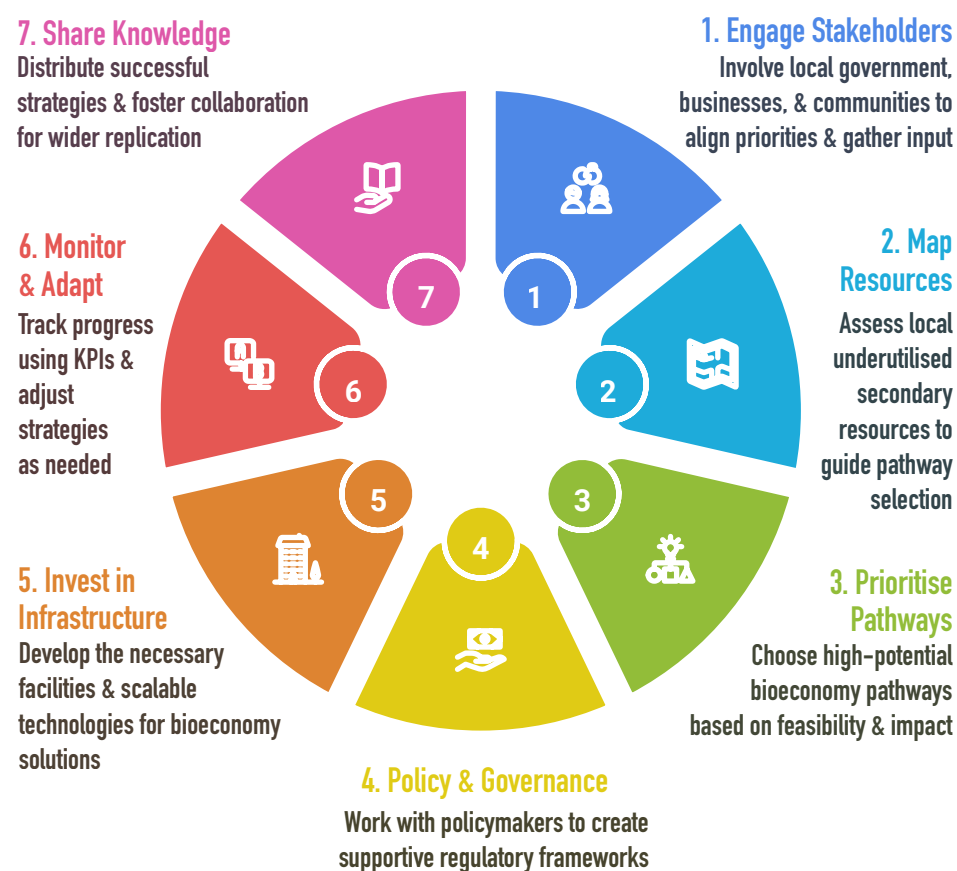
Roadmaps – the Path to Transformation



Roadmaps for case studies illustrate the progress of circular transition (Y-axis) on the suggested timeline (X-axis). Roadmaps often utilise milestone achievements and PESTEL analysis as framework to monitor the factors (political, economic, social, technical, environmental and legal). This can additionally include funding necessities and possibilities.

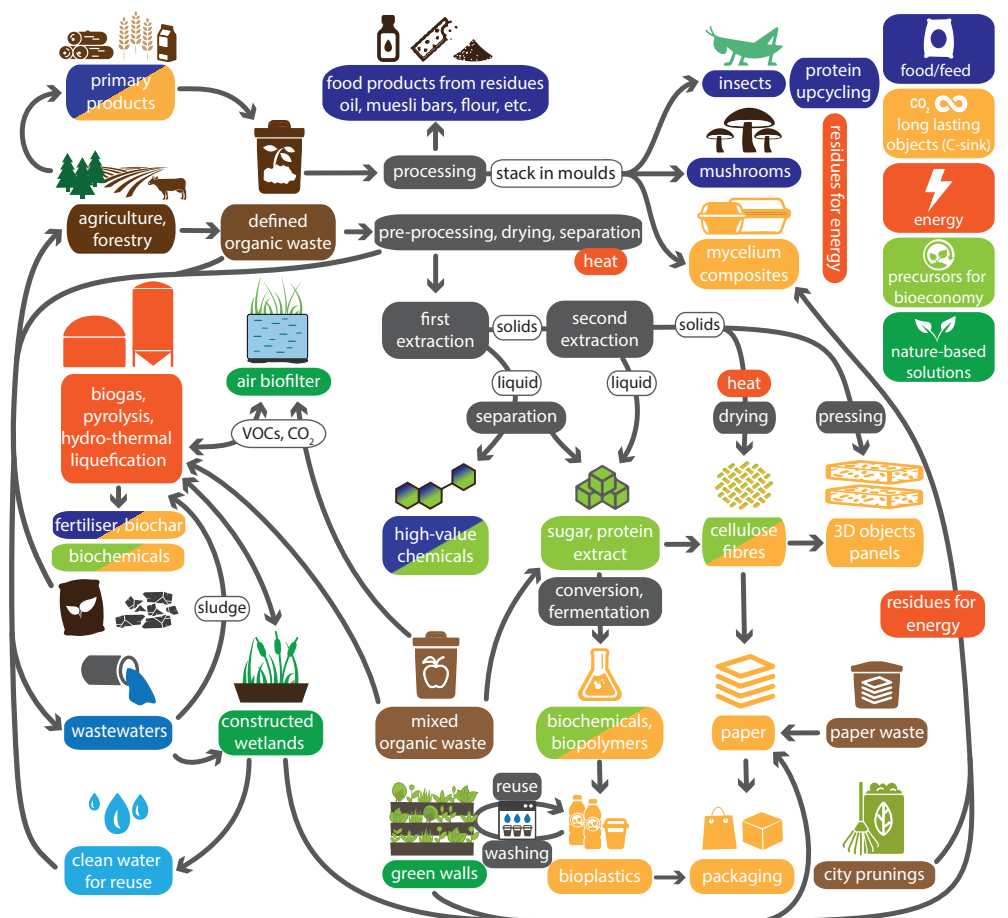
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Biocascading

Cascading valorisation of underutilised resources



Key questions and answers for decision-makers

1. What are key barriers to adoption of circular bioeconomy?

Key challenges include a lack of awareness, insufficient financing options, limited infrastructure, and unclear or inconsistent policy incentives. Overcoming these barriers requires targeted policy development and improved access to finance.

2. Who should be involved in the regional transition?

A successful transition requires collaboration between local authorities, businesses, academic institutions, NGOs, and citizens. Each stakeholder plays a crucial role in driving the circular economy forward through innovation, policy implementation, and community engagement. In addition, a driving force is always needed to set the transition process in motion.

3. Which resources support the transition to a circular economy?

Regions can tap into a variety of resources as we have demonstrated in the case study resource section. The BIOTRANSFORM methodology also supports the selection process of these resources. These can then provide a sustainable and local resource base for bio-based industries and reduce dependence on fossil materials.

4. What role does public policy play in facilitating this transition?

Public policy is essential for creating an enabling environment. This includes facilitating funding, ensuring

regulatory clarity, setting long-term targets, and fostering market uptake of bio-based products through policies that incentivise circular business models.

5. Which financial tools are needed to support businesses?

Businesses in the circular bioeconomy need access to grants, tax incentives, low-interest loans, and Public-Private-Public Partnership (PPPP) models. These will help reduce the financial risks associated with innovation and infrastructure development, making circular projects more attractive for investors.

6. How can local communities contribute to circular bioeconomy?

Communities can play a pivotal role by capturing the availability of secondary resources, supporting local circular initiatives, and participating in awareness-raising campaigns. Education and outreach are key to fostering community engagement in circular practices.

7. How can scalability be achieved?

Scalability relies on stable policy frameworks, shared infrastructure, cross-sector collaboration, and the development of replicable models. By engaging stakeholders early, ensuring financial and technical support, and focusing on long-term sustainability, successful pilot projects can be expanded.