
The Circular Bioeconomy

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Bioeconomy since 2005

The Bioeconomy of the last 13 years draws on 4 main pillars:

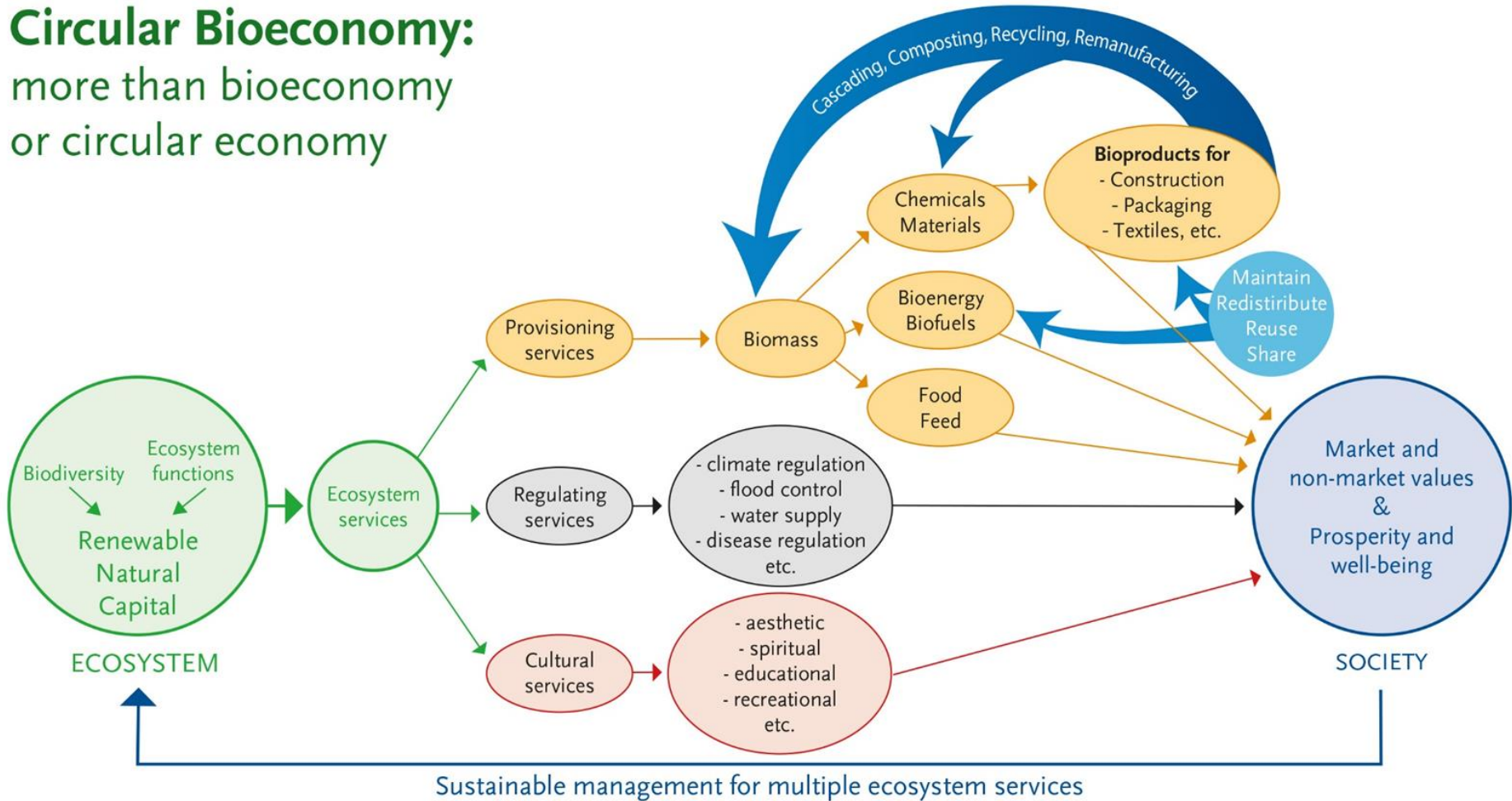
- (1) The potential of biological resources,
- (2) The integration of new knowledge coming from various disciplines, linking it with biotechnologies and life sciences,
- (3) Partnerships and interactions in achieving Sustainable Development Goals (SDG) and enabling a Circular Economy, and this vice versa,
- (4) Contributing to the emerging biological and digital transition.

Just to recall - Characteristics of biological resources:

The uniqueness of some remarkable features of biological resources makes them attractive for becoming the possible fundament of an economy:

- Their Renewability.
- Their CO² -“ friendliness” or even sometimes carbon neutrality.
- Their Re-use or multiuse , also in the format of cascades.
- Their potentials for new, better functions in their products, like higher stability, longer life, stronger endurance, less or no toxicity, less water etc..

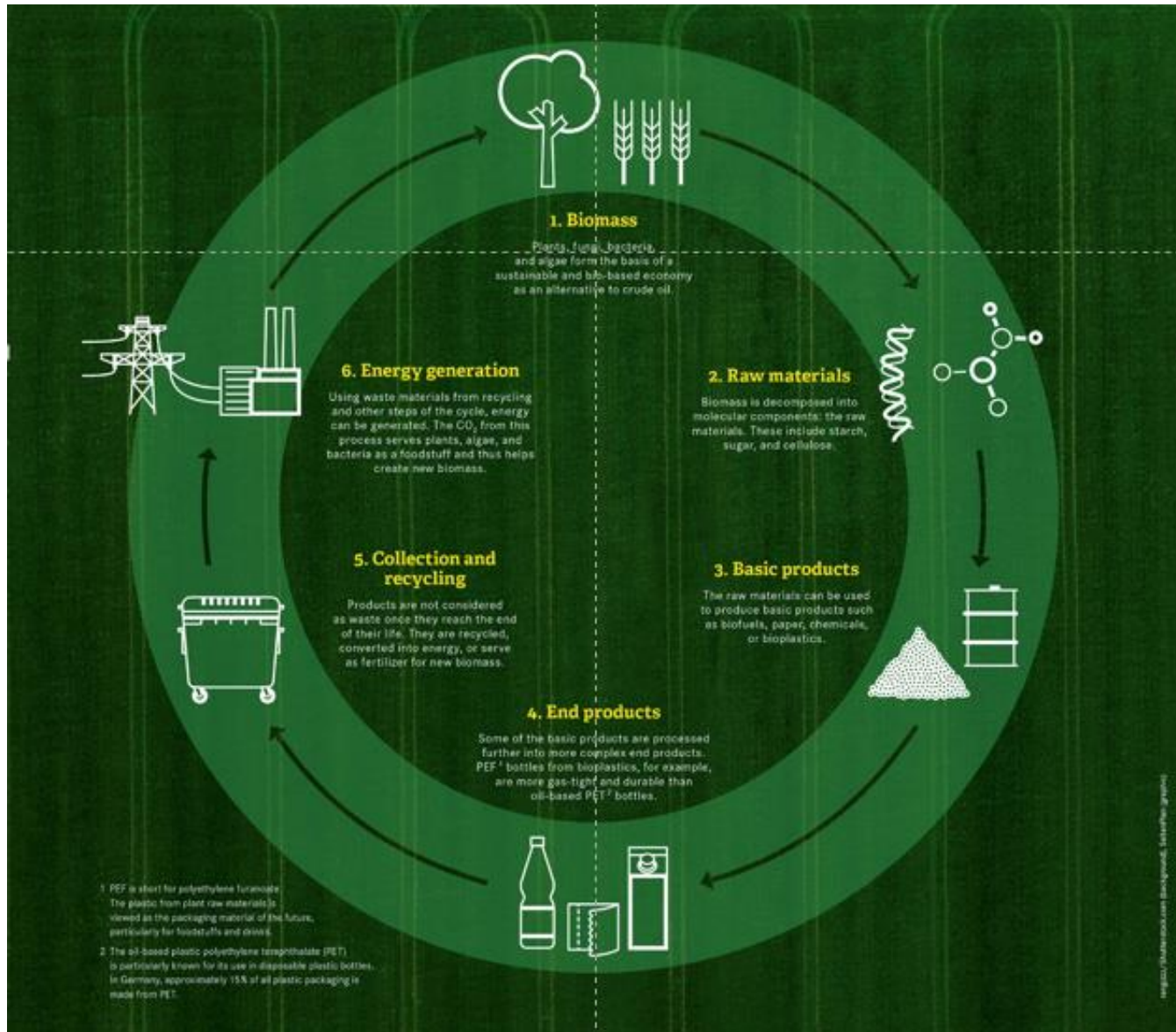
Circular Bioeconomy: more than bioeconomy or circular economy



Circularity element is getting relevant

This circularity element is getting even more content and relevant when you look on new developments, like the manifold activities in RTD to make use of carbon dioxide, not as a “climate killer“, but as a promising natural resource, in particular when looking on the potentials of biological resources being used in urban and regional ambiances (Biocities and Biocommunities).

Bio-based recycling economy



Source: Forschungszentrum Jülich, rangizz/Shutterstock.com (background), Seitenplan (graphic). Detail.

THE GLOBAL GOALS

For Sustainable Development



- **However:**

Interactions between followers of SDG's and the Bioeconomy are often a one-way road, primarily driven by the partners within the Bioeconomy Family, but not yet vice versa.

- **How can we change that?**

- **Possible solution:**

Academia, industry and the public should join in working out proper Bioeconomy Goals, BG's, which indeed will differ from SDG's.

EXAMPLES:

- ❑ Preferring and/or optimizing the principle of renewability;
 - ❑ Focusing on Innovation;
 - ❑ Emphasizing principle of science-based evidence as a political tool;
 - ❑ Establishing a new thinking and action in cycles and value chains etc..
-
- These principles are missing in any tool box or goals list for strategies until today!

These trends will strongly influence further directions of the bio-based economies around the world:

- On the choice of topics, goals and objectives
- On the ways of implementing the Bioeconomy
- On new demands and challenges for education and training
- On new demands and challenges for communication and funding

Impacts on the choice of new topics, goals and objectives, including RTDI for the Bioeconomy of tomorrow

- These trends will be particularly relevant when large aggregations of biological resources are found, large flows of materials, biomass, organic wastes. They offer new potentials in recycling, reusing, closing loops, chains and cycles, instead of restoring, replacing and destroying (burning)!
- Biocities and Biocommunities are in addition also new marketplaces for biological resources because of their immense aggregation of potential customers, workers, stakeholder citizens !

There are many open questions, hopefully answered by RTDI:

- Better knowledge and understanding on the complex flows of biological materials in rural and urban environments, and their interface with issues of sustainable development;
- Potentials and risks for urban biorefining;
- New partnerships or relationships among urban and rural communities.

Other impacts, also on new application fields of the Bioeconomy, include:

- A new changing role of urban planning, architecture and design,
- Energy and construction industries,
- Food, clothing (textile), daily care and health industries,
- New non-food and non-energetic urban production lines, linking biobased materials, circularity and digital applications.

Three important areas of application for the bioeconomy of tomorrow

- Assured healthy food and feed supply for periurban and urban areas and megacities, using new bio-based ways of packaging, chilling, prolonged shelf-lives, guaranteed freshness, quality and origin, also benefitting from new digital technologies.
- Combating plastics on land and in the seas, their production, their processing, their recycling, reuse, emphasizing the replacing of micro-plastics and on their avoidance worldwide !!!

Three important areas of application for the bioeconomy of tomorrow (cont.)

- Coping successfully with food and feed waste in urban and periurban areas. According to FAO (Report on Global Food Losses and Food Waste-Extent, Causes and Prevention, 2016) food and feed waste in urban areas represent the 3rd largest source of GHG emissions, worldwide, an excellent bridge by the way for introducing these topics in COP 24!

Strong role against this background will be joining forces with the digital transformation!

Impact on the way how to implement the bioeconomies worldwide:

- As we face new stakeholder communities and a new class of clients, customers and users in cities and periurban regions, we need new ways of reach out and **communication**, not only among farmers, fishermen, industrialists, retailers, but also with urban planners, architects, gardeners, designers, and waste specialists, and a new cooperation among urban and rural stakeholders.

Impact on the way how to implement the bioeconomies worldwide (cont.):

- This also applies on **new ways of funding**. Here the idea of cooperatives, already widely existing and practiced in Europe (sugar industries, dairy productions, rural funding systems, etc.) should be put in the foreground of discussion on new funding and business models.

**Thank you very much
for your attention !**