
Bioeconomy in Europe – Role of regions: Hype or Reality?

Soria, 27th of October, 2021

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„ A biobased economy is defined as a concept that uses renewable bioresources, efficient bioprocesses and ecoindustrial clusters to produce sustainable bioproducts, jobs and income“.

Footnote page 1 of OECD report “Biotechnology for sustainable Growth and Development”, of 29th of January 2004.

First mentioning whatsoever of the notion of a biobased economy worldwide in a political document!

Bioeconomy since 2005

The Bioeconomy of the last 16 years draws on 4 main pillars:

- (1) Exploitation of the potential of biological resources,
- (2) The integration of new knowledge coming from various disciplines, linking it with biotechnologies and life sciences, like the role of TIC's in the „Plan de Impulso a la Bioeconomia agroalimentaria de Castilla y León of 2019”.
- (3) Contributing to the emerging biological and digital transition or transformation,
- (4) Offering new partnerships and interactions in achieving Sustainable Development Goals (SDG) and enabling a Circular Economy, and this vice versa.

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; central role of renewable carbon in the atmosphere and biosphere ("Renewable Carbon Initiative - RCI").
- Their Re-use or multiuse, also in the format of cascades.
- Their potentials for new, better functions in their products, e.g. higher stability, longer life, stronger endurance, less or no toxicity, less water use etc. what the EC recently qualifies as "biobased innovation“.

Additional USP's of the Bioeconomy

- It is a value-based, an ENABLING Value- Economy, more than many other economy or business models
- It is centered around adding values within value-chains, cross-regional and cross-sectorial
- It is appreciating natural capital as a fundament in its concept
- It is open for integrating knowledge produced by neighboring technologies, like nano, digital, AI, cognitive sciences etc.

Present status – Today

- About 60 states worldwide and more than half a dozen regions officially support the bioeconomy either via dedicated programmes, strategies, action plans, roadmaps etc. or via closely related political, programmatic and/ or strategic activities, the majority of them still in Europe.
- Canada is the only case where we find a strategy, exclusively elaborated by industry!
- Many of these activities, however, are limited to biotechnology and/ or biofuels production and use.
- Today, almost 16 years after it's launch there is no more a single bioeconomy but there are many bioeconomies!
- This has an impact on the necessary frameworks, public funding, private investment and thematical content.

Present status (cont.)

- 2020 was a year when only a few new strategies were published: **Germany, Costa Rica, East African Union, the German State of Bavaria and Colombia.**
- **Uruguay** published its strategy in Spring 2021, the region of **Catalonia** in September 2021 and the **Basque region** in October 2021.
- **Portugal** (with a dedicated Bioeconomy Action Plan), **Namibia**. The **People's Republic of China** will make public its dedicated Bioeconomy strategy within its new 14th Five Year's Plan starting in 2021: "...to make the bioeconomy bigger and stronger!" in October 2021.

Present status (cont.)

- **Austria** has published in July 2021 the first elements for its emerging Action Plan, introducing 8 lighthouse projects to drive the implementation of its strategy of 2020. One is the biobased circular economy. Others elements of implementation will follow, particularly aiming at regional implementation still this year.
- **North-Rhine Westphalia** is going to publish the cornerstones for its new strategy these days and might then immediately jump to introduce an Action Plan next year. In the German states **Saxony** and **Mecklenburg Pomerania** very serious undertakings are underway to highlight the bioeconomy in emerging innovation strategies as part of the “missions” for the next year!

Present status (cont.)

- **Finland** intends to update its strategy of 2014 next year.
- Strong multilateral moves to boost the **bioeconomy globally** during the 2nd half of 2021: **G-20 meeting in Rome** in July 2021 under Italian Presidency, **UN Food Systems Summit (UNFSS)** in September 2021 in **New York**, with Bioeconomy and One Health as important scientific priorities; **World Bioeconomy Forum in Belem**, Brazil in October 2021, focusing on tropical forests.

A late trend worldwide and in particular in
Europe –

The Bioeconomies move into the regions,
lately even into urban and perurban regions.

Some interesting examples and maybe models (1):

- **Germany**

- Regional strategy of Baden-Württemberg has been revised and updated in May 2019; Bavaria published its strategy in November 2020: both strategies are strongly action oriented, offering more than 40 - 50 concrete action fields.
- North-Rhine Westphalia is preparing a cornerstone strategy still in fall 2021 and might also foresee a dedicated strategy for the transformation of the old brown-coal-mining field regions into a model region "BioökonomieRevier" between Aachen, Cologne and Düsseldorf;

Some interesting examples and maybe models (2):

- **Germany**

- A lead market initiative on bio-based chemistry by Sachsen-Anhalt;
- Mecklenburg - Pommerania and Saxonia published special bioinitiatives in which the Bioeconomy works as a pillar or "Mission" of their regional innovation policies.

- **Belgium, Flanders**

- One of the oldest regional strategies plus action plan.

- **The Netherlands**

- Many regional activities, but no dedicated regional strategy, mostly in the Delta, Rotterdam, etc. areas.

Some interesting examples and maybe models (3):

- **France**

- Regional strategies of Haut-de France and the newly shaped region Grand-Est, from Reims to Strasbourg, of autumn 2019, and a close cooperation agreement among various regions, BioPacte; A special Bioeconomy Task Force in Grand-Est aiming at making Grand Est the Capital of the Bioeconomy in France.
- Establishment of an European Center for Biotechnology and Bioeconomy in Reims.

- **Spain**

- Many regional strategies and action plans already in vigour: Andalucia, Extremadura, Castillia y Leon, the Basque region (Circular and Bioeconomy strategy) and Catalonia.

Some interesting examples and maybe models (4):

- **Italy**

- The new Italian Strategy BIT of May 2019 stresses with many examples the role of regions in Italy;
- a position paper of the Conference of Regions and Autonomous Provinces on the potentials of the Bioeconomy;
- in addition quite a few regional bio-based R&D centers in Piedmont, Lombardy, Veneto, Emilia Romagna, Basilicata, Sardinia etc..

Some interesting examples and maybe models (5):

- **Sweden**

- For Southern Sweden (Skane) a comprehensive handbook of instructions for building up a Bioeconomy has been issued.
- Ten regions have launched "Sweden's regional communication platform for bioeconomic development", lasting until 2020, funded by the Swedish agency for Economic and Regional Growth.

- **Finland**

- Many regional activities around Helsinki, Joensuu and in various regions of Karelia and North East Bothnia, but no dedicated action plan.

Some interesting examples and maybe models (5):

- **Norway**
 - The following regions have established regional strategies and action plans: Hedmark, Oppland, Rogaland, Trondelag, and Ostfold;
- **Poland**
 - Various activities on regional level, " Bioeconomy Forum of Lodz";
- **Scotland**
 - Since 2014 a regional road map for biorefining.
- **Austria**
 - Strong bioeconomy activities in the Länder Steiermark, Upper Austria and Kärnten, but not yet with dedicated regional strategies.

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- Thus a fragmented, but highly diverse picture.
 - A dedicated urban Bioeconomy strategy is however missing.

Further trends: **Circularity element - a key principle!**

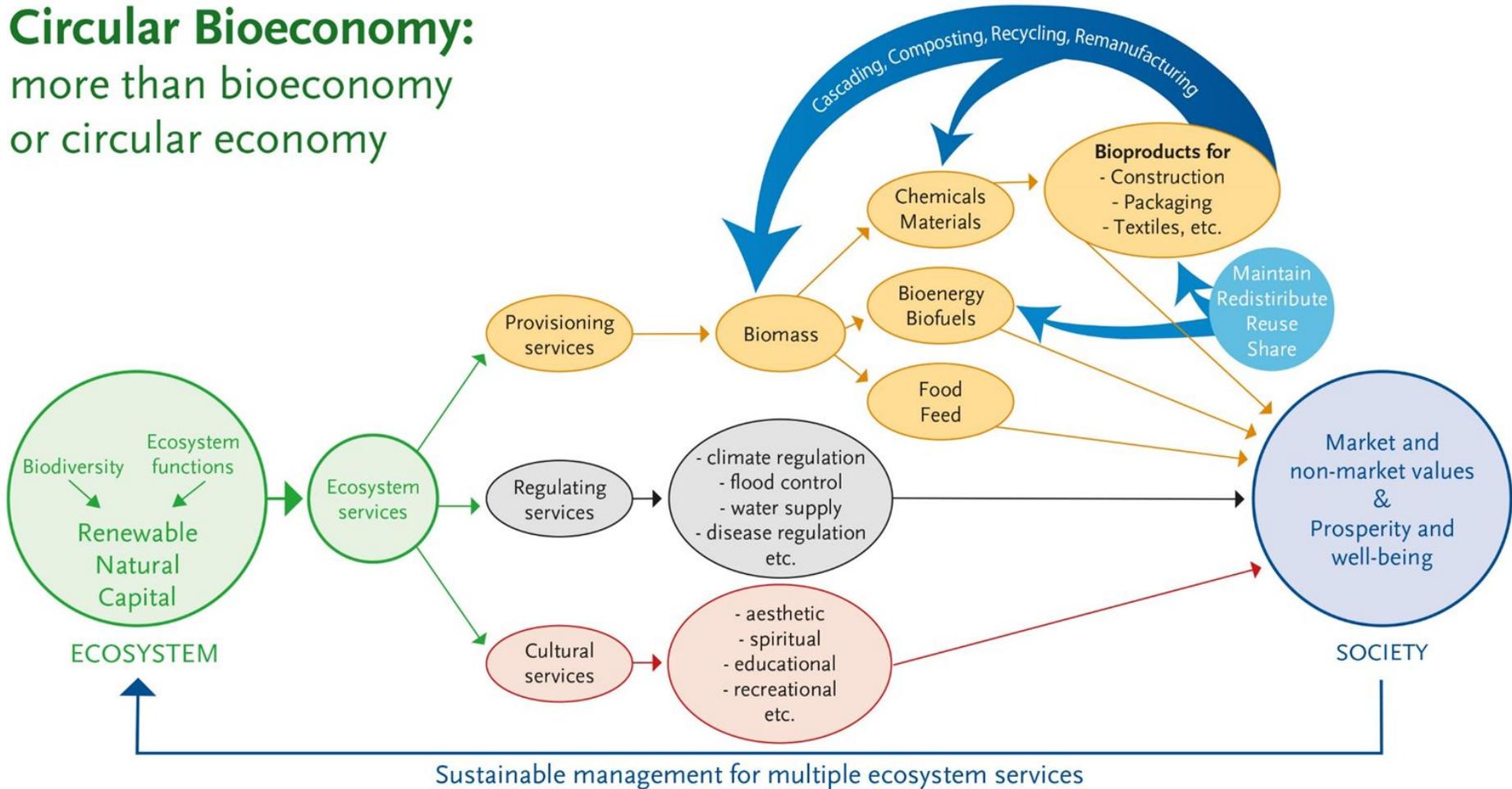
Circular economy and the bioeconomy are true partners in sustainability!

Excellent contribution by the European Environmental Agency in Copenhagen, EEA from 2018.

Some practical illustrating examples:

- ❑ Biorefining;
- ❑ 3-D printing with bioplastics;
- ❑ Multipurpose crops;
- ❑ Valorizing residues, in particular food waste!

Circular Bioeconomy: more than bioeconomy or circular economy



THE GLOBAL GOALS

For Sustainable Development



Circularity and sustainability will strongly influence further directions of biobased economies around the world and in Europe...

- 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

Recent trends within biobased economies

- More attention is recently paid to the biobased closing of waste cycles, hereby contributing to a better supply of so-called rare and/or critical raw materials (CRM), like Lithium, Phosphorous, Cobalt etc., important for technologies developing E-mobility, additive manufacturing, 3-D printing, artificial intelligence, but also water reuse, etc.: All very relevant industrial and technological topics of this new decade!

These aspects of optimizing CRM's availability, so-called "Raw Materials Safety" is hitherto strongly underestimated in former and present discussions on the potentials and goals of a circular Bioeconomy, but is gaining momentum.

Recent trends within biobased economies (cont.)

- Stronger emphasis on “soft skills” to enable or to optimize the implementation of biobased economies:
 - **New ways for funding:** Launch of the ECBF (European Circular Bioeconomy Fund) by the EU and the EIB, with first closes end of last year; new initiatives to support private investments for the Bioeconomy by tax incentives, special coaching and information actions for family offices, investment fund managers, PE actors, mobilizing the potentials of COOPERATIVES etc..

Recent trends within biobased economies (cont.)

- ❑ **New ways for academic and vocational training and education** connecting educational platforms among more than 30 European universities, offering bachelor and master courses; implementation of the concept of a European Bioeconomy University; anchoring of bioeconomy as a subject for teaching and learning in curricula of primary and secondary schools (e.g., in the Strategy of Bavaria).
- ❑ **New ways of communication**, including stronger focus on younger people, kids, students etc., but also on specific “interest groups” like teachers, journalists, influencers etc.

Recent trends within biobased economies (cont.)

- The pandemic will also trigger **new trends**, i.e. paying more attention to livestock issues within the context of biological resources, focusing more on respecting biodiversity and including health as an issue in the Global Bioeconomy Agenda (“One Health“ Initiative by the WHO). The German Helmholtz Society has opened a new ONE HEALTH Research Institute recently at Greifswald, Mecklenburg-Pomerania, the first of its kind in the world! “One health” and the bioeconomy are important topics of the upcoming UNFSS.
- Strong focus **on corona-oriented new value-chains**, like virus-resistant or virus-free food packaging materials, smart alternate proteins or new biomaterials for personal protective equipment (PPE) etc.

What might be the particular role of the Pandemic?

- We see already a strong trend lately in many strategies that they are accompanied or followed by concrete action plans and road maps, containing accountable milestones, monitoring observatories, budgets for implementation and focusing also on other stakeholders than researchers and scientists, like investors, public officials, teachers etc..
- But these encouraging signs might not be sufficient in the years after Corona: Our communities must be prepared to deliver MORE THAN EVER plausible arguments on the advantages, on the pros of choosing the bioeconomy model as the preferred or very relevant complementary one, including explaining preferences for biobased products and biobased solutions!

Castilla León and the bioeconomy

- Plan de Impulso... is a very good base for a comprehensive future strategy, in particular because of its Lineas 2, (Circular Economy), Linea 4 (Water use) and 5 (TIC's and Industry 4.0), which make them very different and advanced compared with many other regional initiatives.
- Focus on agrifood is understandable, but portfolio of the strategy might be scaled-up!
- A thorough and comprehensive mapping on existing materials and biomass streams is absolutely necessary, including nutrients, fibers, livestock, residues, rural and urban, as well as on existing teaching and education facilities, academic and vocational. This is a must to identify potentials, weaknesses and strengths in the availability of biological resources.

Castilla León and the bioeconomy

- A next goal should be the construction and operation of biorefining complex, using mainly local feedstock, in close cooperation with industry, commerce and investors, at its best until 2026.

Existing food and agri-companies must be closely involved in this process: the idea of a local regional bioeconomy platform or council to convene relevant actors within the various value-chains should be studied, also taking into account complementary economic and industrial circularity operations.

Suerte y lo mejor. Adelante con la bioeconomía en el centro de España.

Gracias por su atención!