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THE GOVERNANCE OF CIRCULAR BIOECONOMY

Practices and lessons learnt
from European regions



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Executive summary

In the framework of a collaboration agreement with the French Pays de la Loire region, ACR+ set up a working group on circular bioeconomy, with a particular focus on governance. The objective of the working group is to support the development of local or regional (intended as sub-national) roadmaps on circular bioeconomy where public authorities have a strong role in terms of steering and supporting the development of circular bioeconomy on their territory.

This publication is the result of the ACR+ activities implemented via the working group. These activities included:

- Desk research on the EU framework relevant to circular bioeconomy as well as cases that were published within EU funded projects or various studies and that could include significant level of details regarding the governance of circular bioeconomy strategies at local or regional level;
- Interviews of experts involved in EU projects and/or in the development of circular bioeconomy strategy or related activities on their territory;
- Meeting of the working group participants on 21st September 2020 with a presentation of three cases from Navarre, Bayern and Flanders.

The publication starts with a clarification of the concept of circular bioeconomy and the EU framework (including policy aspects, institutional responsibility and financial opportunities) that influences the development of such strategies at local or regional level. Three detailed cases in Navarre, Bayern and Flanders provide information about the development and implementation of circular bioeconomy strategies in different contexts as well as lessons learnt. These cases were chosen on the basis of their geographical diversity, the degree of maturity of the strategy, the diverse approach followed in each case and the significant role of public authorities.

One of the main conclusions from the three case studies is that bioeconomy should be considered as part of the circular economy strategy, and that public authorities should take the lead for the development and coordination of circular bioeconomy on their territory. It is also key to ensure an integrative approach and that a participatory and inclusive process is set up in order to bring all relevant stakeholders around the table, from both an 'internal' perspective (relevant policy departments, in particular agriculture and fisheries, environment, economic development, research and innovation) and an 'external' perspective (in particular public authorities, private sector, research organisations, civil society representatives).





Introduction What is (sustainable) circular bioeconomy?

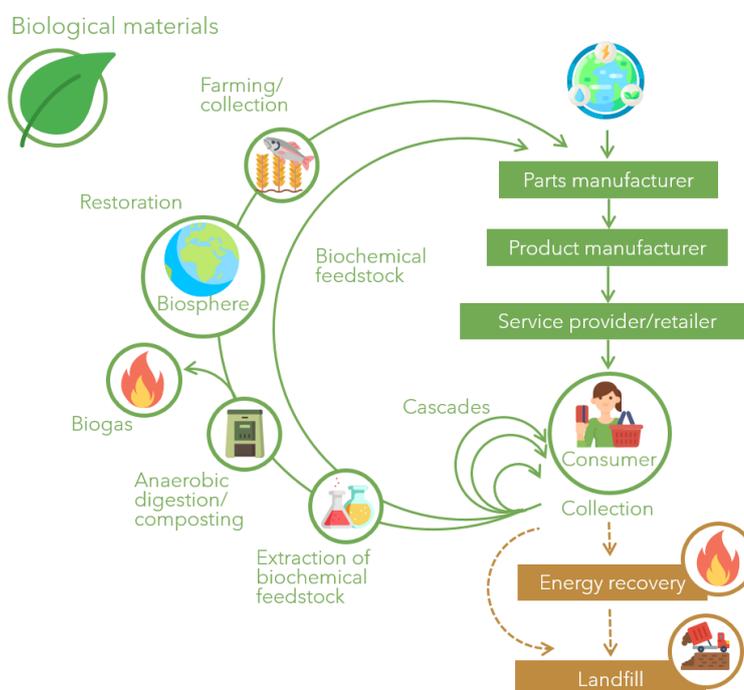
The EU bioeconomy strategy (2018)¹ defines bioeconomy as follows: “The bioeconomy covers all sectors and systems that rely on biological resources (animals, plants, micro-organisms and derived biomass, including organic waste), their functions and principles. It includes and interlinks: land and marine ecosystems and the services they provide; all primary production sectors that use and produce biological resources (agriculture, forestry, fisheries and aquaculture); and all economic and industrial sectors that use biological resources and processes to produce food, feed, bio-based products, energy and services.” In short, the bioeconomy comprises those parts of the economy that use renewable biological resources from land and sea – such as crops, forests, fish, animals and micro-organisms – as well as their residual streams to produce food, materials and energy.

Circular bioeconomy is the application of the concept of circular economy to biological resources, products and materials. The circular economy is an economy where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimised².

The circularity aspect of bioeconomy comes in particular from the cascading use of biomass, meaning when biomass is processed into a product and this product is used at least once more either for material or energy purposes. As such no specific hierarchy of purpose is embedded into the concept of bioeconomy.

On the other hand, the concept of circular economy is strongly related to the waste hierarchy³, meaning for instance that a circular bioeconomy favours lifetime extension and re-use of a bio-based product while energy recovery becomes the least preferred option.

Although no official (legal) definition exists, we can say that the circular bioeconomy is at the intersection of bioeconomy and circular economy, including the following topics: Bio-based products; Share, reuse, remanufacture, recycling; Cascading use; Utilization of organic waste streams; Resource-efficient value chains; Organic recycling, nutrient cycling.⁴



Source: ACR+, adapted from Ellen Mac Arthur Foundation

¹ European Commission, 2018, A sustainable Bioeconomy for Europe: strengthening the connection between economy, society and the environment

² European Commission, 2015, Closing the loop - An EU Action Plan for the Circular Economy

³ ACR+, 2015, General guidelines for integrated circular economy strategies at local and regional level

⁴ Nova Institute, 2018, The “Circular Bioeconomy” – Concepts, Opportunities and Limitations





There is a wide range of drivers of the bioeconomy in European regions, which have an important influence on the way the bioeconomy is understood and promoted in those regions. Drivers can be found in the regional resources and assets that could be part of the regional bioeconomy. In many cases, the focus on bioeconomy comes from the active use of biological resources or industrial knowledge on the topic. However, there are also external factors that stimulate the bioeconomy, for instance political decisions to increase competitiveness and to promote economic development, or the need to reduce the dependence of a territory on imported raw materials and fuels. Support to the development of bioeconomy can also be a response to environmental or territorial challenges⁵, for instance the loss of population in rural areas or local impact of climate change, but also be part of the action addressing Sustainable Development Goal⁶.

Those drivers have an influence on the role and action of the various organisations and stakeholders involved in the development and implementation of a circular bioeconomy. Indeed it is key to have an ecosystemic approach of circular bioeconomy, meaning addressing various stages in the products' value chains that are interrelated and managed by interconnected stakeholders, in order to develop and implement an efficient strategy for the territory. Those ecosystems integrate public authorities, at least through policies related to biomass feedstock management (in particular agriculture, forestry, fisheries, as well as – municipal – waste), but also as supporter and promoter, and more and more frequently as steering organisation regarding the definition and implementation of circular bioeconomy priorities and activities.

Such ecosystemic approach will not only help to develop, implement and ensure acceptance of the circular bioeconomy strategy, but also facilitate monitoring since relevant data (about processes, results and impacts) will be generated by all involved stakeholders.

“To be successful, the European bioeconomy needs to have sustainability and circularity at its heart. This will drive the renewal of our industries, the modernisation of our primary production systems, the protection of the environment and will enhance biodiversity.”

Updated EU Bioeconomy Strategy, 2018

Achieving a sustainable and/or circular bioeconomy faces many challenges, related to ensuring food security but also addressing climate change and managing natural resources in a sustainable way (including by preserving biodiversity), managing competition between different uses of biomass feedstocks, while guaranteeing that bioeconomy development benefits everybody.

A hierarchy of use and objectives must therefore come from political vision and guidance by public authorities, in order to ensure that bioeconomy is set in a sustainable way and in line with economic, social and environmental priorities for the territory.

⁵ European Commission, 2017, Bioeconomy development in EU regions

⁶ <https://sdgs.un.org/goals>





Chapter 1 The European framework of circular bioeconomy policy

1.1. The EU policy framework

1.1.1. The EU Bioeconomy Strategy

In 2018 the European Commission updated its [Bioeconomy Strategy](#) originally adopted in 2012, in order to achieve the goal of developing a more innovative and low-emissions economy, reconciling demands for sustainable agriculture and fisheries, food security, and the sustainable use of renewable biological resources for industrial purposes, while ensuring biodiversity and environmental protection⁷. Under the lead of Directorate General (DG) for Research and Innovation, the Strategy was co-signed by several other Commission departments namely DG Agriculture and Rural Development, DG Environment, DG Maritime Affairs, and DG Industry and Entrepreneurship.

The 2018 updated Bioeconomy Strategy aims to pave the way for the renewal of European industries and primary sectors through bio-based innovation, the provision of food and nutrition security and the valorisation and protection of ecosystems and biological resources.

The Strategy provides a coherent framework that cuts across various sectors and policies, allowing to build synergies (i.e. the exploitation of a service leading to the increased provision of another service), addressing trade-offs (i.e. the exploitation of a service to the detriment of another one) and delivering sustainability across various policy and sectoral objectives.

In particular, the renewed Industrial Policy Strategy⁸, the Circular Economy Action Plan⁹ and Accelerating Clean Energy Innovation¹⁰ refer to the bioeconomy as key for accelerating progress towards a circular, low-carbon economy.



Source: EC, 2018

⁷ COM(2018)673, A sustainable Bioeconomy for Europe: Strengthening the connection between economy, society and the environment

⁸ COM(2017)479, Investing in a smart, innovative and sustainable Industry A renewed EU Industrial Policy Strategy

⁹ COM(2015)614, Closing the loop – An EU action plan for the circular economy

¹⁰ COM(2016)860, Clean Energy for All Europeans – unlocking Europe's growth potential



The Bioeconomy Strategy proposed a set of 14 concrete actions that were launched at the latest in 2019 and addressed three priorities:

- Strengthen and scale-up the bio-based sectors, unlock investments and markets (in particular via mobilization of research stakeholders, launch and implementation of specific investment instruments, support to standards and to the development of biorefineries);
- Deploy local bioeconomies rapidly across Europe (in particular, via a strategic deployment agenda for sustainable food and farming systems, forestry and bio-based products, support to pilot actions in rural, coastal and urban areas, as well as education and knowledge exchange);
- Understand the ecological boundaries of the bioeconomy (in particular, via the JRC Knowledge Centre for Bioeconomy as well as the development of a monitoring framework and guidance for bioeconomy).

The strategy and the action plan expect to generate key impacts on: developing new technologies and processes for the bioeconomy; developing markets and competitiveness in bioeconomy sectors; and pushing policymakers and stakeholders to work more closely together.

The European Joint Research Centre (JRC) is in charge of the development of the [EU Bioeconomy Monitoring System](#) to track progress on the development of bioeconomy in Europe and published a first report was published in 2020 in collaboration with experts throughout European and International organisations, EU Member States, Commission Services and other stakeholders.

Overview of biomaterials use in Europe

- The bioeconomy sector accounted in 2014 accounting for 9 % of employment and more than 25 % of total material flows.
- Agriculture constitutes about 63 % of the total biomass supply in the EU, forestry 36 % and fisheries less than 1 %. Food and feed account for 62 % of the EU's biomass use, with materials and energy each representing around 19 %.
- More than one third of primary biomass sourced from forests is directly used to produce energy. In total, 47 % of the EU's need for wood products and pulp and paper are met by secondary resources from recycling.
- The global production of plastics is estimated to account for about 7 % of the world's fossil fuel consumption. The proportion of bioplastics is still low, currently below 1 %. However, the worldwide biopolymer production capacity is forecast to increase from 6.6 million tonnes in 2016 to 8.5 million tonnes in 2021. Some bioplastics are biodegradable, but many are not. In 2019, less than 20 % of bioplastics are expected to be biodegradable. The proper collection and sorting of bioplastics poses problems in closing material loops.
- In 2012 biocomposites (wood-plastic composites and natural fibre composites) accounted for 15 % of the total European composite market. The use of biocomposites is expected to increase further, e.g. in the automotive industry, but their recycling is difficult.
- Between 118 and 138 million tonnes of biowaste are generated annually, of which 100 million tonnes is food waste. About 25 % is collected and recycled.

*Source: European Environment Agency, 2018,
The circular economy and the bioeconomy - Partners in sustainability*





1.1.2. Other key relevant policy actions

Moreover, the European Commission works on ensuring a coherent approach to the bioeconomy through different programmes and instruments including the Common Agricultural Policy, the Common Fisheries Policy, Horizon 2020, European environmental initiatives, the Blue Growth initiative for the marine sector and the European Innovation Partnership on Sustainable Agriculture. The main policy initiatives relevant to circular bioeconomy are listed hereafter.

European Green Deal¹¹. The European Green Deal launched in 2019 is the overarching strategy aiming at making the EU's economy sustainable to reach EU carbon neutrality by 2050. It provides a roadmap with actions to boost the efficient use of resources by moving to a clean, circular economy and stop climate change, revert biodiversity loss and cut pollution. It outlines investments needed and financing tools available, and explains how to ensure a just and inclusive transition. The European Green Deal covers all sectors of the economy, notably agriculture, energy, buildings, and industries such as textiles and chemicals, where circular bioeconomy can play a significant role.

Farm to fork Strategy¹². The Farm to Fork Strategy is at the heart of the European Green Deal aiming to make food systems fair, healthy and environmentally-friendly. It refers to bioeconomy in particular as a way to provide new business opportunities, for instance linked to making use of food waste. Investing in research and innovation, via Horizon Europe funding programme, is mentioned as a way to leverage these opportunities so that they contribute to achieve the Farm to Fork strategy's objectives, for instance with regards to the use of fertilizers and pesticides.

Circular Economy Action Plan¹³. The Circular Economy Action Plan adopted in 2020 supports a circular economy in each step of the value chain, including regarding biomass and its use in bioeconomy activities. It aims to ensure less waste and focuses on the sectors that use most resources and where the potential for circularity is high such as: packaging, plastics, textiles, construction and buildings, food, water and nutrients, all sectors where bioeconomy could have an impact. In addition, the CEAP explicitly mentions upcoming EU action aimed at addressing sustainability challenges related to bio-plastics and biodegradable or compostable plastics.

Waste Framework Directive¹⁴. The WFD [revised in 2018](#) provides for a general framework of waste management requirements and sets the basic waste management definitions for the EU. It also includes targets for the separation and collection of diverse waste fractions, in particular mandatory separate collection for bio-waste by end 2023. It is important to mention that a large part of the bioeconomy sector relies on waste characterization legislation as a means to utilize biowaste or bio-based products: the [List of Waste](#) provides an EU-wide common terminology for waste classification to ease waste management.

FOOD2030 initiative. FOOD 2030 is the EU R&I policy framework to drive sustainable, healthy and inclusive food systems and thus achieve co-benefits for the four priorities of nutrition, climate, circularity, and innovation and communities, through its 10 Pathways for Action to be deployed in Horizon Europe (food systems intervention area, missions and partnership on "Safe and Sustainable Food Systems for People Planet and Climate").

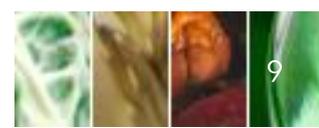
Future of the Common Agricultural Policy. In 2018, the European Commission presented legislative proposals on the common agricultural policy (CAP) for the period 2021-27 with the aim to make the EU's agricultural policy more responsive to current and future challenges, while continuing to support the active needs of European farmers. The proposals are built around nine key objectives, including

¹¹ COM(2019)640, The European Green Deal

¹² COM(2020)381, A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system

¹³ COM(2020)98, A new Circular Economy Action Plan for a Cleaner and More Competitive Europe

¹⁴ Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste





“[climate change action](#)” and “[jobs and growth in rural areas](#)”, for which bioeconomy has been specifically identified as a key positive contributor, for instance by replacing fossil-based products and energy, with the supply of sustainably produced biomass, including from afforestation, without hampering food security.

[Blue Growth - the EU’s integrated Maritime Strategy](#)¹⁵. As part of the Integrated Maritime Policy, the Blue Growth is the long-term strategy to support sustainable growth in the marine and maritime sectors, taking duly into account the environmental pillars embedded in the Integrated Maritime Policy. This policy is the marine and maritime contribution to achieving the Europe 2020 strategy for smart, sustainable and inclusive growth. In 2018 the European Commission published a report providing a comprehensive overview of the blue bioeconomy sector in the European Union, including on sectors attracting investments.¹⁶

[EU Biodiversity strategy for 2030](#)¹⁷. Adopted in 2020, the EU Biodiversity strategy calls for reversing biodiversity loss and restoring nature in order to ensure that it can continue to deliver its ecosystemic services of providing food, health and medicines, materials, as well as recreation and wellbeing. In particular, the strategy refers specifically to sustainable bioenergy, with the aim to reduce the use of whole trees and food and feed crops for energy production.

[Renewable energy directive](#)¹⁸. The Renewable Energy Directive revised in 2018 includes strengthened sustainability criteria in particular for energy from biomass. It also promotes the shift to advanced biofuels based on residues and non-reusable and non-recyclable waste.

[EU Forest Strategy](#)¹⁹. In 2013, the Forest Strategy was adopted set a new EU framework until 2020 to coordinate and ensure coherence in forest-related policies and enhance the contribution of forests and the forest-based sector to EU objectives. The strategy promoted, in particular, the sustainable and resource-efficient mobilisation and use of forest biomass, the development of the bioeconomy, access to domestic and international markets, and enhanced R&I.

1.2. The current institutional framework

The main impulse to EU bioeconomy policy is given by the European Commission, as the EU institution in charge of representing the interests of the European Union as a whole, in particular by proposing policies and laws that will be adopted by the European Parliament (representing EU’s citizens) and the Council of the European Union (representing governments of the individual Member States). Several other institutions have to be considered for the development of a circular bioeconomy, in particular the European Economic and Social Committee and the European Committee of the Regions. Other bodies and initiatives not directly part of the EU institutional framework but closely related to it can also be mentioned.

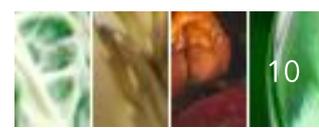
¹⁵ COM(2014)254, Innovation in the Blue Economy: realising the potential of our seas and oceans for jobs and growth

¹⁶ Source: European Commission, 2018, Blue bioeconomy - Situation report and perspectives

¹⁷ COM(2020)380, EU Biodiversity Strategy for 2030 - Bringing nature back into our lives

¹⁸ Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources

¹⁹ COM(2013)659, A new Forest Strategy: for forests and the forest-based sector

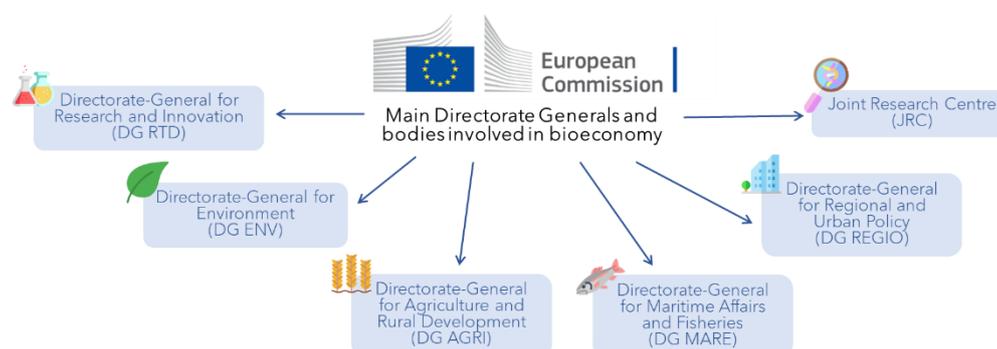




1.2.1. The EU institutions

The European Commission

Without attempting to be exhaustive, this section lists key services from the European Commission that have an influence over the development of circular bioeconomy policy in Europe. The Directorate General for Research and Innovation has been the main engine for developing the EU bioeconomy strategy, in collaboration with other Directorate Generals. More details about relevant webpages and contacts from the European Commission are mentioned in [annex 1](#).



The European Parliament

In July 2013, the European Parliament issued a [resolution](#) on the Commission's communication entitled 'Innovating for Sustainable Growth: a Bioeconomy for Europe'. No particular EP Committee has a specific mandate on bioeconomy, although the Committees involved in the preparation of the resolution were:

- Regional Development ([REGI](#));
- Industry, Research and Energy ([ITRE](#));
- Environment, Public Health and Food Safety ([ENVI](#)).

A specific intergroup is working on the topic of bioeconomy, the European Parliament Intergroup on "Climate Change, Biodiversity and Sustainable Development" – [Working Group on Bioeconomy](#). Current chair of the working group: Franc BOGOVIČ (SI)

The European Parliament also issued a [resolution](#) in June 2018 on cohesion policy and the circular economy mentioning the importance of bioeconomy as contributing to the objectives of the circular economy.

The Council of the European Union

In November 2019 the Council adopted [conclusions on the updated bioeconomy strategy for Europe](#). In its conclusions, the Council expresses its support for the updated bioeconomy strategy set out in the Commission communication. It calls on member states to implement this strategy without delay and on the Commission to facilitate and drive forward its implementation.

Among the 10 different 'configurations' of the Council of the EU, the "Agriculture and Fisheries" Council has been the most active on the topic of bioeconomy, with in particular several exchanges of views on the EU Bioeconomy Strategy ([02/2018](#), [12/2018](#), [03/2019](#)).



The European Committee of the Regions (CoR)

The lead body of the CoR active on bioeconomy is the Commission for Social Policy, Education, Employment, Research and Culture ([SEDEC Commission](#); sedec@cor.europa.eu). Current chair: Anne KARJALAINEN (FI).

Relevant documents and initiatives:

- [Opinion report](#) on updated EU bioeconomy strategy (06/2019);
- 2019 [conference](#) with relevant members of the CoR active on the topic;
- [ESPON study](#) on behalf of CoR: Experts concluded that the mainstreaming of the bioeconomy requires action from decision-makers at multiple levels, depending on the competences of European, national, regional and local authorities, but also, and crucially on the value chains of each activity within the bioeconomy. Specifically, the report calls on local and regional authorities to become active in linking their economic players to each other and to other European regions where they can achieve a symbiotic relationship, promoting innovative activities and new business models anchored in their local potential.

The European Economic and Social Committee (EESC)

The lead body of the EESC active on bioeconomy is the Agriculture, Rural Development and Environment Section ([NAT Commission](#)). Current chair: Maurizio REALE (IT).

Relevant documents and initiatives:

- Opinion reports in 2018: [exploratory opinion](#) and [own initiative opinion](#);
- [Opinion report](#) about the Communication updating the 2012 Bio-economy Strategy (05/2019);
- 2019 [conference](#) with relevant members of the EESC active on the topic.

1.2.2. Other bodies and initiatives relevant to bioeconomy²⁰

[European Innovation Partnership 'Agricultural Productivity and Sustainability'](#) (EIP-AGRI): Launched in 2012 as one of the new interactive approach to innovation defined by the 'Europe 2020' strategy in order to foster competitive and sustainable farming and forestry, the EIP-AGRI contributes to integrating different funding streams (in particular from Horizon 2020 and the rural development pillar of the CAP) and brings together innovation actors at EU level and within the rural development programmes.

[EU Bioeconomy Policy Support Facility](#): Through this governmental initiative, 11 Central and Eastern European countries without bioeconomy strategies and/or action plans are working on policy level developments with the aim to develop for 2030 knowledge and cooperation based circular bioeconomies, which helps to enhance their inclusive growth and to create new value-added jobs especially in rural areas.

[European Network for Rural Development \(ENRD\)](#): hub for exchange of information on rural development policy, programmes, projects and other initiatives.

[Bio-based Industries Joint Undertaking \(BBI JU\)](#): Public-Private Partnership between the EU and the Bio-based Industries Consortium, with the aim to implement research and innovation activities in

²⁰ excluding financing bodies – see next section on EU financing for circular bioeconomy



Europe for the development of new bio-based products, materials and fuels. The BBI JU provides both information and funding.

Smart Specialisation Platform: The S3 Platform and its [thematic platform on bioeconomy](#) were launched by the European Commission to facilitate mutual learning, data gathering, analysis, and networking opportunities for around European regions and countries, which have therefore the possibility to join forces and pool resources on the basis of matching smart specialisation priorities in high valued added sectors.

Bioeconomy Stakeholders Panel: a platform for informed discussions on the bioeconomy as a whole.

International Bioeconomy Forum (IBF): a co-owned platform, organised in ad-hoc working groups, to guide international cooperation on specific research and innovation priorities.

Consultative groups contributing to the EU's research policy: Programme Committees, Advisory groups, Standing Committee on Agricultural Research.

Blue Bioeconomy Forum: The aim of the forum was to develop a shared understanding of the current status of the emerging blue bioeconomy in Europe and to collectively develop a roadmap to advance the blue bioeconomy in Europe.

1.3. EU financing for circular bioeconomy

The European Union has set up a wide range of financing instruments and mechanisms that can support the development and implementation of circular bioeconomy activities in Europe. Some of these instruments and mechanisms are general, while others are specific to the topic embraced by the concept of circular bioeconomy as defined supra. The most recent approach considers sustainability as a key element to be taken into account for the allocation of financial support.

1.3.1. Recovery Plan for Europe

Proposed in May 2020 in order to help repair the economic and social damage brought by the coronavirus pandemic, kick-start European recovery, and protect and create jobs, the [Recovery Plan for Europe](#) includes a two-fold response (reinforced MFF and Next Generation EU) across three pillars: Supporting Member States to recover; Kick-starting the economy and helping private investment; Learning the lessons from the crisis:

- **Reinforced Multiannual Financial Framework (MFF) 2021-2027:** with a total of €1,074.3 billion the proposed EU budget aims to finance a fair socio-economic recovery, repair and revitalise the Single Market, guarantee a level playing field, and support the urgent investments, in particular in the green and digital transitions²¹.
- **Next Generation EU:** a new temporary instrument which will boost the EU budget with new financing of €750 billion borrowed on the financial markets for 2021-2024. This additional funding will be channeled through EU programmes and repaid over a long period of time throughout future EU budgets – not before 2028 and not after 2058.

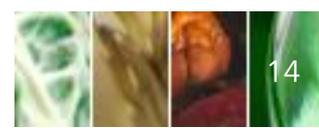
²¹ Over half of EU funding is channelled through the 5 European structural and investment funds (ESIF) which are jointly managed by the European Commission and the EU countries: the European regional development fund (ERDF), the Cohesion fund (CF), the European social fund (ESF), the European agricultural fund for rural development (EAFRD) and the European maritime and fisheries fund (EMFF).





1.3.2. Financing opportunities

- **Bio-based Industries Joint Undertaking (BBI JU):** The BBI JU is responsible for the implementation of open [calls for proposals](#) for research and innovation actions and innovation actions, as well as coordination and support actions, in line with the Horizon 2020 rules for participation. The [Call 2020](#) was open from April to September 2020 and had the following focus:
 - 4 strategic orientations: Feedstock, Process, Products, and Market uptake;
 - Indicative budget: EUR 87 million;
 - Priorities on involving more farmers in projects (partners, advisory board members), having higher technical readiness level (TRL) projects (not only on biorefineries but also sustainable agriculture), appointing farmer champions, as well as monitoring impact on rural areas during project.
- **Horizon 2020:** Horizon 2020 is the biggest EU Research and Innovation programme with nearly €80 billion of funding available over 7 years (2014 to 2020). It provides [research and innovation funding](#) for multi-national collaboration projects as well as for individual researchers and supports SMEs with a special funding instrument. Bioeconomy related calls for proposal have been published under the Societal Challenge 2 – "Food security, sustainable agriculture and forestry, marine, maritime and inland water research, and the bioeconomy".
- **Horizon Europe** is the next research and innovation framework programme, from 2021 to 2027. With a proposed budget of €100 billion, Horizon Europe will be built around three pillars:
 - Excellent Science;
 - Global Challenges and European Industrial Competitiveness (including a cluster on Food, Bioeconomy, Natural Resources, Agriculture and Environment);
 - Innovative Europe.
- **European Circular Bioeconomy Fund (ECBF):** The ECBF is a new Thematic Investment Platform for Circular Bioeconomy resulting from the cooperation between EIB, the European Commission and ECBF Management GmbH. The ECBF is the first equity fund exclusively dedicated to the bioeconomy and the circular bioeconomy in the EU and the Horizon 2020 Associated Countries. On 1st October 2020 the ECBF closed its first round with €82 million in commitments from EIB, PreZero, Corbion, and the Hettich family office, to provide financing to innovative growth-stage companies and projects, with initial investments made in plant-based proteins and orange peel recycling.
- **European Structural & Investment Funds (ESIF):** The European Structural & Investment Funds (ESIF) consist of five EU funds that invest in growth, job creation, and a sustainable and healthy European economy and environment: [European Regional Development Fund](#) (ERDF), [Cohesion Fund](#) (CF), [European Social Fund](#) (ESF), [European Agricultural Fund for Rural Development](#) (EAFRD), [European Maritime and Fisheries Fund](#) (EMFF).
- **Blue Bioeconomy Fund:** This COFUND is the result of a collaboration between JPI Oceans and the former ERA-NETS COFASP and ERA MBT and consists of 27 partners from 16 countries. Its main objective is to establish a coordinated R&D funding scheme that will strengthen Europe's position in the blue bioeconomy, in particular by supporting new and existing ways of bringing bio-based products and services to the market, as well as the identification of new ways of creating value from in the blue bioeconomy.





- **LIFE:** LIFE is the European Programme for co-financing projects that demonstrate or pilot solutions that tackle environmental (including circular economy, nature and biodiversity) or climate issues.
- **Erasmus+:** Erasmus+ is the EU's programme to support education, training, youth and sport in Europe.

1.3.3. European Investment Bank (EIB)

The EIB²² provides funding for projects that help to achieve EU aims, both within and outside the EU, via 3 main types of products and services: lending (about 90 % of its total financial commitment), 'blending' (combination of EIB financing with additional investment), advising and technical assistance. In addition to its financial support, the EIB has had specific activities related to support investment in the circular bioeconomy:

- EIB study on access to finance for the bioeconomy (2017): This study reviewed the access-to-finance conditions for Bio-based Industries (BBI) and the Blue Economy (BE) and proposes potential solutions that could catalyse investments into the sector.²³
- EIB Circular City Funding Guide²⁴: Launched in January 2020, the Circular City Funding Guide is an online platform providing information on the financing of circular economy projects in cities, for both fund-seekers on available financing and funders wishing to create financing programmes for circular economy projects.

1.3.4. Private financing and EU taxonomy

Besides EU funding, circular bioeconomy can be supported by private sources. Without the ambition to go into details in this publication, an important recent issue to take into account with regards to private financing of circular bioeconomy is the "EU taxonomy", meaning the establishment of an EU classification system for sustainable activities²⁵. Adopted in June 2020, the Taxonomy Regulation²⁶ is a tool to encourage investment flows from the financial sector to companies engaged in or transitioning to more sustainable activities. The Regulation aims in particular to define technical criteria for economic activities that can make a substantial contribution to one of the six following environmental objectives, while avoiding significant harm to the five others: climate change mitigation, climate change adaptation, sustainable use and protection of water and marine resources, transition to a circular economy, pollution prevention control, and protection and restoration of biodiversity and ecosystems.

²² <https://www.eib.org/en/>

²³ EIB, 2017, Access-to-finance conditions for Investments in Bio-Based Industries and the Blue Economy

²⁴ <https://www.circularcityfundingguide.eu/>

²⁵ https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en

²⁶ Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment





Chapter 2 Developing the governance of circular bioeconomy at local and regional level – case studies

2.1. General considerations on strategies and governance models

In 2017, a study from the European Commission²⁷ showed that 19 Member States already have a bioeconomy strategy (or a similar strategic document) in place or are in the process of developing a strategy. Moreover, 49 of the analysed regions have developed a regional bioeconomy strategy or a similar comprehensive document. In the regions and countries without an explicit bioeconomy strategy, the bioeconomy support is often embedded in one or several other strategic documents or funding programmes.

2.1.1. Local and regional authorities as drivers of circular bioeconomy governance

The bioeconomy applies by definition at cross-sector, cross-policy and cross-border level. The development and implementation of circular bioeconomy strategies and activities therefore involve a large range of sectors and stakeholders. This is why an **integrative and transversal approach** is needed with an essential role for public authorities in order to steer and facilitate the development of bioeconomy with sustainability and circularity at its heart, in particular with regards to reducing the carbon impact of our consumption and production patterns, respecting the priority given to food purposes, reducing the need for materials, supporting healthy ecosystems and minimizing pollution resulting from human activities. Indeed, the various stakeholders involved in circular bioeconomy activities generally prioritise an interest over others. The diversity of perspectives and interests needs to be acknowledged and effectively channelled into a constructive dynamic, where public authorities act as a focal point bringing together the various stakeholders in the perspective of public interest and local or regional sustainable development: cities and regions must take **leadership** to steer and facilitate the development of circular bioeconomy on their territory.

In general terms, the preparation of a circular bioeconomy strategy should include the following elements²⁸:

- Mobilise the planning process: mobilise support to the strategy (including at political level); Identify the main actors in the territory (stakeholders' analysis); structure the work framework, possibly with specific working groups (covering for instance transversal issues like food waste and loss, as well as issues related to local characteristics – see next point);
- Analyse the baseline situation on your territory: territorial analysis an identification of locally available feedstocks (from agriculture, agri-food sector, forestry, maritime activities and fisheries, residual streams, municipal bio-waste, etc.); global and/or sectorial diagnosis, including an analysis of current and planned actions; mapping of opportunities and key

²⁷ European Commission, 2017, Bioeconomy development in EU regions

²⁸ Adapted from: ACR+, 2015, General guidelines on circular economy strategies by local and regional authorities



working areas in particular to support the establishment of innovative value chains (sectors, streams, products/services);

- Establish a strategic framework for planning: define a strategic vision and objectives as well as the area of intervention; develop the bioeconomy ecosystem, in particular bridging elements and platforms between traditional (agro-food, fisheries) sectors, industry, science and research, technology as well as public administration; Identify and evaluate the options, particularly taking into account initiatives from front-runners and/or regions with the same bioeconomy profile/approach;
- Prepare the action plan: by sector, stream or product/service; include short-/mid-/long-term actions related in particular to supporting bio-based value chain/cycle development, research and innovation on technologies, capacity building, awareness raising and bio-based solutions acceptance; assess risks and opportunities, in particular related to the integration of bio-based solutions in existing local waste management systems;
- Implement and monitor the action plan: organise deadlines and accompany the actors; follow-up on the implementation of the action plan and the performance; Improve the plan according to the observed results.

The transversal nature of circular bioeconomy means that several policy departments in local and regional administrations are potentially interested in being included in the development and implementation of a circular bioeconomy strategy. **Inclusive internal governance and interservice cooperation** are thus needed in order to bring around the table the relevant public administrations and departments at local or regional level, in particular those in charge of economic development, agriculture and rural affairs, environment and waste, as well as research and innovation²⁹.

In terms of economic development and innovation, **smart specialization** has been considered as a booster of circular bioeconomy development in EU regions that can bring together several regional stakeholders from different regions around the same topic. Conceived within the reformed EU cohesion policy, smart specialization is a place-based approach aimed at strengthening innovation in European regions and characterised by the identification of strategic areas for intervention based both on the analysis of the strengths and potential of the economy and on stakeholder involvement. Through this partnership and bottom-up approach, smart specialisation strategies (S3) bring together local authorities, academia, business spheres and the civil society, working for the implementation of long-term growth strategies supported by EU funds (S3 is an ex-ante conditionality for the ERDF investments in research and innovation). The need to respond to the requirements of the EU smart specialisation strategies has been considered as a primary driver of bioeconomy strategy development³⁰. Since 2011, regional and national authorities receive advice from the European Commission on how to develop, implement their smart specialisation strategies, via the [Smart Specialisation Platform](#) and its [Thematic Smart Specialisation platform on bioeconomy](#) which provide around 180 European regions and 19 national governments with support for knowledge exchange and cooperation.

Besides the “internal” governance linked to territorial assets and thematic departments, it is clear that **cities and regions** cannot develop their circular bioeconomy strategy without **interacting with each other**: cities as gathering the densest quantity of consumers have to be connected to regional authorities, that will in particular determine local agriculture policy. Cities and regions also have to take into account the **larger context**, since the top-down regulatory and policy framework at **EU and national level** will strongly influence local and regional strategies. Nine European countries have a

²⁹ In 2017 the European Commission highlighted that out of 210 analysed territorial units (European regions and countries), 207 (98.6%) include bioeconomy related aspects in their 2014-2020 R&I priorities and plans. Source: European Commission, 2017, Bioeconomy development in EU regions

³⁰ BioSTEP, 2016, Case studies of regional bioeconomy strategies across Europe





dedicated bioeconomy strategy at national level (Austria, Finland, France, Germany, Ireland, Italy, Latvia, Portugal and the United Kingdom)³¹ although many strategies and policy documents at national level not specifically addressing bioeconomy also have an influence (e.g. focusing on green growth or low carbon perspectives). If not a cooperation with those various levels, at least a consistency with the upper-level(s) strategy needs to be considered. Similarly, lower-level organisations and administrations have to be taken into consideration.

Overview of public bodies relevant for circular bioeconomy in France

- Local and Regional Authorities (*collectivités territoriales*): municipalities, intermunicipal organisations, departments, regions;
- Public bodies with an industrial or economic statute (*Etablissements Publics à caractère Industriel et Commercial - EPIC*): Agency for environment and energy management (ADEME), scientific and technical centre for building (CSTB), national forestry office (ONF);
- Public bodies with an administrative statute (*Etablissements Publics à caractère Administratif - EPA*): water agency, FranceAgriMer, national centre for forestry estate;
- Consular chambers (*chambres consulaires*): agricultural chambers, chambres of commerce and industry, chambres of work and craftmanshift;
- Regional state services (*services déconcentrés de l'Etat*): Regional Directorate for Business, Competition, Consumption, Labor and Employment (DIRECCTE), Regional Directorate of Food, Agriculture and Forestry (DRAAF), Regional Directorate for Environment, Planning and Housing (DREAL);
- Public financial institutions: Bpifrance (public investment bank), Deposit and consignment office (*Caisse des dépôts et des consignations*);
- Associations of public bodies: national federation of forestry municipalities.

Source: Agro-Transfert Ressources et Territoires, 2017, Processus de décision des acteurs publics et bioéconomie territoriale

2.1.2. Participatory approaches and stakeholders' involvement

From a governance point of view, regional bioeconomy ecosystems in Europe are usually built around a triple helix³²: governments and public administration, businesses and representatives of sectoral associations and business intermediaries, as well as academic, scientific and technological institutions.

Clusters are an important tool to gather stakeholders around specific bioeconomy sectors/products. Clusters are considered as regional ecosystems of related industries and competences featuring a broad array of inter-industry interdependencies³³. They are defined as groups of firms, related economic actors, and institutions that are located near each other and have reached a sufficient scale

³¹ Source: <https://ec.europa.eu/research/bioeconomy/index.cfm?pg=policy&lib=strategy> (last update from May 2019)

³² European Commission, 2017, Bioeconomy development in EU regions

³³ Delgado, Mercedes/Porter, Michael E./Stern, Scott, 2013: Defining Clusters of Related Industries





to develop specialised expertise, services, resources, suppliers and skills. Clusters' cooperation is facilitated at EU level via the [European Cluster Cooperation Platform](#) (ECCP).

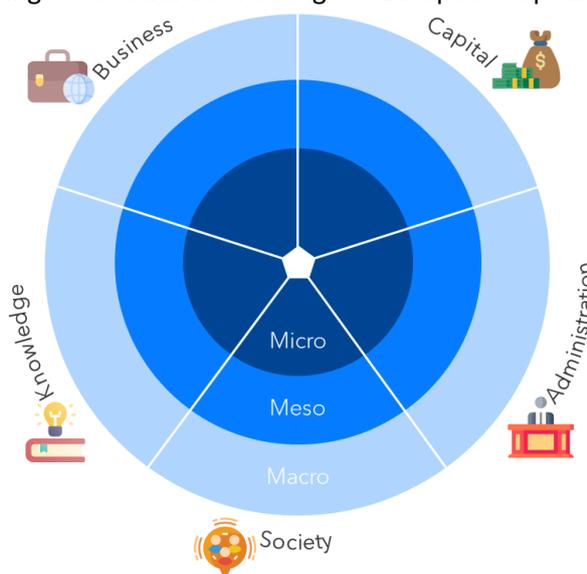
In comparison to traditional industrial clusters, bioeconomy related clusters often need to integrate also producers of biological resources, i.e. farmers and fishermen, as well as their associations. In particular, at the level of government, coordination among different policy areas (e.g. research and innovation, agriculture, environment) is needed to promote the bioeconomy.³⁴

Experience in transition strategies³⁵ demonstrated the value of a larger engagement of stakeholders than the aforementioned triple helix, bringing in the loop civil society organisations (CSOs) that represent local communities, as well as representatives from the financial sector in a **penta helix of stakeholders**.

Indeed, involving CSOs and NGOs will enable them to share give direct feedback on circular bio-based solutions and related activities, and at the same time will be likely to increase acceptance of those solutions by consumers. Financial organisations have specific criteria and programmes that have to be considered early in the process in order to ensure that circular bioeconomy solutions can get the appropriate support.

Individuals and communities also have an influential power with regards to sustainability that can be activated using culture and art as bearer of changing the mindset on sustainability. In the Dutch Province of Friesland for instance, the work resulting in the award of hosting the European Capital of Culture (ECOC) in 2018 included actions like sustainability festivals (e.g. [Welcome to the Village](#)) that can be living labs where innovative actions and projects can be discussed and tested.

The BioSTEP project highlighted that examples of participative governance within national bioeconomy strategies are interesting because they indicate explicit strategies and guidelines that encourage public participation, while at the level of regional bioeconomy, strategies are less easy to trace because explicit strategies and guidelines are lacking or not publicly available. The project showed that regional strategies may often be developed by bioeconomy clusters and tend to be shaped by several actors and networks in a specific region, often in less formal ways than at national level where public authorities will have a steering role. Due to these characteristics, the state of participative governance in regional strategies is more difficult to grasp than in national strategies³⁶.



Intermediary organisations or 'bridges' are particularly important in the field of bioeconomy, as many technologies are still rather immature and cooperation between different sectors is important³⁷. However, the circular bioeconomy does not always have its own players. Many regions report the lack of specific bioeconomy bodies or networks, in turn hampering the organised

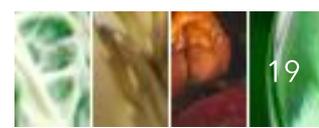
Adapted from TURAS project, 2017

³⁴ European Commission, 2017, Bioeconomy development in EU regions

³⁵ In particular the TURAS project and its main deliverable: "Bridges to local economies - Strategies for place and community based economies"

³⁶ BioSTEP, 2016, Review of bioeconomy strategies at regional and national levels

³⁷ European Commission, 2017, Bioeconomy development in EU regions





deployment of specific bioeconomy areas. In addition to the usual stakeholders stated above, some cases in Europe present additional emergent players that seem to play a vital role in the promotion of the bioeconomy. Among these specific and emergent stakeholders are:

- Bioeconomy Strategy Councils;
- Bridges and links between stakeholders (thematic platforms, networks, projects);
- Specialised Technology, Research and Innovation Centres;
- Operational coordination bodies at local level;
- Cross-border and interregional cooperation projects.

2.2. Focus on 3 regional case studies: Navarre, Flanders, Bavaria

The case studies were chosen among a list of territories that had been previously identified by EU projects, reports and initiatives that have been mentioned in the “references” section. The selection of the three cases presented here was made on the basis of the diversity of geographical scopes and of approaches in terms of governance and integration of circular bioeconomy in their strategies. The bioeconomy maturity index developed by the European Commission³⁸ (focusing more on the research and innovation aspects) has also been taken into account although the current publication focuses more on governance than R&I.

³⁸ European Commission, 2017, Bioeconomy development in EU regions





2.2.1. Circular bioeconomy in Navarre: sustainability and policy alignment with the UN SDG's

Navarre

Country: Spain

Population: 640,00 inhabitants

Size of the territory: 10,391 km²

Main responsible administrations:

- Department of Rural Development and Environment, Government of Navarre;
- Department of Economic Development and Industry, Government of Navarre;
- Service of Circular Economy, Water and Climate Change, Government of Navarre;
- SODENA (Financial instrument for industrial and economic development), Public Organization.

Main partners:

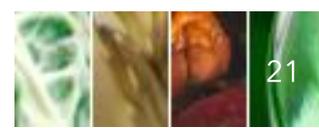
- UPNA, Public University of Navarre;
- CENER, National Centre for Renewable Energies (Navarre), Research and Technology Organization (RTO);
- AIN, Industry Association of Navarre, RTO;
- CNTA, National Centre for Food Safety and Technology, RTO;
- INTIA, Institute for Innovation and Agrifood Technologies of Navarre;
- ADItech Foundation, the Regional Innovation Ecosystem coordinator of Navarre.

Summary

In 2015 the UN Summit approved in the 2030 Agenda for Sustainable Development, a universal roadmap to end poverty, fight inequality and injustice and address climate change. In 2016 the regional government developed the Navarre's Sustainable Development Agenda for 2030. This case describes the process followed in Navarre to establish a **Circular Sustainability Strategy** and identifies the plans in the region that contribute to the enrichment of a circular bioeconomy in Navarre.

a. Governance of the circular bioeconomy strategy

Although the region of Navarre does not have a bioeconomy strategy, bioeconomy is embedded in a set of policy instruments under the umbrella of Navarre's 2030 Agenda for Sustainable Development. This Agenda is directly linked to Navarre's 2030 Circular Economy Agenda, which includes



bioeconomy, and there are important synergies with Navarre’s S3 smart specialisation strategy, in which bioeconomy is mentioned.

A set of actions started as an initiative of the interest of the region of Navarre to tackle the overall goal of the sustainable development at local level and in coherence with the **S3 Smart Specialisation Strategy**. Navarre’s S3 is the medium and long-term plan for socio-economic improvement through the specialisation of its economy in the areas where it has the greatest future prospects. The regional S3 challenges are linked to six priority economic areas defined by the S3 (automotive and mechatronics; food chain, renewable energies and resources, health, integral tourism and creative and digital industries) and five key competitiveness factors (business development, R&D&I, infrastructures, administration and taxation and education and training). The strategy states that bioeconomy is an opportunity for the territory, and it should be promoted, in the framework of circular economy, capitalising on knowledge in the field of agri-food, energy efficiency and waste and resource management.

In the framework of the S3 strategy, a number of entities, listed in the introduction, collaborate on bioeconomy and meet periodically through the **monitoring committee for the S3 Challenge on circular economy**. These include research centres and [universities](#), industry associations, government departments and one public organisation.



The image (from left to the right) depicts the Agenda 2030 for development of the SDGs in Navarre, the Circular Economy 2030 Agenda, and the regional Climate Change Roadmap 2030-2050.

In order to implement the **Agenda 2030 for Sustainable Development**, and with regard to international policy, 30 General Directorates or Autonomous Bodies of the different government departments are involved, 25 directly and 5 with a cross-cutting role. Among them, 67 plans, programmes or strategies have been identified whose contents, among other purposes, are focused on 72 Agenda 2030 goals, corresponding to 15 SDG’s.

Different administrations participated in the **development of the Circular Economy Agenda for 2030**, in which bioeconomy is included, such as the **Office for the Circular Economy and Water**, the **Innovation and Territorial and Environmental Sustainability Council**, and the **Office of Waste Prevention and Promotion of the Circular Economy**.

In the development of the Circular Economy Agenda for 2030 participated different administration areas such as the Office for the Circular Economy and Water, the Innovation and Territorial and Environmental Sustainability Council, and the Office of Waste Prevention and Promotion of the Circular Economy.



The next table illustrates the approach followed at regional level, highlighting the interconnections, and making effective the interrelationship between public policies. This has required the development of internal alliances between the government's own sectorial policies with the activation of numerous commissions and interdepartmental groups, and the generation of multilevel alliances with other public administrations and citizens. Integration, interrelation and synergies are the only guarantee that the necessary progress will be made in all the areas proposed by the UN Agenda 2030, placing People and the Planet at the centre.

Planning instrument	SDG and prioritized goals
Municipal urban planning plans	 Goal 11.2: public transport Goal 11.3: urban planning Goal 11.6: sustainable cities Goal 11.7: inclusive and safe spaces  Goal 13.1: adaptation Goal 13.2: integrate measures Goal 13.3: awareness-raising
Navarra waste plan (2017-2027)	 Goal 11.6: sustainable cities  Goal 12.5: waste recycling
Level 1: Navarra's strategy for the Conservation and Sustainable Use of Biological Biodiversity (1999) River restoration plans Flood plan Forestry plan Regional hunting plans Fishing executive plan <ul style="list-style-type: none"> salmonid water slow and dammed water (in development) 	 Goal 15.1: ecosystem conservation Goal 15.2: forests Goal 15.4: mountain ecosystems Goal 15.5: degradation of natural habitats and threatened species Goal 15.6: access to genetic resources Goal 15.8: invasive species
Level 2 - derived from the first level: Special Conservation Zone management plans Forest management plans and projects Hunting management plans	 Goal 11.4: cultural and natural heritage
Executive Plan of the Integrated Water Cycle for Urban Use	 Goal 6.4: efficient use of water
Local investment plans	 Goal 11.3: urban planning



b. Instruments and actions

The priority sectors are aligned with the S3 regional strengths such as the **agri-food chain** and the **renewable energy** sector among others in Navarre. The use of forestry biomass, the efficiency in sustainable building, the valorisation of agri-food waste, etc. are important application areas in the region.

Approximately 147 out of 1,000 jobs in the region come from the bioeconomy: agriculture, food industry, forestry, pulp and paper, renewable energy, transport of bio-based raw-materials, wood products, chemical industry and pharmaceutical sector. Forestry covers a 64% of the regional territory, providing 5,000 jobs and the agri-food and feed chain is an outstanding sector providing 25,500 jobs.

The region has a thriving industrial activity coming from feedstock and biomass. Moreover, several research and testing facilities working with this kind of resources are established in the region and support the development of bioeconomy. One important initiative in the region is SIESS, an innovative virtual scientific infrastructure platform and community for the Innovation System of Navarre, created and coordinated by the [ADitech Technology Foundation](#) since 2017 with the support of the Government of Navarre. This is an important instrument to advice bioeconomy policies and align different experiences on smart specialisation areas.

When it comes to policy instruments, the region has several sectorial plans that are linked to transversal instruments: the **Sustainable Development Goals**, the **Smart Specialisation Strategy** and the **Climate Change Roadmap**.



Instruments linking the Navarre SDG's and the specific Plans in the region

The region of Navarre has an advanced regional legislation on aspects of sustainability and waste management. The regulations most closely related to the circular economy focus on waste and classified activities. Public procurement regulations are also considered to be of interest because of their potential for promoting public contracts.

Another example is the **Navarre Forestry Agenda 2019-2023** as an updated instrument that arises from the need for a strategic update of the forest policy in Navarre and its planning tools as an important part of the bioeconomy. This instrument was approved in 2019 to address the profound social and environmental changes that have emerged, as well as new global challenges and problems, new concepts and knowledge in the sector.

Financial Instruments

In relation with financial instruments the regional stakeholders have access to:



- In 2018, the new **Regional Law on Waste** (Regional Law 14/2018 of 18 June on waste and its taxation) was approved, as foreseen in the Waste Plan of Navarre 2017-2027 (PRN). It provides organisational management measures and economic instruments to encourage the circular economy and tackle the climate change.
- **Community and international programmes** through which innovation and cooperation in thematic areas or challenges related to the circular economy are financed. As an example, Navarre participates in the ERA-NET COFUND MANUNET3, in the field of manufacturing and advanced manufacturing.
- Through trans-regional cooperation programmes, with examples of initiatives underway with partner organisations in Navarre related to the Circular Economy, which shows a willingness of Navarre to be at the forefront of these type of cooperation (SUDOE; INTERREG POCTEFA, INTERREG ATLANTIC).
- Some **public calls managed by the Government of Navarre to stimulate innovation** in companies or to support investments, promoting the circular economy. It is highlighted:
 - Financing scheme for R&D projects in companies;
 - Public support under the Rural Development Programme: cooperation aid for pilot projects and investment aids for the creation and development of non-agricultural activities;
 - In the framework of corporate social responsibility, aid for projects in the field of social responsibility, which includes a category of eligible projects in the field of the circular economy.

Examples of projects

The following projects and initiatives are examples of regional actions related to having an impact on the local circular bioeconomy:

- Leading rehabilitation system in Spain: aid for housing and building rehabilitation has increased from € 6.5 million to € 17.7 million in four year, including with regards to buildings using more circular and biobased approaches (e.g. wood, etc.);
- Rehabilitation in the rural environment: public investment programme for the recovery of old, private or municipal-owned houses in the rural environment, also with support to bio-circular projects;
- Kirkos Circular City: public-private collaboration project promoted in the metropolitan area of Pamplona born from the need to adapt the new spaces for urban growth, including from the perspective of circular bioeconomy;
- LIFE NAdapta: first project to adapt to climate change in a European region, endowed with € 15 million of investment between 2017 and 2025 and with 53 measures included in an integrated strategy that covers six areas: water, forests, agriculture, health, infrastructure and urban planning, and monitoring of energy consumption and natural resources;
- Navarra Wood Project: promotion of the use of wood of origin in the local forest mass as a structural constructive element in the building to favour regional development.

c. Lessons learnt

In the region of Navarre bioeconomy has been mainstreamed in several strategic plans and initiatives, in particular in relation to sustainable development, climate action, smart specialisation strategy and circular economy.



It is important to act on those relevant and strategic areas and activities taking into account the **economic and social opportunities offered by the circular economy and therefore the bioeconomy** at regional level. On the one hand, the actions must consider the main problems of regional economic and domestic activities in relation to e.g., agri-food waste, the use of biomass or the use of organic urban residues. On the other hand, the must focus on the opportunities of the circular bioeconomy itself in order to motivate industrial companies and target groups to build on current strengths.

The potential of the circular economy and the bioeconomy as a whole should be exploited for the promotion of the green market, economic and social development, and as a factor generating wealth, employment, sustainability and territorial cohesion. The transition from a non-circular to a circular bioeconomy must also make use of the driving force of strategic value chains (e.g. agri-food, forestry), using emerging ideas as levers of change. These chains are priority areas for regional development and have favourable economic opportunities, which is why the ecological and economic risk is greater.

It is important also to **align policies with European economic funds and resources**, with a view of making the circularity the driving force for achieving the Sustainable Development Goals in a region.

Advancing in inclusive governance based on cooperation and coordination requires the commitment of all agents and citizens to implement new modes of production and consumption; **and the involvement of agents in the future design and development of value chain actions**, this is especially relevant in the case of food waste management in cities.

Any agenda must incorporate inclusive governance at different levels and with a diversity of objectives. This must include **participatory and partnership-based methods**, development and implementation: to have business and consumers and their associations as key actors in making the transition to a circular bioeconomy, to incorporate the people responsible for the main regional policies, and to include the local level. Finally, management and control of the circular bioeconomy policies must be carried out through the principles of **governance** and **transparency**.

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2.2.2. Bioeconomy strategy and Bioeconomy Council in Bavaria

Bavaria



Country: Germany

Population: 13.08 million inhabitants (2019)

Size of the territory: 70,550.19 km²

Main responsible administrations:
State Ministry for Economic Affairs, Regional Development and Energy

Main partners:

- Bioeconomy Council and Office of the Bioeconomy Council;
- Bavarian State Ministry for Food, Agriculture and Forestry;
- Bayern Innovativ (company owned by Bavaria region, responsible for administrative/organisational issues);
- Under the lead of the Ministry for Economic Affairs, Regional Development and Energy, these partners formed the management team of the process.

Accompanying group:

- other State Ministries (interested in bioeconomy and who felt could contribute to the process);
- Bavarian Cluster Organisations (e.g. chemistry cluster): involved in giving feedback, inputs and advertising the process.

Summary

This case study looks at the participatory process which brought to the development of Bavaria's bioeconomy strategy, published on 23 November 2020. This case also explores the experience of the Bavarian Bioeconomy Council, which had been existing for four years prior the adoption of the strategy. The Council was crucial for the success of the process, since it helped to involve the right partners and provided a hand-full of recommendations to the State Ministries.

a. Governance of the circular bioeconomy strategy

In Bavaria, four ministries share the competency in bioeconomy-related subjects:

- Bavarian State Ministry for Nutrition, Agriculture and Forestry (StMELF);
- Bavarian State Ministry of Economic Affairs, Energy and Technology (StMWi);
- Bavarian State Ministry of Science and the Arts (StMWK);



- Bavarian State Ministry of the Environment and Consumer Protection (StMUV).

Under the lead of State Ministry of Economic Affairs, Energy and Technology, a process to develop a regional bioeconomy strategy for Bavaria started in October 2019.

The development was designed as a participatory process to give all relevant actors the opportunity to be heard and to actively participate in the strategy development. The bio-economy strategy has been developed in close consultation with the Bavarian Bioeconomy Council, the Interministerial Working Group on Renewable Resources and Bio-economy, the clusters and representatives from agriculture and forestry, business, science and society. Bayern Innovativ was responsible for the organisation of the process and its workshops and events.

The process had a participatory nature involving several stakeholders. Several activities concentrated in 2020, namely:

- March 2020: Kick-off event in Straubing;
- March/April 2020: 5 workshops (online and offline) were planned with stakeholders between:
 - supply of raw materials
 - use of raw materials, industrial processes, product development
 - recycling, collection, circular economy
 - research, innovation, education and training
 - civil society, consumption, communication

The workshops aimed at gathering as much information as possible on what elements and measures should be part of the strategy.

- June-July 2020: interviews with experts to approve recommendation or assess lack of information/measures;
- August – October 2020: inter-ministerial coordination for a draft strategy;
- November 2020: publishing event in Munich.

Structure of the strategy

Bavaria's [bioeconomy strategy](#) was published on 23 November 2020. The document opens with a chapter about Bavaria's commitment to sustainability, and how the bioeconomy can pave the way to a sustainable lifestyle and economy. The links between bioeconomy, sustainability and circular economy are further outlined in Chapter 3, entitled "strengthening a circular, sustainable bio-economy", in which the authors state that "The aim of the bio-economy is to realise a sustainable way of life and economy based on biogenic resources".

Chapter 1 also outlines the objectives of Bavaria's bioeconomy strategy, which include:

- Reducing the consumption of fossil fuels by implementing a sustainable economy and developing sustainable, bio-based technologies, processes and products;
- Contributing to environmental and resource protection and the protection of biodiversity
- Contributing to the achievement of climate targets;
- Promoting open dialogue and enabling participation in society to achieve acceptance and understanding of the bio-economy in society;





- Contribution to the Bavarian way of "protecting and using" domestic renewable resources. Through the bio-economy, these resources are put to good use and new income prospects and jobs in rural and urban areas are created or secured;
- Securing international competitiveness and opening up new markets by trend-setting use of renewable raw materials as well as residual and waste materials;
- Striving to be a leading location for sustainable products and production methods and thus a model for other regions;
- Strengthening science to further develop biological knowledge and a targeted transfer of knowledge to industry.

Chapter 2 focuses on how to embed the bioeconomy strategy in other existing, such as the national bioeconomy strategy, the EU Bioeconomy strategy and other Bavarian strategies (e.g. biodiversity strategy).

For the following chapters, an “actor-focused” approach was adopted: the strategy contains a chapter for each stakeholder. Each chapter contains measure that should strengthen these actors in the transformation process.

Chapters include:

- Circular, sustainable bio-economy;
- Networking and cooperation;
- Evaluation of the strategy;
- Actor focused chapters on strengthening:
 - civil society;
 - administration and politics;
 - agriculture and forestry;
 - companies;
 - science and research to support the transformation process.

b. Instruments and actions: the Bioeconomy Council

In addition to the work of the responsible state departments, another independent platform was convened for the further development of the bioeconomy in Bavaria: The Bavarian Bioeconomy Council.

The council of experts was first established in 2015 by the former Bavarian State Minister for Food, Agriculture and Forests. Helmut Brunner appointed for three years. This mandate was extended for a second term (2018 - 2020) at the beginning of 2018. Since early 2019, the council has been advising the Bavarian State Ministry for Economic Affairs, Regional Development and Energy. In 2021 a third term of office will start.



Main tasks of the Council



As an independent advisory body, the Bavarian Bioeconomy Advisory Council gives recommendations on how the expansion of the bioeconomy can contribute to sustainable development on a regional and supraregional level.

To this end, the council promotes the social dialogue about bioeconomy and has been providing inputs for the development of a Bavarian bioeconomy strategy.

The Council is made up of an equal number of representatives from industry and academia. The expertise of the appointed members covers different areas of bioeconomy such as biodiversity, nutrition, healthy and safe food, biogenic energy sources, biotechnology, industrial use of renewable raw materials, sustainable forest and agricultural products as well as environmental and social ethics.

The Council is supported by an office as a coordinating and operational interface under the umbrella of the Competence Center for Renewable Raw Materials in Straubing.

Major results of the Council achieved between 2015 and 2019 include:

- A Status Quo report of the Bioeconomy in Bavaria including:
 - Resource base;
 - Industry approach;
 - Bottom-up developments;
- A position paper on the bioeconomy including:
 - A vision of the bioeconomy;
 - The definition of five focus areas for the bioeconomy;
 - Guidelines for the bioeconomy.
- Recommendations for the development of a bioeconomy:
 - 13 official recommendations to the Bavarian State Ministry for Food, Agriculture and Forestry.
- Discussion topics (17 papers) including:
 - Background knowledge for specific topics;
 - Case studies and practical examples;
 - Recommendations.

c. Lessons learnt

The following recommendations can be drawn from this case study³⁹:

- **Building on the existing:** the Council had been existing already for four years before the strategy was adopted. The Council evaluated the status quo of the Bavarian Bioeconomy and expressed many recommendations in the past, which was a valuable basis. It is also important to make the stakeholders feel visible and taken seriously, as well as to express serious intentions, and the Council managed to do this.

³⁹ These lessons learnt are the opinion and perspective of the Head of Office of the Bavarian Bioeconomy Council





- **Going for high-level decision making:** a Bavarian Bioeconomy was always a demand by the Council, but the process started because of the decision by the State Minister. His order stressed the urgency and helped to get it done within the very short time of one year.
- **Involving (strong) partners:** the company Bayern Innovativ is an experienced and strong partner who coordinated the working process and organised all events. Together with the two Ministries and the Office of the Council, they were part of the core group of the process.
- **Involving stakeholders and regularly informing them about the process:** besides the core group and main partners, it was crucial to involve the other Ministries and the Bavarian Cluster Organisations. These partners were involved in one meeting and had the chance to deliver input and propose experts for the interviews. They also served as multipliers to other players. There was no limitation for stakeholder to join the workshops, everyone was welcome. This could be a disadvantage regarding capacity and quality of working results, but it definitely ensures to include every interested stakeholder and increases the acceptance of the strategy.
- **Tight project and time schedule:** although the timeframe was tight (one year), Bavaria succeeded in building a stakeholder dialogue and delivering the strategy, no matter the circumstances caused by the Covid-19 pandemic.

Contact & additional information

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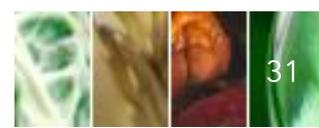
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2.2.3. Circular biobased economy in Flanders

Flanders

Country: Belgium

Population: 6.6 million inhabitants (2019)

Size of the territory: 13,625 km²

Main responsible administrations:
Flemish Government, Department of Economy, Science & Innovation

Main partners:

- Flemish Government, Department of Agriculture and Fisheries
- Circular Flanders

Summary

This case describes the approach adopted in Flanders for the development of a regional bioeconomy strategy. The first bioeconomy strategy, adopted in 2013, was followed by an action plan. The strategy remains, and the action plan is being replaced by a new transversal working agenda part of a 2050 vision for a circular economy transition. The process started in July 2020 and is still in progress at the time of writing.

a. Governance of the bioeconomy strategy

Context and early developments

Belgium has no national bioeconomy strategy, since this topic falls in the competence of the regional authorities. An **early regional bioeconomy strategy** for Flanders was published in 2013 as a result of the work of an **Interdepartmental Working Group for the Bioeconomy (IWG BE)**, set up by the Government of Flanders in 2012. The IWG BE was made of the Departments of Economy, Science & Innovation (EWI), Agriculture & Fisheries (LV), Environment, Nature & Energy (LNE), Work & Social Economy (WSE) and Education & Training (OV), together with their agencies VITO (Flemish Institute for Technological Research), ILVO (Institute for Agricultural and Fisheries Research), OVAM (Public Waste Agency of Flanders), VEA (Flemish Energy Agency), ANB (Agency for Nature and Forests in Flanders), VMM (Flemish Environment Agency), VLM (Flemish Land Agency), VDAB (Flemish Employment and Vocational Training Service), IWT (Agency for Innovation by Science and Technology) and Enterprise Flanders. With this strategy, setting a vision for a sustainable and competitive bioeconomy in 2030, the Flemish Government wanted to send out a strong political message to recognise the importance of the bioeconomy. A set of strategic objectives and actions are outlined in the document, which is [available online](#), where bioeconomy is defined as including both the production of renewable biological resources and the use of those resources and residual streams.





Bioeconomy is a transversal topic in many domains included in [Flanders’ Smart Specialisation Strategy \(S3\)](#) adopted in 2014, such as sustainable chemistry, advanced materials, agro-food, energy, environment & cleantech. The domains included in the S3 strategy were chosen also considering EU funding and partnership opportunities. Bioeconomy, under the umbrella of circular economy, is one of the 7 domains embedded in the [vision 2050 for a societal transition](#) established by the Flemish Government in March 2016.

To enable a **circular economy transition**, “[Circular Flanders](#)” was established in January 2017 by merging the three pillars of the former Flanders’ Materials Programme (Plan C, SuMMa and Agenda 2020) and vesting it with OVAM (Public Waste Agency of Flanders). Circular Flanders is the hub and the inspiration for the Flemish circular economy, acting as a “transition manager”. It is a partnership of governments, companies, civil society, and the knowledge community that will take action together. These organisations are the core of the partnership and each one has committed to carrying out a specific action. Circular Flanders has a quadruple helix⁴⁰ steering group, a policy support centre at the universities and a policy team at OVAM in collaboration with all other policy domains.

Flanders’ bioeconomy counts on knowledge and expertise coming from the **5 universities** and the **4 strategic research organisations** based in the region. Furthermore, Flanders has a top-notch educational system that results in multilingual and multitalented professionals. The bioeconomy greatly benefits from this compelling benefit with over 10,000 students graduating each year in related fields.

The new bioeconomy governance

In July 2020, there was an important change in the governance of the circular economy transition. A **new transversal governance structure** was created to link circular economy to all policy areas of the Flemish Government. Circular Flanders stayed in place, but new **thematic working agendas** are being developed. These working agendas are coordinated by different policy departments. One of the agendas is about bioeconomy, coordinated by the Department of Economics, Science and Innovation in collaboration with the Department of Agriculture and Fisheries. The new governance structure also includes some horizontal levers, listed below.

Working agendas in the New transversal governance structure of Circular Flanders	Horizontal levers in the New transversal governance structure of Circular Flanders
Circular construction	Policy
Water cycle	Research
Bioeconomy	Innovation and entrepreneurship
Chemistry/plastics	Financing
Textile	Jobs and competences
Electronics	Circular public procurement
Food chain	Communication and reporting

⁴⁰ A model where the research and innovation stakeholders that represent key local actors from government, research and scientific institutions, companies and citizens, engage in bottom-up collaborative processes in innovation policy and challenge the traditional top-down policymaking process. Source: [IGI Global](#)





The new governance model is based on a **quadruple helix governance board** and aims to create a roadmap through interdepartmental collaboration. Several actors will be involved in this process, such as **research centres, clusters, federations** and **pilot infrastructure** to scale up innovation to new businesses.

At the time of writing, the new bioeconomy agenda is being developed based on a draft 4 pillars structure:

- Pillar 1: strategic research challenges and agenda for the bioeconomy;
- Pillar 2: economic development;
- Pillar 3: innovative collaborations between industry, primary production and intermediaries;
- Pillar 4: supporting policy actions and policy alignment.

Pillar 3 is particularly important and challenging: it must ensure that farmers are interested in creating new value chains and that they are willing to cooperate with industry. Pillar 4 will imply the coordination of the Social Economy Department, to build skills and competences.

There is a separate **steering group for the bioeconomy agenda** made of research organisations, clusters, federations, pilot plants, administrations and NGOs. The group is coordinated by the State Ministry of Economy, Science and Innovation and will be responsible for the establishment of a working agenda under the circular economy framework, creating synergies with other policy domains and agendas.

The bioeconomy working agenda coordinated by EWI is **one of the relevant policy initiatives in the broader landscape of the Flemish bioeconomy strategy**. It fills in a void specifically in relation to production of non-food biomass, industrial biotech applications and blue economy. The Flemish government is also preparing a new biomass(residues) policy plan, where prevention of biomass residues (prevention of food losses, eco-design, reuse) and more traditional (non) food biomass applications in the bioeconomy are covered (wood processing, composting, digestion, feed, novel foods, etc.).

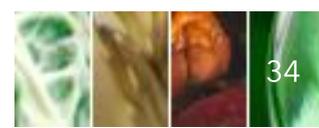
b. Instruments and actions

Bioeconomy was chosen as a priority area for the transition due to the assets of the region in the **biotech, chemistry and agri-food sectors**. These three sectors together make up 50% of Flanders' added value, exports and employment, being real pillars for Flanders' economy. They therefore have the potential to be the foundation of a sustainable bioeconomy.

The long-term approach to various strategic areas for Flanders is powered by **spearhead clusters**. These industry-driven organisations stimulate innovation through cooperation and allocate resources to companies. Both local and international companies can also count on public resources for financial support:

- **Flanders Investment & Trade (FIT)** helps entrepreneurs establish or expand their businesses in Flanders;
- **Flanders Innovation & Entrepreneurship (VLAIO)** is the contact point for regional subsidies and business advice;
- **PMV** is Flanders' investment company, which provides funding for promising start-ups, scale-ups and international firms in every stage of the business lifecycle.

By 2030, Flanders aims to be one of the top bioeconomic regions in Europe. The regional government recognises that the bioeconomy is a unique gateway to numerous benefits, from resource efficiency to job creation. The government strongly supports the sector through grants and subsidies, while the



R&D-friendly **tax system** allows companies to recover parts of their investments. **2.89% of Flanders' GDP is spent on R&D investments**, while the EU average is 2%.

The region counts on **3 flagship pilot facilities**, each with its own expertise: bioaromatics from lignin wood, food, and biobased products. These pilots stimulate tangible innovation output for the bioeconomy and allow to reduce the big leap from lab-scale testing to feasible commercial or industrial innovations.

Logistics and transport connections are important. For the bioeconomy, 3 ports are of utmost importance:

- The **Port of Zeebrugge**, with a focus on the transport of food;
- The **Port of Antwerp**, where a special area is dedicated to industrial pilot tests of biobased technologies;
- The **North Sea Port**, with a focus on the production of biofuels.

A complete overview of Flanders' bioeconomy instruments and actions is available in a [brochure](#) published in September 2020 by the Department of Economics, Science and innovation.

c. Lessons learnt

One of the key outputs from this case is the evolution of the strategic approach in Flanders with regards to bioeconomy: this topic moved from a specific priority agenda to being included in a larger strategy related to circular economy. Pushing for specific sectors related to bioeconomy, in particular biotechnology, agri-food, and chemistry, helped the Flemish region to position itself as a strong circular bioeconomy region.

From a governance point of view, top-down political support is crucial to make bioeconomy a priority in the region. However, the government cannot act alone and strategic collaboration among different departments has to be embedded in the strategy.

Regarding stakeholder's engagement, the range of actors must be as broad as possible, but engaging them all at once can be tricky. The initial enthusiasm tends to fade away rapidly, and achieving concrete steps may take a long time. In the Flemish case, a more pragmatic approach was adopted: the engagement of stakeholders and other policy departments started small on the basis of concrete grounds for collaborations. Gradually, as more and more concrete actions were being developed, additional stakeholders were brought in.

The engagement of the general public shouldn't be forgotten in the development of a bioeconomy strategy, but this has to happen together with other stakeholders, there needs to be a separate dimension for community dialogue. How to do that is still a challenge, however there is a potential to channel research projects in a way that can engage public discussion on concrete projects and their practical implications, such as projects about changes of land use.

Contact & additional information

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2.3. Additional cases and actions

The Circular Europe Network database built by ACR+ includes several cases related to the implementation of circular bioeconomy:

- Life cycle approach by dairy farmers in Drenthe⁴¹: A series of sustainable dairy farm projects have been implemented in the Province of Drenthe. The activities were carried out with a “life cycle approach”, aiming to support farmers in optimizing their farming system. Nutrient recycling and improving soil biodiversity were key to the approach.
- Food valley of Bjuv⁴²: The Food Valley of Bjuv (FVoB) is a cluster initiative founded by the Swedish food producer Findus Sverige AB in cooperation with the Bjuv municipality. It aims at developing innovative sustainable solutions for food production. The cluster has been created to be a meeting place for innovators and entrepreneurs to come together and develop new solutions, and to establish recycling-based production for food. Food Valley of Bjuv has currently several focus areas: sustainable food production, –green impact industrial park, onshore fish farming, greenhouse cultivation, innovative packaging industry and other related supportive industrial establishment.
- The Mienskipsgreen project⁴³: The Mienskipsgreen project aims to reach optimal valorisation of biomass stocks in the region to generate societal and ecological prosperity. Through an integrated approach, the project seeks to demonstrate that a closed biomass cycle is achievable and creates a number of benefits such as increased soil quality, reduced energy consumption and the production of valuable bio-based products.

Other interesting cases have been identified in various sources, studies or EU projects. These cases, while providing valuable information about the territorial context are not always focused on governance or do not provide a lot of information on the role of public authorities beyond funding support. Other cases are only focusing on technological research and innovation and do not take into account other topics.

The BioSTEP project aimed at promoting stakeholder engagement and public awareness for a participative governance of the bioeconomy. This broad perspective on participative governance implies that stakeholder and public engagement can be facilitated through information transmission, consultation and more deliberative practices (participation). In order to explore bioeconomy strategies at the regional level in Europe, BioSTEP focused on the cases of 14 regional ‘bioeconomy clusters’ across 10 different countries⁴⁴. At the level of regional bioeconomy strategies, the following examples of concrete activities for open dialogue could be identified: Biobased Delta (NL), Satakunta (FI), Västra Götaland (SE), and Norwich Research Park (UK). Whereas Satakunta and Götaland were in the development phase of Acceleration, Biobased Delta and Norwich Research Park were respectively in the phase of Development and Take-off.

BioSTEP also provided detailed information about four regional case studies: Scotland, South-West Netherlands, Saxony-Anhalt and Veneto⁴⁵. Each of the regions has a distinctive approach, specialising around the particular assets and strengths of the region and its core stakeholders. Typically, those regional strategies have been developed by regional government or by stakeholder groups sponsored by those governments, and hence the main objectives have been to promote economic development through the application of developments in the bioeconomy. A specific focus has been to identify the

⁴¹ <https://www.circular-europe-network.eu/factsheets/life-cycle-approach-by-dairy-farmers-in-drenthe/>

⁴² <https://www.circular-europe-network.eu/factsheets/food-valley-of-bjuv/>

⁴³ <https://www.circular-europe-network.eu/factsheets/the-mienskipsgreen-project/>

⁴⁴ BioSTEP, 2016, Review of bioeconomy strategies at regional and national levels

⁴⁵ BioSTEP, 2016, Case studies of regional bioeconomy strategies across Europe

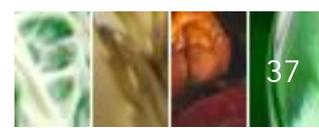




level of engagement with the wider public across the four case studies. Despite there being different rationales for engagement with the public, the main emphasis has been placed on an instrumental rationale: improving levels of trust through the provision of information.

The BIOREGIO project⁴⁶ identifies and promotes bio-based circular economy in six European regions: Päijät-Häme (FI), Castilla La Mancha (ES), Central Macedonia (EL), South Muntenia (RO), Nitra (SK), Pays de la Loire (FR). During the 1st meeting of the project, partners defined criteria about what makes an action a good practice: it should promote CE and sustainability, be resource efficient and minimize waste, encourage closing the loop, encourage joint actions between stakeholders, transferability and scalability. This process led to the sharing of 33 experiences out of which 20 were selected as transferable and replicable good practices on bio-based circular economy, including on cooperation models, such as ecosystems and networks, and the best available technological solutions that are shared and applied in other EU regions. Some of the top good practices included in particular the “Social plate” (good practice from Central Macedonia to minimize food waste), cooperation model of grain cluster (action from Päijät-Häme about how companies are working together and developed together specific biobased/CE innovations from grain leftovers for instance, in particular to make bioethanol), roadmap for circular economy (regional plan in Päijät-Häme, with steps about how to proceed to reach circular economy in the region, also with the role of various stakeholders, and the involvement of these stakeholders – one of the main challenges was to involve private companies; the proposed solution was to highlight that if they participate, their voice can be heard). Following the exchange of these good practices, each of these regions adopted an action plan in order to improve biowaste recycling and close biological loops in the regions.

⁴⁶ <https://www.interregeurope.eu/bioregio/action-plans/>





Conclusions and recommendations

In terms of circular bioeconomy strategy, one of the main conclusions from the three case studies is that bioeconomy should be considered as part of the circular economy strategy (e.g. as the Flanders' case highlights with the new circular economy strategy including bioeconomy as one of its topics), and that public authorities should take the lead for the development and coordination of bioeconomy on their territory (e.g. as the Bavarian case highlights with public authorities taking progressively a stronger role in the governance and action of circular bioeconomy). Indeed, similarly to circular economy, strategic planning and governance is crucial to deploy the bioeconomy at local or regional level, as well as the need to develop a common regional vision, priority-setting, and coordination among research, industrial and sectoral (in particular agriculture) policies. The transversal approach in terms of stakeholders and sectors also follows the same approach, although circular economy has a larger scope and includes the biological resource as a key fraction. It is therefore of foremost importance to ensure that actions and priorities for agriculture, forestry and fisheries sectors are not disconnected from other sectors like (urban) bio-waste management. In that sense it is **suitable that bioeconomy is developed within the larger perspective of circular economy** or that it is progressively included in the development and implementation of circular economy activities. Public authorities at local and regional level should therefore build internal bridges among the various involved policies, for instance via working groups gathering the relevant policy departments, when needed via the perspective of larger objectives (e.g. as the Navarre case highlights with the SDGs pushing for more integration of bioeconomy, circularity and sustainability into regional policies).

The 2017 study from the European Commission⁴⁷ included policy recommendations about future support to the deployment of the bioeconomy at national or regional level regarding the following topics:

- More and better bioeconomy **strategic planning and governance** at national and regional level, with multistakeholder approach and bridging actors;
- Support to **value chain/cycle development and engaging SMEs**, in particular in order to increase the technology readiness level (TRL) of small-scale technologies (e.g. for rural biorefineries, wastewater recycling, use of agricultural and fishery by-products, sustainable aquaculture, etc.) and demonstration plants to support upscaling activities ;
- Develop **R&I on technologies, knowledge transfer and new bioeconomy skills**, especially through using partnerships (e.g. Agriculture European Innovation Partnership, BBI-JU) networks, initiatives and platforms (e.g. ERA-NETs, S3 platforms, macro-regional initiatives, etc.) related to circular bioeconomy, and taking into account that support to R&I has to focus on multi- and transdisciplinary (not only biotechnology) projects to promote the generation of value cycles and closed loops;
- Coordinate **funding and synergies between instruments**, in particular between ESIF and Horizon Europe, COSME, LIFE+ and the instruments of ERA-Nets and Era-Net Co-funds, EIP AGRI, Knowledge and Innovation Communities, S3 platforms, BBI-JU, etc. A better communication of good practices and project results is also recommended;
- Raise **public awareness and acceptance**, in particular with regards to the benefits of a circular economy and on the cascading use of biological resources and residues/by-products, and by taking into account negative perceptions and fears as well as consumer rights. Bioeconomy

⁴⁷ Source: European Commission, 2017, Bioeconomy development in EU regions





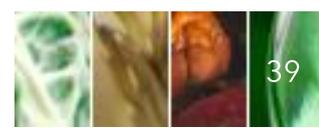
standards and labels should be developed to give an overview on positive and negative features of bio-based and recycled products.

Especially with regards to the governance, regions with a middle and low level of development of circular bioeconomy, in particular in Central and Eastern and in South Europe, should develop their bioeconomy ecosystems with an **integrative approach**, in particular bridging elements and platforms between traditional (agri-food, fisheries) sectors, industry, science and research, technology as well as public administration. Interaction with a broad group of stakeholders and publics is critical to increase mutual understanding, also about value conflicts that may be difficult to solve. Therefore, it is important to consider participatory stakeholder dialogue methodology that can facilitate decision making practices and acceptance. Interaction between stakeholders and knowledge transfer can be facilitated by specific ‘bridging links’ (e.g. thematic platforms, regional networks, flagship projects, specialised innovation centres, science parks). Rural innovation partnerships, linking existing local action groups, operational groups and regional innovation systems, can help to promote innovation in most prominent subsectors (agriculture, fisheries, forestry, food).

Similar recommendations were highlighted by the BioSTEP guidance document⁴⁸ which considers how participation should be designed and implemented, and introduces a series of principles related to stakeholder and citizen engagement, including: (i) design and prepare engagement activities carefully; (ii) ensure transparency, integrity and respect for all perspectives; (iii) ensure that engagement makes a difference; (iv) review and evaluate engagement to improve practice; (v) tailor engagement to the national/regional bioeconomy, (vi) engage people on what matters to them; and (vii) learn from other sectors and countries. With a view to illustrating different methods for engaging with organisational stakeholders on bioeconomy strategies, the guidance document also sets out a series of examples of good practice engagement, which take the form either of dialogue/consultation or the co-production of knowledge (and not to education/information provision). These include: (i) bioeconomy councils and forums; (ii) consultations with stakeholders; (ii) hybrid organisations (such as clusters and innovation centres); (iv) business-led cooperation and engagement; and (v) policy funding for collaborative projects.

It remains necessary to have a flexible approach for the development and implementation of sustainable and circular bioeconomy at local or regional level, considering that the initial input and setting might follow various settings in terms of policy drivers or leading stakeholders. Similarly to circular economy as a whole, public authorities are drivers, enablers and facilitators of circular bioeconomy on their territory. They should sometimes just start and try out innovative approaches and actions, since a disruptive approach might get quick support from various stakeholders willing to take action as well and therefore welcoming public initiative or endorsement. Cooperation and learning from others can help to kick-start or improve the local approach and speed-up the transition by showing that sustainability is possible.

⁴⁸ BioSTEP, 2016, Good practice guidelines for stakeholder and citizen participation in bioeconomy strategies





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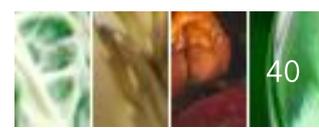
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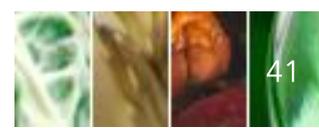
https://ec.europa.eu/knowledge4policy/publication/circular-bioeconomy-concepts-opportunities-limitations_en

TURAS, 2017, Bridges to local economies - Strategies for place and community based economies

https://environnement.brussels/sites/default/files/user_files/turas_d6.9_bridges_to_local_economies.pdf

Urban Agenda Partnership on Circular Economy, 2019, Survey report on regulatory obstacles and drivers for boosting a sustainable and circular urban biobased economy

<https://ec.europa.eu/futurium/en/circular-economy/survey-report-regulatory-obstacles-and-drivers-boosting-sustainable-and-circular>





Annex 1

European Commission main relevant webpages and contacts

Directorate-General for Research and Innovation (DG RTD)

- Main responsible people on bioeconomy:
 - John Bell, Director, Directorate C - Healthy Planet
 - Petra GOYENS (team leader bioeconomy)
- Main relevant webpages and information:
 - Lead on bioeconomy policy
 - https://ec.europa.eu/info/departments/research-and-innovation_en
 - https://ec.europa.eu/info/research-and-innovation/research-area/environment/bioeconomy_en

Directorate-General for Environment (DG ENV)

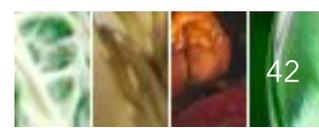
- Main responsible people on bioeconomy:
 - Kestutis SADAUSKAS, Director, Directorate B - Circular Economy and Green Growth
- Main relevant webpages and information:
 - https://ec.europa.eu/info/departments/environment_en
 - https://ec.europa.eu/environment/green-growth/index_en.htm
 - <https://ec.europa.eu/environment/waste/compost/index.htm>
 - <https://ec.europa.eu/environment/waste/sludge/index.htm>

Directorate-General for Agriculture and Rural Development (DG AGRI)

- Main responsible people on bioeconomy:
 - Nathalie SAUZE-VANDEVYVER, Director, Directorate B – Quality, Research and Innovation, Outreach
- Main relevant webpages and information:
 - https://ec.europa.eu/info/departments/agriculture-and-rural-development_en
 - https://ec.europa.eu/info/food-farming-fisheries/sustainability/economic-sustainability/bioeconomy_en
 - https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/future-cap_en

Directorate-General for Maritime Affairs and Fisheries (DG MARE)

- Main responsible people on bioeconomy:
 - Bernhard FRIESS, Director, Directorate A - Maritime Policy and Blue Economy
- Main relevant webpages:
 - https://ec.europa.eu/info/departments/maritime-affairs-and-fisheries_en
 - <https://webgate.ec.europa.eu/maritimeforum/en/frontpage/1142>





Directorate-General for Regional and Urban Policy (DG REGIO)

- Main responsible people on bioeconomy:
 - Nicola DE MICHELIS, Acting Director, Directorate B – Policy
- Main relevant webpage and information:
 - https://ec.europa.eu/info/topics/regional-policy_en

Joint Research Centre (JRC)

- Main responsible people on bioeconomy:
 - Giovanni DE SANTI, Director, Directorate D - Sustainable Resources (Ispra)
- Main relevant webpages and information:
 - https://ec.europa.eu/info/departments/joint-research-centre_en
 - https://ec.europa.eu/knowledge4policy/bioeconomy_en (Knowledge Centre for the Bioeconomy)



Annex 2

Selection of projects relevant to circular bioeconomy

Bioeconomy governance and stakeholders' engagement

BERST (Bioeconomy regional strategy toolkit): www.berst.eu

BE-Rural: <https://be-rural.eu>

BIO4ECO: www.interregeurope.eu/bio4eco

BioBase4SME: www.nweurope.eu/projects/project-search/bio-innovation-support-for-entrepreneurs-throughout-nwe-regions

Biobridges: www.biobridges-project.eu

BIOCAS: <https://northsearegion.eu/biocas>

BIOEAST Initiative: <https://bioeast.eu>

BioMonitor: <http://biomonitor.eu>

BIOREGIO: www.interregeurope.eu/bioregio

BioSTEP: www.bio-step.eu

POWER4BIO: <https://power4bio.eu>

Sustainable food systems

AD-IN Alimentation durable inclusive: <https://ad-in.eu>

ECOWASTE4FOOD: www.interregeurope.eu/ecowaste4food

European Food-STA: www.food-sta.eu

FIT4FOOD2030: <https://fit4food2030.eu>

FoodE: www.foode.eu

FoodSHIFT 2030: <https://foodshift2030.eu>

REGIONS4FOOD: www.interregeurope.eu/regions4food

SmartAgriHubs: <https://smartagrihubs.eu>

SU-EATABLE LIFE: www.sueatablelife.eu/en/

T4F Training for Sustainable Food Systems Development: <https://trainingforfood.eu/>

URBAN SOIL 4 FOOD: <https://uia-initiative.eu/en/uia-cities/maribor>

Biomass and bio-waste use for bio-based products and solutions

AgriWasteValue: www.agriwastevalue.eu

AlpBioEco: www.alpine-space.eu/projects/alpbioeco

BalticBiomass4Value: <https://balticbiomass4value.eu>

BIOCAS: <https://northsearegion.eu/biocas>

BIO-PLASTICS EUROPE: <https://bioplasticseurope.eu>

Cemowas2: <http://cemowas2.com>

Circular Agronomics: www.circularagronomics.eu

EFFECTIVE: www.effective-project.eu

Rehap: www.rehap.eu

SABANA: www.eu-sabana.eu

SCALIBUR: www.scalibur.eu

SeaBioComp: www.centexbel.be/en/projects/seabiocomp

SYSTEMIC: <https://systemicproject.eu>

VALUEWASTE: <http://valuewaste.eu>

WaysTUP!: <http://waystup.eu>





www.acrplus.org

ACR+ is an international network of cities and regions sharing the aim of promoting a sustainable resource management and accelerating the transition towards a circular economy on their territories and beyond. Circular economy calling for cooperation between all actors, ACR+ is open to other key players in the field of material resource management such as NGOs, academic institutions, consultancy or private organisations.

Find out more at www.acrplus.org