

ERRIN input on the update of the EU Bioeconomy Strategy

31 January 2025

Contents

Introduction	2
Biomass utilisation hierarchies in EU Regions	2
Hierarchisation of biomass: not a must-have in every region	2
Regional strategies: a clear focus on sustainability and circular economy	3
Legislative inconsistencies or conflicts that hinder the development of the bioeconomy in regions	3
Waste management and circular economy initiatives	4
Bio-based products	4
Authorisation of bio-based products	5
Biotechnologies	5
Regional prioritisation of materials and destinations within the bioeconomy sector	7
Overview of biomass sources and their uses	7
Recommendations on the use of biomass	8
Final Remarks	9
ANNEX - Examples of bioeconomy related projects	10

Guided by ERRIN members' insights and feedback, this ERRIN contribution offers views from EU regions to support the update of the EU Bioeconomy Strategy.

Introduction

The European Regions Research and Innovation Network (ERRIN) is pleased to share insights and feedback from EU regions to contribute to the update of the EU Bioeconomy Strategy. In November 2024, ERRIN, through its [Bioeconomy Working Group](#), launched a call for members' inputs to provide regional perspectives on three key aspects of the EU Bioeconomy Strategy:

1. Biomass utilisation hierarchies in EU regions;
2. Legislative inconsistencies or conflicts that hinder the development of the bioeconomy in regions;
3. Regional prioritisation of materials and destinations within the bioeconomy sector.

As a result of this initiative, eleven regions from six EU countries provided their inputs: Central Denmark, East North Finland, Emilia-Romagna, Grand-Est, Hauts de France, Helsinki, Murcia, Pays de la Loire, Region Gävleborg, Region Värmland, and West Finland.

Their contributions reveal a variety of perspectives of multiple actors within their regional innovation ecosystems, including universities, municipalities, research centers and bioeconomy experts, while reflecting the unique natural resources and assets of each region. They also underline the importance of tailoring bioeconomy strategies to regional contexts while maintaining alignment with overarching EU sustainability and competitiveness goals. By harnessing this diversity, the EU can ensure that the updated Bioeconomy Strategy is both inclusive and impactful, addressing the specific needs and strengths of its regions.

Biomass utilisation hierarchies in EU Regions

Hierarchisation of biomass: not a must-have in every region

The conclusions based on the feedback are manifold. Some regional Bioeconomy Strategies or Biomass Action Plans are specifically mentioning that the use of biobased resources should be based on the hierarchy of use, where usually food and feed security come as first priorities. This is for instance the case in the French regions of Hauts-de-France and Grand Est. In Hauts-de-France, a collective public observation tool was developed to provide answers to questions from companies wishing to be based in Hauts-de-France, concerning the availability of biomass to feed their potential value-added units ([Observatoire Régional de la biomasse et des projets de Bioéconomie en Hauts-de-France](#)).

In some cases, regions are making more subtle distinctions by using ecological and economic sustainability arguments as guiding principles in their use of biomass. This is the case of Uusimaa Region (Helsinki), and Central Denmark who recommend a "cascade utilisation of biomass". Interestingly, the Danish National Strategy emphasises that it is not important to focus on individual aspects of the bioeconomy (such as the production of bioenergy) but rather on making entire

bioeconomy value chains coherent. Coherence includes a focus on high-added value, zero waste and minimal land use.

Other regions which highlight bioeconomy as a priority in their regional strategies do not necessarily refer to a specific hierarchy of use. For example, in Region Gävleborg “the basis relies on utilising all resources, from twig to timber”. In the French region Pays de la Loire, the hierarchy of use is as important as the proper identification of where the bioresources of a region are located and how they can be used and by whom. In the Emilia-Romagna Region, the focus is placed more on the types of biomasses suitable for bioeconomy activities than on their specific applications. For instance, biomass to be used to produce sustainable biomethane needs to meet certain criteria such as being circular and show a potential to reduce significantly greenhouse gas emissions.

Regional strategies: a clear focus on sustainability and circular economy

The potential that sustainable use of biomass offers for industry and competitiveness was highlighted by several regions in their regional strategies. [Finland](#), Denmark and [Italy](#) have a National Bioeconomy Strategy, which also inspired their regions. The Finnish strategy for instance clearly mentions the objective of creating added value when it comes to fostering bioeconomy-related developments. France also has a National Strategy, but it is interesting to note that some regions have established their own individual approaches (e.g. [Grand Est](#), [Hauts-de-France](#), [Pays de la Loire](#)).

The majority of responding regions made a clear connection in their strategies with circular economy. In other words, for bioeconomy to be sustainable, it also needs to be circular. This is the case for Region Gävleborg, Helsinki-Uusimaa, Murcia, Pays de la Loire, West Finland (where bioeconomy falls under the overarching “circular economy category”), East North Finland, Central Denmark, Helsinki and Emilia-Romagna.

While the two sectors share common aspects and are occasionally interconnected, it is important to highlight that they do not necessarily overlap. Biobased should aim to be both circular and sustainable, but this is not always the case. Similarly, circular does not always mean biobased.

Finally, agriculture and forestry are particularly highlighted as relevant sectors in most of the inputs received.

Legislative inconsistencies or conflicts that hinder the development of the bioeconomy in regions

In the ERRIN survey, regions were asked to provide examples of EU-level legislative inconsistencies or conflicts that hinder the growth and development of the bioeconomy. Indeed, legislative inconsistencies at different levels, including at the European one, can significantly impact the growth and development of the bioeconomy across different regions. These inconsistencies create challenges for various sectors of the bioeconomy such as investment uncertainty, supply chain disruptions or

market fragmentation. They can create difficulties for some sectors or for some precise categories of products.

Waste management and circular economy initiatives

Differences in waste management regulations and circular economy policies across regions could impact businesses working on bio-based solutions for waste reduction and recycling. For West Finland, the EU definition of waste remains problematic as some materials could be recycled and used in a circular way if waste terminology could be avoided. Moreover, for the Region of Murcia, the **end-of-waste status** is a significant issue as there is a lack of harmonisation on the criteria for biowaste, which hinders innovation. While regulatory instruments for metals like copper, aluminium and iron exist at the EU level, they are not used for biowaste. This inconsistency creates difficulties for project promoters or suppliers needing waste management permits, slowing the deployment of sustainable bio-based solutions.

Another major barrier in the deployment of urban circular bioeconomy is the **Animal By-products Regulation (ABPR)**, as it limits many potential applications and value chains. The regulation imposes long administrative procedures for considering alternative treatment methods or for defining when bioproducts reach the endpoint of the manufacturing chain. This complex process, depending on DG SANTE and scientific opinions from EFSA, creates significant regulatory uncertainty.

Additionally, **ROOTS - circular pOlicies for changing the biOWasTe System**, a joint initiative of five Horizon 2020 projects (HOOP, VALUEWASTE, SCALIBUR, WaysTUP!, and CITYLOOPS), in their article on [“Circular policies for changing the biowaste system”](#) from May 2023, has identified a number of bottlenecks that prevent the deployment of a circular bioeconomy, such as technological readiness, funding and financing tools availability, quality and quantity of biowaste and regulatory barriers. The document provides specific policy recommendations for each level of governance, and information about solutions, good practices and concrete experiences from participating projects.

Bio-based products

Although bio-based materials are increasingly used and encouraged in construction sector, the building industry still has difficulties to use bio-based products. For instance, in France, [National regulation](#) encourages the use of bio-based products in 25% of building renovation and constructions linked to public procurement and this incitation will become compulsory from 2030. However, as explained by the Hauts-de-France Region, certain materials, such as hygrothermal performance of hemp concrete, are not taken into account in regulatory calculations, which means that the full technical benefits of these bio-sourced materials (e.g. summer comfort) cannot be exploited. Also, the lack of end-of-life recycling options (flows are still low and unevenly distributed across the region) means that only landfill can be considered by default for several deconstructed plant-based concretes. This solution heavily penalises these materials in terms of their environmental impact on life cycle analyses (LCA). This is not ideal for these materials, in a context of Extended Producer Responsibility (EPR). It would be important to harmonise and develop thermal and energy assessment methods for buildings at

European level, including dynamic (comfort and phase shift) and hygrothermal aspects, and to incorporate the performance obtained into a specific calculation standard at EU level.

Additionally, according to Central Denmark Region, restrictions on CRISPR-Cas technology are limiting innovation in bioindustries, despite its safety and potential to enhance novel food development. Meanwhile, riskier methods like Random Mutagenesis remain permitted. Allowing CRISPR-Cas technology would accelerate innovation and support the safer, more efficient production of bio-based products.

The **development of bioenergy, including biogas and biofuels**, often faces challenges due to conflicting legislative requirements. To facilitate the production of biogas, according to Central Denmark Region, the current slurry definition requiring at least 75% livestock manure, restricts the use of plant-based materials like residual green biomass. This Region would recommend reducing the percentage of livestock manure in the definition of 'slurry' to e.g. 60% to better integrate other types of biomasses such as residual green biomass.

Regarding biofuels, the revision of the [Regulation \(EU\) 2019/1242 setting CO2 emission performance standards](#) establishes new CO2 reduction targets for **new heavy-duty vehicles** (city buses, trucks and intercity coaches). The current method of calculating emissions at the vehicle tailpipe means biogas/biomethane (BioNGV) vehicles are no longer classified as 'zero-emission' under the RED II directive, putting their development at risk. The introduction of a 'Carbon Correction Factor' (CCF), a calculation method based on the RED II directive, would enable taking into account the proportion of renewable fuel in the fuel mix for different types of fuel during a reference year, as reported by the Grand Est Region.

Authorisation of bio-based products

Legislative inconsistencies often delay the approval of bio-based products, limiting innovation and regional market entry in some regions. For instance, with the [EU novel foods Regulation](#), according to Central Denmark or West-Finland, the approval process for novel foods is costly, complex and time-consuming, especially for SMEs. While respecting the safety of food, the authorisation process could be speeded up to facilitate innovation such as white protein extraction and use for human consumption. Another difficulty, in the Grand Est Region, is linked to [the colours for use in foodstuffs](#) and cosmetics. The list of approved technologies for producing these colours needs to be updated to include those derived from biotechnology. Ideally, this update should also ban colors produced through polluting technologies.

Biotechnologies

Biotechnologies play an essential and significant role for the delivery of EU goals for competitive, healthy, resilient and sustainable economies and societies. Applications are integrated throughout industrial and social ecosystems, including the medicines that create and sustain a healthy society, agri-food supply chains, manufacturing processes, plus biomanufacturing of chemicals and consumer

goods. Biotechnologies are a hallmark of success, demonstrating EU growth and benefit through innovation. According to the Region of Murcia, there are difficulties in the authorisation of certain biotechnological applications due to a **lack of specific EU legislation on biotechnology**. This includes challenges in defining growth media, which impacts both microorganisms and biomass-based bioproducts. This regulatory uncertainty is perceived as a risk by investors, impeding the development and financing of biotechnological projects. According to Grand Est Region, a strong EU Bioeconomy Strategy must also enable the innovators who lead societal and industrial transformations in Europe and beyond. This is why anticipating and supporting the development of biomanufacturing, including for industrial fermentations and bioconversions, is necessary through a dedicated EU Biotech Act.

The U.S. Executive Order on Advancing Biotechnology and Biomanufacturing (2022) and the EU's response in 2024 reflect a clear political commitment to biotechnology. These initiatives build on significant scientific and technological advances in synthetic biology, which are creating new opportunities for industrial fermentation. While many startup and company projects are now reaching the industrial demonstration stage, scaling up remains a challenge. Beyond economic and regulatory barriers, which offer limited incentives, a critical factor is "industrial learning." The so-called "valley of death"—the gap between innovation and full-scale industrial production—is not just about market access and financing but also the development of essential industrial know-how.

Finally, some regions expressed their concerns about how recent legislation affects biomass availability. For instance, [Deforestation regulation](#) could limit forest biomass and create costly administrative burdens, as noted by Värmland Region. East and North Finland regions, where the wood biomass used by forest industry often comes from multiple different sources, would recommend using forest certification as criteria for the required traceability methods defined in the [Deforestation-free Products \(EUDR\)](#).

A more comprehensive analysis of EU legislative inconsistencies is needed and could be addressed during the planned EU consultation for updating the bioeconomy strategy in 2025. In some cases, national legislations have found innovative ways to overcome barriers and facilitate innovative processes. A **database of good practices** on how to overcome difficulties and barriers would be welcome.

The update of the EU bioeconomy strategy should assess and help to reduce legislative inconsistencies and create a more cohesive and comprehensive regulatory environment for the bioeconomy sector.

Regional prioritisation of materials and destinations within the bioeconomy sector

Overview of biomass sources and their uses

The table below provides an overview of the main feedstock for the bioeconomy present in the regions which responded to the survey, and what they are used for (**please note that this list is not exhaustive*):

Main category	Specific feedstocks and their uses
Forest biomass	- Coniferous and deciduous timber: construction carpentry, sawmills - Wood: buildings but also for energy - Pulpwood: packaging industry, hygiene products, and other new products - Lignin: replacing fossil materials such as plastic or binders, additive to concrete. High potential in industries like automotive, construction, coatings, plastics, and pharmaceuticals. Applications include replacing fossil-based phenols in resins and creating carbon fiber or energy storage materials. - By-products: building materials, textiles, healthcare products, 3D printing
Crops	- Grass-legume crops: proteins - Grass: Focus on the use of grass species in crop rotation with nitrogen-fixing properties and nutrient runoff reduction properties - Beets: proteins
Plant fibers	- Hemp: textiles, food, buildings and composite - Straws: agro-sourced construction, isolation materials - Miscanthus: buildings and energy - Nettle: food and textiles - Flax: textiles, food, buildings and composite - Grass biomass: feed for biogas plants, extraction of protein, use of fibers and brown juice for other sectors
Blue bioeconomy	- Microalgae: cosmetics, nutraceuticals, food supplement - Shellfish by-products: textile
Other sources	- Wool: isolation materials - Agriculture and agri-food by-products: food, construction, furniture, packaging, bioenergy - Organic matter: new products (e.g. fertilisers, nutrients) for the agriculture sector, production of renewable energy

	• Biogas digestate: can be spread on agricultural fields or sent to pyrolysis, or other sectors (e.g., sustainable building materials) • Biochar: agricultural fields, sustainable building materials, animal feed • Urban biowaste (food waste and sewage sludge): biogas/bioenergy, transport fuel, nutrients for green construction or agriculture
--	---

The most common uses mentioned are bioenergy, food and feed, construction materials, cosmetics, and as alternatives to fossil-based products (i.e. novel bio-based products).

Recommendations on the use of biomass

In addition to this overview, it is important to note that several regions also provided with recommendations regarding the use of biomass:

In Region Gävleborg, prioritising the availability of sustainably produced forest raw materials, with a focus on effective growth measures and efficient climate adaptation, is of high priority. Wood construction should remain a cornerstone of the bioeconomy.

A similar conclusion is drawn by the Swedish Region Värmland. Generally prioritising the availability of sustainably produced forest raw material, including through focusing on effective growth measures and effective climate adaptation, is of high priority. This enables flexibility in what the raw material is then subsequently used for.

Central Denmark emphasises integrated bio-industrial and energy complexes to maximise biomass utility across food, materials, and energy sectors, achieving a zero-waste system. Furthermore, creating synergies between the forthcoming CAP and the Bioeconomy strategy is recommended to increase the basic biomass resource. This is because enhancing the basic biomass resource requires a focus on crop rotation to improve bioeconomy efficiency.

Similarly, West Finland highlights the importance of providing stronger regulatory guidance on upcycling practices to ensure that materials are used to their fullest potential. The region stresses that cascade use should be encouraged, while downcycling should not be subsidised.

Finally in Emilia-Romagna, there is a clear priority for agricultural residues, livestock by-products, food waste for bioenergy and bio-based products. The region also invests in logistics (collection, transport, storage) to optimise supply chain efficiency. Also, they leverage anaerobic digestion systems for their flexibility and ability to process diverse feedstocks into a wide range of products.

Final Remarks

The inputs gathered from across the regions demonstrate the diversity and innovation capacity of regional approaches to advancing the EU bioeconomy. These perspectives underscore the importance of addressing legislative inconsistencies and tailoring bioeconomy strategies to regional contexts to unlock their full potential.

It is important to note that the feedback presented here is just a part of broader contributions shared by ERRIN's members. These inputs were gathered in a remarkably short time to ensure a prompt and timely response. If interested in exploring the full range of recommendations, resources and strategies highlighted by the regions, we encourage you to reach out to ERRIN for further details and access to additional materials.

Moving forward, ERRIN remains committed to supporting the advancement of the EU Bioeconomy Strategy update. The network will continue to monitor progress and mobilise its members to contribute with further insights. To this end, additional meetings with ERRIN members have been scheduled throughout the year, providing opportunities to deepen the discussion and integrate new perspectives into the evolving strategy.

For more information on the inputs please contact:

Pirita Lindholm, ERRIN Director, pirita.lindholm@errin.eu

Gianpiero Petruzzello, ERRIN Project and Policy Manager, gianpiero.petruzzello@errin.eu

Marie Clotteau, Grand Est-Europe, ERRIN Bioeconomy WG co-leader, marie.clotteau@grandest.eu

Angèle Liaigre, Cities Northern Netherlands EU Office, ERRIN Bioeconomy WG co-leader, a.liaigre@citiesnorthernnetherlands.eu

ERRIN (European Regions Research and Innovation Network) is a Brussels-based platform that gathers around 120 regional organisations in more than 20 European countries. ERRIN aims to strengthen the regional and local dimension in EU Research and Innovation policy and programmes. ERRIN supports members to enhance their regional and local research and innovation capacities and further develop their research and innovation ecosystems.

The ERRIN members primarily collaborate through 13 Working Groups (WGs) and two Task Forces (TFs), covering both thematic areas and overarching policy issues. The WGs and TFs are based on members' priorities and current funding opportunities. The WG and TF meetings are at the heart of ERRIN's activities, as this is where our members meet regularly to exchange information, present regional examples, build new partnerships, develop joint projects, network and much more.

ANNEX - Examples of bioeconomy related projects

This annex highlights a selection of innovative bioeconomy-related projects from various European regions responding to this initiative. These projects showcase the diverse applications of biomass and bio-based products, as well as the commitment to sustainable practices and circular economy principles in the bioeconomy sector. The examples demonstrate the diverse ways in which bio-based solutions are being implemented across different sectors, highlighting both local innovation and the broader potential for scaling sustainable practices within the bioeconomy.

Hauts de France (FR)

INDUSTRIALISATION (ERDF / Industrialisation of cotton hemp): The company “[VAN ROBAEYS FRERES](#)” has been awarded an ERDF grant of around 5M€ for its industrial project to redeploy a competitive and sustainable French hemp textile industry via hemp scutching equipment. With its solid expertise in flax, the company intends to use its expertise in scutching and its knowledge of the fibre to develop a quality industry, optimising impacts and enabling France to re-establish itself as a major player on a European and international scale for an alternative service to cotton.

R&D and Innovation: Feasibility study for the development of bio-based products based on sheep’s wool for use in the building industry (mixed insulation panels and felt). Supported by a local authority (SM PNR Caps & Marais d’Opale), this project aims to create a dedicated cooperative company (Hauts-de-Laine) and a partnership with a regional manufacturer to subcontract production.

PILOT OPERATION (“[PECQUENCHANVRE](#)”): interior insulation renovation programme for 50 homes in the former coal-mining area, using hemp (shotcrete and insulating blocks) to validate the organisation and skills required for mass production.

Pays de la Loire (FR)

[BYSCO](#): company producing textile from mussel by-products

[ISOL’en Paille](#): straw insulation for buildings

[Les Coureurs de Lune](#): Valorization of brewers' grains through the cultivation of mushrooms and aromatic plants via the design of an urban farm "Mush-room" in order to valorize all these by-products of the microbrewery's beer production.

[Alegina](#): design and manufacture of innovative and useful materials and products made from oyster shells: KAOMER, porcelain, VIVAWAY drainage paving stones and VIVAROOOF green roofs, low-carbon inventions, alternatives to soil artificialisation and ferments of biodiversity will renaturalise the city and construction.

Grand Est (FR)

European hemp cluster: coming from an Operational Group of EIP Group, this cluster aims to federate actors all along the hemp supply chains and stimulate its different uses.

ExtraBark: recovery of wood bark by-products by extracting molecules of interest as an alternative to synthetic products in agronomy and wood protection.

The Center for Biotechnology and Bioeconomy is a multidisciplinary research academic center at the heart of a biorefinery to the value of biomass and industrial by-products.

Värmland (SE)

Mechanical pulp: Biosorbe AB, absorption material for oil from water.

Beams made of paper pulp: Woodtube, building beams pressed from paper pulp.

Molded pulp: Blue Ocean Closures, screw caps for liquid packaging.

Helsinki (FI)

The Espoo biogas plant, which processes biowaste and sewage sludge to produce biogas used as transport fuel, significantly reducing reliance on fossil fuels.

Knehtilä Farm's Agroecological Symbiosis: This innovative model of circular agriculture integrates renewable energy production and local food systems, reducing emissions and enhancing sustainability. The symbiosis demonstrates how collaboration among local actors can create efficient, low-impact solutions for agriculture and energy use.