

Creating a sustainable bioeconomy using biomass in a smart and efficient way

The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed and bio-based products (chemicals, materials and fuels) via innovative and efficient technologies provided by industrial biotechnology. Industrial biotechnology produces and uses enzymes and microorganisms to transform renewable resources into everyday products. As such, it provides an alternative to using fossil resources, such as crude oil, natural gas or coal, as the raw material for making these products.

The concept of cascading use of biomass is increasingly referred to by a broad variety of sectors, organisations, policy makers and academics in the context of biomass use but it can and often does mean different things to different people.

This concept was initially developed by the wood sector. In this sector, the cascading principle is defined as: “a strategy for using raw materials or the products made from them in chronologically sequential steps as long, often and efficiently as possible for materials and only to recover energy from them at the end of the product life cycle”.

It is increasingly cited by several stakeholders and policy makers as a guiding principle for all sectors using biomass as their primary feedstock to ensure a sustainable bioeconomy.

While this concept may be relevant for some parts of the bioeconomy, EuropaBio’s IB Council strongly believes that the realities of the bioeconomy are too complex and diverse to apply such a principle transversally and indiscriminately. For example, products such as bio-based detergents or cosmetics cannot be recycled or valorized as energy but still have important environmental, economic and consumer benefits.

Biomass is a valuable resource and many parameters need to be taken into account when assessing its use and the products made from it. However, using biomass several times should not be the main and/or only criteria to assess the best way to use the available renewable resources. For instance, one of the most valuable and important uses of biomass is for food, which is essentially a single use application, but which is nevertheless essential to the survival of humans. Indeed, a multitude of criteria such as local economics, regional differences and specialisations, societal needs, existence of viable alternatives, etc. must also be considered to assess the most sustainable and efficient way to valorise the available biomass.

EuropaBio believes that **smart and efficient use** of biomass should be the guiding principle and that every biomass fraction should be valorised for food, feed, bio-based products and energy.

The corner stone of bio-based industries are biorefineries. Biorefineries focus on the sustainable processing of biomass into a spectrum of products including food, feed, chemicals, fuels and materials. Biorefineries extract the maximum value from biomass, optimising the use of individual fractions to deliver several end products, not only improving the economic viability of bio-based industries and their sustainability but also optimizing use of all biomass fractions in the process. The biorefinery model therefore exemplifies the best and most efficient use possible of the available renewables resources and will play an important role in the transition towards the ‘zero waste’ economy.

Several bio-based products can subsequently be re-used and recycled with the objective of prolonging the time that atmospheric carbon is stored until the bio-based product is finally processed with the object of energy recovery. However, while this approach is possible for certain applications, it does not work for all

bio-based products. Several bio-based products cannot be re-used or recycled but they still have significant societal, economic and environmental value - hence the need to adopt a case by case approach.

Finally, in the current debate on cascading use of biomass, some papers and organisations are increasingly confusing cascading use and the hierarchy of use. EuropaBio believes that all products have their own value in the market place and that many parameters influence it (local economics, availability of biomass in certain regions, availability of viable alternatives, etc.). The theoretical concept of hierarchy of use of biomass is therefore not adequate and cannot be translated into regulation.

EuropaBio therefore asks for:

- Smart and efficient use of biomass to be the main guiding principle when it comes to valorising biomass. The cascading principle, as defined in the wood sector, should therefore not be considered transversally and indiscriminately applicable for all sectors using biomass as primary feedstock.
- A policy framework for the smart and efficient use of biomass should take into account the reality of all industrial sectors and avoid unnecessary new barriers to the development and commercialisation of biobased products in Europe. A level-playing field for the bioeconomy vis a vis fossil fuel uses must be ensured
- The adoption of support measures for the development of biorefineries in Europe. Such measures should address the barriers to fostering investments, facilitating the introduction of innovative bio-based products on the market and enabling access to sustainably sourced, competitively priced renewable feedstocks.

Annex – Biorefineries

The concept of biorefineries is analogous to that of petrochemical refinery processes, which produce a wide range of products and fuels from fossil resources.

Maximising uses and optimising value is what the oil industry has been doing in the past century and is still doing today. It refines oil not only to use it as a source of energy but progressively, as technology developed, as a feedstock for a series of chemicals and materials, maximising the use and value, and applications for each fraction of the barrel. Nevertheless, use of fossil sources presents increasing problems as GHG emissions rise and fossil carbon becomes more costly and difficult to extract.

However, the fossil carbon refining process is similarly applied to biomass in biorefineries with the important difference that biomass is grown by removing carbon from the atmosphere. Progressively an increasing number of products are being produced from biomass feedstock, maximising the use and value of biomass. Similarly to petrochemical refineries, the last biomass fraction remaining from the biorefining process, and that cannot be valorised in higher value product, is commonly valorised on-site through energy production.

It should be mentioned that bioethanol is not only used as an energy source. Indeed, as fuels are one (high volume) product from oil refining, biofuels are one product of biomass valorisation. Biofuels can be used in transport but they can also be used as building blocks for the manufacture of other important chemical compounds. Furthermore, in order to start producing higher value-lower volume biochemicals from waste and residues, it is important to have cost-competitive higher volume molecules, such as biofuels, that will enable the necessary economies of scale.