Procurement of biobased products in Flanders

In the context of the biobased economy, renewable raw materials are used to substitute fossil raw materials, which is an essential part of the transition to a climate-neutral and fully circular economy by 2050 (see ambitions of the European Green Deal). **Procuring biobased products implies the use of renewable materials with a natural (biological) origin in the acquisition of services, supplies, and projects.**

Careful consideration is necessary in the use of biomass, aiming to use biomass preferably within the function (such as food, feed, materials, energy, etc.) that generates the highest societal and/or economic value. Increasing the demand for biobased products through procurement contracts can stimulate the production of biobased items and promote the development of new biobased products. Detailed information is provided in the following sections on biobased products, the benefits of their application, and how these principles can be practically integrated.

Definition of biobased products

Biobased products are manufactured from bio-based raw materials, entirely or partially. These bio-based raw materials can be applied directly, such as wood in construction applications, or used in new chemical production processes, such as converting starch from potatoes into biobased plastic. Biobased products can be identical to existing (fossil-based) products, for example, biobased polyethylene. Additionally, some biobased products have specific and unique properties, such as biodegradability or compostability.

Bio-based raw materials

Bio-based raw materials include all natural material on earth that is alive or has ever lived, excluding fossil raw materials. This includes the biodegradable fraction of products, waste, residues from agriculture, forestry, fisheries, aquaculture, and related sectors. Fossil raw materials are excluded from this definition because, although they have been formed over millions of years from plant residues, they cannot be renewed quickly enough for practical use.

Biobased Material Groups

Below is an overview of various biobased material groups, with some examples of products composed of these materials:

- **Wood:** Obtained from forests and individual trees. Some shrubs and plants such as bamboo are also considered wood. Wood contains sugars (cellulose) and fibers (lignin). Material applications of wood are well-known in practice. Think of the built environment where wood is used in the form of floors, beams, roofs, but also as interior wall finishes. Innovations make it possible to use the cellulose and lignin from wood in chemical applications such as biofuel, bitumen, and biopolymers. Many win-win opportunities are possible for biobased and circular by using wood

high-quality. Especially achieving a low MKI score and long-term sequestration of biogenic CO2 so that it does not enter the atmosphere.

- **Natural Fibers:** Material applications of natural fibers offer a lot of functionality. Fiber structures such as cotton, wool, and hemp fiber, applied in the construction and textile sector, with growing applications such as shoes and clothing. There are already shoes and clothes based on lyocell (wood) fibers, insulation material from roadside mowing, and paper with fibers from grass or aquatic plants. Here, there is often a win-win possible with residual flows from agriculture or the management and maintenance of greenery (in the broadest sense of the word) that can be valuable.
- **Biobased Chemicals:** Some components of bio-based raw materials can be used to make synthetic plastics, the basic raw material of which is derived from biomass. When plastics (polymers) are made with building blocks (monomers), a limited number of biobased plastics can be chemically identical to the fossil version (e.g., Bio-PET or bio-PE). Natural rubbers consist of an organic polymer derived from the rubber tree, a possible alternative to rubber made from fossil oil in various products. Other components in rubber, such as the filler, can also be replaced by a biobased version.
- **Natural Oils and Fats:** Various oils and fats are natural raw materials for biobased chemicals, biofuels, lubricants, biocomposites, with examples such as oils from orange peels and coffee grounds.
- **Bioenergy:** Certain residues, such as organic waste, can be converted into green gas or burned for energy generation. Within the added value valorization of bio-based raw materials, there remains a part that can ultimately be converted into green gas or burned for energy generation.
- **Biocomposites:** Mixtures of natural fibers in resin, used in construction, automotive industry, and electronics. Because the material is strong and long-lasting, it can have a significant impact on environmental savings compared to products made from traditional fiber-reinforced plastic. The disadvantage is that it is difficult to recycle into its individual components.

These various biobased material groups offer a wide range of applications, with the choice of biobased materials contributing to a sustainable and circular economy.

The biobased economy and the circular economy overlap in various ways. The circular economy serves as an alternative to the traditional linear economy, in which products are produced, used, and then discarded. In the circular economy, efforts are made to minimize waste by using raw materials and products for as long as possible, extracting maximum value from used products, and reusing them at the component level or as a whole. The ultimate goal of a circular economy is to eliminate waste streams. In addition to preventing residual and waste streams, it is crucial for the circular economy to choose raw materials for materials and products from the beginning that are renewable, have a low ecological

Met opmerkingen [1]: Dit zou best een onderdeel zijn van de vorige categorie.

Met opmerkingen [2]: Klopt dat de auto-mobiel industrie gevoelig is voor CO2-reductie als duurzaamheidsparameter. Maar met de revisie van de EndofLife-Vehicles richtlijn (ELV) en SPI (sustainable product initiative) zullen 'recycled content'-doelstellingen opgelegd worden aan de kunststofonderdelen van een voertuig en mogelijks ook bouw en electronica, net vanuit milieu-overwegingen. Dan rijst mogelijks de vraag of biocomposieten dan nog in diezelfde mate zullen ingezet worden...

Met opmerkingen [3R2]: De chemische industrie zet initiatieven op om data te verzamelen rond de "circular carbon" content in hun chemicaliën. Dit is recycled + biobased. Dit is essentieel gemengd en zal niet meer apart te volgen zijn hoeveel recycled is en hoeveel biobased. De data gaat over circular in zijn geheel. Dus ook voor de auto-industrie zullen ze zich op de CC-indicator baseren, waardoor er nog altijd een incentive is voor biobased chemicals.

Met opmerkingen [4]: Best te staven met een Vlaams beleidsdocument

Met opmerkingen [5R4]: Ik zie niet in waarom. De Vlaamse beleidsdocumenten zijn geen wetenschappelijke papers.
En we hebben juist een nieuw beleidsdocument nodig voor biobased aankopen, dus ik zou deze voorwaarde hier niet stellen.

footprint, and are easily reusable or recyclable. This is where biobased procurement comes to the forefront. It is more than simply choosing based on the origin of the raw material (renewable or fossil), think of eco-design. The policy note of our Minister of Environment 2019-2024 emphasizes that local resource extraction is preferred.

Flemish policy for biomass

The bio-economy has been a priority for the economic development of Flanders for some time. The Department of Economy, Science, and Innovation (EWI) organized a significant bio-economy conference in 2010 during the Belgian presidency of the EU. In 2011, under the leadership of EWI, along with the Department of Agriculture and Fisheries, a civil servant network was established. This initiative was later expanded into an interdepartmental working group with the aim of developing a coherent policy for the bio-economy in Flanders.

Met opmerkingen [6]: Kan je hier niet verwijzen naar de Vlaamse strategie voor een duurzame bio-economie van 2015?

Policy note of our Minister of Environment 2019-2024: "Circular economy offers particular opportunities for our prosperity and economy if we can reduce the use of primary raw materials and materials and increase their reuse without compromising our comfort or prosperity. We support the development of business models where a service is offered instead of a product and products are shared. **Products must be designed smarter so that they last longer and are easier to repair, reuse, and recycle. We promote the repair of products and the reuse of parts; recycling is the keystone to maximize the recovery of all raw materials**."

On December 18, 2020, the Flemish Government approved the Bio-economy Policy Plan. This plan supports and stimulates new initiatives in the broad bio-economy, focusing on (i) innovative biomass production, (ii) synthetic biology and biological prospecting, (iii) technological and chemical transformation of biomass and residual streams, and (iv) supporting technology for biobased value chains. More information can be found in the Circular Food Loss and Biomass (Residue) Streams Action Plan 2021-2025 of the Flemish government.

The Bio-economy Strategic Agenda, under Circular Flanders, focuses specifically on the great economic potential for bio-economic activities outside the food and water sectors. The focus is on initiatives for new non-food products and the sustainable valorization of organic residual and by-products. The bio-economy work agenda focuses on concrete actions for and with companies to build clear bio-economic projects. In collaboration with the government and companies, six major ambitions have been formulated that define the main developments for the future bio-economy in Flanders.

For more information about the bio-economy in Flanders, see the webpage of EWI Flanders and the LinkedIn group "Bio-economy in Flanders - Bioeconomy in Flanders." This group aims to create a network of (Flemish) research institutions, companies, civil society organizations, and civil servants who are active and/or interested in the bio-economy.

Benefits of Biobased Procurement

There are several reasons to support the purchase of biobased products, such as aligning with government policy priorities or expecting specific benefits**. When promoting biobased products in procurement processes for goods, services, and/or projects, various approaches are possible. One can focus on criteria related to the origin of the product (direct stimulus) or on the properties of the product to be purchased (indirect stimulus).** When biobased products have significant functional advantages and the tender is also focused on functional requirements, it quickly becomes attractive for bidders to offer biobased products. Benefits:

1. **Reduced Use and Dependence on Fossil Raw Materials:** By using bio-based raw materials, there is no reliance on fossil raw materials, which prevents the depletion of fossil reserves and reduces negative environmental impacts.
2. **Lower CO2-Footprint:** Biobased products have an advantage if they can demonstrate a lower CO2 emissions compared to products based on fossil raw materials.
3. **Higher-quality Use of Residuals:** Biobased production often uses residual streams and waste materials, contributing to more efficient use of resources. Bio-based raw materials are often locally sourced, unlike fossil raw materials.
4. **Contribution to Circular Economy:** When bio-based raw materials are used to produce biomaterials eligible for material recycling, they contribute to the realization of the circular economy.
5. **Driver for Innovation:** The demand for biobased products stimulates innovation, which can lead to improved products, new markets, and economic growth.
6. **Contribution to Organizational Goals and Policies:** Sustainable procurement of biobased products supports organizational goals and policy objectives, such as rural development and promotion of employment.
7. **Total Cost of Ownership (TCO):** Despite a potentially higher purchase price, biobased products often have lower life cycle costs, especially due to specific properties.
8. **Product Properties:** Biobased products can have improved properties, such as lightness, strength, flexibility, and applicability, compared to non-biobased alternatives.

More information is available through the factsheets of InnProBio, a European platform for biobased innovations in public procurement. The following factsheets have been published in English.

- Factsheet 1: What are biobased products? This factsheet describes when a product is called 'biobased' and from which raw materials and materials products are made.

- Factsheet 2: Sustainability of biobased products. This factsheet addresses environmental aspects of raw materials for biobased products and the life cycle of biobased products and how to ensure this through life cycle analysis (LCA), certificates, and labels.
- Factsheet 3: Myths and facts about biodegradability. This factsheet discusses when and which products are biodegradable and what this means in practice.
- Factsheet 4: Biobased products and services in the circular economy.
- Factsheet 5: Total Cost of Ownership (TCO) and Life Cycle Analysis (LCA).

Summary

In the circular economy, biobased raw materials are used in a high-quality manner. When new raw materials are needed, fossil, critical (scarce), and unsustainably produced raw materials are replaced by sustainably produced, renewable, and widely available raw materials. This not only makes the economy more resilient for the future but also less dependent on fossil sources. The biobased economy plays a crucial role in realizing these circular ambitions.

Within the circular economy, technical and biological cycles can be distinguished. To be circular, biobased products must be reusable, recyclable, or biodegradable in the end-of-life phase. Setting conscious requirements regarding circularity in the design phase lays the foundation for this circular approach. Biodegradable biobased products are incorporated into the biological cycle after use, while sometimes they can also enter the technical cycle (for example, wood recycling or paper recycling or textiles). Non-biodegradable products become part of the technical cycle and are reused or recycled as high as possible.

In essence, the integration of biobased and circular principles offers a sustainable path to a resilient, less wasteful economy.

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