Henkel Biomass Position

Our Responsibility on the Way to the Bioeconomy

1. Executive Summary

Henkel commits to the use of renewable energy and renewable raw materials[1], including bioenergy and bio-based materials. Henkel is aware that the use of biomass for the bioeconomy might imply resource conflicts with the production of food and feed. Based on current research, it could not be confirmed that the bioeconomy is negatively affecting food security, but Henkel closely monitors the developments on this topic. We prioritize the use of second-generation biomass, recycled materials and materials from carbon capture and utilization over first-generation biomass wherever feasible and sustainable. Additionally, Henkel prioritizes the use of biomass for material production over the use of biomass for energy production, especially for first-generation biomass.

2. Background

The term **bioeconomy** refers to an economic system that leverages biological resources and processes to produce goods and services. It focuses on utilizing renewable biological materials (e.g., plants, animals, microorganisms, and organic waste) while reducing dependence on fossil resources. The bioeconomy is further divided into **bio-based material production** and **bioenergy production**. The bioeconomy, and along with it, the use of biomass in the production of energy, bio-based products and packaging materials is receiving substantially increased attention by consumers, brand owners, manufacturers, the packaging industry and lawmakers. With an intensified debate on the carbon footprint, other environmental footprints and finite resources associated with the use of petrochemical materials, interest in biomass utilization increased.

Together with other renewable feedstock technologies, the use of biomass for industrial applications has the potential to substitute fossil feedstocks. Thus, it contributes to the urgently needed defossilization and potentially the reduction of fossil greenhouse gas emissions into our atmosphere to mitigate climate change and to overcome the dependency on limited fossil resources. Henkel sees the use of biomass as one pillar of our strategy to substitute fossil with renewable carbon. This goes hand in hand with the use of other renewable carbon sources, such as from recycled packaging and raw materials and materials based on carbon capture and utilization technologies.

Biomass is defined as a material of biological origin, excluding material embedded in geological formations or transformed to fossilized material and excluding peat [1]. This definition includes organic material from above and below the ground, such as trees, crops, grasses, tree litter, algae, animals and waste of biological origin like manure. A differentiation can be made between **first-generation** biomass and **second-generation** biomass. First-generation biomass refers to biomass derived directly from crops or parts of plants which are specifically grown for industrial use. These are often also used for food or feed, such as corn, sugarcane, wheat, and soybean [2]. Second-generation biomass consists of materials that are not directly tied to food crops. It uses non-edible parts of plants, agricultural residues, forestry

[1] Renewable materials are defined as materials that are derived from resources that are quickly replenished by ecological cycles or agricultural processes, so that the services provided by these and other linked resources are not endangered and remain available for the next generation. This can include recycled material, bio-based material or material derived from CCU.

residues, and waste materials [2]. A **bio-based product** or **bio-based material** is a product wholly or partly derived from biomass [3]. As most definitions of "bio-based products" do not require a minimum amount of biomass to be present in the product, a key characteristic to consider for "bio-based" products is their **bio-based content**. The simplest definition of bio-based content is given as [the] fraction of a product that is derived from biomass [3]. The direct (measurable) bio-based content describes the bio-based content in a sample of a material as can be measured by C-14 radiocarbon analysis [4]. It is originating from segregated or identity preserving raw material sources. Additionally, bio-based content can be allocated to a material under e.g. a mass balance supply chain model if applying to internal and external standards.

3. Potential Conflicts in Biomass Utilization

Henkel is aware that the shift towards an increased use of biomass in the bioeconomy might imply **resource conflicts** with food and feed production [5]. Resources to be considered are, predominantly, land, water, labor, and capital.

Current research indicates that the bio-based industry is not negatively affecting, and on the contrary, enhancing food security and other objectives on agricultural food production following the EU policies [6]. Henkel is referring to state-of-the-art knowledge, however changes in the environment, the social community, economic interest or governance, e.g. induced by climate change might influence the food/feed-bioeconomy-conflict [6]. Thus, Henkel closely reviews the ongoing research and its position regularly.

While the demand of biomass for bioenergy production significantly exceeds the demand of biomass for bio-based material production [7], responsible sourcing remains crucial for both to avoid potential conflicts. In some cases, bio-based material production in combination with feedstock recycling can further increase material sustainability, whereas this feedstock recycling option is not possible for bioenergy production. This implies a hierarchical approach to assign priority to material production over energy production under conditions in which the amount of biomass for the bioeconomy is limited.

4. Responsible Biomass Utilization

To avoid and adapt to potential future conflicts between the use of biomass for food, feed and bioeconomy, Henkel pursues a **hierarchical and circular approach** for the use of biological feedstocks based on scientific evidence. This approach implies sourcing second-generation feedstocks, recycled feedstocks or feedstocks derived from carbon capture technologies as raw materials for production and packaging materials wherever possible. However, first-generation feedstocks are not in all cases replaceable or economically feasible for the bioeconomy. In such cases, the use of first-generation feedstocks for the production of bio-based material is prioritized over the production of bioenergy.

Regarding renewable electricity, Henkel drives for **decarbonization** by using solar, wind or hydropower as renewable energy solutions. In terms of thermal energy, we believe that biomass and biogas derived from biomass can be a suitable replacement for fossil fuels. However, because of the high demand of biological resources needed for energy production, we are pushing for bioenergy produced from wastes, residues and co-products and deprioritize using first-generation biomass feedstocks when in conflict with food or feed production.

Furthermore, Henkel assesses the **environmental and social impacts** of relevant purchased bio-based feedstocks and engages its suppliers to provide transparency on the feedstock type and origin, as well as several environmental indicators. For identified key feedstocks we request recognized sustainability certification schemes both for agricultural and forest biomass to ensure the socially and ecologically sustainable production of biomass, if available.

Henkel is aware that economic interests are not likely to be decoupled from environmental goals in future. Thus, trade-offs between different political objectives and economic interests of the agro-food, waste, and bio-based industry, as well as the renewable industry will continue to occur. As Henkel, we are committed towards responsible sourcing regarding social, ecological and economical sustainability. For further reference especially on environmental sustainability please see also our Responsible-Sourcing-Policy [8], Henkel Nature Policy [9] and Zero Net Deforestation Policy [10].

5. References

[1] International Organization for Standardization, „ISO 14021:2016: Environmental Labels and Declarations - Self-declared Environmental Claims (Type II Environmental Labelling)," International Organization for Standardization, 2016.

[2] United Nations Environment Programme, „Global Bioeconomy Assessment: Coordinated Efforts of Policy, Innovation, and Sustainability for a Greener Future," United Nations Environment Programme, Nairobi, 2024.

[3] European Committee for Standardization, „EN 16575:2014: Bio-based products - Vocabulary," European Committee for Standardization, 2014.

[4] International Organization for Standardization, „ISO 16620-2:2019: Plastics - Biobased Content Part 2: Determination of Biobased Content," International Organization for Standardization, 2019.

[5] European Commission, „Innovating for Sustainable Growth: A Bioeconomy for Europe," *Industrial Biotechnology,* Bd. 8, Nr. 2, p. 57 ff., 2012.

[6] A. Muscat, E. M. De Olde, Z. Kovacic, I. J. M. de Boer und R. Ripoll-Bosch, „Food, energy or biomaterials? Policy coherence across agro-food and bioeconomy policy domains in the EU," *Environmental Science & Policy,* Bd. 123, pp. 21-30, 2021.

[7] J. Popp, S. Kovács, J. Oláh, Z. Divéki und E. Balázs, „Bioeconomy: Biomass and biomass-based energy supply and demand," *New Biotechnology,* Bd. 60, pp. 76-84, 2021.

[8] Henkel AG & Co. KGaA, „Responsible Sourcing Policy," Henkel AG & Co. KGaA, Düsseldorf, 2023.

[9] Henkel AG & Co KGaA, „Henkel Nature Policy," Henkel AG & Co KGaA, Düsseldorf, 2024.

[10] Henkel AG & Co KGaA, „Policy on Deforestation-Risk Commodities," Henkel AG & Co KGaA, Düsseldorf, 2023.