

PRESS RELEASE

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Subsistence economy 2.0

Backward integration to secure access to biobased raw materials



Although the price of crude oil is currently low, many companies are already running or developing processes for use of biobased raw materials as fuels and ultimately as feedstock for manufacturing refined products. That is why access to these raw materials is starting to become a critical issue.

The tendency to use biobased materials is still gathering momentum. It is driven on the one hand by the increasing number of consumers that ask for such products and on the other hand by the large number of companies that have already recognized the future importance of conserving resources and protecting the climate. Global climate problems are compelling us to rethink our use of fossil energy sources. A shift of our present economy towards a biological economy is inevitable.

Even though less than 10% of crude oil is used as starting material for industrial products, nearly all products used in developed countries are based on crude oil constituents: starting from the omnipresent plastics, which account for more than 5% of petroleum consumption, to tires, sealing materials, paints and textiles, and finally even pharmaceuticals. Their basic ingredients also consist mainly of petroleum products.

Biobased raw materials as a growing market

Intensive research to identify alternative feedstocks for crude oil based materials is ongoing. Biobased raw materials are a growing market, especially in the biobased plastics industry. Here, the most important application for biopolymers is packaging. Their share is expected to grow from the current 70% to more than 80% by the year 2020. According to European Bioplastics, the global production capacity for biobased polymers will increase from currently 2% to 4% of total plastics production in 2020. Main drivers are the production of biobased PE and Bio-PET.

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From a technical point of view, so-called **drop-in-biopolymers** are the most promising alternative. As they are chemically identical to the compounds obtained from crude oil, they are easily integrated into current production processes. Besides the established traditional approaches for the production of biobased polymers, promising new bioengineered production techniques are emerging. They enable the synthesis of fine chemicals as well as specialty chemicals like antibiotics for the pharmaceutical industry. Enzymes and microorganisms obtained from biotechnological processes are used, for example, as cleaning agents. Another example is provided by the dandelion: Numerous development projects are striving to use its juice for the production of rubbers.

Small differences – huge effects

However, the challenge of utilizing biomaterials is not restricted solely to processing. A crucial point is access to the required materials. Depending on their source, some biomaterials possess a unique structure with specific properties that cannot simply be substituted by another.

An excellent example illustrating this issue is the utilization of by-products in the food industry. A breakdown of the value chain reveals that the processors of natural dyes have long been dependent on intense cooperation with their raw material suppliers. Even small changes in the cultivation methods of plants strongly affect the properties of the final product. Converters of animal products such as proteins face the same problem: They cannot simply buy many products with a specific quality and performance on the free market. For example, the quality of the animal proteins found in milk is influenced by the pasture and by farming methods. Another influencing factor is the milk processing at farms and dairies. Depending on the techniques used for separation, drying and further treatment, which vary with the dairy product type, different proteins can be obtained with unique features. In consequence, consistent access to suitable raw materials is a substantial challenge for the protein converter.

Access to natural resources is also a crucial criterion in the case of biopolymers for packaging. Up until 2020, the increase in production capacities for biopolymers will be concentrated in Asia, because there the access to biobased raw materials is relatively easy and cost-efficient.

If the biopolymer industry in other regions of the world does not want to fall behind, it will have to increase its efforts to secure access to biobased raw materials.

In the future, the processors of biomaterials will have to look for possibilities of backward integration. A cooperative agreement with producers of starting materials is often a good approach. Sometimes the answer is to become directly involved in agricultural business. Here we could speak of subsistence economy 2.0.

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