

ABSTRACT in English

How Sustainable are Biochemicals and Biobased Materials?

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In recent years, the rising prices for oil and natural gas as well as the discussion on the climate have brought the use of biomass into the centre of public attention. For many decades the technical use of biobased materials had been limited mostly to the manufacturing industries processing wood and other plant parts, including the material-based uses within the chemical industry. Lately, however, the use of biomass for the production of bioenergy for electricity, steam and especially transportation fuel has been booming. At the same time, so-called biorefinery concepts are being increasingly discussed; in these concepts, biobased materials, biochemicals and bioenergy are produced simultaneously from one or several types of biomasses. For some production focuses such as on bioplastics, economically viable production facilities already exist today. For more complex biorefinery concepts, the first pilot plants have been put into operation.

The demand for biomass beyond the food and feed sectors has increased considerably worldwide but has also revealed limits: rising food prices, the devastation of natural areas such as tropical rainforests, beginning supply shortfalls and also certain social consequences. This shows that an intensified use of biomass in the future is not per se sustainable simply because biomass is a renewable resource.

In order to paint an extensive picture regarding the question how sustainable biochemicals and biobased materials are, the following crucial topics are presented:

- How large is a future sustainable biomass potential estimated to be ?
- How large are the savings potentials for fossil energy carriers and greenhouse gases resulting from the use of biochemicals and biobased materials ?
- What characterises an optimised biomass use in the transport and energy/power supply sectors, as biobased materials and for biochemicals ?
- Which concepts for the utilisation of biomass for biochemicals and biobased materials are advisable from the aspect of sustainability ?

The detailed discussion and presentation of the scientific findings regarding these questions are rounded off by conclusions and recommendations.