Creating a circular bioeconomy – benefits an barriers

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Great efforts are made to realize concepts for replacing oil and using renewable resources as starting material in biorefineries. Currently, biorefineries produce chemical base materials on an industrial scale from readily available sugar-or starch-containing plant components. However, these feedstocks only account for about 1% of the available plant biomass. The majority of available plant biomass, constitutes lignocellulose, which is currently inaccessible to conventional biorefineries and biogas processes. In future generating higher economic efficiency for biorefineries and biogas plants is important to ensure these operations can compete with the efficiency of oil refineries even in the absence of government subsidies. Further, it is desirable to increase the ecological efficiency of these operations in order to reduce the required agricultural land use and to improve the CO2 balance. All these claims could be achieved if hitherto waste products such as digestates, agricultural, food and municipal waste streams could be used as feedstock. Physico-chemical and biotechnological pre-treatment technologies, such as the LX process are being established, which would allow utilization of these feedstocks particularly for biogas plants and biorefineries.