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### **Transport Biofuels and Their Perspectives.**

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## TRANSPORT BIOFUELS AND THEIR PERSPECTIVES

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For the society, energy availability, food security and an advanced transport structure are vital to its survival. Transport biofuels are a renewable alternative to fossil fuels. The main causes of their implementation were the fear of exhaustion of global fossil sources, possible logistical problems with their recovery from politically unstable areas and the expectation that their introduction will contribute to the reduction of greenhouse gas emissions. The EU considers it to be "advanced biofuels" produced mainly from waste and algae, see e.g. Renewable Energy Directive (2009/28/EC). The technological and economic aspects of technologies for the production of biofuels from selected bio-produced in industrially interesting quantities with advantageous content of an energy-efficient component. These are in particular forest waste and lignocellulosic biomass, including energy crops and fast growing trees, biodegradable municipal waste (BRKO) and sludge. There are discussed already applied procedures or procedures verified in pilot scale and only in laboratory scale. Essentially, transport biofuel technologies can be considered: Hydrolysis and fermentation of lignocelluloses to lower alcohols, transesterification of oils, production of liquid biomass pyrolysis product, so called bio-oil as the main product in addition to bio-coal and pyrolysis gases, gasification to produce synthesis gas followed by catalytic production of gasoline and naphtha hydrocarbons (Fischer-Tropsch synthesis), transformation of a system of chemical compounds obtained from bio-oil into hydrocarbons by catalytic hydro deoxygenation and /or hydrocarbons obtained directly from the biomass by catalytic hydro deoxygenation.

So far, none of the biofuel production technologies considered is comparable to fossil. Enzymatic oil transesterification is more favorable than chemical, pyrolysis products, especially catalyzed, with increased production of so called bio-oil, followed by catalytic hydrodeoxygenation, can produce transportable hydrocarbons. Both techniques can be promising for both sludge and BRKO. Autotrophically or heterotrophically cultivated algae are currently not attractive. On the contrary, the direct production of ethanol into media from genetically manipulated autotrophically cultivated algae appears to be very promising. Finally, the perspective of advanced biofuels under the conditions of promoting decarbonisation of the industry and in particular electro mobility is discussed.

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