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Plant-based Fuels

Summary



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SUMMARY

To date we have based our mobility on the unrestricted use of fossil fuel. But these resources are limited and using them often results in high environmental pollution. Substituting mineral oil diesel with biodiesel from rape-seed oil in diesel engines is one way of reducing environmental pollution. This option has now been fully researched, tested and demonstrated. Domestic capacity to produce biodiesel has been expanded using public funds. More than 700 petrol stations now supply biodiesel, and the number of vehicles capable of operating on biodiesel is on the increase. As plant-based fuels are exempt from petrol tax in Germany, users can fill up with biodiesel for about the same price as mineral oil diesel.

But the price of biodiesel before tax is practically double that of diesel fuel. To achieve a station selling price level equal to that of mineral oil diesel, the state must exempt biodiesel from tax (unrestricted exemption in terms of time and quantity). Moreover, rape-seed cropping and other crops to produce biogenic fuels on »set-aside« agricultural land are indirectly promoted by the »premium for set-aside land«.

The price difference before tax between mineral-oil diesel and biodiesel is expected to be maintained in the medium term. There are no signs at the present time that today's price range for crude oil will be clearly and permanently exceeded in the foreseeable future. Simultaneously, there is little hope that the biofuel prices can be reduced to a competitive level in the medium term. This applies even in a context of progress in production and process technology and the greater use of cheap biogenic recycled oils and fats to produce biodiesel. Biodiesel and other plant-based fuels will, therefore, continue to depend on state promotion measures such as lower fuel tax rates in the foreseeable future.

Lower tax revenues as a result of tax exemptions on biofuel could be desirable and feasible from the socio-political viewpoint, if they generate positive macro-economic and ecological effects which cannot be achieved by market mechanisms. This cannot be stated clearly for biodiesel.

> Biodiesel sales only have modest impacts on farmers' income and on rural employment, despite the fact that rape-seed cropping for biodiesel is the main productive option for setaside land. Most set-aside areas are not used to grow regenerative raw materials because there is no economic incentive to do so. However, this does not apply to animal fattening operations with a small



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- amount of land, because on-farm economic benefits are obtained from using gully in rape-seed cropping.
- > Raising the demand for biodiesel by offering more financial incentives will not necessarily result in a clearly improved income and employment situation, because biodiesel from imported vegetable oils is also tax exempt. The lower tax revenues may not then benefit domestic agriculture and biofuel production, but rather impact on other countries in Europe or elsewhere.
 - > While rape-seed cropping for biodiesel has some clear ecological advantages, it also brings disadvantages. In principle, rape-seed cropping for fuel does not differ from rape cropping for food or fodder production. Indeed, even slightly less fertiliser and pesticides are required for biodiesel rape-seed. This is because the premium for set-aside land is granted independent of yield, and the producer price for biodiesel rape-seed is lower than that of food rape-seed. Negative ecological impacts would only be expected if cropping were expanded, because rape-seed would be grown on less suitable sites and closer crop rotations would be necessary. Compared with green-covered set-aside areas, however, impacts on the quality of groundwater, surface water and on soil are less favourable even today.
 - > A comparison of the composition of exhaust gases from rape-seed oil, biodiesel and bioethanol and substituted fossil fuels, also show both advantages and disadvantages. Biodiesel, for example, has lower emissions of sulphur, carbon monoxide, hydrocarbon and particles but higher nitrogen emissions which are a growing environmental problem not only in the transport sector. Non-contested plus points for biofuels are their contributions to lowering the consumption of fossil raw materials and to stemming release of additional carbon dioxide, the chief greenhouse gas. The reduction in CO₂ emissions per substituted fossil energy unit is not as high as the reduction obtained from using plant-based solid fuels for energy. Growing ligneous or grassy energy plants could bind a far higher amount of CO₂ per unit area, and replace more fossil energy.

In view of Germany's limited potentials to produce raw materials and the high cost of production, biodiesel and other biofuels obtained from plants should be preferentially used in those areas in which they generate the maximum ecological benefit. Increased use of biodiesel for transportation on inland waterways is worthy of consideration particularly because of the low water contamination generated and the greater biological degradability compared to mineral-oil based marine diesel.

But using biodiesel is extremely uneconomical for inland shipping companies at the present time, because mineral-oil-based diesel for inland navigation is currently exempt from petrol tax. A similarly unfavourable situation prevails

for the use of biofuel in agriculture, where part of the tax on diesel fuel is reimbursed to farmers in the form of a diesel subsidy. While legislative regulations on the use of biodiesel and other environmentally-sound fuels for privately-used ships would not impact unfavourably on competition they would, however, only lead to a small amount of fuel being introduced on the market.

Extending tax exemption on plant-based fuels to the biogenic part of mixed fuels would lead to increased quantities being used and lower tax revenues if tax exemption was not limited to specific quantities. This is particularly relevant in a context of remedying existing agro-policy market constraints. These include aspects such as coupling the cropping of regenerative raw materials with set-aside land, which again depends on the offer and supply situation for foodstuffs and fodder on the world market. The fact that the amount of set-aside land is regulated anew each year leads to high fluctuations in the quantities of rape-seed oil available for biodiesel. Moreover, according to stipulations in the Blair-House agreement, only 1 million t soya-meal-equivalent of oil meal obtained from the production of oleaginous plants on set-aside areas is allowed to be utilised as fodder each year in the EU. Using rape meal for purposes other than fodder, e.g. as fuel or fertiliser, would lead to lower revenue and high biodiesel prices and make biodiesel production even less economically viable.

The higher tax revenue losses from the increased use of biodiesel contrasts with only modest contributions to lowering environmental pollution, to creating jobs and to securing income in agriculture. While expanding the use of biofuels to replace fossil fuels is technically feasible and can be rapidly implemented, it is a comparatively cost-intensive way of reducing CO₂ emissions in road transport. This should be considered when expanding promotion measures for biodiesel and plant-based fuels.

No matter whether or not the rape-seed grown on set-aside land is used as biodiesel, it would nevertheless seem appropriate to relax some of the cropping limitations stipulated in the Blair-House agreement. Permitting wider oil-seed production for non-food purposes could contribute to remedying the EU's low self-sufficiency in vegetable protein fodder and reduce dependence on the few soya producers.

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