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Policies and measures to promote market development of sustainable biofuels

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Executive Summary

Biofuels are easier to commercialize than other alternative motor fuels as they are largely compatible with vehicles of today, and can be blended with current fossil fuels. They can therefore play an important role in decreasing the oil import dependency of road transport as well as reducing transport-related emissions of greenhouse gases. A large number of biofuel feedstock and production technologies are available today. Advanced technologies that incorporate a number of advantages compared to conventional biofuels, including the capacity of using a broad variety of feedstock and achieving higher GHG savings, are likely to be available at large scale within the coming two decades.

The main obstacle to a large deployment of biofuels lies in their high production costs compared to fossil fuels. Even with high oil prices, biofuels are hardly competitive with fossil fuels and despite a converging trend, this is expected to remain so for the coming years. Prices for conventional biofuels are also not likely to further decrease significantly, as feedstock prices rise with an increasing demand for biofuels.

Support to biofuels will thus be needed to create a biofuel demand. A large number of policies and measures to support biofuels are available and have been used in different combination and different successes.

A successful policy mix needs to simultaneously:

- create stable "technical" preconditions, such as fuel standards, fuel availability and compatibility with engines;
- create a financial or regulatory framework that reduces the final consumer prices of biofuels to that of fossil fuels;
- create long-term investment security for investors: this requires a stable predictable framework and binding targets, a political commitment and support from stakeholders.

Due to efforts from some pioneering countries and the EU, key preconditions for a wider market introduction are fulfilled on an European level with the existence of fuel standards, the compatibility of engines to low blends and the availability of vehicles that can use high blends or pure biofuels. Furthermore, with the creation of substantial production capacities,

a market momentum has been created. A wide range of mature technologies is available and more promising advanced technologies are likely to enter the market in the coming decade.

A future biofuel support policy will need to be adapted to the situation of larger volumes being involved. It will therefore have to focus on:

1. the most efficient policies and measures to promote biofuels,
2. measures to steer the composition of biofuels and underlying production pathways in order to better meet the dominant objectives of a biofuel policy,
3. combining national and European biofuel policies to create long-term investment security.

Cost-efficient measures to stimulate biofuel demand

So far, subsidies through (partial or total) tax exemptions (complemented by other measures) have proven to be the most successful instrument in opening the market for biofuels. This has been the case particularly in countries with high taxes on fossil fuels, wherein the tax exemption could compensate the higher production costs of biofuels.

While tax exemptions seem to be one key instrument in creating initial market introduction of biofuels, the impact on public revenue might be too high for reaching high shares of biofuels. When biofuels gain a considerable share in total transport fuel volumes, obligations for fuel producers to sell a certain amount of biofuels relative to the total volume of transport fuels sold can to some extent overcome this problem: no losses of revenue for the government will occur as the costs are carried by fuel suppliers and ultimately transport users thus following the polluter pays principle; total costs may be lower than for subsidies as a) overcompensation is impossible and b) low-cost options will be used. On the other hand, obligations tend to favour low blend-options, while tax exemptions can also stimulate the use of pure biofuels.

Recently, a switch from tax exemption to obligation (or mixed) systems can be observed in the EU, reflecting the need for efficient support systems. For example, since 2005 Austria has an obligation system in place, and France introduced a "mixed" system with the TGAP. Slovenia introduced an obligation in 2006. Germany and the Netherlands changed towards an obligation system by 2007; Poland will introduce one in 2008, as well as the UK with its Renewable Transport Fuel Obligation as from 2008. Only two major players namely Spain and Sweden have not moved to an obligation or mixed system.

While measures on the supply side (feedstock support and investment support) have had a limited impact up to now in developing a market demand, their significance may increase as a tool to steer a growing biofuel market into the desired direction, yet at additional costs compared to the low-cost options. A crop-specific feedstock support subsidy like the energy crop scheme may help to direct the crop mix into a high-yield and environmentally-beneficial pathway. Investment subsidies for production facilities can become more important for supporting advanced (2nd generation) biofuels as these are confronted with much higher capital costs than for conventional biofuels.

Steering the biofuels market

A biofuel policy should not primarily and exclusively aim at fulfilling a certain volume target for biofuel consumption, but the key drivers underlying a biofuel policy must be kept in mind, namely to increase energy security, secure domestic agricultural income and reduce GHG emissions. Biofuels comprise a number of different fuels, production pathways and suitable feedstock, all of them associated with specific production costs, net environmental effects, impacts on supply security and agricultural income etc.

Within a large biofuel market, it is possible – and desirable – to differentiate between different biofuels and production pathways. Factors such as the share of imports, the choice of feedstock, or the dominance of conventional (1st generation) or advanced (2nd generation) technologies strongly influence the impact of a biofuel policy on avoided greenhouse gas emissions, security of supply or agricultural income. From an environmental and sustainability point of view, it might be useful to ensure a traceability of biofuels. Furthermore, a ranking of different biofuel production pathways based on the efficient use of biomass, the carbon content and GHG savings potential, and production costs would be helpful to identify those pathways that should primarily be supported to best fulfil a countries' objectives in supporting biofuels.

A government may consequently decide to differentiate support to different biofuels in order to better meet the objectives of the policy and minimise potential negative impacts. Other measures will therefore ideally complement the main instrument that creates the market demand (obligation or tax exemption). This is of particular relevance when the main support instrument is an obligation as this creates an incentive for industry to opt for low-cost biofuels.

Aligning national and European biofuel policies to create long-term investment security.

Creating a long-term stable framework for farmers, biofuel producers, oil companies and car manufacturers is an important factor for a successful biofuel policy. This can best be met by setting long-term targets and a predictable policy. From an industry point of view, this would argue in favour of a unique European level biofuel policy.

On the other hand, biofuel markets differ widely among countries and regions and it is likely to assume that differences will continue as countries have a different level of interest and potential in supporting biofuels (indicated by the country clustering).

Moreover, the specific drivers for supporting biofuels are likely to vary among countries; some may be more suited and interested in producing feedstock for biofuels and thus creating alternative incomes for the agricultural sectors, while greenhouse gas reduction or concerns about security of supply are major objectives to increase the consumption of biofuels for others.

Standards for biofuels are best taken on a European level. This will be beneficial for transport users and car manufactures as well as the biofuel industry. Also a certification scheme to ensure sustainability of domestic and imported biomass is most efficient on an European and even worldwide scale. Furthermore, current European legislation (i.e. fuel quality directive) will need to be adapted so as to allow for higher shares of biofuels, the process of which has already started.

Additionally, RTD is necessary in a coordinated way between the national and European levels. In particular, advanced biofuels are a promising technology that requires further R&D. Additionally, there should be an emphasis on R&D for dedicated energy feedstock.

Today's production techniques use traditional food/fodder crops. These crops can be further optimised for energy/biofuel production. Also new crops can become interesting for advanced biofuels.