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## EUROPEAN EXPERIENCE REGARDING FUEL AND BIOFUEL REGULATION

### Abstract

*Transport fuels' quality and movement is regulated in the EU internal market to ensure that consumers buy the same fuel, appropriate for their cars all over the EU. For the last 15 years fossil fuels became much cleaner and therefore reduce the environmental impact of transport.*

*The latest developments are aimed at reducing the carbon footprint of transport through fuel quality regulation. Such a complex system requires proper quality control system and inspection system.*

*The paper will show the experience of some EU countries with implementation of the EU fuel and biofuel regulation.*

**Key words:** fuel, biofuel, EU regulation

## EUROPSKA ISKUSTVA U SVEZI PROPISA ZA GORIVA I BIOGORIVA

### Sažetak

*Kvaliteta i prijevoz goriva regulirani su unutar EU tržišta kako bi se osiguralo da potrošači kupuju gorivo iste kvalitete, prikladno za njihove automobile diljem EU. Posljednjih 15 godina fosilna goriva su postala mnogo čistija i stoga je smanjen utjecaj transporta na okoliš.*

*Najnoviji razvoj je usmjeren na smanjenje ugljičnog otiska u prometu regulacijom kvalitete goriva. Takav složeni sustav zahtijeva odgovarajući sustav kontrole kvalitete i sustav inspekcija.*

*Ovim radom će se pokazati iskustvo nekih zemalja EU s provedbom propisa vezanih za goriva i biogoriva.*

**Ključne riječi:** gorivo, biogorivo, EU propisi

## 1. Introduction

The European Union has developed a set a legislation to harmonize rules regarding fuel and biofuel quality, movement of these fuels and their taxation. There are different drivers influencing development of this regulatory framework – market demand, environmental considerations, operation of the EU excise tax system and competition and state aid rules of the EU.

## 2. Overview of fuel regulation in the European Union

- 1) **DEMAND:** Consumers of the EU need to be served with the same quality fuel without interruption all over Europe.
  - a) Fuels have to fit to purpose: the oil industry have to produce fuels compatible with the car park of the European consumers. The EU quality changes are usually in compliance with the recommendation of the *World-wide Fuel Charter*.

*„The objective of the global fuels harmonization effort is to develop common, worldwide recommendations for “quality fuels,” taking into consideration customer requirements and vehicle emission technologies, which, in turn, will benefit our customers and all other affected parties.*

*These recommendations allow automotive and engine manufacturers to provide consistent fuel quality advice worldwide.”*
  - b) Mobility has to be ensured even if normal supply conditions are interrupted because of catastrophes or political disturbances. In order to handle these situations the EU has developed 90 days stocks of crude and oil products.
- 2) **ENVIRONMENT:** The negative environmental impact of fuels has to be as minimal as possible. Components with high risk to the environment and human health are reduced as well as air emission related components. The latest changes are aimed at fighting climate change. Mandatory fuel quality specifications are part of the Fuel Quality Directive (98/70/EC – FQD). On the bases of these specifications the European standardization body, the CEN elaborated European standards. Fuels meeting these standards comply with the directive.
  - a) Just to mention the main steps for the last 15 years the lead content of petrol was phased out, sulphur content of petrol and diesel was reduced to 10 ppm, aromatics in petrol and poly-aromatics in diesel were reduced. The latest change was introduced in 2009 (2009/30/EC directive modifying the FQD). This directive reduced the sulphur content of all transport diesels including the ones used in non-road machinery to 10 ppm and introduced steps to phase-out metallic additives in petrol. Implementation of these measures in national legislation is completed through national fuel decrees and adoption of EU standards.

In order to inspect fuel quality it is required that only fuels certified in accredited laboratories can be marketed. The customs office is in charge of inspection, plus an independent accredited laboratory - selected by the government in public procurement - monitors fuel quality in Hungary.

- b) Transport sector is responsible for 20% of greenhouse gas emission of the EU and this is the only sector where the emission shows continuously growing trend. There are different initiatives to tackle this phenomenon – vehicle emission reduction, biofuel blending and alternative fuels. Most of the changes introduced in 2009 in the FQD were related to biofuels. The other new area brought into fuel legislation is related to the extension of the greenhouse gas emission reduction goals of the EU to transport. Monitoring and inspection of compliance with these measures is more complex, see chapters 3 and 4.
- 3) TAX REVENUE:** Fuels provide an important source for governments' tax revenues. In order to eliminate the risk of tax avoidance and ensure free movement of fuels within the EU the Union has developed a complex regime for fuel movements and tax payments.
- a) Minimum tax levels are defined for each fuel type. There are limited cases when member states are allowed to use incentives in order to promote national or EU policy goals. Such measures are subject to Commission approval.
  - b) The draft directive to revise the energy taxation directive (2003/96/EC) has introduced environmental consideration. The Commission proposed to introduce a reform of fuel taxation by setting minimum levels depending on the energy content of the fuel and tailpipe greenhouse gas emission of the fuel. The proposal is waiting for approval in the Council.
- 4) INTERNAL MARKET – COMPETITION, STATE AID:** Rules of the EU internal market have to be met - free movement of products can't be prohibited and state aid rules have to be met as well. Special guidance has been developed to evaluate state aids in the field of the environment – i.e. biofuel subsidies, tax regimes.

### 3. Biofuels in the fuel market

Comparing the lifecycle greenhouse gas emission of biofuels and fossil fuels - the emission during the cultivation and producing of some biofuels is lower than the emission during oil extraction, refining and combustion of fuel in the engines. Burning biofuels is considered to emit zero greenhouse gases as the plants used CO<sub>2</sub> from the atmosphere to grow its molecules. The difference (the greenhouse gas saving) between fossil and biofuels depend on the biofuel feedstock and technology to produce the biofuel (see Figure 1).

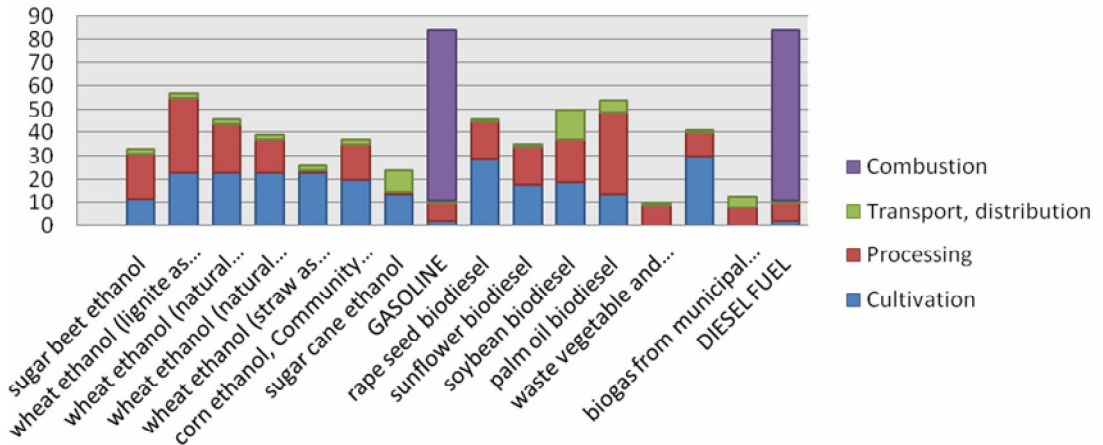


Figure 1: Typical GHG-intensity values for biofuels with no emission from land-use change (Annex V. Directive 2009/28/EC)

In order to reduce the greenhouse gas emission of transport the EU decided to promote the use of biofuels in transport. Since 2005 member states are forced to introduce measures to reach a certain share of biofuels in the fuel market. The target for renewable fuels in transport by 2020 is 10 e%:

$$\frac{2e_{w/c} + 2,5e_{re} + e_b + e_a + e_s}{2,5e_e + e_p + e_d} \times 100 = 10 \% \text{ RES TARGET IN TRANSPORT}$$

Where:

- $e_{w/c}$  – biofuels from waste,
- $e_e, e_{re}$  – electricity and renewable electricity in road transport,
- $e_q, e_s$  – renewables in shipping and aviation,
- $e_b$  – biofuels in all form of transport,
- $e_p, e_d$  – petrol and diesel including biofuels.

Member states had to set their national roadmaps to achieve the 10 % target, in addition to this there is a need for national measures to promote biofuels because biofuels are not competitive due to their high production costs. There are issues regarding compatibility of biofuels and biofuel blends with cars, limited quantity of biofuels can be blended to petrol and diesel – we call these limits blending wall. National roadmaps and implementing measures have to take into consideration these issues.

Hungary: The implementing measures of member states are tax incentives and obligation of fuel suppliers to sell a certain proportion of biofuels in their fuel mix. Hungary used to promote biofuels by tax incentive on biofuels mixed with fossil fuels. As biofuel targets became higher and the EU biofuel market has been established obligation replaced tax incentives. Obligation scheme is the most flexible and efficient way of promoting biofuels.

In Hungary fuel supplier passing the fuel (petrol and diesel) through the duty point is obliged to put biofuels on the market. The biofuel quota - given in e% of diesel and petrol sold on the market – is used to calculate the quantity of biofuel to be marketed. In 2012 the biofuel quota is - 3.1 e% of petrol, 4.4 e% of diesel (4.9 e% from 2014 for both). Biofuel quantity ( $Q_b$ ) can be calculated by the next formula ( $Q_p$  and  $Q_d$  are the petrol and diesel quantities,  $Q_b$  is the biodiesel quantity):

$$Q_p \times 3.1 \% + Q_d \times 4.4 \% = Q_b$$

Biofuel quota to be met by any combination of biofuels – blended in accordance with fossil fuel standards or pure biofuels monthly. There is a high penalty on non-compliance (HUF 35 of missing MJ)\*.

Since 2010 biofuels to be used to meet the biofuel quota has to comply with the sustainability criteria of the EU. There are 3 mandatory criteria – biodiversity, land use change and greenhouse gas saving threshold.

- Biodiversity: Feedstock can not originate from land with high biodiversity, from protected areas.
- Land Use: Land for bio-crops can't be increased on expense of woods, wetland, etc.
- GHG threshold: Lifecycle GHG emission of biofuels shall be lower than that of fossil fuels (2011: 35%; 2018: 50%).

National Chain of Custody systems or international voluntary schemes tested by the EU Commission can be used to demonstrate sustainability of biofuels. The Hungarian agricultural producers and biofuel producers are using the Hungarian national certification system and voluntary schemes as well. In setting the Hungarian national system the regulator aimed to create a cost effective, low-administrative cost model. In the Hungarian system players have to be registered at the Central Agricultural Office (see Figure 2). Each player of the chain is responsible and reliable for its own data, record keeping and passing information to the next player of the chain. The office has the right to inspect the activity of the players at any time and there is a reporting requirement as well. Two types of certificates exist – biomass and biofuel certificates. Fuel producers use biofuel certificates to demonstrate they use sustainable biofuel for compliance with biofuel obligation. The complexity of monitoring and inspecting fuel quality and biofuel obligations has increased since biofuel sustainability is introduced. A laboratory test alone is not enough to show that the fuel we put on the market meets all the requirements.

Regulation regarding biofuels is still not complete. There is an additional legislative process within the Commission regarding biofuels. Sustainability criteria agreed in 2009 do not handle the issue of indirect land use change (ILUC) – increasing the territory of lands for biofuel crop production on the expense of other agricultural products, mainly food crops. The proposal is expected to be published in October 2012 by the Commission to open the decision-making process in the Council and the Parliament. The stake is high, the proposal is likely to limit the use of 1<sup>st</sup> generation biofuels produced from food crops and introduce a multiple support to non-food 2<sup>nd</sup> generation biofuels. More stringent GHG-threshold to be introduced for new plants and an ILUC factor – penalty like GHG emission to be added to 1<sup>st</sup> generation biofuels GHG-intensity. In practice this would stop investment in 1<sup>st</sup> generation biofuel plants.

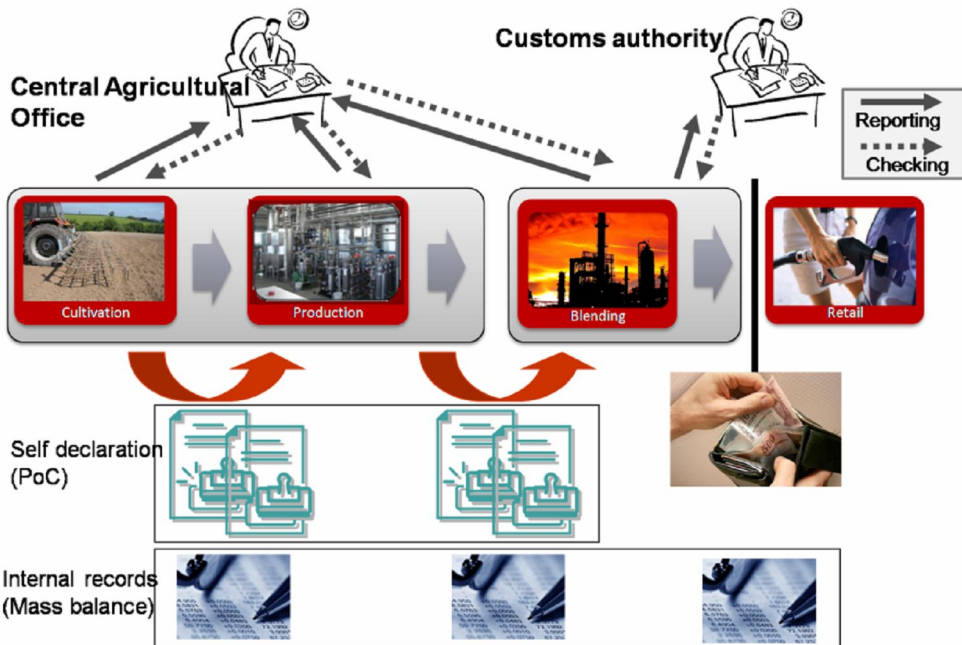


Figure 2: The Hungarian national certification scheme

#### 4. GHG-intensity reduction of fossil fuels

In 2010 a new obligation of fuel suppliers was introduced in the FQD. According to the FQD fuel suppliers passing the fuel through the duty point will be obliged to reduce GHG-intensity of fuels they sell. The target was set but to make it a workable legislation the Commission has to elaborate implementing measures – GHG calculation method for fossil fuels and identification of the baseline for reduction.

The EU Commission has elaborated the proposal, but there is still a big concern amongst Member States and different stakeholders about the impact of the proposal and whether the proposed solution is the appropriate one to reach the original goals of the directive.

The proposal would set default values for GHG intensity of different fuel types based on their feedstock – conventional or unconventional crude oil. Fuel suppliers passing fuels through the duty point would be obliged to sell a fuel mix with lower GHG-intensity in 2020 than in 2010. Suppliers selling fossil fuels produced from unconventional crude would need to sell better or more biofuels or pay penalty.

In a summary fuel related legislation became much more complex for the last five years. In addition to quality certificates provided by laboratories and product movement tax documents oil companies have to handle additional documents – biofuel certificates and in the future GHG-data will be added for fossil fuels as well. This additional administrative burden requires new verification methods.

## **5. Summary**

- Transport fuels regulated in the EU to ensure that consumers buy the same fuel, compatible with their car all over the EU with no interruption.
- For the last 15 years fossil fuels became much cleaner to reduce the environmental impact of transport.
- The latest developments are aimed at reducing the carbon footprint of transport through fuel quality and tax regulation.
- Such a legislation has to be accompanied with complex enforcement and control system.
- Flexibility provided to fuel suppliers helps to meet the European targets.

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