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COMMISSION STAFF WORKING DOCUMENT

Accompanying document to the

Proposal for a

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil that may be placed on the market and introducing a mechanism to monitor and reduce greenhouse gas emissions from the use of road transport fuels and amending Council Directive 99/32/EC to remove the elements setting the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC

Impact Assessment of the Review of the Fuel Quality Directive -

Executive Summary

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1. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

1.1. Organisation and timing

Reference 2006/ENV/19 of the Commission's 2006 work programme is a review of Directive 98/70/EC. Following data gathering and consultation in 2005, an Inter Service Group was set up in May 2006 and met four times. In collaboration with this group, DG Environment has prepared the Impact Assessment.

1.2. Consultation and expertise

The Commission's minimum standards for consultation have been met. Input to the review has been sought from relevant stakeholders. These are primarily the different industries, Member States and NGOs. Two meetings with stakeholders were held in 2005. A publicly accessible web site where presentations, stakeholder comments and other documentation from these meetings is accessible at "http://forum.europa.eu.int/Public/irc/env/fuel_quality/home".

2. PROBLEM DEFINITION

Directive 98/70/EC established a minimum specification for petrol and diesel fuels for use in road transport. These specifications were established for health and environmental reasons following the Auto Oil process. Directive 2003/17/EC modified the Directive in a number of aspects including a requirement that a review should occur. Continuing technical progress in automotive and fuel technology and the continuing desire to ensure that the level of environmental and health protection is optimised necessitate periodic review of the fuel specifications. The review assesses whether policy on vehicle emission limits, CO_2 reduction from cars, air quality, alternative fuel or developments in additives require changes to the Directive.

3. OBJECTIVES

The Directive ensures a single market for fuels by setting a minimum specification for these to be marketed based on environmental and health grounds. In considering whether the specification should be revised, these concerns remain paramount.

A number of Community strategies provide guidelines for the direction of the review. The Thematic Strategy on Air Pollution[1] set high level goals for the reduction of air pollutant emissions. Other objectives pertinent to the review are found in the Lisbon agenda, sustainable development strategy, climate change policy and biofuel strategy.

[1] Communication from the Commission to the Council and the European Parliament: Thematic Strategy on air pollution - COM(2005) 446, 21.9.2005.

4. POLICY OPTIONS AND ANALYSIS OF IMPACTS

A wide range of topics are covered in the review. These have been broken down into discrete areas for analysis. As far as possible this avoids interactions between the different areas. These areas are set out below with a problem overview, analysis and preferred option.

4.1. World Wide Fuel Charter

The World Wide Fuel Charter (WWFC) is proposed by car manufacturers to harmonise fuel standards. It is claimed that adoption would facilitate the marketing of vehicles in many different markets. The WWFC addresses a range of parameters each of which needs to be assessed for environmental benefit and cost effectiveness. In view of this, the WWFC in its entirety is not assessed, but the relevant parameters are assessed individually where appropriate.

4.2. Limit on biodiesel (FAME) content in diesel

The diesel specification in the Directive does not contain a FAME limit. Such a limit exists in European Standard EN590, because the use of higher proportions of FAME is reported to lead to technical problems. The FAME industry requested a limit to be established in the Directive, however the analysis has not identified any health or environmental reason for establishing such a limit. In line with better regulation, no change is proposed, but the Commission has requested CEN to review the FAME limit set in EN590.

4.3. LPG, CNG and Biofuel specifications

There could be environment or health grounds to establish specifications for these fuels in the Directive. The assessment of these and other fuels including Hydrogen, emulsion fuels and Di-Methyl Ether (DME) concludes that there are not grounds to include these fuels in the Directive.

In view of the lack of benefit and in line with better regulation, specifications for these fuels are not proposed for inclusion in the Directive.

4.4. Captive fleet fuel specification

There might be environmental or health benefits from establishing special specifications for fuels used by captive fleets, because of their use in urban areas where there might be specific air quality problems. Analysis shows many options are available for addressing transport emissions and air quality problems. Establishing a fuel specification for captive fleets offers little if any benefit over other approaches.

The Directive enables a tighter fuel specification to be used in certain circumstances. No additional benefit has been identified from establishing a captive fleet specification and no action is proposed.

4.5. Final date for 10ppm sulphur in diesel

Diesel with 10ppm maximum sulphur content is an enabling fuel for higher vehicle efficiency and reduces sulphur dioxide and particulate matter emissions. Sulphur also poisons De-NOx after-treatment systems which are likely to be introduced in the future. The Directive contains a provisional end date for diesel to have a maximum sulphur content of 10ppm.

The decision should be based on ensuring that there is no overall increase in Greenhouse Gas (GHG) emissions, but this cannot be established with certainty. The analysis based on Light Duty Vehicles indicates that the break even point might be later than the provisional date of 2009. However, this ignores any possible saving from Heavy Duty Vehicles, where a small benefit would have a large impact. There is no clear benefit from delaying the date beyond 2009 except the possible, but uncertain, slight GHG saving.

Confirming 2009 delivers some air quality benefit and assures vehicle manufacturers about fuel availability, facilitating achievement of Euro 5 emission limits. It isn't possible to base the conclusion on GHG emissions alone, but in view of the benefits and the progress that has been made so far, it is proposed to confirm the date for 10ppm sulphur as 1 January 2009.

4.6. HDV emissions

Stakeholders were asked by the Commission in preparation for the proposal setting Euro VI emission limits, what fuel quality would be required for different limit value scenarios. The responses gave no indication that fuel composition will need to be altered to comply with any likely change in emission requirements for HDVs. In view of this no change is proposed.

4.7. Review of CO_2 and cars voluntary agreement

As part of their voluntary agreements, ACEA, JAMA and KAMA have, jointly with the European Commission, carried out reviews of the situation and expressed general satisfaction with the fuel qualities provided during the review period. During consultation, stakeholders have not expressly requested any modification to the fuel specification in relation to the current CO_2 and cars voluntary commitments. In view of these facts no change is proposed.

4.8. Review of Directive 1999/30/EC

Directive 1999/30/EC establishes limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air. The Directive was reviewed as part of the Clean Air For Europe (CAFE) programme which led to the Communication on a Thematic strategy on air pollution.

Sulphur dioxide and lead pollutant emissions are no longer a major source of concern from road transport. For lead, no further action is required. Sulphur content of diesel is addressed in Section 4.7 above. For the foreseeable future, the main road transport challenges for air quality attainment are nitrogen oxides and particulate matter.

There is currently no convincing evidence of further changes in the fuel specification that would reduce these emissions, or that this would provide the most cost effective approach to do so. In view of this no changes are proposed.

4.9. Poly Aromatic Hydrocarbons

Certain Polycyclic Aromatic Hydrocarbons (PAHs) are carcinogenic. PAHs are emitted in vehicle exhausts and the Directive establishes a maximum PAH content of 11% in diesel. During the stakeholder discussions, ACEA (European automobile manufacturers association) requested a lowering of diesel PAH content while EUROPIA (European Petroleum Industry Association) states that PAH content does not need to be further lowered because this has an unimportant effect on PAH emissions.

Nevertheless, the oil industry has shown that a reduction to 8% could be achieved in parallel with reducing sulphur content to 10ppm at no cost. In view of this it is proposed to reduce the limit to 8%.

4.10. Non-road diesel

Non-road mobile machinery consumes some 9% of diesel fuel. In its previous revision of Directive 98/70/EC the Commission noted that the sulphur content of non-road fuel would need to be modified to allow tighter emission standards.

Directive 2004/26/EC establishes emission limits for non road mobile machinery type approval. The enhanced emission control equipment required to meet the specifications requires better quality fuel. The draft of that Directive foresaw the need for fuel with 10 to 50ppm sulphur. Engine manufacturers favour 10ppm sulphur, making it easier to meet emission limits and improving reliability.

Inland waterways have less stringent emission limits, but a request for lower sulphur fuel has been made by inland waterway vessel operators. The Directive anticipated use of 1000ppm fuel, although the relevant reference fuel contains 300ppm sulphur.

The analysis concludes that fuel for land-based equipment should have 10ppm sulphur while that for inland waterways should be 300ppm. Directive 99/32/EC (relating to a reduction in the sulphur content of certain liquid fuels) refers to inland waterway fuel and needs to be amended as a result of this change. A further reduction will be needed when tighter engine emission limits are agreed and this is proposed for 2011.

4.11. Detergents

Deposits can be formed in engines as a result of normal operation. Fuel detergents are used to tackle this problem. Detergents do not directly influence pollutant emissions; they may reduce or avoid a possible increase of emissions due to deposits which are known to affect pollutant emissions, driveability and fuel economy.

Car manufacturers must increasingly ensure that vehicles comply with emission requirements over their whole life. In view of this, avoiding engine deposits is increasingly important to them. At present detergents may be added to fuel, but there

is no obligation. Fuel suppliers make considerable claims for more advanced fuels containing sophisticated detergent packages and car manufacturers therefore request that the use of these be made mandatory.

At present there is no quick, cheap and effective test to evaluate the detergency of fuel and therefore this cannot be assessed by sampling fuel. The only effective approach would be to determine appropriate rates of fuel treatment, monitor the addition of detergent and thus indirectly ensure appropriate use.

The difficulties outlined point to processes and procedures being the most appropriate means of addressing detergent in line with better regulation. Further work might open the way to specifying actual detergent performance standards. In view of the claimed improvements to vehicle efficiency, detergent use could be promoted by the proposed life cycle Greenhouse Gas monitoring mechanism.

4.12. Metallic Additives

A number of metallic additives are employed in transport fuels for example to improve combustion or enhance octane. Concerns have been raised about the health effects of emissions from fuel containing additives and the impact of the additives on engines and emission control equipment. Despite these concerns, it does not appear to be possible to state with certainty that metallic additives cause damage. To improve understanding, it was considered desirable to establish a test protocol to determine their effect.

No sufficiently compelling evidence has been provided for either a generalised ban on metallic additives, or a ban of a specific product. The Commission will continue developing the test protocol. In parallel, the relevant industries need to provide information to their customers that should enable them to avoid any undesirable impacts.

4.13. Diesel Density

A maximum diesel density is set because of its link to pollutant emissions. An increase creates a risk of increased emissions. Fatty Acid Methyl Ester (FAME) is denser than this limit and it was suggested that the limit constrains its use. Analysis shows that the constraint is minor and is likely to be offset by introduction of less dense synthetic diesel, in particular made from biomass. There does not appear to be a case for a change to and none is proposed.

4.14. Oxygenate content of petrol

The Directive limits the maximum permitted proportion of oxygenates that may be used in petrol. This is to limit car emissions and ensure fuel compatibility with the existing vehicle fleet.

The main problem is that ethanol is incompatible with some vehicle fuel systems. Because some cars could be damaged, higher ethanol content can only be permitted as a separate blend for compatible vehicles.

There are also environmental risks associated with higher ethanol and oxygenate content. Higher oxygenate content can lead to higher NOx emissions primarily from older vehicles. Increased ethanol content risks higher VOC emissions because of reduced effectiveness of vehicle evaporative controls. Increasing ethanol content above current levels also increases VOC permeation. A higher ethanol blend needs to have a lower vapour pressure than conventional petrol because of its non-linear behaviour if it is mixed with petrol containing a lower ethanol content.

To facilitate expansion of biofuel use, a higher permitted oxygenate is desirable and therefore an approach is taken that reduces the environmental risks. A 10% ethanol blend is proposed as a clearly marked blend.

4.15. Maximum petrol vapour pressure.

The addition of ethanol to petrol raises its vapour pressure. It has been suggested to increase the maximum permitted vapour pressure for petrol blends containing ethanol, which would result in increased VOC emissions. Modelling show that a 10kPa increase would increase overall by around 1% VOC emissions while the Community goal is a 50% reduction by 2020. The overall level of the impact is uncertain.

Making such an exception for ethanol blends is undesirable and the problem can be addressed by removing other light components from petrol such as Butane. Making a special rule for one part of the biofuel industry would not be technologically neutral. Since ethanol suppliers are in direct competition with both ether suppliers (e.g. ETBE) and other biofuels, this would de facto favour one production pathway over others.

The vapour pressure exemption provided for severe winter conditions is clarified to provide legal certainty.

4.16. Lifecycle Greenhouse Gas emissions

Technological advances, energy costs and concern over security of energy supply have led to a number of advances in unconventional routes to supply road transport fuel. Some processes have higher Greenhouse Gas emissions while others are lower. In addition, the production of synthetic fuels is possible from a number of feedstocks, which have widely different Greenhouse Gas emissions. Limited account has been taken of this problem although it is recognised in the Biofuel Strategy.

To address this, a requirement would be introduced for fuel suppliers to monitor and report the lifecycle greenhouse gas emissions of the fuel that they supply. A Committee procedure will develop the monitoring details. Subsequently mandatory reductions in these emissions would be required, supporting the implementation of biofuel policy.

5. MONITORING AND EVALUATION

The indicator of achieving the goals of Directive 98/70/EC is compliance with the fuel parameters. A Fuel Quality Monitoring system is in place and the fifth report for the year 2005 will be published at the end of 2006. The Commission submits annual reports to the Council and Parliament. All data is available on the internet at: http://europa.eu.int/comm/environment/air/fuel_quality_monitoring.htm. Under the changes proposed it will be necessary to introduce reporting and monitoring of GHG emissions from road transport fuel.