TRANSPORT & ENVIRONMENT
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Ensuring carbon reductions from fuel production

How the EU should implement Article 7a of the Fuel Quality Directive

May 2010

In theory, it is a great idea

In December 2008 the European Union adopted the revised Fuel Quality Directive (FQD)[1]. Article 7a of that law contains a powerful new tool for reducing greenhouse gas (GHG) emissions from transport fuel production. The law obliges transport fuel suppliers to cut the carbon footprint of their products, per unit of energy sold, by 6% in 2020, compared to the baseline in 2010 (likely to be set as 86 g CO2/MJ). That footprint includes greenhouse emissions on a so-called 'well to wheel' basis i.e. emissions associated with both the production and the use of the fuels.

Fuel suppliers cannot influence CO2 emissions from the *use* of fuels like petrol, diesel, ethanol and biodiesel. Every litre of such fuels burnt inevitably releases a fixed amount of CO2 into the air. Therefore the law's main impact is that it gives the suppliers an incentive to either clean up the production process of these fuels, or to offer transport energy that emits less CO2 in the use phase such as clean electricity or hydrogen.

T&E has been very supportive of this approach and strongly prefers it over the 10% target for renewable energy (mostly biofuels) by 2020. The main reason is that the GHG target gives fuel suppliers strong incentives to reduce the carbon footprint of their products, whereas the 10% renewables target contains few incentives to do so. The GHG target therefore is far more cost effective and as such it offers far better perspectives for true decarbonisation of transport fuels than quantity targets for specific types of fuels.

More concretely, the directive (in theory) offers two key benefits the renewables target lacks:

- **Safeguards against high carbon fuels** by discouraging suppliers from selling carbon-intensive fuels, such as those derived from tar sands or the coal-to-liquid process, on the EU market.
- **A genuine drive for improvement in GHG performance** by giving a genuine incentive to further improve the GHG savings of biofuels, the electricity used for electric vehicles as well as the efficiency of fossil fuel production, for example by reducing flaring.

In practice, the small print will decide

The benefits are described above as theoretical because the actual scope of reductions that result from this legislation will largely depend on the methodology to calculate emissions from production of fossil fuels such as petrol or diesel. This methodology is currently being developed under the EU's comitology procedure, to be finalised by the end of 2010.

It is absolutely vital that the 'small print' of this law also gives maximum incentives to suppliers of fossil fuels to cut their carbon footprint.

But current draft implementing measures are deeply flawed. This briefing seeks to explain what is at stake and what should be done to ensure this law does what it is supposed to, i.e. that it delivers genuine CO2 emissions reductions from transport fuel production.

Oil-based fuels are not created equal

The Commission currently seems to favour a single GHG default value for all diesel derived from oil, one for petrol derived from oil and other default values for fuels such as hydrogen and coal-to-liquid. As cleaner fuels start to form a larger percentage of the fuel mix, the average carbon intensity will be reduced, with the reductions calculated using the default values for alternative fuels, i.e. biofuels or electricity. However, grouping all oil-derived fuels under two default values would seriously undermine the stated objectives of the law by:

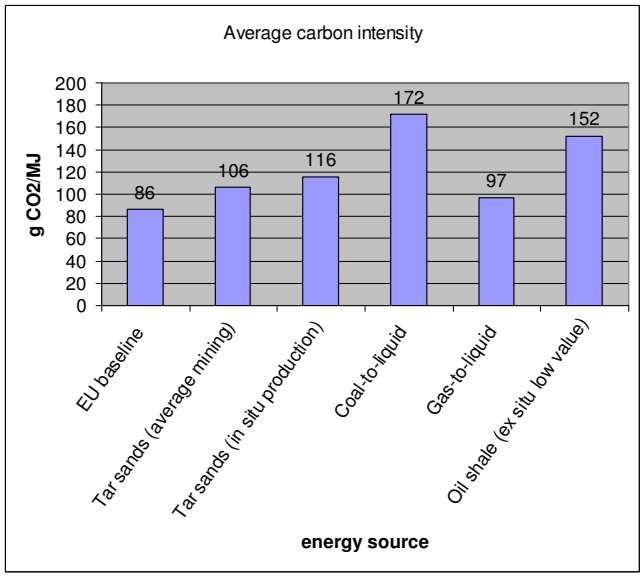
- failing to accurately reflect genuine differences that exist among different production methods and sources of fossil fuels and not incentivising fuel suppliers to use cleaner crudes or invest in extraction efficiency. Oil companies that invest in cleaning up their production chain will get the same default value as those that do nothing or worsen their emissions by investing heavily in the production of high carbon intensity crude oil.
- hampering investments in efficiency along the fossil fuels chain and diluting the

[1] Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC.

safeguard element of the Fuel Quality Directive. This would also reduce the principle of technological neutrality and would therefore impair the future effectiveness of the law.

- creating inconsistencies with the methodology that was developed for biofuels, which requires an accurate lifecycle assessment as well as reporting and verification of sourcing. While biofuel expansion is largely driven by policies and public subsidies, which implies that extra care has to be given to their production methods, it is clear that oil companies should be subject to a similar approach for fossil fuels.

According to media reports, the Commission originally favoured separate default values for different oil-derived products including tar sands. But these were removed, apparently under pressure from Canada and the oil industry[2].



Graph 1: Life cycle emissions of different fossil fuels[3]
This graph compares average carbon intensity of high carbon intensity fuels with the EU baseline carbon intensity, which is likely to be 86 g CO2/MJ. We can see that different fuel sources have an average carbon intensity that is 23 till 100% worse than the EU baseline on a life cycle basis. The difference is created because the extraction and refining of these heavy crudes is more energy intensive and creates more emissions. (Sources: European Commission's public consultation document on the measures necessary for the implementation of the Article 7a(5) and Mui et al. (2010) GHG Emissions Factors for High Carbon Intesity Crude Oils).

The EU can adopt a better approach

A better approach to the Fuel Quality Directive is to establish a set of individual, and conservative, default values for different oil-derived and other fossil sources with the possibility for companies to prove that their processes and products perform better than the default value.

It would be sensible to create separate default values for different sources of fuels, extraction characteristics and technology used, in order to reflect the variation in carbon intensity of oil extraction and production. For each fuel source, these sub-values could be added together to give the overall default value.

If companies can prove that their product performs better than the default, they should be given an opportunity to provide evidence for their better value.

If the default values are set too optimistically, this would not give any incentive to increase the efficiency of production for the more carbon-intensive crudes. It is therefore desirable that they are set at a more conservative level, which would give companies an incentive to look into ways to reduce emissions and prove that they are better than the default.

Conservative default values should be derived by adding together sub-values for the following aspects of the fuel lifecycle:

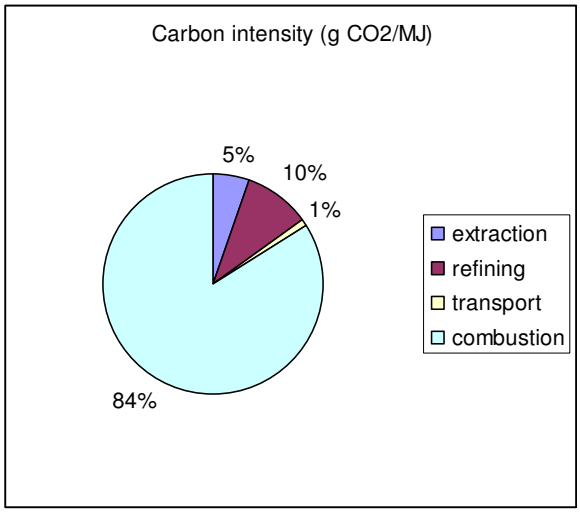
- Energy carrier (e.g: petrol, diesel, electricity, hydrogen)

- Energy source (e.g: diesel can be produced from regular crude oil, tar sands, coal, natural gas, etc.)

- Production/extraction method (e.g: crude oil can be extracted with a lot of flaring, which leads to high GHG emissions, tar sands can be mined through land clearing, etc.)

- Refinery efficiency. As several studies suggest, increasing efficiency decreases production costs and thus adds to the competitiveness of the refinery. Furthermore, refineries are already part of the European Union Emissions Trading Scheme (EU-ETS), so improving the efficiency of their production could bring double benefits to companies that go forward with the investment.

[2] ca.reuters.com/article/domesticNews/idCATRE62N3T920100324
[3] This graph only compares average values of high carbon fossil fuel production on the life cycle basis and the extreme ranges can be much worse.



Graph 2: Life cycle carbon intensity of average EU diesel
This graph shows the carbon intensity of the average value for diesel that was part of the European Commission's consultation document. As can be seen from the graph, 84% of emissions are created during the combustion (use) phase. Fuel suppliers cannot reduce the emissions from combustion. The other 15% of emissions are created during combustion and refining and can be reduced with efficiency measures. The graph only shows average values for refining and extraction. In the case of tar sands production, the emissions from extraction and refining are around 3-times higher, which results in average 23-35% worse emissions over the whole life cycle (see graph 1).

This arrangement would limit the administrative burden, as companies would not be forced to calculate the GHG intensity of each consignment of fuels, but would have the option to use default values instead.

This approach would also ensure maximum environmental benefit, as it would lead to greater transparency and accuracy of GHG reporting and would make GHG reductions from using different crudes feasible.

Last but not least, it would be consistent with the approach to biofuels, which would add to the credibility of the European Union by treating all transport fuels equally.

Accurate reporting is crucial

The approach described above should be underpinned by accurate reporting on GHG emissions from fossil fuels.

This reporting has to start immediately in order to enable regulators a better overview for future reviews of the methodology. Separate default values for high carbon oil are in particular very important in order to ensure that reporting really takes place.

Oil companies should have to report the carbon intensity of their products, including source of fuel and extraction method. In case of failure to provide the data, they would automatically get the highest GHG values for extraction (i.e. tar sands or coal).

Sufficient scientific data are available in the public domain on the production emissions from high carbon intensity oil, notably tar sands, oil shale (see graph 1).

It is important that the structure for the individual default values approach is put in place by the end of this year. The methodology can start by taking into account high carbon crude oils from different sources: tar sands, coal and oil shale are the obvious starting points.

Crude oil produced with large emissions from flaring should also be easy to identify and receive a specific value. Such diversification would enable real incentives for oil companies to invest in reducing production emissions.

Companies investing in good practice would be rewarded, while the ones with inefficient or poor practice would get a carbon penalty based on actual performance.

Conclusion

European institutions have over the next months a unique opportunity to make decarbonisation of transport cheaper and more effective. In order to achieve that, the Fuel Quality Directive should assess the carbon footprint of petrol and diesel in the same detailed way as for biofuels. Only by truly and transparently reflecting the GHG intensity of different sources of fuels across the production chain will bring the desired benefits and reductions in emissions. One default value for all oil-based fuels would seriously limit GHG savings on the fossil fuel side, and hence unnecessarily drive up the cost to comply with decarbonisation targets.

A conservative – technology forcing – set of values would maximise opportunities for CO2 cuts and the future effectiveness and cost effectiveness of the law. The European Commission should set up the structure for this approach as part of the Fuel Quality Directive immediately and ensure that separate default values for high carbon oil, including for tar sands and oil shale, are part of the methodology.

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