

Summary of the study 'Environmental and economic impacts of FQD implementation' by CE Delft and Carbon Matters

A new study by Carbon Matters and CE Delft shows that proper implementation of the Fuel Quality Directive (FQD) with different values assigned to different types of unconventional fossil fuels, such as tar sands and oil shale, can shift investments away from these ultra-high carbon energy sources towards lower-carbon ones, leading to global greenhouse gas savings. As such, the study underpins the need for keeping such differentiated values in the legislative proposal by the European Commission, which is currently subject to an impact assessment.

The Fuel Quality Directive, what it says and where it stands

In 2009 the EU adopted the revised FQD, which obliges fuel suppliers to reduce the carbon intensity of fuels they sell on the EU market by 6%, relative to a 2010 baseline. The idea behind this performance-based target is that it leaves industry the freedom to meet it in the lowest-cost way. One such way is by providing alternative low carbon fuels such as good biofuels, or clean electricity. The 2009 law already provides calculation rules for both. But it does not yet give such rules for measures in the fossil fuel supply chain. These are currently still under discussion.

The Commission's proposal on 'default values'

The law tells the European Commission to propose such implementing measures to report and account for greenhouse gas (GHG) emissions from fossil fuels by January 2011. The Commission eventually published its proposal ten months late, in October 2011. It was voted on in the Technical Committee in February 2012 - without a qualified majority in favour or against.

The proposal assigns carbon intensity to different types (or feedstocks) of fossil fuels through so-called 'default values', based on their average extraction and processing emissions (see table 1 in the next page). In addition, fuel suppliers have to report the carbon intensity, feedstock and origin of the fuels in their fuel mix on an annual basis. If emissions of a specific fuel are lower than the default value, they have the right to submit data and apply for a lower value. If they are higher than the default, they can (and likely will) report the default.

Table 1: Carbon intensity values for different fossil fuel feedstocks in the 2011 proposal

Type of fossil fuel feedstock	Carbon intensity value (g CO ₂ /MJ)	
	Petrol	Diesel
Conventional oil	87.5	89.1
Tar sands	107	108.5
Oil shale	131.3	133.7
Coal-to-liquid	172	172
Gas-to-liquid	97	97

On the request of the committee, the Commission is currently evaluating the proposal for its impact on environment, economy and potential to meet the 6% target.

Oil industry's opposition to 'default values'

The whole point of the Fuel Quality Directive is to act as a tool that rewards fuel suppliers to opt for low carbon fuels and opt out of high carbon ones. Economics suggest that the more options there are to achieve the 6% target, the cheaper the cost of compliance will be. Thus, the introduction of 'default values' for different sources of fuel enables oil companies to have a wide range of options to achieve the FQD target.

However, the oil industry has argued that petrol and diesel values should not be differentiated on the basis of their feedstock and that instead one value for petrol and one for diesel should be used. All reductions should hence come from alternative fuels such as biofuels. One of the arguments for this position was that the administrative burden of reporting and tracing oil would be too high. T&E commissioned a specific study into this issue. The text box below outlines its results.

Difference between administrative and compliance costs

An effective FQD rewards low carbon fuels and discourages high carbon ones; low carbon fuels will become more valuable and high carbon ones less.

The objective of the research commissioned is to assess the impact of such a low-carbon fuel price premium on investment in ultra-high carbon fuels, such as tar sands. It does not forecast what this premium will be. But it will be at least the cost of administrative cost plus compliance costs.

Administrative costs refer to the cost to fuel suppliers of administrative and verification procedures. According to a previous analysis by CE Delft, Carbon Matters and ECN, administrative costs are very moderate, namely around 0.8-1.6 euro cents per barrel of oil or about one quarter to half a cent for a typical 50 litre tank of fuel.

<http://www.transportenvironment.org/publications/lower-carbon-fossil-fuels-big-benefits-low-administrative-costs>

Compliance costs are related with the achievement of the FQD target and can be calculated with the cost of measures to achieve the 6% target, such as good biofuels, clean electricity, and flaring reductions. The cheaper the compliance pathways, the more cost-effective reaching the 6% target is. This is also an argument in favour of having the most compliance options available.

A second industry argument against differentiated default values for petrol and diesel is that such values would only lead to 'reshuffling' i.e. existing high carbon fuels would be sold outside of Europe, and existing lower carbon ones in Europe, without any net change in the amounts of high carbon and low carbon fuel on the market i.e. without an environmental effect. This claim is the subject of this study.

The purpose of the study

T&E has commissioned this study to Carbon Matters and CE Delft, in order to investigate what impact differentiated default values for petrol and diesel would have on investment in ultra-high carbon feedstocks such as tar sands. The impact would come from a price premium on low carbon fuels, and hence a lower market price for high carbon ones, as described in the text box above.

This study specifically looks into the impact feedstock differentiation can have on upstream investments in tar sands. For this reason, consultants looked into the existing cost of tar sands projects in Venezuela and Canada - main production countries - and developed an economic-cost model that evaluated the impacts different price differentials resulting from the FQD would have on existing and new projects and associated GHG emissions reductions. The study does not look at the impact of oil shale or coal-to-liquid, but due to the higher carbon intensity of these fuels, it can be expected that the impact would be higher.

Key findings

1. The study shows that the October 2011 proposal with differentiated values for different unconventional feedstocks for petrol and diesel can save up to 19 Mt of GHG emissions by shifting investment in tar sands projects to lower-carbon alternatives.

The impact mainly depends on two factors. The first is the market price for tar sands crudes (traded as Western Canadian Select or WCS), the second is the price differential resulting from the proposal between tar sands crudes and conventional crude oil. Both are difficult to forecast, therefore the study works with ranges for both. For the purposes of analysis, the study looks into three scenarios with the price differentials of 0.5, 1 and 3 USD per barrel.

The study shows that an FQD price differential will have an impact when WCS prices are between 30 and 90 USD per barrel, which is what they have been so far in 2013. If the prices are lower, no investment in tar sands is viable. If the prices are higher, the FQD differential does not have any impact, because the vast majority of projects become viable.

For existing projects, the impact of a price differential of 3 US\$ is the most powerful at WCS prices of 50 US\$ per barrel, leading to 13 Mt CO₂ emissions savings. For new projects, the impact is the highest at 60 US\$ per barrel, amounting to 13 Mt CO₂ per year. Combined, the impact is the most important at 60 US\$ per barrel, amounting to 19 Mt CO₂ per year.

It is important to note that these GHG savings would be additional to the 50-60 Mt CO₂ savings per year that will be the result of the achievement of the FQD target in the EU by supplying alternative fuels to the market. These 19 Mt CO₂ per year are the global GHG reductions that result from differentiation of tar sands and their reduced viability for the EU market.

The study does not look into the impacts of investment on shale oil and CTL, but the savings from not investing in these high carbon sources are likely to be even higher.

2. Differentiation of unconventional feedstocks will not affect European refineries, as they cannot process these crudes.

European refineries are not equipped to process unconventional crudes, such as the ones from tar sands. Only Spain has recently upgraded refineries to be able to accept some Venezuelan tar sands crudes. For this reason, the differentiation among different feedstocks, as proposed in the FQD, will not have an impact on European refineries. They will not have to make additional investments and they will continue relying on conventional crudes that they can process.

3. Differentiation will impact the imports of products and intermediates to the EU, which can translate into the price signal for upstream investments.

The environmental impact as described above hence stems almost completely from lower prices for tar sand-derived products, especially diesel. With the growth of the EU's imports of diesel and a higher share of tar sands crude entering the refineries on the Gulf Coast (particularly if the Keystone XL pipeline gets built), it is likely that the share of EU tar sands imports through diesel would increase significantly.

In the case of Venezuela, which holds the second largest tar sands reserves in the world, the main bottleneck to export its tar sands fuel is its political situation. If this changes in the coming years, then Europe will be the natural market for Venezuelan tar sands

Conclusions and T&E policy recommendations

The study shows that differentiation between different unconventional fossil feedstocks for petrol and diesel – as in the October 2011 proposal of the European Commission - can give a powerful incentive to shift investment away from ultra-high carbon feedstocks to lower-carbon ones, with significant ensuing environmental benefits.

This approach is justifiable from a legal, fairness and cost-effectiveness point of view. Legal: the FQD obliges feedstock-specific default values. Fairness: why would biofuels be subject to feedstock-based carbon footprinting and fossil fuels not? Cost-effectiveness: giving fuel suppliers the extra compliance option of not supplying ultra-high carbon fuels on the EU market will lower compliance costs.

This study is the first to underpin the possible environmental impact of differentiated values, adding to the urgency to stick to the approach of the Commission proposal.

T&E recommends:

- Leave carbon intensity values for tar sands, oil shale, CTL and other feedstocks in the implementing rules for the FQD.
- Ensure that fuel suppliers are obliged to report these values (and not member states or the Commission).
- Ensure proper verification of reporting and establish a methodology that would allow companies that do better than the default to report actual values.
- Introduce a review clause that would enable further differentiation among conventional crudes and production processes at the later date, when more information becomes

available. Robust reporting for feedstocks and providing methodology for the calculation of actual values are the key steps for this review clause.

Together these recommendations will ensure a consistent incentive to shift investment away from high carbon fuels towards lower carbon ones, and hence ensure environmental robustness and a level-playing field among different fuel suppliers.

References

www.transportenvironment.org/what-we-do/dirty-oil