TRANSPORT & ENVIRONMENT

July 2013

Briefing

A fact-finding trip to the core of the Fuel Quality Directive

The purpose of this briefing is to share the facts about the EU's Fuel Quality Directive and its provisions to label transport fuels according to their greenhouse gas (GHG) emissions intensity from extraction and production processes. An unprecedented lobby has been mounted against the Commission's implementing measures of the FQD, which label fuels from tar sands – along with other unconventional fuels – as more climate polluting than conventional oil and gas. This briefing specifically addresses the arguments brought against the Commission's proposal and provides facts based on science for EU decision-makers. It focuses on climate arguments and does not address other concerns, such as water contamination or local community rights.[1] Some of the fiercest argumentation against the Commission's proposal has been undertaken by the government of Canada, and in particular the province of Alberta, in combination with the oil industry. It is for this reason that parts of this briefing have a specific focus on Canada, although the FQD does not in any way discriminate against Canada.

Context

In 2009, the EU adopted the Fuel Quality Directive (FQD) with a new target, set out in the Article 7a, to decarbonise transport fuels by 6% by 2020 compared to the 2010 baseline. This target sent an important signal that the EU's fuels should become cleaner over time. However, the real scope of the reductions will depend on the 'implementing measures' that define reporting guidelines, the baseline for emissions reductions, and the methodology for carbon intensity of different fossil fuels and electricity. These implementing measures were due to be in place by January 2011. The lobbying against the proposal is causing a considerable delay in the implementation, which at the time of writing is still under discussion.

On 4 October 2011 the Commission published the proposal that outlined the above and included separate labels, or "default" values, for unconventional fossil fuels, such as tar sands and oil shale. The proposal was voted in the Fuel Quality Committee[2] in February 2012 and is currently subject to a Commission's impact assessment.

All about the FQD and Tar Sands

Are tar sands being treated fairly?

The FQD addresses GHG emissions from **all** types of fuels, not only fossil fuels but also biofuels and electricity. A specific methodology, based on the feedstock of origin, already exists under the FQD to treat biofuels according to their GHG intensity.

The proposed FQD measures give default values to **all** unconventional fuels, and tar sands are one of them. The FQD proposal treats all tar sands the same, regardless of whether they are produced in Canada, Venezuela or any other country in the world. The same is the case

for oil shale, coal-to-liquid (CTL) or gas-to-liquid (GTL), which get separate values regardless of where they are produced.

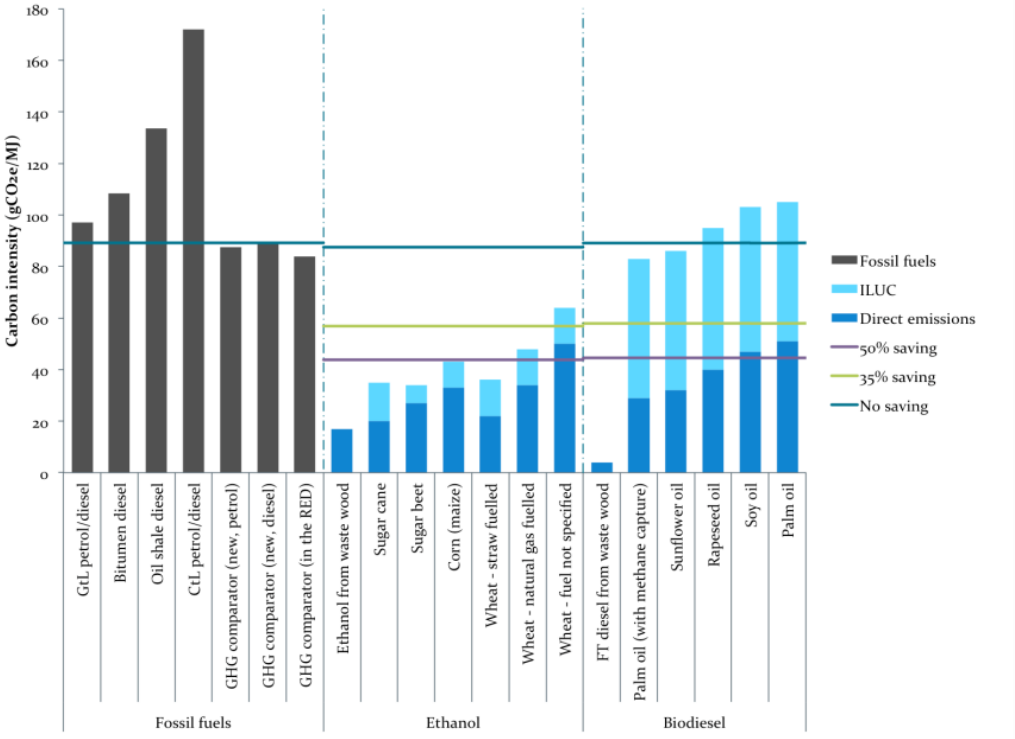

Figure 1 – Carbon intensity of different feedstocks[3]

Tar sands are produced from a different feedstock than conventional crude – also called natural bitumen. Bitumen is a mixture of sand, water and around 11% of oil. Bitumen is too thick to be pumped from the ground and has to be mined or extracted by injecting steam into the ground. Producing petrol and diesel from this feedstock requires much more energy than producing it from conventional crude oil, even the heavy ones, which affects the carbon intensity of the final product.

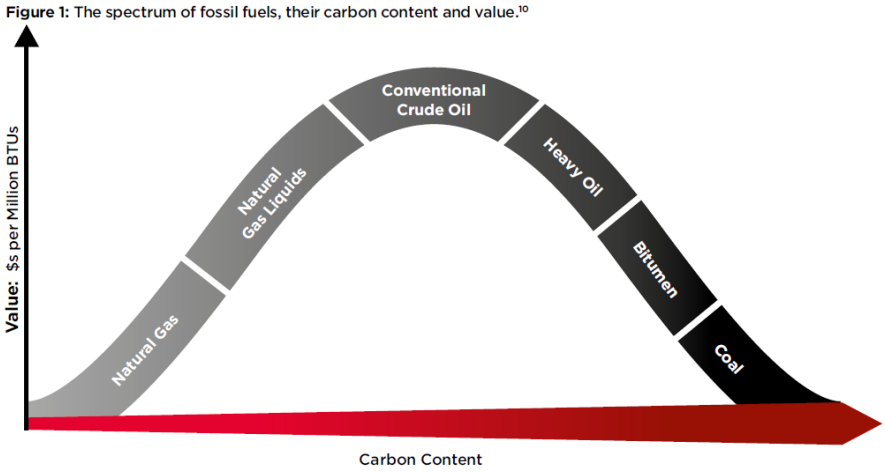

Figure 2: The carbon intensity of different fossil fuels[4]

Tar sands crudes are also different for the following reasons:

- they are generally more dense and viscous and do not flow freely under natural conditions, hence they need different extraction methods;
- they are denser than water (API – American Petroleum Institute gravity - less than 10[5]) which means that unlike regular or heavy crude oil they sink in water. This has proven to be very difficult for clean-up operations in case of tar sands spills.[6]
- they are also treated differently in other regulations. For example, tar sands have different tariff classifications (CN codes) than conventional oil. In the US, tar sands are excluded from the Oil Spill Liability Trust Fund, which provides emergency funds for oil spill clean-ups and claims, because they are different than conventional oil[7].

How do tar sands compare to conventional oil?

Independent scientific studies[8] show that the average carbon footprint from extraction and processing of tar sands is higher than the average carbon footprint of conventional oil. In fact, the only overlap is between the worse conventional oil (produced with very high levels of flaring) and the lowest carbon tar sands projects, as demonstrated in figure 3 below. This clearly demonstrates the need for the FQD to label tar sands with a separate and higher 'default' value than conventional oil. This has also been recommended in the Commission's study by Professor Adam Brandt, who concluded that regulatory frameworks should incorporate "emissions factors that distinguish between oil sands and conventional oil"[9].

In addition, a report by Energy-Redefined LLC for the ICCT shows that "average emissions from tar sands projects are higher than the average emissions from projects that flare"[10].

Figure 3 clearly shows that countries with high levels of flaring, especially Nigeria, on average still have less GHG emissions than the average of tar sands.

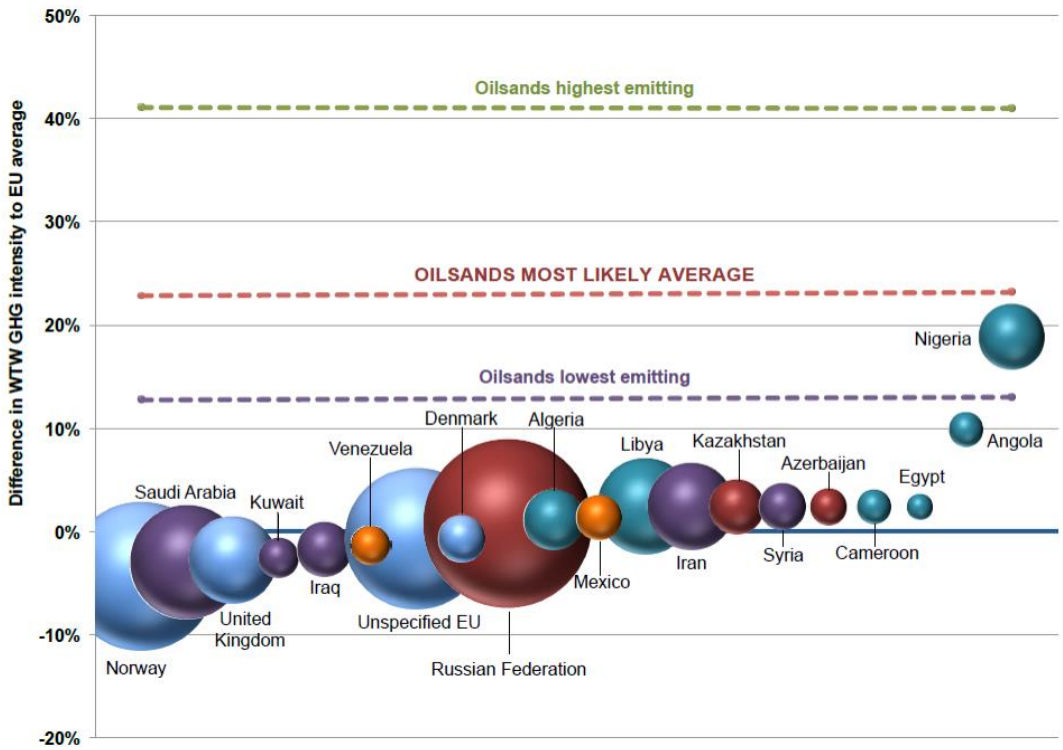

Figure 3 – GHG emissions intensity of conventional EU refinery inputs by source country relative to their weighted average value[11]

In addition, the EU's value for conventional oil includes flaring. Therefore, GHG emissions related to flaring are taken into account. The source for the value is the latest WTW report from JEC (Joint research centre, car industry and oil industry)[12]. With an estimate of an additional 2.5 g CO2/MJ to conventional oil default value, this is considered a conservatively high figure by the authors of the report.

What is the science that underpins the default value for tar sands?

The default value of 107 g CO2/MJ proposed in the Fuel Quality Directive is based on the industry average for tar sands production that could be processed in EU refineries[13]. The figure comes from a peer-reviewed study by Professor Adam Brandt from Stanford University for the European Commission[14], which extensively used the data from Canadian research. The study found that tar sands are on average 23% more GHG intensive than conventional crude currently used in the EU.

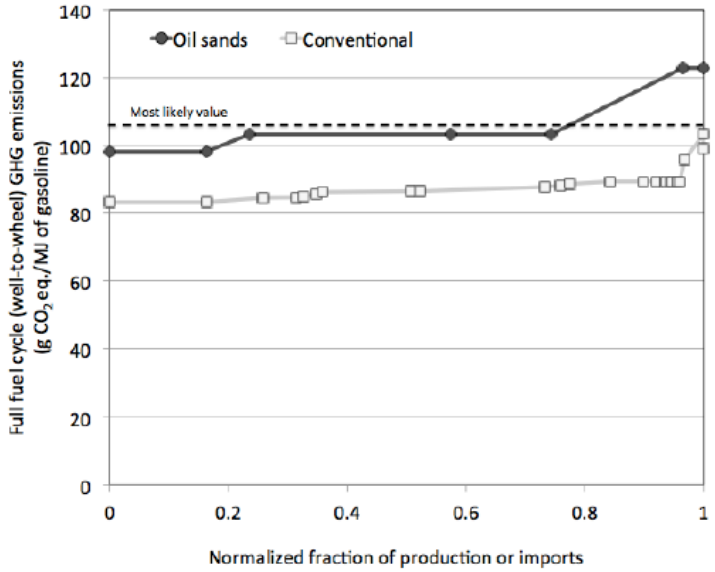

Figure 4 – Well-to-wheel GHG emissions for oil sands and conventional[15]

In addition, a recent NRDC review of 13 scientific studies[16] found tar sands fuels to be 18 to 49% more GHG intensive than the proposed EU default value for conventional oil.

Even the Albertan government's own study, commissioned from Jacobs Engineering Group, found that, in line with the Brandt study findings, tar sands oil is 12% worse than the **dirtiest** conventional oil refined in Europe, and so much worse than the EU average.[17]

It is important to note that the proposed tar sands value is also based on average carbon intensity of current production[18]. This means that tar sands projects that have much higher emissions (for example, the average value for Synthetic Crude Oil produced via in-situ extraction method results in 25% greater emissions (116 g/MJ[19])) will benefit from the average default value, as they will not have to report their higher actual value. According to the proposed regulation, better tar sands projects will be able to show that they have lower emissions. This encourages and rewards research and innovation that would reduce the carbon intensity of tar sands projects.

Are tar sands likely to be exported to Europe?

The FQD addresses **all** types of fuels, including the currently known range of unconventional fuels and biofuels, regardless of the current import or production volumes in the EU.

Although very little unconventional oil from tar sands or any other feedstock is entering the EU market, these fuels have a common characteristic: even in small quantities, they can significantly increase carbon intensity of transport fuels and move Europe away from meeting the 6% FQD target. Thus, the approach that sets specific default values for each unconventional fuel to clearly label its carbon intensity and inform future supply decisions and investments by European companies, makes a lot of sense.

However, current low import volumes do not offer any guarantee that unconventional fuels will not reach the EU market. A lot depends on the approval of the planned pipeline projects in Canada and the US. Most notably, if the Keystone XL pipeline gets built, it will bring more than 500.000 barrels per day of additional tar sands crude to the Gulf of Mexico. The Gulf Coast refiners at the end of the pipeline's route are focused on expanding exports[20]. Several refiners are already exporting diesel to Europe, due to Europe's diesel deficit (Valero exports 165.000 barrels per day) and they plan to further expand this with tar sands crudes.

Misleading claims by Canada and industry

Canada is not penalized for transparency on emissions from its tar sands projects

Canada often claims that it is penalized for being transparent about the carbon emissions of its tar sands; while other countries with equally high emissions just don't report them. As we have seen above, this is not the case: the emissions from tar sands are scientifically proven to be higher than emissions from conventional crudes - even the ones with a lot of associated flaring. All tar sands produced around the world will get a higher GHG value, while all conventional oil (also produced in Canada) will get a value for conventional oil.

Unconventional oil is also being produced in Europe, notably in Estonia, where large reserves of oil shale are planned to be used for transport. Another study from Adam Brandt shows that oil shale is 50% more carbon intensive than the average for conventional crude currently used in the EU[21]. It clearly proves that the European Union is not trying to penalise anyone for transparency, but rather to provide an accurate assessment of carbon intensity, as demanded by the legislative mandate in the FQD.

Canada would likely lose any potential WTO challenge

Despite Canada's threats to challenge the default values for tar sands in the WTO, a legal analysis from June 2011 demonstrated that the European Union would have a strong likelihood of success in case of a WTO challenge.[22]

Under WTO rules, there is a general prohibition of discrimination against "like products" (articles I and II of the GATT): foreign "like products" should not be subject to a less favourable treatment than national ones, with an exception when the measure has been taken in view of achieving an environmental objective (article XX(g) of the GATT) in a non-discriminative manner.

Canada bears the burden of proof that tar sands can be considered "like products" to conventional crudes and that, due to this, they receive a less favourable treatment. At the feedstock level, physical characteristics of tar sands differ from those of conventional crudes (lower density compared to water, different viscosity at different temperatures). In addition, tar

sands don't have the same tariff classification (Combined Nomenclature code) than conventional crude. This is why tar sands would not be considered like products.

Even in the unlikely case that the WTO body finds that tar sands are a like product, the EU can still adopt non-discriminatory trade-restrictive measures, under article XX(g) of the GATT, for the purpose of the conservation of exhaustible natural resources. The legal analysis demonstrates that FQD reporting measures comply with all the requirements introduced by this article. The climate system can be considered an exhaustible natural resource. Moreover, the European Union has acted in good faith, setting up implementing measures backed by the best available scientific evidence and treating unconventional crudes alike, regardless of their location.

Canada defaults on its own climate legislation

After leaving the Kyoto Protocol[23], Canada decided on a target to reduce its total greenhouse gas emissions by 17 per cent from 2005 levels by 2020 (under the Copenhagen accord). The government is often claiming that it is halfway towards achieving this target. However, the latest national projections show that in 2020 Canada's emissions will be in the range of 2005 levels (rather than 17% below) and 19-23% above the target[24]. Despite these projections, Canadian officials are still depicting their country as a world leader in the fight against climate change.

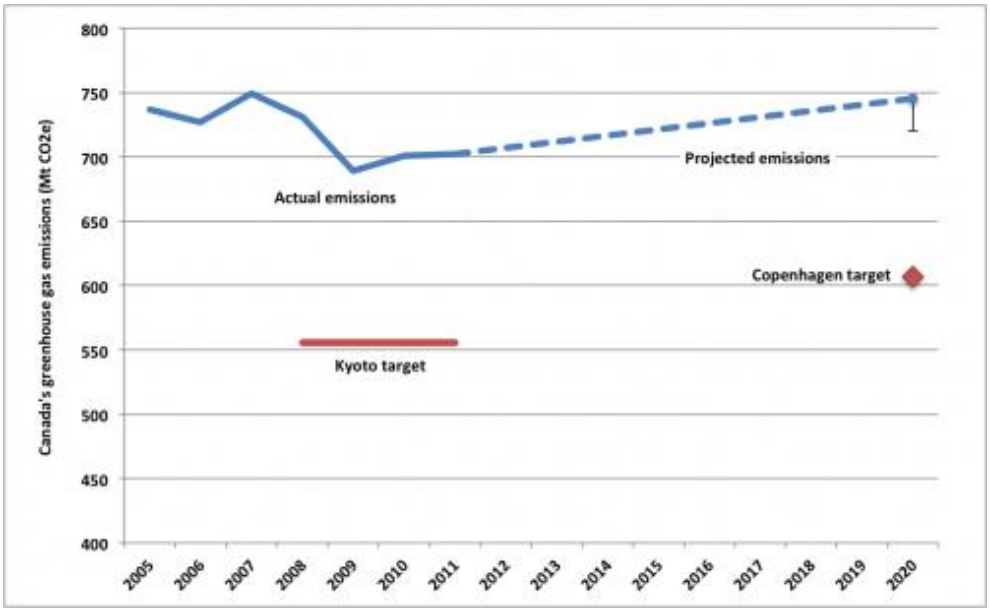

Figure 6: Canada's GHG emissions[25]

Substantial growth of tar sands production is often cited as a reason for Canada's growing GHG emissions and also for Canada dropping out of the Kyoto protocol[26].

Alberta doesn't properly address GHG emissions from tar sands

Like the federal government, the government of Alberta is often describing its province as one of the most progressive in the world in terms of environmental protection. It is also specifically referring to its provincial regulation to prove that it is addressing the problem of GHG emissions from the tar sands industry. But when looking in more detail at its functioning, the impacts on GHG emissions don't seem to be that significant. The Specified Gas Emitter Regulation that came into force on 1 July 2007 is not a carbon tax. In fact, Alberta has put into

place a hybrid system, combining an intensity target and a flexible system for offsetting emissions.

Basically, facilities that emit more than 100,000 tons of greenhouse gases a year are required to reduce their net emissions intensity (the amount of CO2 per barrel of oil in the case of tar sands) by up to 12% compared to a facility-specific baseline. Emitters can chose between four options to meet their target, including contributing $15 a tonne to a dedicated technology fund or the use of Alberta-based offset credits.[27] If the facility reduces its emissions intensity as required by the regulation, it doesn't have to pay anything.

Since the compliance is required only for the 12% intensity reduction target, the regulation doesn't cover the GHG emissions growth from the tar sands projects. The incentive given by the regulation to decrease emissions is finally quite weak, as the marginal cost is effectively capped at $15 per tonne and average costs are limited to at most $1.80 per tonne.[28] GHG emissions from the oil sands sector are expected to increase by 73 Mt during the period 2005-2020[29] with this policy in place, undermining the achievement of Canada's climate targets.

Opening the doors to unconventional fuels will not increase Europe's energy security

An argument often used to justify the extraction of tar sands and other unconventional fuels is energy security. This argument is partly based on the assumption that unconventional sources of energy are located in "friendly" countries, such as Canada, and most of the conventional are located in countries with unstable political systems and poor regulatory frameworks. The following map shows clearly that, on the contrary, unconventional sources of fuels are located all over the world, including in countries like Russia, Congo or Venezuela. Thus, going for the exploitation of unconventional fossil fuels will not automatically increase Europe's energy security in the same way as reducing oil consumption or switching to more sustainable alternatives, such as renewables.

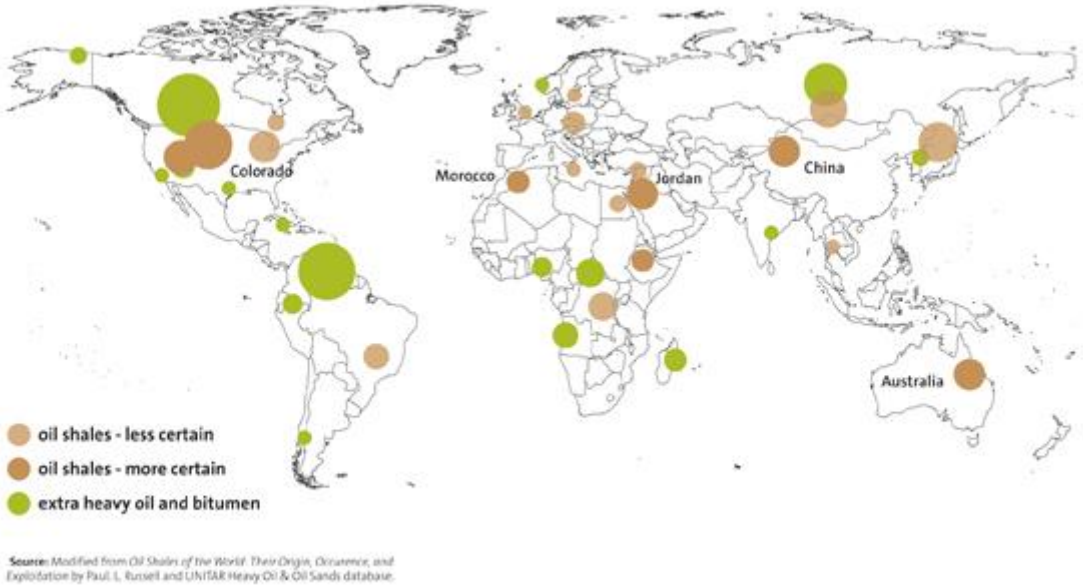

Figure 7 – Oil sands and oil shale reserves around the world[30]

Global environmental gains - our conclusion

Regulating high carbon fuels in the FQD will lead to global GHG benefits

Many opponents to the FQD argue that the differentiation between low-carbon fuels and high-carbon fuels will just result in reshuffling and therefore won't have any impact, or might even lead to an increase in global GHG emissions due to higher shipping emissions[31].

T&E commissioned a study[32] looking at the economic and environmental effects of the FQD. This study, carried out by CE Delft and Carbon Matters, proves that proper implementation of the FQD (with company-specific reporting and default values) could save emissions of up to 19 million tonnes of CO2 every year – equivalent to taking 7 million cars off the roads, solely due to reduced investment in tar sands projects.

Because low-carbon fuels are bringing oil companies closer to meeting their 6% target, these fuels would receive a price premium on the market, while high carbon fuels would have to be sold at a discount, as they make the achievement of the target more difficult. Fuel suppliers would therefore be incentivised to invest in low-carbon fuels and *disincentivised* to invest in high carbon fuels. On this basis, an economic-cost model has been developed to evaluate the impacts that different price differentials resulting from the FQD would have on existing and new projects, and associated GHG emissions reductions. The model showed that any price differential would have an impact in reducing investments and production of tar sands – therefore resulting in global GHG benefits.

Proper implementation of the FQD will lead to minimum additional administrative burden

The administrative cost of implementing the Commission's FQD proposal would be minimal. A study by CE Delft and Carbon matters shows that it would add less than half a eurocent for a 50-litre fill-up or a maximum of 1.6 eurocents per barrel of oil, but it would make the overall compliance with the target cheaper. The industry has claimed a figure of $1 a barrel, but has not published any research to back it up.[33]

Conclusions - why it is important to regulate unconventional fuels

This briefing demonstrates that the science on high carbon intensity of tar sands and other unconventional fuels is clear and that Europe should stick to its original FQD proposal and strengthen it further.

Exploitation of unconventional fuels will only lead us further away from climate solutions, needed to avoid dangerous climate scenarios above 2 degrees. Figure 8 shows how Canada has already approved more tar sands projects than what would be in line with the IEA 6 degrees (Climate Catastrophe) scenario. Policies like the FQD are critical in ensuring that investments from such high carbon fuels are diverted to lower carbon projects.

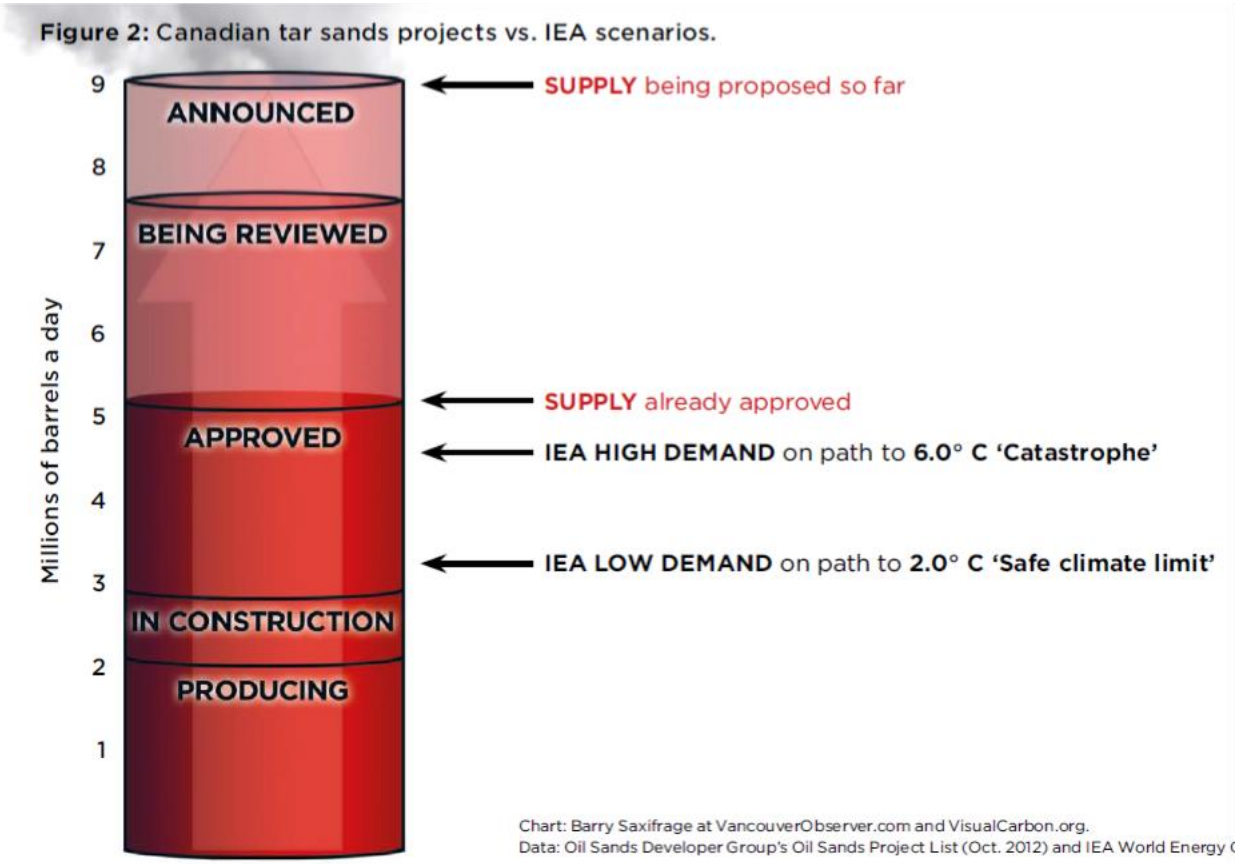

Figure 8 – Canadian tar sands projects compared with IEA climate scenarios[34]

T&E recommends that policy-makers:

- Stick to the 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 individually report these values (and not member states or the Commission). Only supplier specific reporting will provide an incentive to invest in truly cleaner fuels.
- 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 methods at the later date, when more information becomes available.

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.

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

References:

[1] For more information on these issues: http://oilsandsrealitycheck.org/.

[2] The "Fuel Quality Committee" is a committee of experts from the 27 Member States.

[3] *Drivers & impacts of Europe's biofuel policy*. Transport & Environment, BirdLife Europe, Friends of the Earth Europe, European Environmental Bureau, P.2, http://www.transportenvironment.org/sites/te/files/publications/Biofuels_FACT_SHEET_FINAL.pdf

[4] Stockman, L.; *Petroleum Coke: the coal hiding in the tar Sands.* Oil Change International, January 2013, p.8, http://priceofoil.org/content/uploads/2013/01/OCI.Petcoke.FINALSCREEN.pdf

[5] API - American Petroleum Institute gravity - is a measure of the density of the petroleum liquid compared to water. If its API gravity is greater than 10, it is lighter and floats on water; if it is less than 10, it is heavier and sinks.

[6] The spills are more damaging and difficult to clean, as shown by the 2010 Enbridge tar sands spill into the Kalamazoo River: Swift, A.; *Tar sands pipeline risks - examining the facts*. Natural Resources Defence Council Staff Blog, March 2103, http://switchboard.nrdc.org/blogs/aswift/tar_sands_pipeline_safety_risk.html

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[12] JEC Well-to-wheels analyses**,** http://iet.jrc.ec.europa.eu/about-jec/jec-well-wheels-analyses-wtw

[13] The value is based specifically on the GHGenius model, developed by (S&T)2 Consultants for Natural Resources Canada and described in the Adam Brandt study as the "most likely case".

[14] Brandt, A. R.; *Upstream greenhouse gas (GHG) emissions from Canadian oil Sands as feedstock for European refineries*.

[15] Brandt, A. R.; *Upstream greenhouse gas (GHG) emissions from Canadian oil Sands as feedstock for European refineries*. P.5 Figure 2.

[16] Mui, S.; Tonachel, L.; McEnaney, B.; Shope, E; *GHG emission Factors for High Carbon Intensity Crude Oils.* Natural Resources Defence Council, Sept. 2010, http://docs.nrdc.org/energy/ene_10070101.asp.

[17] The Jacobs report says that, for Alberta heavy crude oil, the carbon intensity of diesel fuel is within 12 per cent of the upper range of carbon intensity for diesel from representative crude oils refined in Europe. For more information: Huot, M.; *Alberta government misinterprets findings of Jacobs report on oilsands emissions*. Pembina blogs, May 2012, http://www.pembina.org/blog/627

[18] Brandt, A. R.; *Upstream greenhouse gas (GHG) emissions from Canadian oil Sands as feedstock for European refineries*.

[19] In-situ extraction method is required when oil sands are too deep for surface mining, more than 75 metres underground. This method consists of drilling several wells into the deep oil sands deposits. Then, high-pressure steam is injected to heat the bitumen so that it can flow and it is then pumped to the surface. Mui, S.; Tonachel, L.; McEnaney, B.; Shope *GHG emission Factors for High Carbon Intensity Crude Oils.* Natural Resources Defence Council.

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[27] The two other options are: make improvements to their operations or purchase or use Emission Performance Credits. Alberta, Environment and Sustainable Resource Development, Greenhouse Gas Reduction Program, http://environment.alberta.ca/01838.html

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