

The tar sands threat to Europe: briefing

Summary

An analysis by the Natural Resources Defense Council (NRDC) based on recent developments in the North American oil market reveals that, unless Europe takes action, 5.3 to 6.7% of its crude oil and transport fuels will likely come from Canadian tar sands by 2020. This is 30 times higher than estimated in the European Commission's study which underpins its impact assessment for the implementation of the Fuel Quality Directive (FQD).

New pipelines planned or under construction in North America, in combination with refinery developments in Europe, could turn Europe into a significant market for Canadian tar sands oil. This is good news for Canada's tar sands producers, since US demand is decreasing as a result of increasing tight oil production and slowing demand. But it is bad news for Europe and its efforts to reduce its climate change impact.

Tar sands are 23% more greenhouse gas intensive than conventional oil, according to a Commission study. The NRDC analysis concludes that European imports of tar sands will rise from 4.000 barrels per day (bpd) in 2012 to over 700.000 bpd in 2020. This would be the equivalent of adding six million cars to Europe's roads by 2020. It would also mean that the greenhouse gas intensity of European fuels *increases* by around 1.5% in 2020. Meanwhile, under the European Union's Fuel Quality Directive, fuel suppliers have to *decrease* this intensity by 6% by 2020.

With tar sands in the fuel mix, achieving the additional emissions reductions will cost more money. Fuel suppliers will likely choose to supply more biofuels produced from food crops, which continue to be rated as low carbon under the EU's flawed carbon accounting rules. This could drive up compliance costs by an estimated 4 billion Euros per year and increase pressure on the environment and food production. The extra cost can be avoided by a robust implementation of the FQD - which keeps tar sands out of Europe.

This briefing shows that there is no time to lose for the Commission, since significant amounts of high carbon tar sands are on the verge of entering Europe.

"You can have all the oil and gas in the world, but it's not much good if you can't get it to market...the FQD (European fuel quality directive) could stigmatise the oil from Canada and impact on our access to some markets. It would clearly not be helpful. While the growth in demand is not as high [as in Asia], Europe is the biggest single market in the world right now."
- Joe Oliver, Minister of Natural Resources, Government of Canada¹

The Fuel Quality Directive and its decarbonisation target

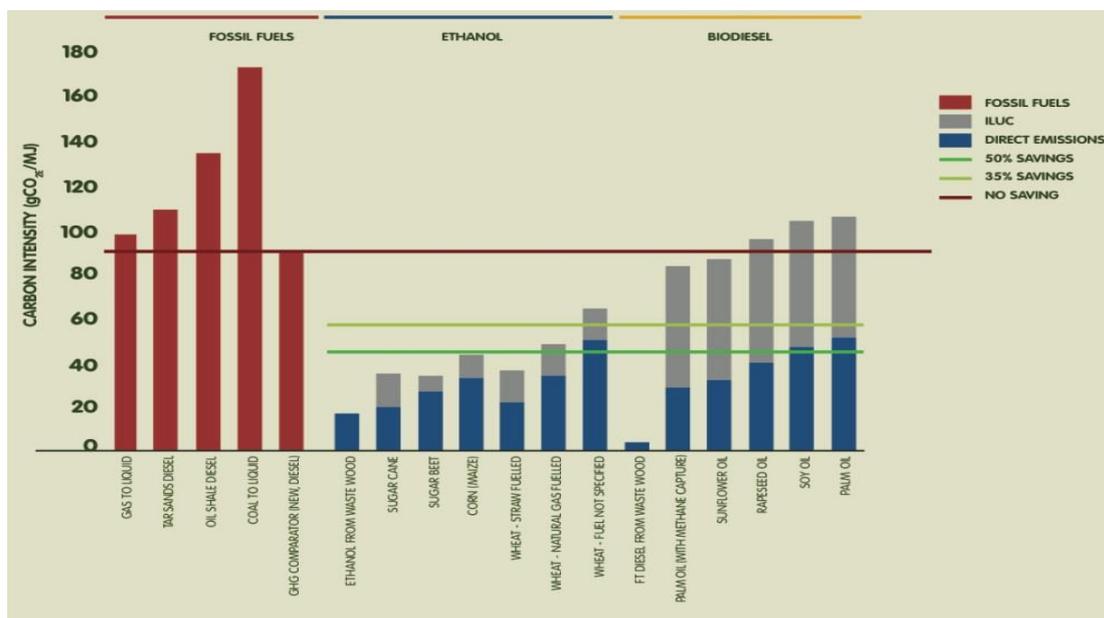
The Fuel Quality Directive (FQD), adopted in 2009, obliges fuel suppliers to reduce the lifecycle greenhouse gas intensity of transport fuel by 6% by 2020, compared with 2010. This reduction can be achieved through the use of biofuels, renewable electricity and a reduction in the flaring and venting of gases during the extraction of fossil fuels.

According to the Directive, fuel suppliers have to report each year on the greenhouse gas intensity of their petrol and diesel. However, the implementation of this reporting clause is still pending.

In 2011, the Commission published a proposal that assigned each source of fuels a greenhouse gas intensity value, including conventional crude oil as well as unconventional feedstock such as tar sands, oil shale, coal-to-liquid and different gas derivatives. It also set out reporting obligations for fuel suppliers to individually report on the feedstock of the fuels they are selling in Europe. Independent research for the Commission found tar sands fuels to be 23%

more greenhouse gas intensive than fuels made of conventional oil,¹ but less carbon intensive than oil shale or coal-to-liquid (see figure 1). These values complement those for direct emissions from biofuels that have already been established in the law.

Figure 1: Carbon intensity values for different transport fuels



This proposal was voted in a Member State committee in February 2012. However, the vote ended without a decision. Following requests by some Member States, the Commission conducted a regulatory impact assessment analysing various policy options. The Commission found that, without further action, tar sands from Canada could make up 0.2% of the Europe's transport fuel consumption in supply in 2020, with an additional 2.8% coming from Venezuela.²

Tar sands imports make the FQD 6% reduction target more costly to reach

The EU currently consumes almost no transport fuels from unconventional sources, and has set in place mandatory climate and clean energy targets. The ICF research for the Commission suggests that the EU would only become a small market for unconventional, high carbon fuels³, although these fuels would still lead to an increase in the greenhouse gas intensity of EU transport fuels. However, new research by the NRDC shows that, due to recent changes on the North American oil market, the amount of tar sands from Canada could be significantly higher. Taking the International Energy Agency (IEA) estimates for oil consumption in Europe as a basis, oil from Canadian tar sands could reach up to 6.7% of the EU transport fuels consumption in 2020, which would **increase the greenhouse gas intensity of European transport fuels by around 1.5%.**⁴ This represents a quarter of the 6% reduction target and is equivalent to adding around 6 million cars on European roads by 2020⁵.

¹ https://circabc.europa.eu/d/d/workspace/SpacesStore/db806977-6418-44db-a464-20267139b34d/Brandt_Oil_Sands_GHG_Final.pdf

² <http://www.transportenvironment.org/sites/te/files/publications/15.04.13%20Revised%202020%20baseline-1.pdf>

³ All unconventional fuels (tar sands, coal-to-liquid, gas-to-liquid and oil shale) would represent 4.1% share of European transport fuel consumption in 2020.

⁴ 6.7% (share) * 23% (extra GHG intensity) = 1.5%. Note this excludes tar sands imports from Venezuela and all other unconventional oil that will also be imported to the EU.

⁵ 1.5% of around 900MT of CO₂ under the FQD is 13MT of CO₂. In 2020, the well-to-wheel emissions from a car will be around 2.2t CO₂/yr (±13,000 km/y, ±150 gCO₂/km real-world fleet average, ±15% well to tank emissions).

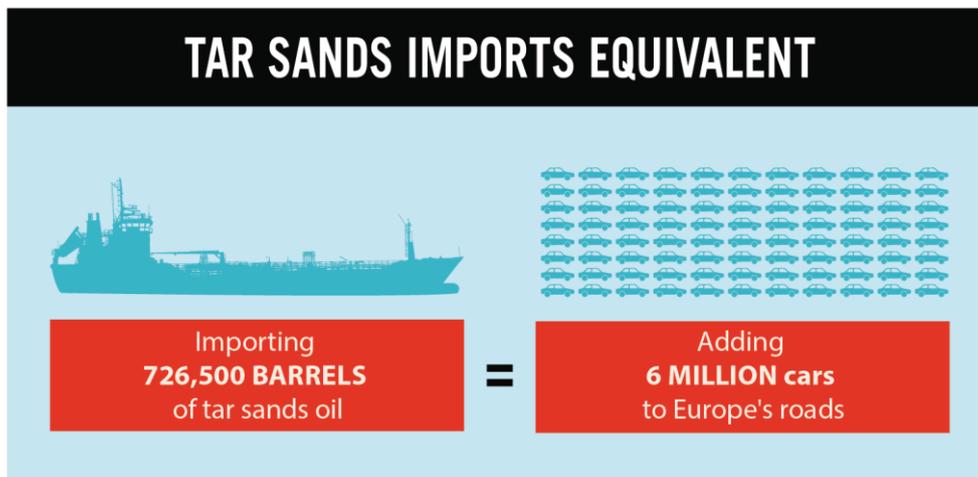


Table 1: The difference between Commission and NRDC estimates for unconventional oil supply to the EU in 2020⁶

Study	Tar sands Venezuela	Tar sands Canada	Other unconventional oil (CTL, GTL, oil shale)
Commission study (ICF)	2.8%	0.2%	1.1%
NRDC study	Not calculated	5.3-6.7%	Not calculated

The extra emissions from an increased use of tar sands fuels in Europe makes the FQD targets much more difficult to achieve. Europe has two options to deal with this.

The first is to prevent these extra emissions from happening in the first place by making each fuel supplier report on their tar sands fuels, thereby discouraging their imports. This can only be done if tar sands fuels are correctly labelled for their higher carbon intensity, and companies held accountable individually.

The second option is for fuel suppliers to reduce the additional emissions by blending in more biofuels. This is because under EU rules, the carbon emissions of biofuels continue to be underestimated, despite scientific evidence that their full carbon footprint can even be higher than that of fuels produced from crude oil.⁷ Fuel suppliers would choose this option if the directive differentiates between conventional and tar sands oil but does not oblige each company individually to report its emissions.

We made an indicative calculation of the additional compliance costs: achieving an additional 1.5% reduction in greenhouse gas (GHG) intensity could be done by supplying an extra 3% biofuels that deliver approximately 50% GHG savings compared to conventional fuels. Today's biofuels volume (around 5%) costs Europe 6-8 billion EUR/year⁸. Supplying 3% more biofuels would therefore cost an extra 3.6-4.8 billion EUR, and probably more since most of today's biofuels do not achieve 50% lower carbon emissions if emissions from indirect land-use change are taken into account. This means that the cost of meeting the higher FQD target with biofuels alone would increase by around 4 billion EUR a year, whilst also increasing environmental pressures. This cost would ultimately be borne by European drivers and taxpayers.

⁶ As the Commission did not include 2030 figures, the comparison focuses on 2020.

⁷ <http://www.transportenvironment.org/what-we-do/what-science-says-0>

⁸ The IEA estimates that the EU subsidised biofuels at 8 billion EUR/year in 2011 (http://www.worldenergyoutlook.org/media/weowebiste/2012/WEO2012_Renewables.pdf). The International Institute for Sustainable Development assumed that the annual subsidy in 2011 was 6 billion/year (<http://www.transportenvironment.org/publications/uneven-returns-economics-eu-biofuels-policy>). In 2011, the EU consumed around 4.7% biofuels.

Rapidly changing oil market leads to increasing imports of heavy crude oil to Europe

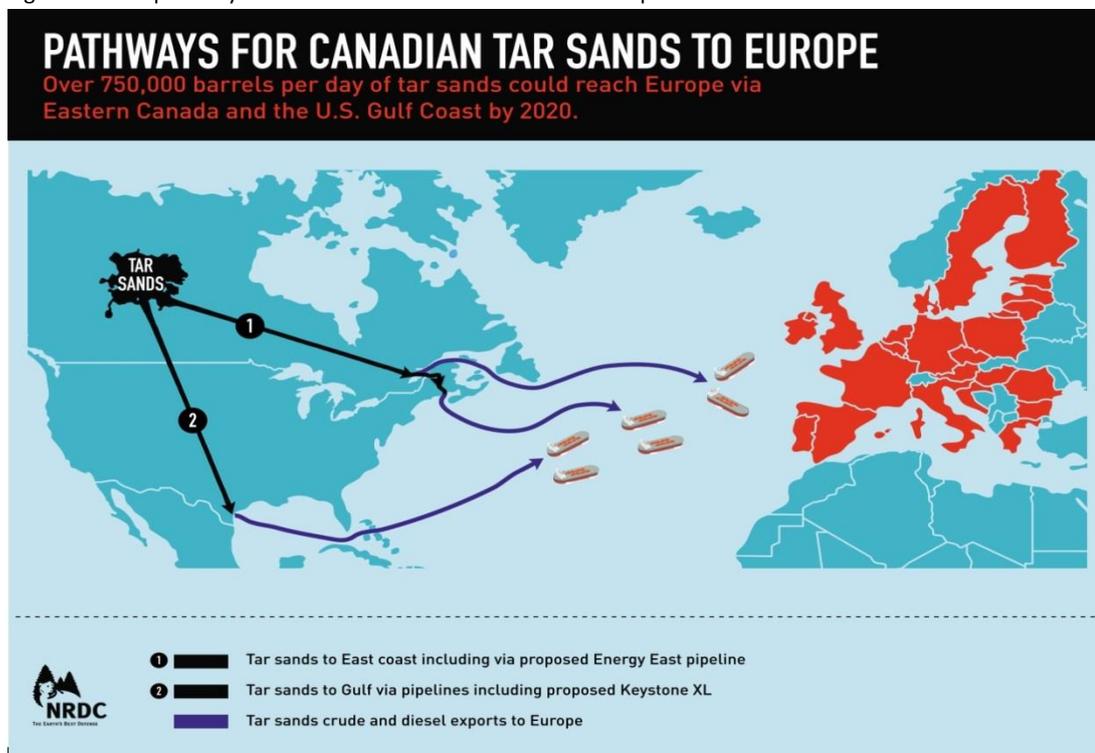
Carried out in early 2013, the impact assessment study for the European Commission did not anticipate some of the recent changes in the North American oil market, and therefore assumed a very limited role for Canadian tar sands to enter Europe. One of the main assumptions has been infrastructure constraints for tar sands crude to reach tidewater ports and a limited capacity by European refiners to process tar sands oil. Yet recent developments have changed the outlook. For example, TransCanada's current Energy East tar sands pipeline could bring 1.1 million bpd from Alberta to eastern Canadian ports. It has Europe as one of the main intended destinations for the crude oil. Moreover, market dynamics in the US Gulf Coast region will likely facilitate higher volumes of diesel exports than projected. The US is already a competitive diesel exporter to Europe and is set to export even more. Due to further pipelines projects, crude arriving at the US Gulf coast will include a higher share of Canadian tar sands oil in the future.

Crude oil markets in North America are rapidly changing. The growth of US shale oil (or tight oil) production combined with slowing demand for oil due to efficiency standards for vehicles and export restrictions on crude oil⁹ have led to a glut of supply. This means that Canadian tar sands oil, which has been exported only to the US so far¹⁰, needs to find new markets. The EU is an attractive market that is geographically close, import dependent and in need of large amounts of diesel.¹¹ Gaining access to new markets is especially important for the tar sands industry, because it plans to increase its production from 1.4 million bpd in 2012 to 5.8 million bpd by 2030.

Currently, the ability to expand is constrained by the lack of pipeline capacity and could be further limited by clean fuel standards such as the FQD.

There are two major pathways for tar sands fuels to come to Europe

Figure 2: Main pathways for Canadian tar sands oil to reach Europe



⁹ <http://insideclimatenews.org/news/20140106/2014-export-american-oil-contentious-industry-goal-after-4-decade-federal-ban?page=2>

¹⁰ In 2012 US imported 1.65 million bpd of Canadian crude (Oil change International, 2013).

¹¹ Around 60% of the fuel used in the road transport sector in the EU is diesel. This share will go up to 80% in 2030, unless lower taxes on diesel fuels change. This is currently being revised with the energy tax directive, but appears difficult to change, as Member States have to agree with unanimity to any revision.

1. Energy East pathway from Alberta to the East of Canada – mostly crude oil exports

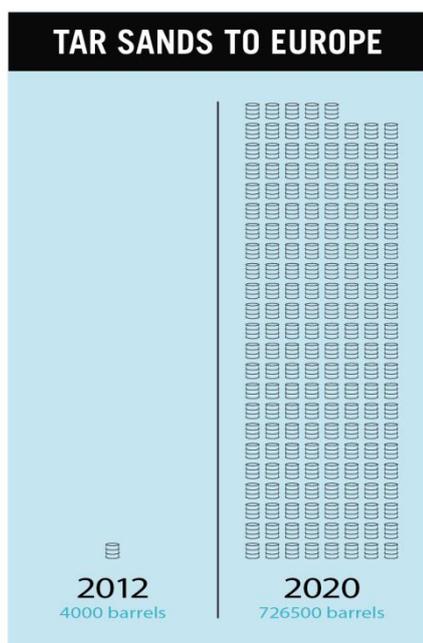
This pipeline, recently proposed by TransCanada, would link tar sands production in Alberta with the ports on the Canadian East Coast. It would be able to transport 1.1 million bpd of tar sands crudes. It is clear that the Energy East pipeline project is an export pipeline and oil company executives have mentioned Europe (and in particular Spain) as a priority destination. The oil exported would be crudes, either heavy diluted bitumen or light synthetic crude oil (SCO). A number of refineries in Spain can process heavy crudes, including diluted bitumen.¹² In addition, the Spanish oil company Repsol has existing ties with TransCanada’s key partner Irving oil.

2. US Gulf Coast pathway from Alberta to the East of the US – mostly diesel exports

Gulf Coast refineries export increasing amounts of diesel to Europe, with volumes going up from 66,000 bpd in 2008 to 335,000 bpd in 2012. In addition, many refineries have already modified their operations to increase the diesel production and the yield of diesel from heavy oil, such as tar sands. Increasing pipeline capacity from Alberta to the Gulf Coast has been a top priority for the tar sands industry. Several pipelines have been proposed, are being reversed or built in order to increase the capacity. The most notable one is Keystone XL, which could add another 830,000 bpd of capacity from tar sands to the Gulf Coast adding to 110,000 bpd currently received. This means that the volume of tar sands processed in Gulf refineries could grow to nearly 24% of all crude by 2020.

Table 2: Potential volumes of tar sands derived oil reaching Europe through major routes in 2020 and 2030

	Potential exports of tar sands derived crude from Eastern Canada if Energy East goes ahead (bpd)	Tar sands derived diesel exports from the U.S. Gulf (bpd)	TOTAL (bpd)
2012	0	4,000	4,000
2020	454,000 – 606,000	120,500	574,500 – 726,500
2030	371,000 – 494,000	148,125	519,125 – 642,125



In addition to these two major pathways, there are other routes that could lead to more tar sands exports to Europe but are excluded from the calculations. These are:

- Other US pathways

It is likely that the volume of Canadian tar sands crude, if the Keystone XL pipeline gets built, will exceed capacity of US refineries at the Gulf Coast, which could lead to crude exports from there.¹³ In addition, some tar sands crude will be transported by train from North Dakota to New Jersey and could be exported to Europe via a Bahamas terminal.

- Tar sands crude imports from Venezuela

According to the ICF study, Europe would get up to 2.8% of its transport fuel from Venezuelan tar sands in 2020.¹⁴ The Spanish company Repsol recently announced a 4 billion USD investment in the Venezuelan

¹² These refineries are in are the Repsol refinery in Cartagena, the Repsol/Petronor refinery in Somorrostro (near Bilbao), and the BP refinery in Castellon. Foster Wheeler, “SYDEC Delayed Coking: Maximize profit from the bottom of the barrel,” (undated), www.digitalrefining.com/data/printed_adverts/file/Delayed_Coking.pdf.

¹³ The US has restrictions for exports of US crude oil in place. However, these restrictions would not apply to Canadian crude oil shipped from US export terminals.

¹⁴ ICF expects Venezuela to export 169 PJ of crude to Europe in 2020. At 6.1 gigajoules a barrel, this converts to approximately 80,000 bpd. ICF International, “Impact Analysis of Options for Implementing Article 7a of Directive 98/70/EC – Revised 2020 baseline fuel mix and costs,” Slide 33.

Orinoco belt, which holds the largest accumulation of heavy and extra-heavy crude (tar sands) in the world. This coincides with Repsol's plans to upgrade refineries in Spain (see below).

- **Indian tar sands derived diesel**

India is a major exporter of diesel to Europe and will likely remain so in the short to medium term. Indian refineries are able to process heavy crudes and have expressed interest in using tar sands as a feedstock. If constructed, India could receive tar sands crude via Energy East and other pipelines.

All pipelines that have been proposed and are discussed in this report are subject to substantial public opposition in Canada and in the US. Keystone XL is the prime example of such a pipeline - it has been delayed for 5 years due to significant public opposition and has to be approved by President Obama himself. The development of pipeline projects will be one of the main factors in determining how much tar sands derived oil could reach Europe in 2020.

Capability of European refineries to accept tar sands crudes

While there are no technical challenges with importing diesel produced from tar sands to Europe, tar sands crudes are very heavy and need additional refining. So far it was assumed that the capacity of EU refineries to process these crudes was limited. However, new research shows that up to 700,000 bpd of European refining capacity could be used to refine tar sands crude (diluted bitumen) by 2020.¹⁵ According to the IEA, European refineries are investing in additional capacity to refine heavy crude, which is expected to increase by 70% between 2008 and 2018. Many refineries, such as Repsol's Cartagena and Bilbao refineries, are already configured to maximise the input of heavy crudes. These refineries can take either Venezuelan or Canadian tar sands oil and the capacity is sufficient to absorb all the crude that would come via the Energy East pipeline. By 2030 the refining capacity could grow to up to 1.4 million bpd.

Conclusion and policy recommendations

The growth of Canada's tar sands industry in the coming decades depends crucially on the market access. Building new pipelines and getting access to premium markets, such as Europe, will have a major impact on investments in tar sands projects and on global GHG emissions related to the expansion of high carbon unconventional oil.

The IEA's 2012 *World Energy Outlook* states that "no more than one third of proven reserves of fossil fuels can be consumed prior to 2050 if the world is to achieve the 2 degree C goal."¹⁶ This means that the vast majority of unconventional, high carbon oil has to stay in the ground.

The Fuel Quality Directive is one of the key instruments to reduce future demand for tar sands and drive the fuel market in a cleaner direction. Studies have shown that a proper implementation of the directive would lead to global GHG emissions reductions of 19 million tonnes per year.¹⁷ The FQD could be a game-changer for the future of the tar sands industry.

In order to achieve the climate targets already agreed by the European institutions, NGOs call on the European Commission to immediately submit a proposal for carbon reporting under the Fuel Quality Directive, which includes at least the following elements:

¹⁵ The capacity of European refineries is 17.2 million bpd. Current heavy crude capacity is 2.2 million bpd, of which 700.000 bpd can be used to refine diluted bitumen (which is even heavier crude).

¹⁶ IEA "World Energy Outlook 2012"

¹⁷ <http://www.transportenvironment.org/publications/environmental-and-economic-impacts-fgd-implementation>

- **As accurate GHG intensity values for petrol and diesel as possible; at least differentiated defaults for all unconventional fuels (tar sands, oil shale, coal to liquid and gas to liquid);**
- **Reporting of the GHG intensity of each fuel supplier's individual fuel mix, based on these default values or actual carbon intensity values, as outlined in the legislative mandate;**
- **A review of the implementation measure to enable further differentiation, including of conventional crudes, at a later date, when more information becomes available.**

In addition, the Commission should adopt a further decarbonisation target for transport fuels as part of the EU's post-2020 climate and energy framework.

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