

Jean-Pierre Debruxelles
Alessandro Bartelloni
Damien Valdenaire

The Role of Supply Chain Emissions

FuelsEurope and Concawe
Case Study

Chapter

1

The Role of Supply Chain Emissions

Emissions in Decarbonization and Compliance
Case Study

Case Study: Supply Chain Emissions in the Fuels Sector

Outline

1. Introduction
2. Scope 3 emissions in the fuels sector
3. Share of scope 3 Emissions in the sector compared to Scope 1 and 2 emissions
4. Opportunities for value chain emissions reductions in the fuels sector
5. Incentives for supply chain emissions reductions

1. Introduction

- The refining industry is expected to face an important transformation in the next decades due to the evolution of the transport sector :
 - stricter regulations,
 - new mobility schemes and transport modes,
 - new technologies
 - new sources of energy for transport

will contribute to reducing the carbon intensity of transport (Well-to-Wheel).

- It is therefore crucial that the fuels industry addresses its scope 3 (upstream and downstream the refinery fence) emissions in a comprehensive manner.

2. Scope 3 emissions in the fuels sector

- Scope 3 emissions in the refining industry, can be divided in two categories: upstream & downstream.
- These emissions include elements such as combustion emissions from the products use phase, or transport related emissions from the transport and distribution phases.
- Conventional refineries convert oil into many products; including transportation fuels (more than 75% of total production), with emissions linked to conversion & transport steps and final product use.

Figure 4
Illustration of scope 3 upstream
and downstream emissions
sources for a refinery

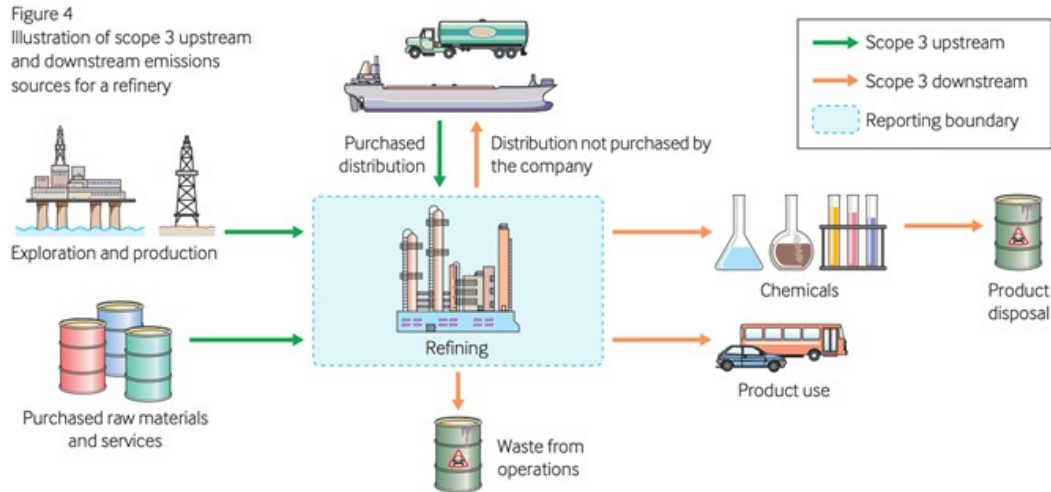
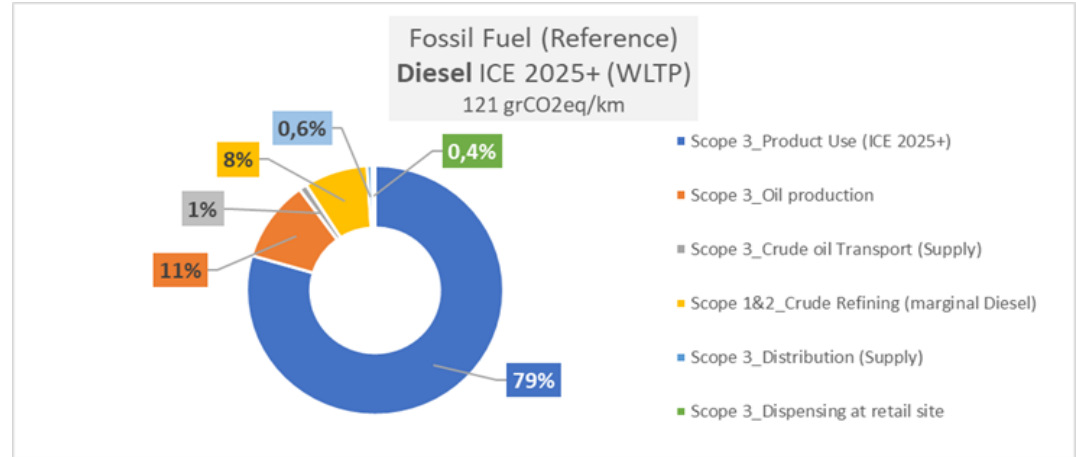


Figure 1 - Scope 3 upstream and downstream emissions sources for a refinery - IPIECA (2021)

The illustration above shows a generic production chain & emissions from non-upstream integrated refining perspective

3. Share of Scope 3 Emissions compared to Scope 1 and 2

Figure 2 – Example of Scope 1 to 3 emissions for a diesel fuel in a passenger car



- The vast majority of Well-to-Wheels emissions occur during the combustion phase.
- The chart above represents the relative contribution of the WTT and TTW combustion to the total GHG emissions, expressed in g Co₂eq/km.
- Scope 3 emissions for the non-upstream integrated refining industry is the sum of all of the sections in the chart, except the refining step, which is 92% of the total WTW diesel emissions.

4. Opportunities for Value Chain Emission Reductions

- The Scope 3 emissions connected to the refining industry are essentially generated in the downstream supply chain, thus reduction of these emissions may occur in one of the following ways:
 - Enhanced energy efficiency measures in the use phase of the products;
 - Capture of GHG emitted during combustion;
 - Offsetting the GHG emissions generated during the use of the products with CO2 credit certificates;
 - Replacing fossil CO2 in the products with biogenic or recycled CO2.
- The first two measures lie within the control of the users of the products where the refining industry can only invest in energy efficiency or infrastructure for the collection, storage or recycling of CO2 emissions,
- The last two measures lie within the control of refineries where the last option especially tackles the issue at its root, and has the potential to progressively bring the Scope 3 emissions of the refining industry close to zero.

4. Opportunities for Value Chain Emission Reductions

- The strategy of replacing fossil carbon in the products with biogenic or recycled carbon has been illustrated by FuelsEurope in the [Clean Fuels for All](#) (CFFA).
- EU refining companies are currently investing in projects for the production of renewable and low-carbon fuels. They have the capabilities to progressively increase the output of renewable fuels with the installation of Hydrotreated Vegetable Oil (HVO), Biomass Technology Laboratory (B-T-L lignocellulosic) and e-fuels plants at industrial scale. This would allow to:
 - Adapt the supply to evolving patterns of demand for fuels in transport
 - Increasingly reduce the carbon footprint of fuels
- As the regulatory framework is conducive to a remunerative market for low carbon fuels, a growing number of renewable fuels production facilities can come on stream starting in 2022 and account for up to 83% in 2050 of the total EU demand in transport for liquid fuels. The investment cost being estimated to be in the order of some €650 billion.
- First examples can be seen in the recent conversion of refineries into HVO production facilities

Clean Fuels for All Strategy

- 📄 A strategy that started more than 5 years ago.
- 📄 The EU refining industry's potential pathway to enabling transport to contribute to EU's Climate neutrality ambition by 2050.
- 📄 By 2050, at the latest, every litre of liquid fuel for transport could be net climate neutral, enabling so the decarbonisation of aviation, maritime and road transport.

What "Low-Carbon Liquid Fuels" are?

Sustainable liquid fuels from non-petroleum origin.

Produced from new feedstock such as biomass, renewables, waste and captured CO₂.

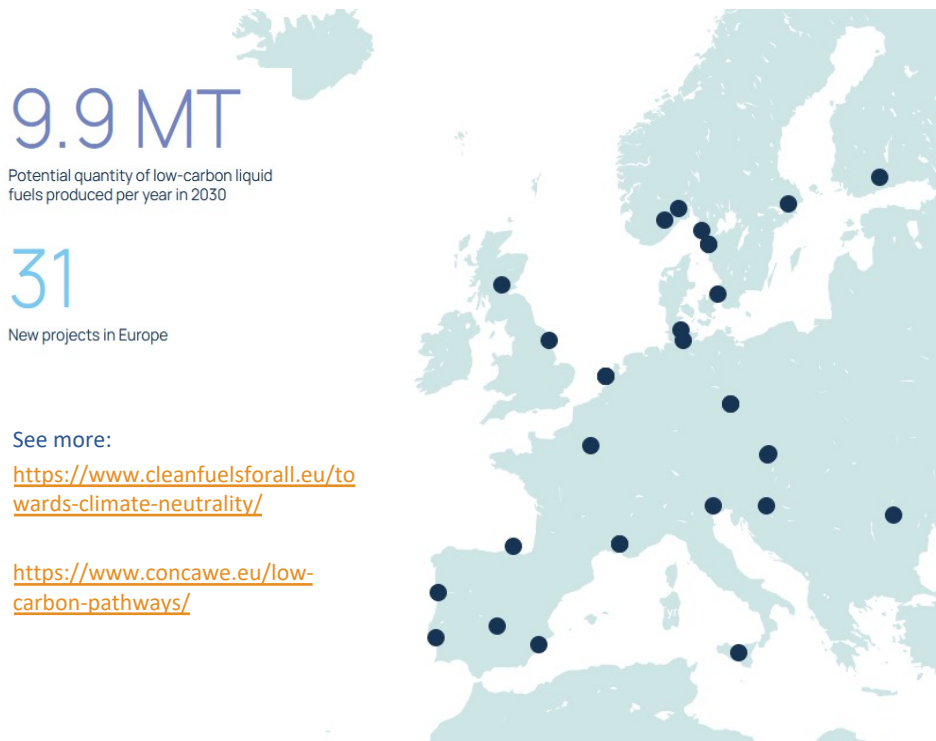


Transition to low-carbon liquid fuels initiatives

- FuelsEurope's members pursue a wide range of low-carbon initiatives across at least 12 member states in different phases of the project cycle, including CCUS, E-Fuels, Green H₂, Advanced biofuels, bio-refinery conversions, waste to fuel, etc.
 - Well over 20 projects for low-carbon liquids have already been started or are planned until 2030 (in the public domain)
 - Projects facilitate industrial clustering through links with Chemicals, Recycling, Steel and Cement Industries, ...
 - Scaling up and increasing the overall number of projects will be possible with the right enabling framework in place

Provisional examples*:

- 9 Advanced biofuel projects, with capacities between 100.000 and 750.000 tonnes of output.
- 7 CCUS projects, up to 6 mt. of capacity for CO₂ sequestration.
- 12 Green Hydrogen Projects, some of which lower the GHG intensity of manufacturing processes, others combine the green H₂ with captured carbon to produce synthetic fuels with a capacity of up to 3.4 million tonnes of output per year.
- 3 Waste-to-fuel projects, with a capacity of up to 100.000 tonnes per year in output (derived from urban waste).



*While the final list of projects may differ from the map or the list shown here, these projects are being considered by FuelsEurope's members to be put forth for support under the EU Recovery Fund.

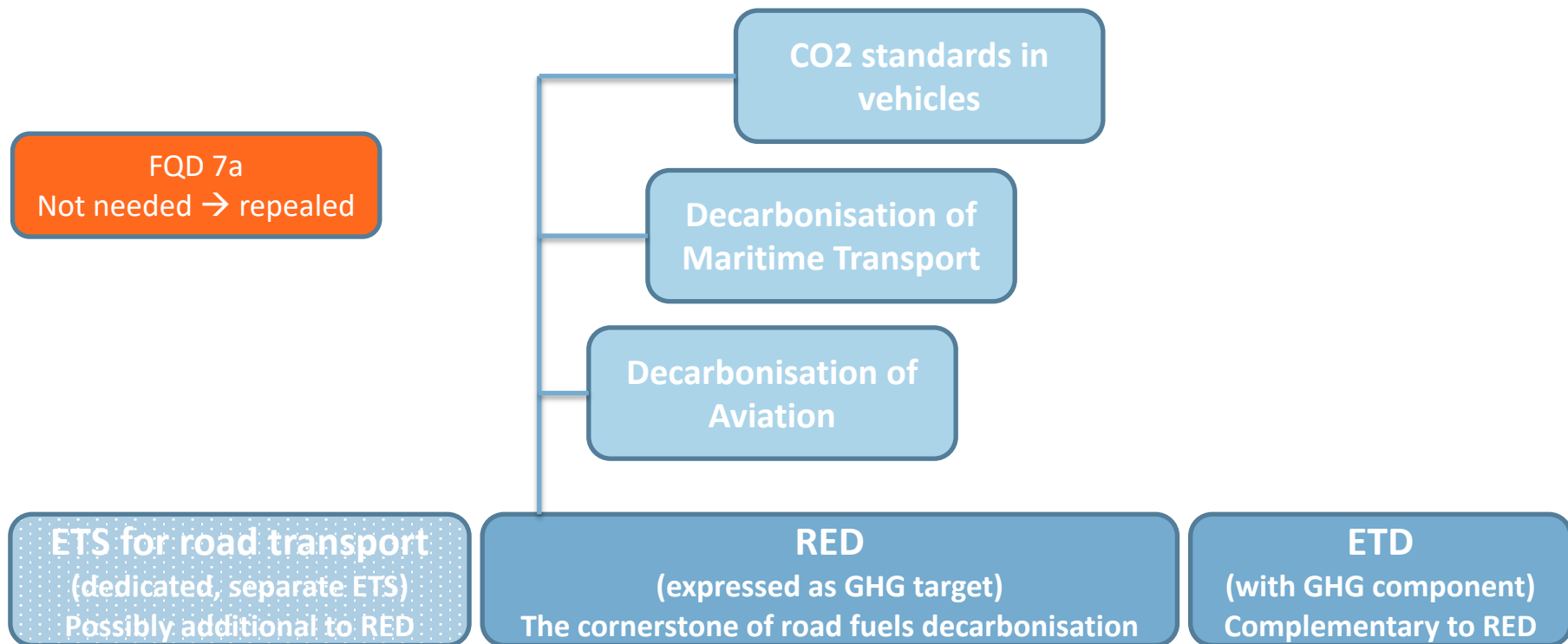
5. Incentives for Supply Chain Emissions Reductions

- The regulatory framework for fuels and transport plays a fundamental role in driving down the scope 3 emissions connected to the refining industry. As “Fit for 55 package” includes proposals with a potential deep impact on the decarbonisation of transport, FuelsEurope recommends in its contribution to the debate key measures in the relevant regulations which can create the conditions for a progressive abatement of scope 3 emissions.
 - The revision of RED creates the best opportunity to make it the primary regulatory instrument to drive the effective and efficient decarbonisation of road transport fuels through the expression of transport targets in GHG terms ; a technology-unbiased approach allowing different solutions to compete ; clear and robust sustainability eligibility criteria to be the only ones.
 - Even if one regulation for one policy objective is favoured to avoid overlaps and unintended consequences, a cap-and-trade system for the decarbonization of road transport may play a complementary role.

5. Incentives for Supply Chain Emissions Reductions

- Complementary to the RED, the ETD should recognise a lower taxation rate on renewable fuels vs. fossil fuels, contributing together with the RED and possibly with an ETS for transport, to the creation of a carbon price signal capable to create the business case for investments in low-carbon liquid fuels.
- Dedicated regulation to drive the decarbonisation of fuels for aviation and maritime transport can also play a useful role, if they provide the conditions for a progressive uptake of renewable and low carbon fuels.
- The upcoming revision of the CO2 standards in cars and vans and the one for Heavy Duty Vehicles offer an opportunity to open these regulations to technology inclusiveness by accounting for the CO2 reduction from fuels with low and net zero CO2 emissions.

Architecture of regulatory instruments



THANK YOU FOR YOUR ATTENTION

This document was presented
by Jean-Pierre Debruxelles
jean-pierre.debruxelles@fuelseurope.eu

FuelsEurope
165, Boulevard du Souverain
1160 Brussels - Belgium
T: +32 2 566 91 00



@FuelsEurope



FuelsEurope



FuelsEurope



www.fuelseurope.eu