More palm and rapeseed in our tanks than on our plates

Ten years of EU biofuels policy

July 2020

Summary

2019 marked 10 years since the European Union started promoting the use of renewable energy in transport through the 2009 Renewable Energy Directive (RED). Due to flawed sustainability criteria that did not take into account the entire lifecycle emissions of fuels, the RED has mostly favoured the uptake of the cheapest and most unsustainable source of energy for transport: food- and feed-based biofuels.

Europe has seen a continued increase in the consumption of biodiesel in the past decade, starred by an increase of the most unsustainable feedstocks such as palm oil. The consumption of vegetable oil for biodiesel production has increased by 48% in the past decade, whereas the consumption of these oils for food has remained fairly stable (an increase of 4.5% in the same period). The growth in biodiesel production has been mostly based on imported feedstocks, palm oil being a key contributor. In 2009, only 24% of the palm oil imports were used to produce biodiesel; in 2019, more than half the imports (53%) went to the EU drivers.

Because of their climate and environmental impacts, food- and feed-based biofuels are limited in Europe's policy. This restriction will affect especially palm oil diesel, which has been labelled unsustainable and will be phased out by 2030 at the very latest. But the EU and its Member States can be more ambitious in the REDII implementation and in the upcoming reviews of the law and stop public support for all food-based and feed-based fuels as soon as in 2021.

1. Introduction and context

The EU Renewable Energy Directive (RED) of 2009 sought to promote the use of renewable energy in the transport sector by setting a sectorial target - 10% of the energy used in transport must be renewable by 2020 in each EU member state. The lack of proper sustainability criteria (such as the accounting of greenhouse gas emissions of the whole life cycle of the feedstocks, including indirect land use change [ILUC] emissions[1]) has led to the uptake of the cheapest and dirtiest biofuel feedstocks, i.e. palm oil for biodiesel.

The recast of the RED (REDII)[2], adopted in 2018, sets the path to (slowly) move away from food- and feed-based biofuels by focusing on advanced fuels (such as biofuels based on waste and residues and renewable electricity). However, the REDII measures do not go far enough as they still allow for food and feed based biofuels, albeit limited. The REDII specifically regulates high and low ILUC risk biofuels[3]. As per the EU Commission's definition, palm oil biodiesel is the only feedstock that falls within this category. It means that palm oil biodiesel use will be frozen at 2019 volume levels and then, from 2023, progressively phased down to 0% by 2030, although some palm oil can "escape" the phase-out if labelled as low-ILUC risk.

This briefing is an update of the data that T&E has been publishing since 2016[4] and focuses specifically on vegetable oil biodiesel produced and used in EU-28[5]. There are two main reasons for this: firstly, biodiesel dominates the EU biofuels mix, representing 80% of the biofuels sales vs. 19% bioethanol (which is blended with gasoline)[6]. This is explained partly because there are more diesel than petrol vehicles on the European roads (almost 72% of fuel used in road transport is diesel vs. about 28.5% petrol). Secondly, greenhouse gas emissions linked to vegetable oil biodiesel are very high[7].

The latest EU study[8] that looks into the impacts of biofuels used in Europe shows that when projected ILUC emissions are taken into account, all biodiesels based on virgin vegetable oil have more emissions than fossil diesel. This is particularly true for palm (three times the emissions of fossil diesel) and soy (twice as much as fossil diesel). On average, food- and feed-based biodiesel emits at least 80% more greenhouse gas emissions than fossil diesel.

2. Ten years of biofuels policy: More palm and rapeseed oil in our tanks than on our plates

2019 marks the 10th anniversary since the RED was adopted. In this past decade, we can observe a steady increase in the overall consumption of biodiesel in Europe. This growth has been mostly based on imported feedstocks strongly linked to deforestation such as palm and soy oil, which are filling up the share of biodiesel produced in Europe.

The graph below shows this evolution. The most remarkable case is the growth of palm oil biodiesel, which today represents 30% of the biodiesel produced in the EU.

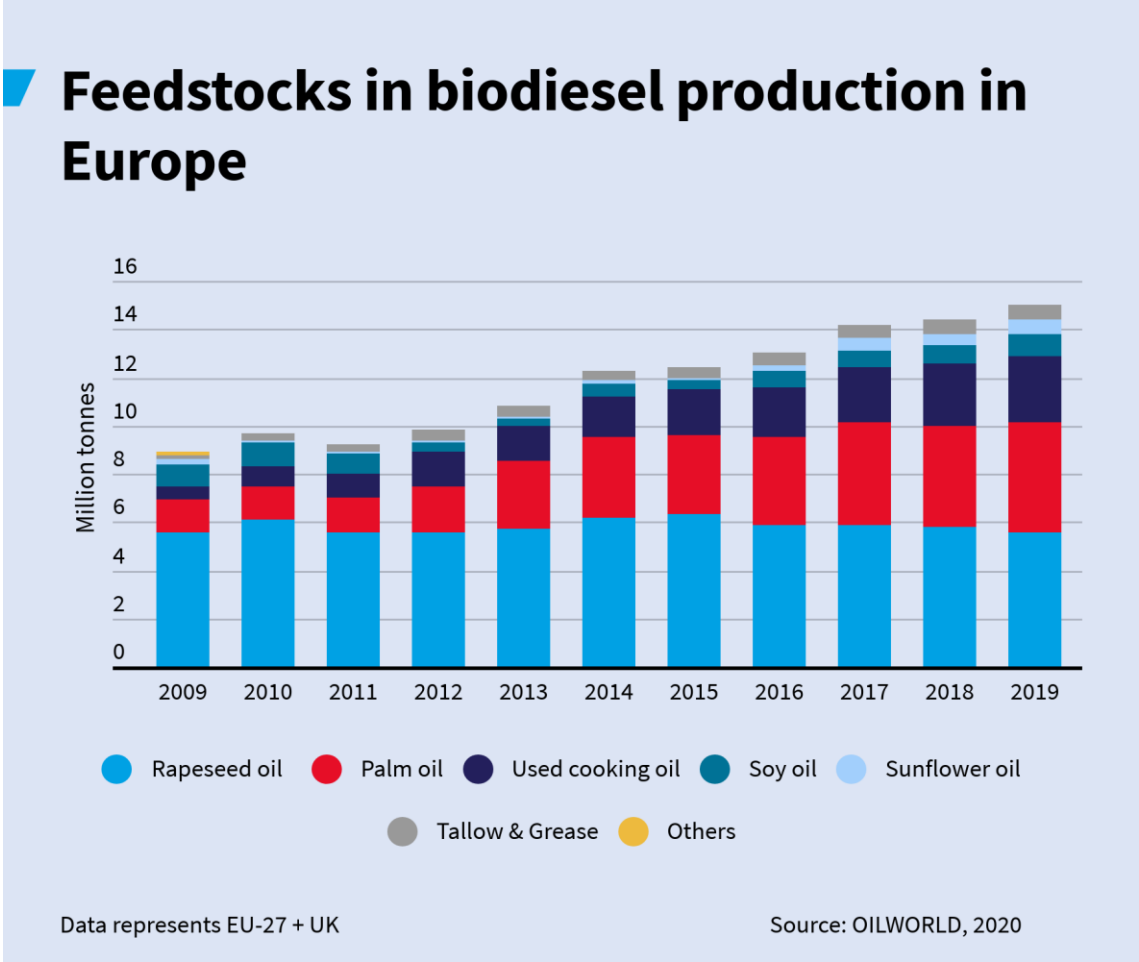

Figure 1: share of feedstocks in biodiesel production in Europe

Looking at the three main vegetable oil biodiesel feedstocks we can observe that the use for energy (biofuel and other energy uses such as heating and electricity production) for each of these feedstocks has increased (see figure 2). This is particularly the case for rapeseed and palm oil, for which the consumption for non-energy uses (mainly food, but also feed and oleochemical industry) has remained stable over the years, while the use for energy (mainly biodiesel, but also for heating and electricity generation) has increased quite dramatically. For soy, food, feed and oleochemical sectors remain the main destination for this vegetable oil. The use for energy has fluctuated over the past decade, with a low in 2013. Since then, it has steadily grown, with a rapid increase from 2018 to 2019.

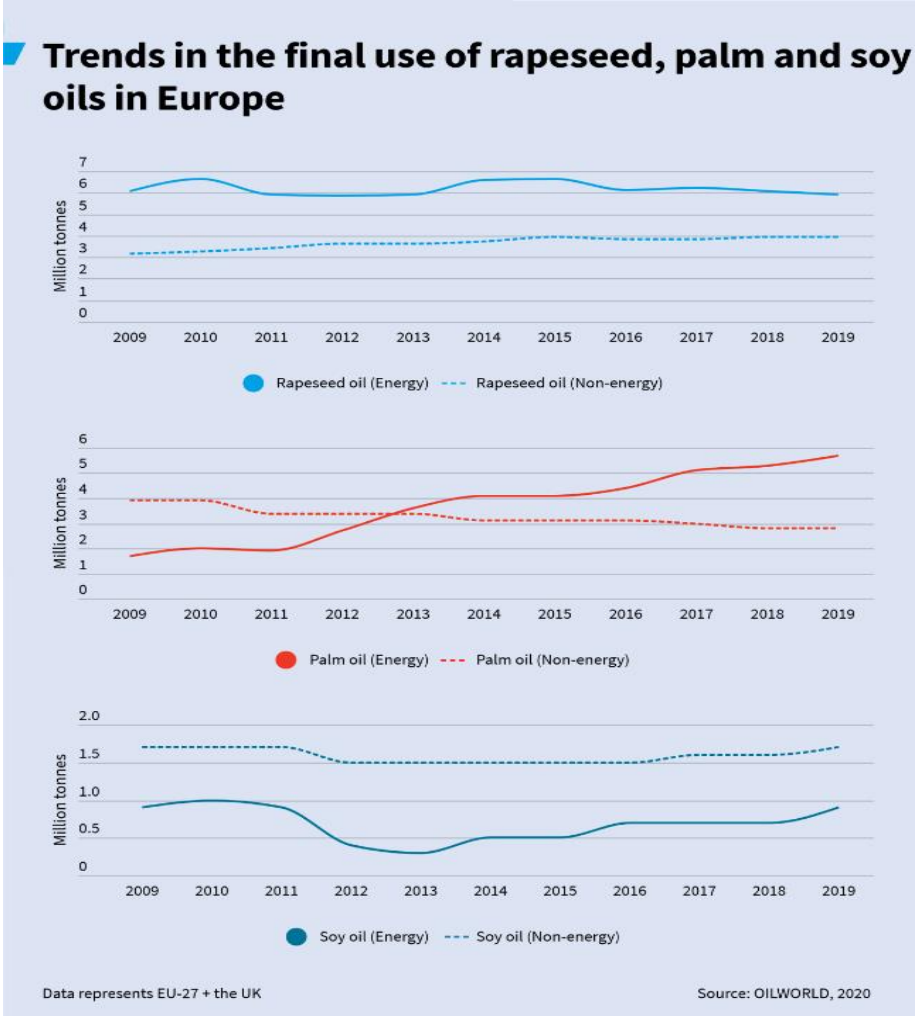

Figure 2: evolution of uses of imported vegetable oil in Europe.

The fluctuations in the consumption and uses of vegetable oils in Europe can also be partly explained by trade policies (note that the figure above does not consider imported refined biodiesel). In 2013, the EU imposed anti-dumping duties on Argentinian soy diesel and Indonesian palm oil diesel in order to avoid unfairly cheap imports[10]. This caused a big decline in the imports of the refined biodiesel from these countries. However, this measure favoured a dramatic increase in the imports of crude palm oil to be refined in Europe. This was not the case for the use of soy oil for energy, which has remained fairly constant over the past 10 years. This is most likely due to palm oil being cheaper than soy oil over the past decade[11].

The graph above also shows an increase in soy for energy in the past two/three years. This could be based on the latest legislative measures discussed and adopted in Europe (REDII). Due to the debate, palm oil could be more and more negatively perceived, which might increase producers' willingness to use soy instead. But also, two important events happen in 2020: a) each EU country has to reach the RED transport renewable target (10% of the total energy in transport must be renewable); and b) under the REDII, member states must set the food-and feed-based biofuels cap based on the volumes consumed in 2020 (with a maximum of 7%), which might make EU countries consume as much as possible in the run up to 2020 in order to have the highest cap possible until 2030.

3. More biodiesel, more unsustainable feedstocks in 2019

The European Union has produced more biodiesel in 2019 than any year before. This comes right after the EU adopted measures to limit the consumption of biofuels and specifically those with high ILUC risk, namely palm oil - of which consumption in Europe has also increased in 2019). The use of soy oil for biodiesel production has doubled in the past five years and the consumption of Used Cooking OIl (UCO) to produce biodiesel has also seen a steady increase - tripled since 2011. The use of rapeseed for biodiesel production has remained stable over the past years, showing a slight decrease since 2017.

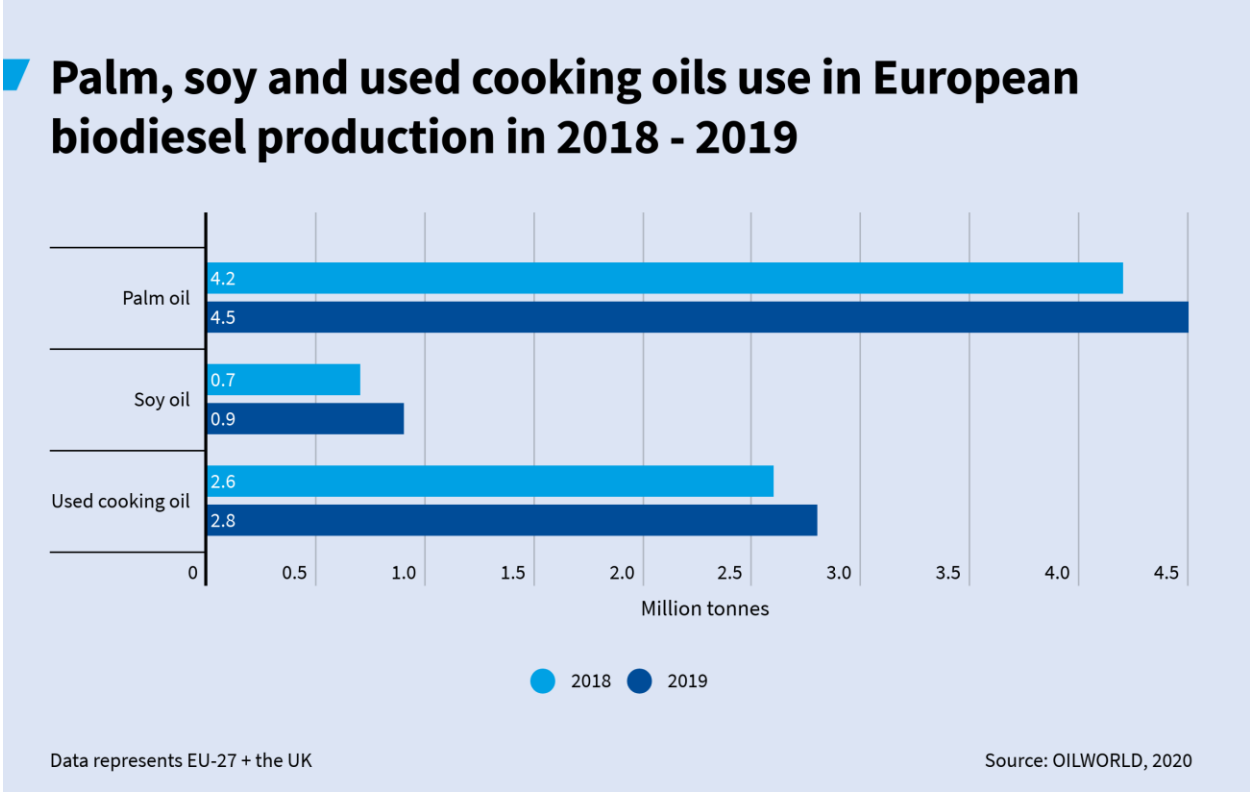

Figure 3: use of palm, soy and UCO in biodiesel production in 2018 and 2019

3.1. Palm oil

The imports of palm have increased in 2019 and so has its presence in the EU biodiesel mix. Today, 53% of the imports of palm oil are used in biodiesel. This is the same share as in 2018, but the absolute volume is higher (about 4.5 Mt). Furthermore, the use of palm imports for energy (heating and electricity generation) has also increased. Thus, today, 67% of the palm oil imports are used for EU energy production (in comparison with 65% of the total in 2018).

In those 4.5Mt of palm oil, 0.67Mt is PFAD (palm fatty acid distillate) from Indonesia[12]. PFAD is a by-product of the palm oil industry that is used today in industries such as the feed, the oleochemical and the cosmetic industries. Its utilisation for biofuels would lead to a displacement effect in these industries and other virgin feedstocks would be needed to replace it - such as palm oil[13].

The increase of palm oil for biodiesel does not come as a surprise since, as per the REDII, palm oil volumes are frozen at 2019 levels and cannot grow beyond that to be counted in renewable policies (with caveats). Therefore, a peak in 2019 would "guarantee" the volumes of palm oil biodiesel until 2023

(the year when the consumption of palm oil biodiesel must start being gradually decreased until 0% in 2030).

Is diesel or Nutella the biggest palm oil problem in the EU?

European drivers have consumed much more palm oil in their vehicles than in food or cosmetics. The volumes of palm oil used in Europe to produce biodiesel in 2019 are[14]:

- 22 times higher than the volumes that Ferrero (Nutella, Kinder) used in 2019;
- 15 times higher than the Mondelez group (Oreo, Cadbury) used in 2019;
- 4 times higher than Unilever (Axe, Dove, Knorr) used in 2019.

3.2. Soy oil

The use of soy for biodiesel production in Europe is increasing. It has more than doubled since 2015 and in 2019 it represented 6% of the total biodiesel produced in Europe versus less than 5% in 2018.

The increasing trend of soy biodiesel use in Europe in the past years is worrisome. Soy oil is directly associated with deforestation in Brazil, Paraguay, Argentina, Uruguay and Bolivia. Between 2008 and 2017, 14% of soy expansion in Latin America occurred in high carbon stock areas such as forests and savannas. It's worth noting that in Bolivia and Paraguay, more than 50% of the expansion occurred in these types of natural areas[15].

The fact that soy expansion is directly and indirectly causing deforestation makes soy biodiesel highly unsustainable, with life cycle emissions (LCA) twice as high as fossil diesel. Despite this, soy oil biodiesel (unlike palm) is not considered a high ILUC risk feedstock as per the Commission Delegated Regulation (EU) 2019/807[16].

3.3. Used cooking oil (UCO)

The analysis of the Oilworld data for 2019 also shows an increase in the use of used cooking oil (UCO) to produce biodiesel in Europe. It has tripled since 2011 representing today 18.5% of the total European biodiesel production.

The REDII considers UCO an advanced biofuel feedstock. However, its use in Europe will be capped, meaning that EU member states can only count a certain amount (1.7% of the energy used in transport[17]) to meet the targets. The cap is, however, a "soft" cap and member states can request the EU Commission an increase of this limitation.

While UCO can contribute to reducing greenhouse gas emissions in transport, robust sustainability criteria for its use are needed, including indirect impacts. There are concerns about whether these are really "used" vegetable oils and there are ongoing investigations due to suspected cases of fraud (such

as oil being imported and sold as UCO when it was in fact virgin oil)[18]. UCO has other uses outside of Europe (i.e. animal feed) so its use as energy can lead to indirect displacement effects.

4. Where does it come from and where is it produced?

4.1. Origin of the vegetable oil imports

The increase in the use of vegetable oil for biodiesel production in Europe is mainly based on imported commodities. Over 75% of the total palm oil imports to the EU come from SouthEast Asia, followed, but to a much lesser extent, by South America. The soy oil used in Europe, on the other hand, comes primarily from within the Union (more than 80%). The rest comes from Ukraine, Serbia, Brazil (through Norway[19]) and Russia, primarily. About 10% is coming from Paraguay - as noted before, 57% of the expansion of soy in Paraguay has happened at the expense of natural areas rich in carbon stocks.

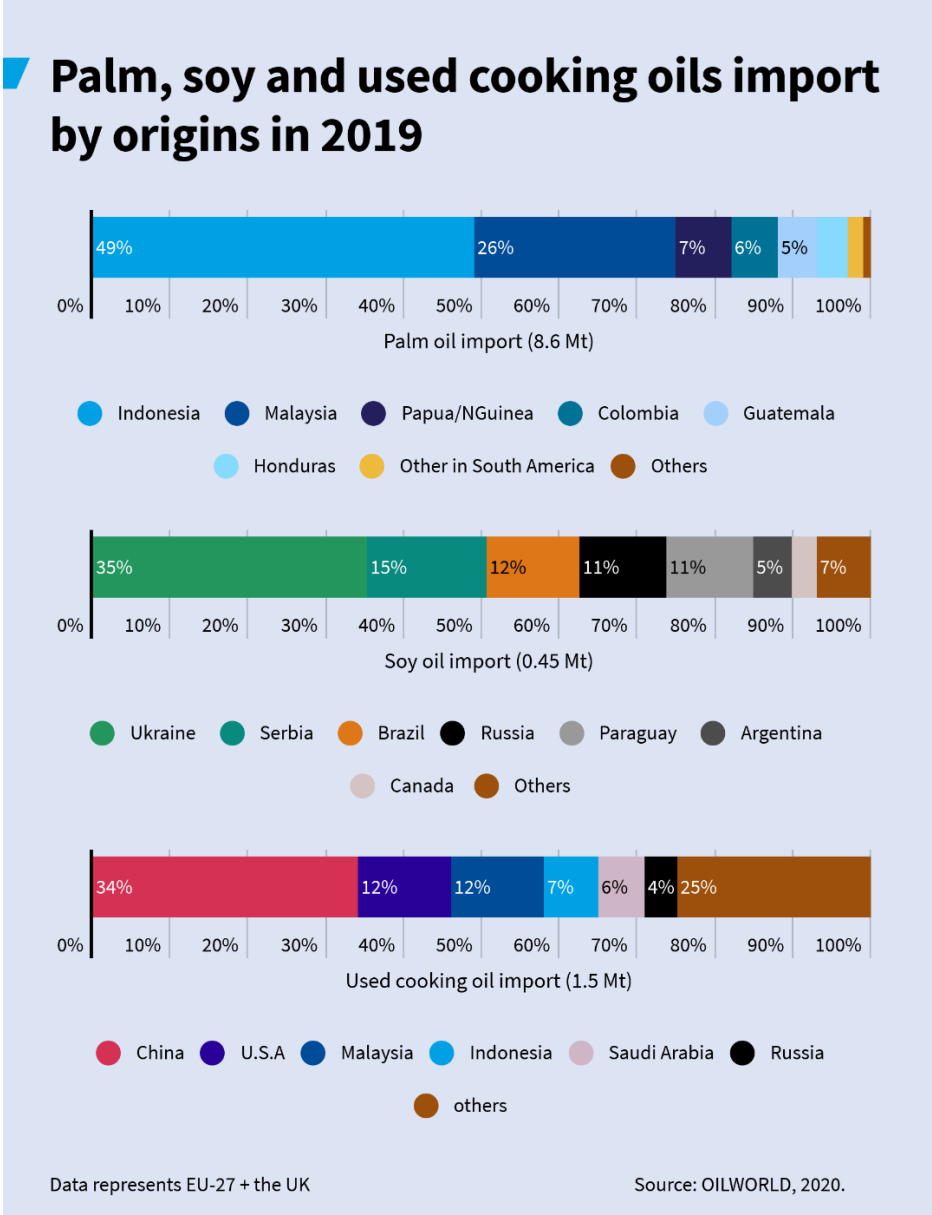

Figure 4: origin of feedstocks imports

More than half the UCO used in Europe in 2019 was imported (1.5Mt out of 2.8Mt). The biggest share comes from China, and about 20% comes from Malaysia and Indonesia - the biggest producers of palm oil. Due to the suspected fraud cases (currently under investigation), it is important to closely monitor these imports along the supply chain to ensure the UCO has actually really been "used".

4.2. Who produces palm oil diesel in Europe?

Spain, Italy and The Netherlands have the biggest production capacities in Europe: Italy has 6 plants with a capacity of at least 2.68 million tonnes per year; In Spain, ten biodiesel plants have a production capacity of, at least, two million tonnes per year; The top three closes with The Netherlands, where two plants have a capacity of 1.4 million tonnes per year.

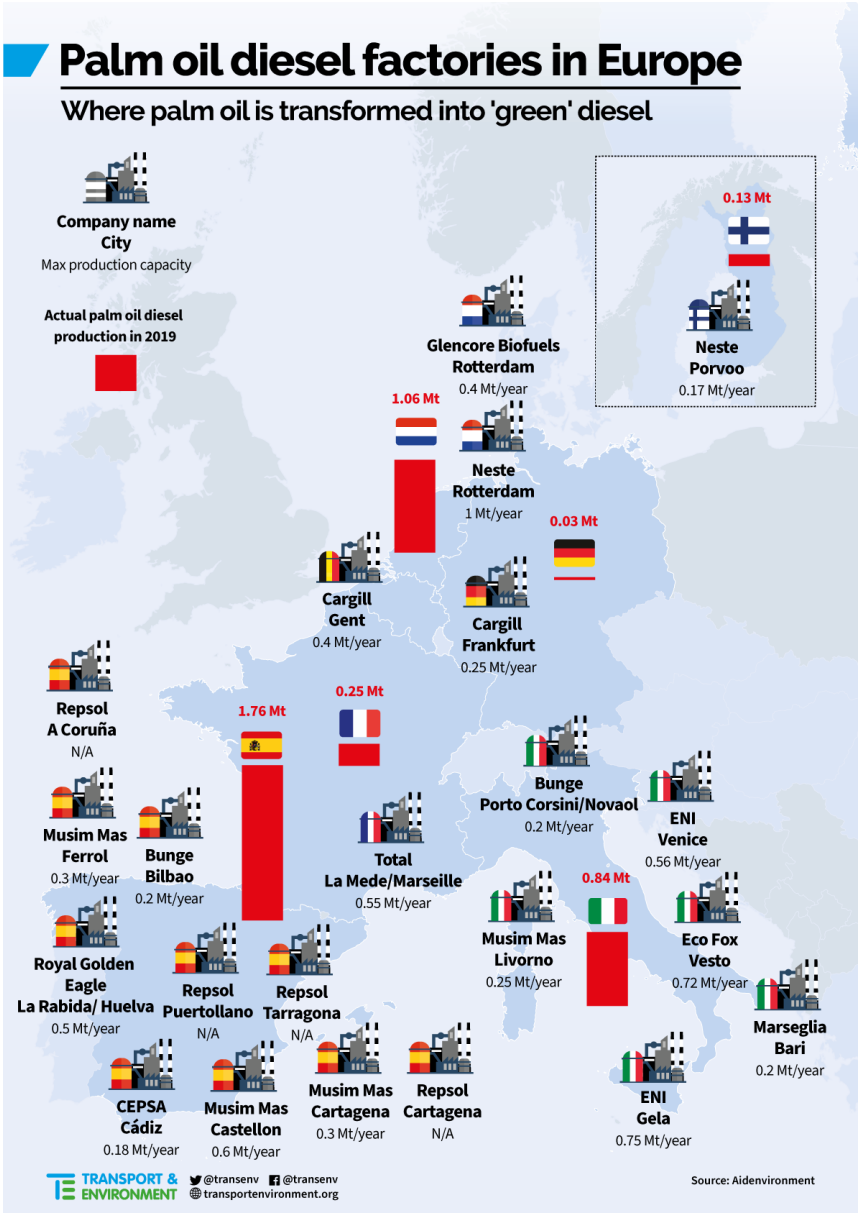

Figure 5: Main producers of palm oil diesel in Europe (non-exhaustive list)

Of the total volumes of palm oil for biodiesel production in Europe in 2019, Spain has used 1.76 Mt of palm oil to produce biodiesel, followed by the Netherlands (1.06 Mt) and Italy (0.84 Mt). Finland has used 0.13 Mt, France 0.25 Mt and Germany, 0.03 Mt.

4.3. Imported biodiesel

In previous sections of this briefing we analyse the volumes of vegetable oil produced (and consumed) in Europe in 2019 based on European and imported vegetable oils - a total of 15Mt. On top of that, Europe has consumed 3.3Mt of biodiesel which was imported as an already refined product (see figure 6 below).

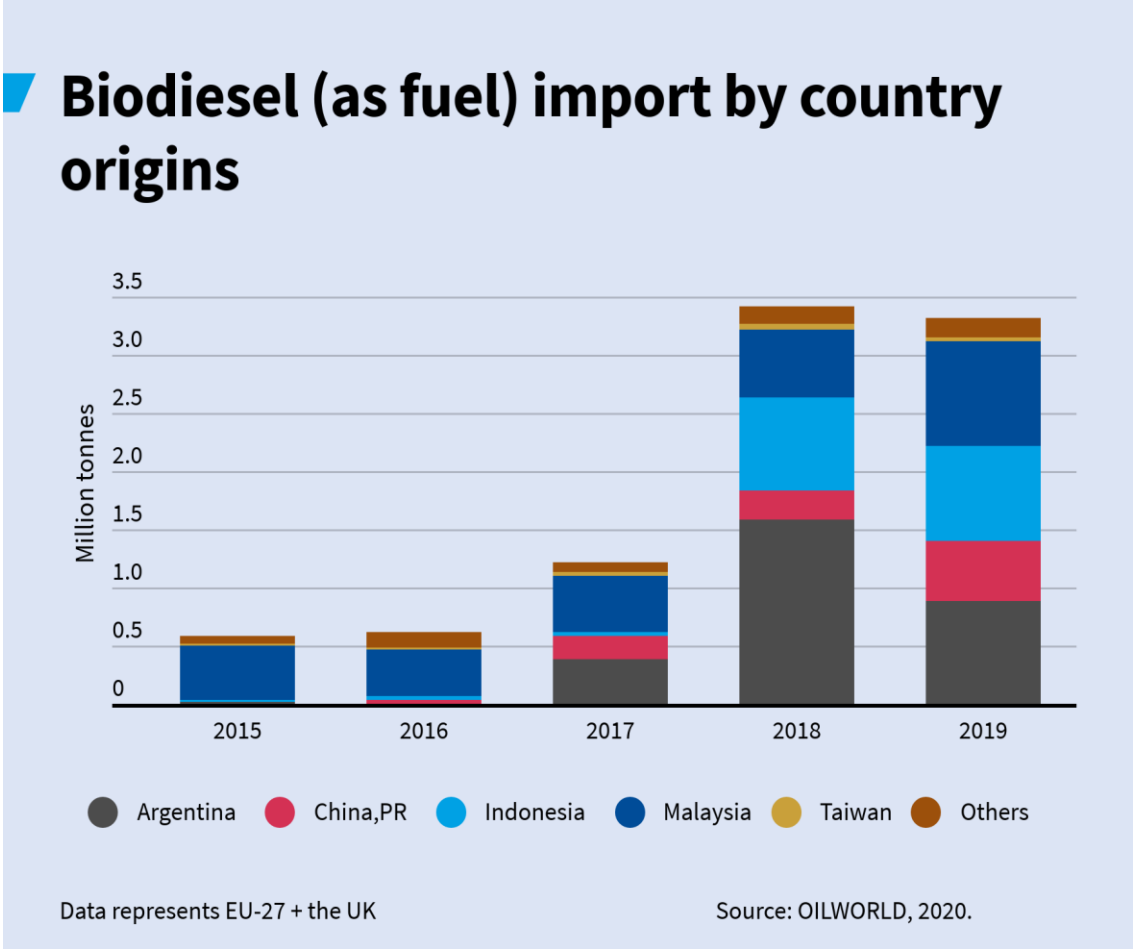

Figure 6: imports of refined biodiesel

There's a clear spike in imported biodiesel starting in 2018. The reason for this is the reduction of the biodiesel anti-dumping duties imposed by the EU on Argentinian and Indonesian biodiesel (discussed in section 2). The World Trade Organisation forced the EU to cut these duties in late 2017, but already that year there is an increase in biodiesel imports from Argentina (see endnote 9). Despite the lack of transparency regarding the feedstocks used for the production of this imported biodiesel, we can assume that palm oil will be the main feedstock of the imports from Malaysia and Indonesia, and soy for Argentina.

5. Recommendations

The EU is at a turning point in its climate change policy. The EU Green Deal (which aims at making the EU the first carbon neutral continent) will shake up all the policies that have an impact on energy. Unsustainable, deforestation-causing and high-emitting biofuels should not have a place in this context nor receive any form of support.

The data hereby presented shows that, despite some restrictions in place, unsustainable biofuels are still very much present in the European market and even increasing. In view of the decarbonisation goals, we recommend to the EU and the EU member states:

- **A quicker phase-out of high ILUC risk biofuels (palm oil biodiesel, including PFAD) use**. The 2019 volumes of palm biodiesel (about 4.5 Mt/year) will be permitted until 2023, before the phase-down begins. This will continue leading to deforestation and peatland destruction in tropical forests. EU countries, in the implementation of REDII into national legislation, should thus set a quicker phase-out trajectory and make sure PFAD is part of it.
- **Include soy oil biodiesel within the high ILUC risk category**. The EU Commission will revise the data on agricultural expansion of feedstocks used for biofuels, and also the REDII. In this context, the Commission should make sure soy is included as a high ILUC risk feedstock due to its expansion into high carbon stock areas. This is particularly important in the context of the palm oil freeze and phase-down, as soy could substitute palm in the EU biofuels mix. In the meantime, EU member states, in the implementation of REDII, should limit and end support to soy biodiesel, due to its environmental impacts.
- **Phase-out the use of all food and feed based biofuels.** The use of food and feed crops for biofuels is not sustainable and a potential decline in soy and palm could lead to other crops replacing them. Instead, member states should focus on advanced fuels based on wastes and residues and renewable electricity and the EU green deal should commit to the phase out of crop based biofuels as soon as possible.

- **Set robust criteria for UCO**, based on sustainable domestic availability. The criteria must ensure proper traceability of the supply chain and take into account the potential displacement effects derived from the promotion of imported UCO as advanced biofuels feedstock.
- **Ensure transparency of the energy used for transport at national level**. Information such as energy sources and feedstocks for biofuels, origin and potentially also climate impacts of the fuels should be made publicly available.

Further information

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Endnotes

[1] ILUC occurs when productive agricultural land is used to produce crops for energy, displacing its original use - food production. The demand for land increases to meet the food and energy demands, expanding the agricultural frontier onto natural areas such as tropical forests.
[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.328.01.0082.01.ENG&toc=OJ:L:2018:328:TOC
[3] https://ec.europa.eu/commission/presscorner/detail/en/MEMO_19_1656
[4] https://www.transportenvironment.org/publications/trend-worsens-more-palm-oil-energy-less-food ; https://www.transportenvironment.org/publications/smoke-europe%E2%80%99s-cars-driving-deforestation-south-east-asia#overlay-context= ; https://www.transportenvironment.org/sites/te/files/publications/2016_11_Briefing_Palm_oil_use_continues_to_grow.pdf https://www.transportenvironment.org/publications/eu-biodiesel-market-briefing
[5] It includes the UK as it was still a EU member in 2019.
[6] https://ec.europa.eu/commission/sites/beta-political/files/report-progress-renewable-energy-april2019_en.pdf
[7] https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nrg_cb_oil&lang=en
[8] https://www.transportenvironment.org/publications/globiom-basis-biofuel-policy-post-2020
[9] https://www.transportenvironment.org/newsroom/blog/eu-trade-tools-unable-contain-unsustainable-biodiesel-imports
[10] Assuming a majority of Argentinian biodiesel is produced from soy oil and a majority of Indonesian biodiesel from palm oil.

[11] https://www.worldbank.org/en/research/commodity-markets
[12] There is no data regarding PFAD from other origins. That means there are *at least* 0.67 Mt of PFAD within the palm oil volumes, as there might be more from other origins.
[13] https://theicct.org/sites/default/files/publications/Oil-palm-expansion_ICCT-Briefing_27072017_vF.pdf
[14] https://palmoilscorecard.panda.org/check-the-scores/all
[15] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1558977620744&uri=CELEX:52019DC0142
[16] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2019.133.01.0001.01.ENG&toc=OJ:L:2019:133:TOC
[17] Advanced biofuels (those included in the annex IX of the REDII, such as UCO) can be double-counted.
[18] https://www.euractiv.com/section/all/news/industry-source-one-third-of-used-cooking-oil-in-europe-is-fraudulent/
[19] https://www.tridge.com/intelligences/soybean/NO