Biofuels’ role in displacing oil

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Biofuels have been touted as a way to partially replace Russian oil without relying on foreign fossil fuel imports, as both ethanol and biodiesel can be blended with petrol and diesel to bulk up supplies.

In this special report, EURACTIV explores biofuels’ role in Europe’s liquid energy mix.
Can biofuels help solve Europe’s Russian oil dilemma? 4

Sales of high-blend ethanol surge in France amid rising fuel prices 6

EU ethanol companies produced more animal feed than fuel last year 8

Biofuels to play ‘a big role’ in reducing EU dependency on Russian fossil fuels: MEP 10

Mind the Gap: Unreasonably capping sustainable biofuels opens the door for more imported oil 12
The biofuels industry has called on policymakers to view ethanol and biodiesel as a green means to reduce Europe’s dependence on imported oil from Russia – an assertion swiftly rejected by some NGOs.

Following weeks of diplomatic wrangling, EU leaders agreed on 31 May to end all imports of oil and petroleum products from Russia entering the bloc via ship by 2023.

While oil imported via pipeline will continue to flow to countries at the EU’s eastern border, the oil tanker ban will leave a significant gap in Europe’s energy supply.

Experts expect the EU to pivot towards friendly nations such as Saudi Arabia and the United States to satisfy its oil needs. However, these countries may charge a price premium, particularly for diesel products, exacerbating already sky-high prices.

Motorists have been hit particularly hard by the oil price spike, with fuel prices reaching record highs across Europe. This has led to social unrest in countries like Spain, where lorry drivers took to the streets in protest against mounting fuel prices.

**REPowerEU**

In its REPowerEU plan, launched at the outset of the Ukrainian conflict, the European Commission set a pathway to reduce the EU’s dependence on Russian energy by two thirds before the end of this year before totally eliminating Russian imports around 2027.
Unveiling the document, EU climate chief Frans Timmermans said the answer to reducing Europe's dependence on oil imports “lies in renewable energy and diversification of supply”, adding that “renewables give us the freedom to choose an energy source that is clean, cheap, reliable and ours”.

Part of the Commission’s plan includes initiatives to “accelerate the move to zero-emission vehicles”, including a potential legislative proposal to increase the share of clean vehicles in public and corporate car fleets.

However, despite the rapid shift to electric vehicles, petrol and diesel are expected to continue making a sizeable part of the EU vehicle fleet in the coming decades.

**Biofuels as a solution?**

Ethanol and biodiesel derived from food-and-feed crops and waste sources have been put forward as a means to simultaneously cut emissions in the transport sector while reducing Europe's dependence on third countries for fuel.

ePURE, an association representing European ethanol producers, says renewable ethanol has a strategic role to play in curtailting crude oil imports.

“EU renewable ethanol production is about more than just renewable low-carbon fuel that helps Europe achieve its climate goals by displacing fossil petrol,” said ePURE Director of Government Affairs Simona Vackeová.

“For every tonne of renewable ethanol produced in the EU, there is also a tonne of high-protein, GMO-free animal feed with a high metabolic value, contributing to EU food security by reducing the need to import such feed.”

At present, there is an EU-mandated 7% limit on the quantity of crop-based biofuels used in the transport sector. Member states also cannot go beyond a 1% point increase compared to the 2020 national share of these fuels in rail and road transport.

In a recent op-ed, David Carpintero, Director General of ePURE, sought to warn policymakers against scaling down biofuel production, arguing that it would have negative environmental and geopolitical consequences.

“If we artificially cap sustainable biofuels like European renewable ethanol today, we are creating a gap in the sustainable energy supply for tomorrow. That gap can only be filled by one thing: imported fossil fuels. Casting away a viable option like European sustainable renewable ethanol risks throwing away our future,” he wrote.

This view was echoed by the biodiesel producers’ trade association the European Biodiesel Board (EBB), who encouraged lawmakers to embrace the potential of biofuels as Europe transitions from the fossil fuels era.

“The European biodiesel industry fits in the [REPowerEU] strategy perfectly,” said Xavier Noyon, EBB Secretary General. “We deliver an EU-made green fuel that reduces diesel imports, while co-products from our biorefineries increasingly replace a range of fossil chemicals.”

“Sustainable biodiesel produced in the EU ticks all the boxes of the EU Green Deal and the Fit-for-55 goals: renewable, bioeconomy, circularity, and food security,” he added.

**Green concerns**

But environmentalists disagree, saying the EU’s demand for food-and-feed based biofuels is driving deforestation outside of Europe.

WWF, the global environmental NGO, has argued that biofuels may actually pose a greater threat to the climate than oil due to their impact on carbon sinks like forests.

“Burning trees and crops for energy increases emissions compared to fossil fuels, either in general or over the timeframe we have available to stop climate change,” WWF said in a statement.

“Yet despite this, these practices will largely still be considered ‘renewable’ and so eligible for public subsidies. This approach flies in the face of science, and risks undermining much of EU climate action.”

These assertions from environmental NGOs are roundly rejected by the industry.

“The arguments against using crop-based EU ethanol in the road transport energy mix are outdated and irrelevant, and sustainability issues have been settled,” ePURE said in a statement.

“Increasing its use along with a wider deployment of advanced biofuels is the only realistic way the EU can meet its renewable energy goals.”
Record fuel prices seen since Russia’s invasion of Ukraine have led cost-conscious motorists to pivot towards alternative fuel sources, with sales of E85 – a mixture of petrol and up to 85% bioethanol – rising significantly in France.

French consumption of ethanol, a fuel source made by fermenting sugars contained in crops such as maize and wheat, has been steadily increasing since its introduction in 2007, thanks largely to its favourable cost.

The recent surge in oil prices accelerated the trend, with May 2021 to April 2022 seeing a 53% increase in consumption of E85 compared to the same time period in 2020 to 2021, according to figures released by French ethanol industry group SNPAA.

By April of this year, superethanol E85 represented 6.2% of the fuel market in France – a doubling of market share from 2020.

E85 is currently around half the price of standard gasoline.

France, an agricultural powerhouse, is one of the EU’s strongest proponents of ethanol, with the French government offering reduced fuel tax on E85 and a regulatory approach that incentivises the sale of high ethanol fuel blends.

The number of stations selling E85 has also greatly increased in the country in recent years, rising from...
1,015 in 2018 to 2,856 in 2022, making France the EU leader in high-blend ethanol availability.

Throughout the EU, a blend of 5% or 10% ethanol (E5 or E10) is offered as standard at most petrol stations, with E85 rarely available in other nations except Sweden. In Germany, E85 has all but disappeared from petrol stations after Berlin decided to pull subsidies from the fuel.

The United States is also one of the world’s largest consumers of ethanol. The Biden administration announced in April that it will lift a ban on the summertime sale of higher-ethanol gasoline to help reduce fuel prices at the pump, the *New York Times* reported. The ban was originally introduced to combat smog in warmer weather.

**Flex-fuel vehicles**

Unlike E10 which is suitable for all internal combustion engine vehicles, E85 can cause damage to an engine if the vehicle is not equipped for it.

In France, the sale of so-called ‘flex-fuel’ vehicles – capable of running on both petrol and high levels of ethanol – have increased, thanks in part to authorities waiving registration fees. Flex-fuel vehicles are also subject to lower CO2 taxes, as the vehicles save around 40% CO2 compared to petrol cars.

This flexibility does come at a cost, however, with the upfront purchase price marginally higher – between €110 to €220 – than a standard petrol vehicle. Ethanol also has a lower energy density than fossil gasoline, meaning it is necessary to refuel more often, though this can be mitigated by adopting a more conservative driving style.

Another popular option in France is to retrofit a standard petrol vehicle with a conversion box, thereby enabling the car to run on up to 85% ethanol blends.

The cost of a conversion system is between €560 and €900. Despite the price, the fuel savings over time has made conversion to run on E85 highly attractive to motorists according to ePURE, a trade association representing European ethanol producers.

“France has led the way on E85 by making it easy and cost-effective for motorists to use a fuel that lowers emissions from petrol and flex-fuel cars and showing how a renewable, low-carbon fuel produced domestically can have an impact,” an ePURE spokesperson told EURACTIV.

“The public has responded strongly – with sales figures on an upward trend. Even if other EU countries don’t have E85, they should be able to make better use of renewable ethanol blends such as E10 to reduce emissions and reduce Europe’s reliance on imported fossil fuel,” the spokesperson added.

**Reducing emissions**

The industry has strongly touted the environmental credentials of renewable ethanol as well as its lower cost, positioning it as a vital fuel source in the transition to zero-emission mobility.

In addition to lower emissions, E85 produces fewer air pollutants than its fossil fuel counterpart, helping to reduce the concentration of nitrogen oxides and particulate matter.

However, environmental NGOs have typically questioned the environmental benefits of crop-based biofuels, arguing that the land used for energy crops would be better served as rewilded carbon sinks. A recent line of attack has been to link the production of biofuels with rising global food prices.

Clean mobility NGO Transport & Environment (T&E) has recommended that all countries suspend their use of food-and-feed biofuels so that agricultural land can be prioritised for food production rather than biofuel feedstocks.

“E85 is produced from several feedstocks, for example cereals like wheat or corn. Increasing demand for cereals and agricultural commodities at a time of food crisis would be irresponsible,” Laura Buffet, energy director at T&E, told EURACTIV.

Buffet also attributed the cheaper prices for ethanol to political decisions.

“E85, like other biofuels on the EU market, benefits from policy mandates and tax exemptions or reduced taxes, which explains the price differential,” she added.

Industry has dismissed any link between biofuel production and food insecurity, claiming that the accusation is “ridiculous” and lacks evidence.
The production of bioethanol in Europe has led to greater yields of animal fodder than fuel in 2021, new figures show – further evidence that biofuels can also contribute to food stability, according to the industry.

Data gathered by the European ethanol trade association ePURE found that, for the first time, their members produced more animal feed co-products than renewable ethanol.

The results were certified by Swiss auditing firm Copartner.

Some 4.48 million tonnes of high-protein animal feed were produced thanks to the generation of ethanol in Europe in 2021. [FUN FUN PHOTO / Shutterstock.com]

Green NGOs have portrayed
the production of crop-based biofuels as problematic on both environmental and food security grounds, using food shortages experienced in the wake of the ongoing war in Ukraine to demand an end to crop-based biofuels.

“Ethanol and biodiesel produced from agricultural crops have negative impacts on climate and the environment. As the UN reports, the war in Ukraine has exacerbated steadily rising global food prices, worsening the situation around food security,” Laura Buffet, energy director at the green NGO Transport & Environment (T&E), told EURACTIV.

“In a context of food insecurity, there is no role to play for biofuels produced from agricultural commodities like vegetable oils or cereals,” she added.

T&E are among a group of NGOs calling on EU governments to immediately ban feed crops for biofuel production, warning that continuing to do so may lead food prices “to spiral out of control”.

The ethanol industry rebutted the accusation, arguing that biofuels not only lessen the need for imported fossil fuels, but that the protein feed for animals yielded from the production process bolsters food security.

“Many times over we have demonstrated with documented facts that the industrial, agricultural, economic reality is food and fuel,” said Valérie Corre, the president of ePURE, speaking at a recent EURACTIV conference.

Corre explained that in addition to producing animal feed, EU bioethanol production results in sugar and starch.

“If the biofuel market is undermined, it is clear that this food production would be at stake,” she said.

Biofuels also serve to strengthen farmers’ revenues, which encourages them to continue producing food in Europe, Corre argued.

“It’s a very complex issue. You can’t summarise a complex issue with something that sounds like an ultimatum: ‘food vs fuel,’” she said.

“I hope that the decision makers will follow the fact-based approach which is ‘food and fuel’, and not so much the emotional one which is ‘food vs fuel’.”

Corre also highlighted the small agricultural area used to cultivate ethanol in the EU, which amounts to 2.2% of the EU’s arable area.

“If it was so simple to eradicate hunger by stopping the production of bioethanol, why on Earth didn’t we stop it before? Because it’s more complicated than that,” Corre added.

Emissions reduction

According to ePURE data, the level of greenhouse gas emission reduction of EU-produced ethanol compared to fossil gasoline hit a new high, reaching 76.9%.

“The new data once again confirm what we have known for years: that renewable ethanol is the most cost-effective GHG-abatement solution the EU has,” said David Carpintero, Director General of ePURE.

Curtailing biofuel production is a political mistake, according to Carpintero, who stressed that despite the rise of electric and hydrogen-powered vehicles, petrol and diesel cars will continue to run on European roads for decades to come.

“Phasing out sustainable biofuels such as renewable ethanol – as some policymakers want to do – doesn’t just go against common sense, it also opens the door for more reliance on fossil fuel. Nobody wants that,” he said.

The renewable ethanol industry has touted the crop-based fuel as the most cost effective way to decarbonise road transport, arguing that when life-cycle emissions are taken into account, high blends of ethanol surpass hybrid and battery electric vehicles.

According to an industry-funded study, the fossil fuel-heavy EU electricity mix coupled with the carbon intensity of battery production mean that battery electric vehicles save less greenhouse gas emissions than an internal combustion engine car running on E85 fuel on a full-life-cycle basis.
Biofuels to play ‘a big role’ in reducing EU dependency on Russian fossil fuels: MEP

By Sean Goulding Carroll | euractiv.com

In a landmark decision on 31 May, the EU agreed to end most Russian oil imports by the end of the year. Renewable biofuels have been touted as a means to partially replace the embargoed oil, as the domestically produced fuels can be blended with petrol and diesel.

However, biofuels have proven controversial, with green campaigners seeking to reduce their production. To discuss the role of biofuels in plugging Europe’s oil supply gap, EURACTIV spoke with MEP Henna Virkkunen, who is actively engaged in transport issues.

Henna Virkkunen is a Finnish lawmaker with the centre-right EPP Group. She is a member of the Parliament’s transport and industry committees.

The EU recently agreed on a partial Russian oil ban. One potential source of liquid fuel being put forward to meet the shortfall is biofuels. Do you believe ethanol and biodiesel have a role to play in displacing Russian fossil fuels in the transport sector?

Yes, it is clear that sustainably...
sourced biomass, including biofuels, plays a big role in the process of reducing EU dependency on Russian fossil fuels.

Considering that currently biomass covers around 60% of EU renewable energy sources, and that we need to reach our ever-stricter climate goals already by 2030, it is clear that biofuels are needed to cut emissions quickly in various different modes of transport.

Some NGOs have rejected calls for more biofuels, arguing that food-and-feed biofuels lead to land-use change abroad. Do you agree with this?

I would respond to these concerns that sustainable production of biofuels builds mainly on waste and residues rather than on food crops. We need to incentivise especially biofuels production which builds on an efficient circular economy based on raw material use, where each raw material flow is used to maximise the value of the feedstock and to avoid creating any waste.

The European Parliament recently voted to back a ban on the sale of diesel and petrol cars in 2035. Did you support this position?

I did not support a total ban, but instead I supported the position that 90% of vehicles should be zero emission by 2035. I see that there is also room for diesel and petrol cars, as what matters most is not the type of car per se but the lifecycle emissions of the vehicle and the type of fuel used.

We need to be ambitious but also realistic. Making use of the existing car fleet is a cost-efficient way to gain emission reductions quickly.

France has seen considerable growth in E85 (up to 85% ethanol fuel blend), with price considerations largely driving uptake. Industry says this can lead to greenhouse gas GHG savings of around 70%. But NGOs have been more negative. Would you support more European countries providing higher ethanol blends at the petrol pump, such as E85?

I believe it’s not the job of us, decision-makers, to choose any particular winning technologies or solutions. Our job is to set goals and then allow for industry and the member states themselves to find the most cost-efficient ways to reach those goals.

There is no one-size-fits-all solution – higher ethanol blends contribute to the transition.

There have been concerns that biofuel production can harm food security, particularly given shortages of some crops due to the war in Ukraine. The biofuels industry has branded the claims “ridiculous”, arguing that biofuels can help to bolster food security as they provide animal feed as a byproduct. Do you have a position on this debate?

Concerns on food security due to the Russian war in Ukraine are very legitimate and need urgent addressing. The EU has to take responsibility and help developing countries dependent on Ukrainian food exports to get through the food crisis. However, sustainably produced biofuels should not contribute to the problem as their production builds increasingly on waste and residues.
Lawmakers are in the difficult final stages of resetting EU renewable energy policy for 2030 – and the outcome will have major implications not just for the future of the sustainable biofuels sector but also for Europe’s ability to meet its decarbonisation goals. As David Carpintero writes, the issue is this: If the EU decides to keep limiting the role of biofuels in reducing emissions, it risks creating an energy gap that can only be filled by fossil fuel.

*David Carpintero is the Director General of ePURE, the European renewable ethanol association.*

Alternatives to liquid fuels are not yet just around the corner – but the 2030 deadline for reducing the EU’s GHG emissions by 55% is. And every second and every degree of emissions reduction counts for the future of our planet.

European renewable ethanol (also known as bioethanol) is produced to strict EU sustainability criteria that...
protect the environment and has achieved reduced GHG emissions year on year since 2011 – now about 77% average emissions reduction compared to fossil petrol. What’s more, it’s ready-made, homegrown solution: renewable ethanol is the most immediate, cost-effective, sustainable and socially inclusive way to meet the EU’s 2030 goals to reduce GHG emissions.

If we artificially cap sustainable biofuels like European renewable ethanol today, we are creating a gap in the sustainable energy supply for tomorrow. That gap can only be filled by one thing: imported fossil fuels. Casting away a viable option like European sustainable renewable ethanol risks throwing away our future.

**Real-world emissions reduction**

It’s clear Europe needs more than one solution to achieve real decarbonization by 2030 – especially considering that the EU car fleet will still be made up predominantly of internal combustion engine vehicles, including hybrid, that run on liquid fuels for many years. According to the latest figures from the EU automobile industry, 70% of the cars sold in the EU in the first quarter of 2022 use gasoline.

New research shows that the EU’s most cost-effective solution for decarbonizing these petrol and hybrid cars is renewable ethanol fuel blends.

A study from EU climate research consultancy studio Gear Up assessed various renewable fuel and drivetrain options for climate action in the passenger car segment, based on their greenhouse gas emission abatement costs.

Among its key findings:

- Currently, renewable ethanol blends, ranging from E10 (with up to 10% ethanol) to E85 (with up to 85% ethanol), are the most cost-effective solutions to decarbonise the petrol passenger car segment.
- Considering the current GHG intensity of the EU electricity mix and conditions for battery production, battery electric vehicles save less GHG emissions than a regular internal combustion engine car running on E85 fuel on a full-life-cycle basis.
- The savings achieved by the introduction of electric vehicles are insufficient to reach 2030 climate targets, and therefore additional measures are needed for the fleet of internal combustion engine vehicles that remain in the market well beyond 2030.

“The CO2 emission performance standard – stimulating the introduction of electric vehicles – and the proposed RED III target to reduce the emission intensity of fuels, together do not achieve enough greenhouse gas emission reduction to get on track to climate neutrality in 2050,” the report’s authors wrote. “Higher volumes of renewable fuels are required to reduce emissions in the current (and remaining) fleet of internal combustion engine vehicles.”

**The most cost-effective solution**

The studio Gear Up study looked at the costs and potential GHG savings of switching from a Volkswagen Golf, the most-sold EU mid-size passenger car, running on pure fossil petrol, to low-carbon alternative options in the same car segment. These options included renewable fuels blends (such as E10, E20, E85, but also B30, B100), different levels of electrification (mild hybrid, plug-in hybrid, battery electric vehicle), as well as combinations of hybrid engines with ethanol blends.

It considered the costs of switching from a “societal” perspective, excluding the impact of tax benefits and subsidy schemes that distort the market for EVs. The study also covers the full Well-to-Wheel life-cycle emissions of energy carriers, as well as the impact of manufacturing the vehicles.

Making Fit for 55 fit for purpose requires looking beyond just one solution for decarbonising road transport. While we wait for new technologies to mature and new infrastructure to support them, renewable ethanol is already making a difference. This new research confirms the importance of diversifying solutions. Domestically produced renewable ethanol is an immediate, sustainable, cost-effective and socially inclusive solution to moving beyond fossil fuel.
From London to...
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