How Europe can cut a third of its oil demand by 2030

Short, medium and long term solutions

August 2022

Summary

At the time of Russia's illegal invasion of Ukraine, it typically supplied one out of every four barrels of crude oil that the European Union imported. These imports contributed significantly to funding Putin's military aggression against Ukraine. To cut this funding stream, the European Commission has agreed a ban on imports before the end of the year and a ban on EU ships transporting Russian oil. The UK has also announced a ban on Russian oil imports to fully take effect by the end of the year.

Transport is responsible for two thirds of the EU's oil demand. To ensure that the EU does not simply shift oil purchases from one authoritative regime to another, which will do nothing to improve the EU's energy security, the EU and member states should use this as an opportunity to wean transport of its fossil fuel dependency altogether. This will not only improve the EU's energy security. Crucially, it will also put EU transport on a more sustainable pathway to enable the EU to meet its climate goals.

This paper assesses how and to what extent the EU can reduce oil demand through short, medium and long term measures. We quantify and build upon the key transport recommendations included within the EU's REpowerEU strategy - the new EU strategy to boost Europe's energy independence - published in May.

With a raft of short term measures that are achievable and easily implementable this year such as ending fuel duty cuts, aerodynamic fittings on trucks, reducing business air travel and reduction in car use, we find that oil demand could be reduced by 38.8 Mtoe. This reduction is equivalent to half the EU's Russian imports. Medium and long term measures taken now to reduce transport's structural dependence on oil reduces demand by 111.5 Mtoe by 2030. Combined, the measures can cut 34% of the EU's oil demand by 2030.

Immediate reduction

Action by governments at all levels, companies, and individuals to implement short term measures can have a large impact on oil demand immediately. The most effective policies are:

1. **Ending the fuel excise duty tax cuts** that prop up demand and mostly benefit the rich, could save an estimated 12.9 Mtoe. It is far better to give vulnerable households and small businesses direct cash payments.
2. **A combination of homeworking, car free days, speed limits and a shift to public transport and cycling** would deliver savings of 13.7 Mtoe.
3. **Reducing corporate flying**. Companies should aim to halve their 2019 air travel emissions, locking in the emission saving habits acquired during the pandemic. This could save 6 Mtoe.
4. **Efficiency measures for trucks such as lower speed limits (80 km/h), retrofitting of aerodynamic devices and more efficient tyres**. These combined measures could save 5 Mtoe, also reducing costs for freight operators.

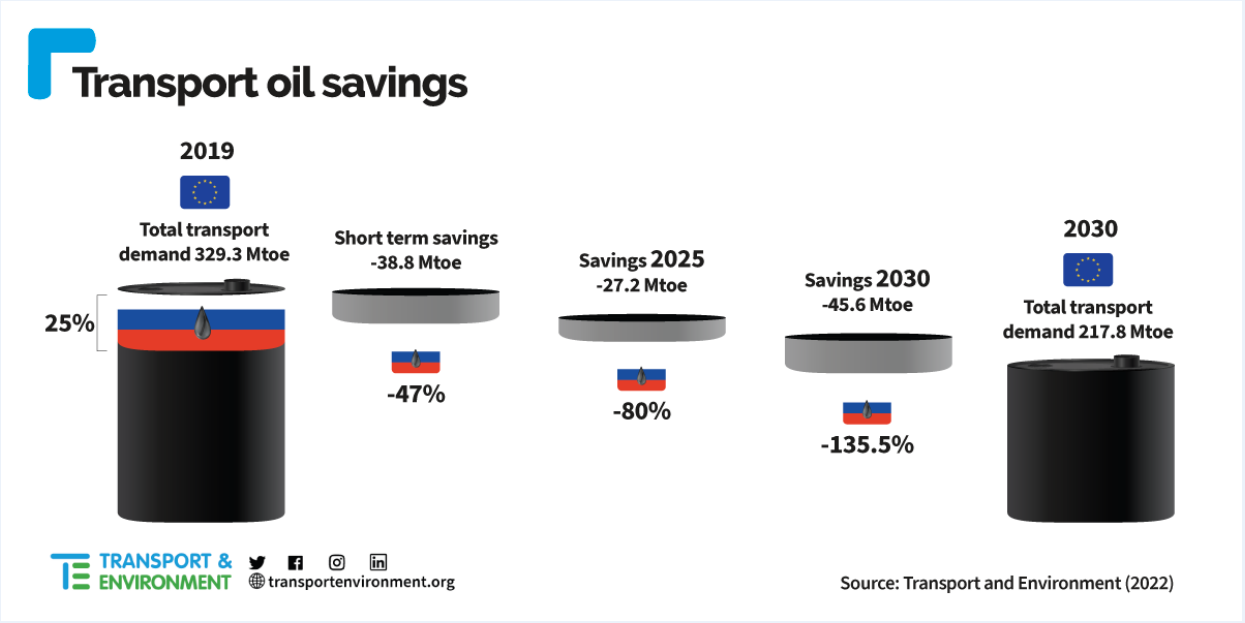
The policy with the largest impact is the fuel excise duty cut roll-back. Rather than regressive fuel tax cuts that favour well-off drivers of large cars, and estimated to cost the EU taxpayer at least €14 billion, national and regional governments should apply the demand reduction measures and provide cash allowances to low income households and small companies directly. The European Commission should coordinate and support cities and governments to implement the short-term measures in a harmonised manner building upon the recommendations included within the REpowerEU strategy.

Plan for EU action for 2025 and 2030

European leaders agreed to cut reliance on Russian gas, oil and coal by 2027. Key to achieving this are effective measures to reduce oil demand from transport in the mid 2020s through increasing the ambition of the current Fit for 55 package and introducing new effective measures to accelerate the energy independence of Europe. The most effective measures according to T&E analysis include:

1. **Accelerated electrification of cars, vans and trucks.** Priority should be given to high-mileage fleets - company cars, business fleets, delivery vans and taxi-like services - where most oil savings can be achieved. This should be done through a new EU fleet regulation as outlined in REpowerEU. Mandating fleets of 20 cars or more to be 50% ZEV by 2025 and 100% ZEV by 2030 would reduce oil demand by 27.3 Mtoe.
2. **Increased fuel efficiency of ships**. Operational efficiency measures such as lower speeds, hull, propeller, boiler, and engine optimisation and upgrades, can save an estimated 9.5 Mtoe. Such measures are severely underutilised today and should be mandated through a 41% fuel efficiency improvement for ships by 2030 within the Energy Efficiency Directive.
3. **Increased road freight efficiency** (e.g. improving the load of trucks and reducing empty journeys)**.** Priority should be given to putting a price on CO_2 via distance based CO_2 pricing (with exemptions for ZEVs) as part of the national implementation of the EU Eurovignette directive, combined with the use and exchange of standardised operations and vehicle data. This could result in 10% improvement in load optimisation for trucks, saving 7.7 Mtoe.

In this report we show that combining short and long term measures, the EU can be completely free of its dependence on Russian oil by 2030. Therefore instead of switching fossil fuel suppliers and making the same energy security mistakes of the past, the EU, member states and cities must now focus on implementing demand reduction measures as soon as possible. Crucially, if implemented these measures will also help the EU meet its climate goals by avoiding 335 Mt of CO_2 by 2030.



Aside from measures that result in a direct reduction in oil demand, other EU files are crucial in ensuring an end to fossil fuel dependence. The EU taxonomy plays a key role in determining what a sustainable investment is, but has recently been watered down with the inclusion of fossil gas. This puts the annual €480 billion investments required for the green transition in jeopardy. Instead, the EU should not allow investments in any project that burns fossil fuels to be counted as a green in the Taxonomy. False solutions such as biofuels which will do nothing to further the EU's energy security or climate goals but risk further land degradation by delaying rewilding and putting hundreds of millions into food poverty should not be considered.

The EU and member states must take action now to immediately cut oil demand to guarantee the largest short term oil savings. This must be combined with concrete policy action to lock in longer term reductions to reduce imported oil dependency and ensure that the transport sector is zero-emission by mid century. To achieve this the EU and member states must rapidly implement and build upon the policy proposals announced within REpowerEU thus improving energy security and reducing funding to autocratic regimes across the globe.

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Introduction

Russia supplies 25% of Europe's crude oil. Two thirds of oil consumption is in transport. After the UK announced a ban on Russian oil imports, the EU followed suit and will implement an embargo for the end of the year. However, unless oil demand is cut by an equivalent amount, this would lead to a shift to suppliers such as Saudi Arabia.

This paper looks at how Europe can and must drastically cut its oil use in transport in the short, medium and long term. One of the underreported benefits of lower oil usage in Europe would be to temper global oil prices which are determined by supply and demand. In a tight global oil market where the OPEC+ oil cartel is holding back supplies, reducing demand is the single most effective measure European nations can take to lower oil prices and inflationary pressures related to it.

RepowerEU - a new EU strategy to boost Europe's energy independence published on 18 May - is an opportunity for the EU to revisit key laws to enable rapid reduction in oil consumption. Alongside this, the Fit for 55 (FF55) package of climate proposals have gone through Parliamentary Committees and is about to undergo Trilogue negotiations. This paper contains recommendations that could be implemented under RepowerEU and FF55, and quantifies the impacts of action in those files.

The EU dependence on Russian oil and diesel

First and foremost, a rapid reduction in oil consumption is necessary to limit climate change to 1.5 degrees above pre-industrial levels. The Russian invasion of Ukraine has highlighted the Bloc's dependence on fossil fuels from countries with a high geopolitical instability index[1] and the need to rapidly reduce fossil fuel demand and move to clean, secure renewable energy sources.

Transport has an important role to play in Europe's oil dependency. The oil consumed in transport - that is the fuel consumed by cars, vans, trucks, aeroplanes, and ships - makes up two thirds of total oil consumption in the EU. Road transport in particular consumes 50% of all of the EU's oil[2]. In total the EU's oil and gas dependency costs the block over $1 billion a day[3].

Fig. 1 shows the final consumption of oil products in the EU in 2019 and how that compares to the net trade of oil products. The EU is typically a net exporter of petrol; the dieselisation of the car fleet means that there is a glut of EU refined petrol. For diesel, the EU imports around 10% of it to meet consumption, which is 3.6 times more than petrol. Most of this (90%) comes from Russia. While oil may be fungible, the EU won't easily be able to source diesel from anywhere else.

[1] Cambridge Econometrics (2016) A Study on Oil Dependency in the EU. Available: www.transportenvironment.org/wp-content/uploads/2021/07/2016_07_Study_EU_oil_dependency.pdf
[2] Transport & Environment (2022) How Russian oil flows to Europe. Available: https://www.transportenvironment.org/discover/how-russian-oil-flows-to-europe/
[3] Chaturvedi, A (6 April 2022) Minister Says EU Giving Russia 1 Billion Euros A Day For Oil, Gas. Available: https://www.ndtv.com/world-news/minister-says-eu-giving-russia-1-billion-euros-a-day-for-oil-gas-2865943

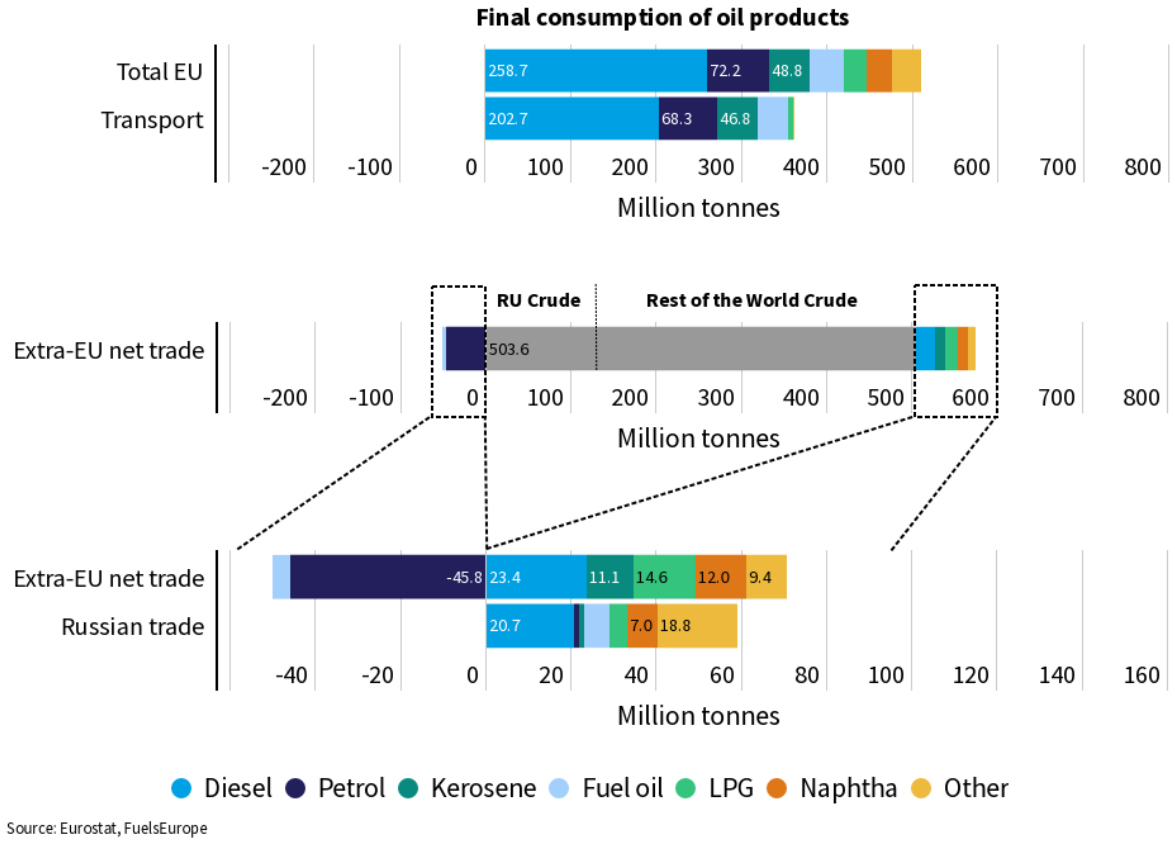
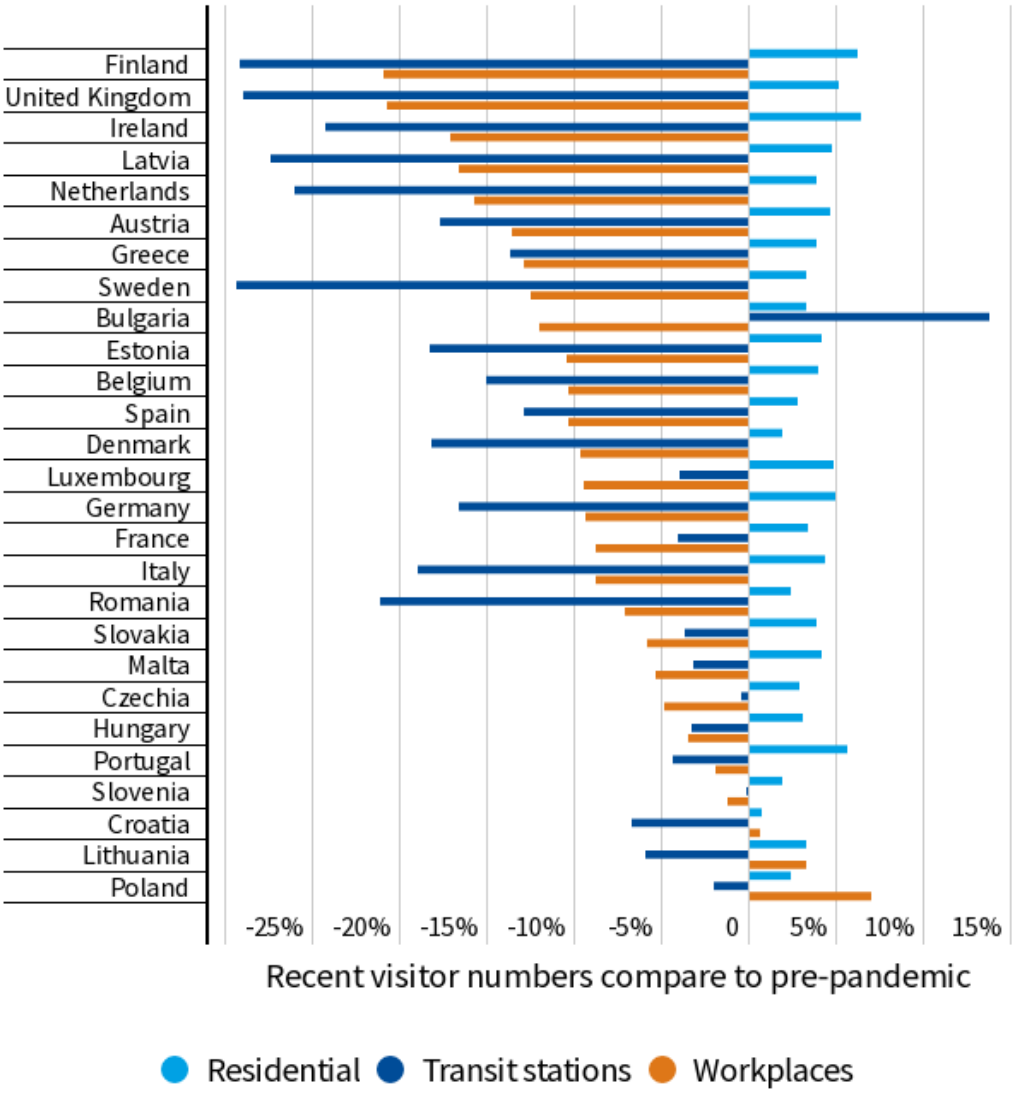


Figure 1: Final consumption and net trade of oil products in the EU, 2019

The impact of covid lockdowns and the recovery

The impacts of the covid pandemic had profound effects on mobility and work. The lockdowns and cancellations of international travel due to the covid pandemic reduced oil consumption in transport in the EU by 18% in 2020 compared to 2019. Analysis of recent Google Mobility Trends data from Our World in Data[4] shows that in five European countries, workplaces are less frequented by 15% or more compared to pre-pandemic levels (Fig. 2). Most countries have a more than 15% reduction in visitors to transit stations, and most countries still have a significant increase in residential activity. Along with the increased visits to residential locations, indicating that increased working from home has continued, albeit not at the levels experienced during the peak of the pandemic.

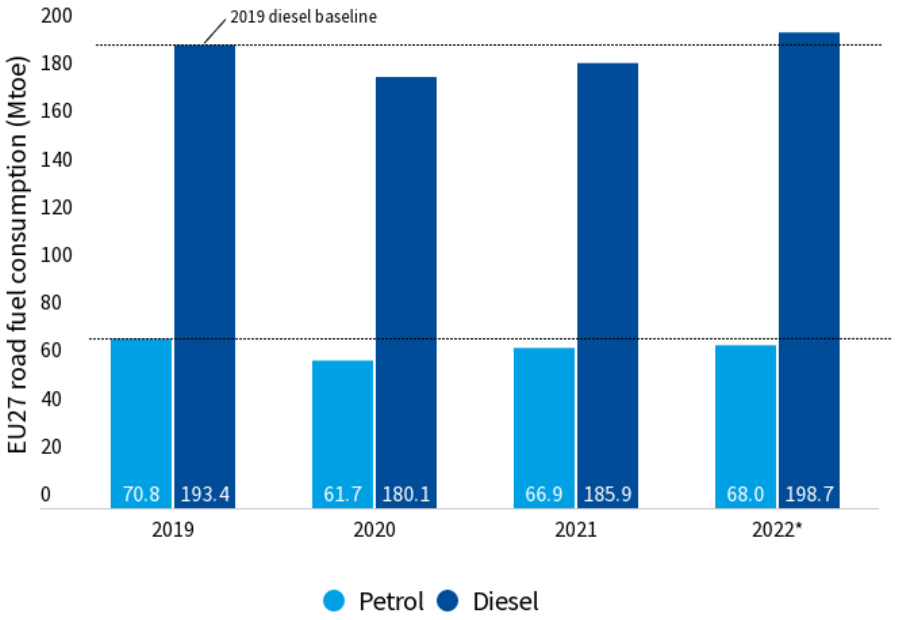
[4] Ritchie, H., Mathieu, E., Rodés-Guirao, L., Appel, C., Giattino, C., Ortiz-Ospina, E., Hasell, J., Macdonald, B., Beltekian, D. and Roser, M. (2020) Coronavirus Pandemic (COVID-19). OurWorldInData.org. Retrieved from: https://ourworldindata.org/coronavirus [Online Resource]



Source: Our World in Data. Average of 5 week period from 3 March to 6 April 2022 compared to 5 week median from 3 January to 6 February 2020, pre-pandemic

Figure 2: Mobility data for the EU and UK comparing pre-pandemic levels to March and April of 2022

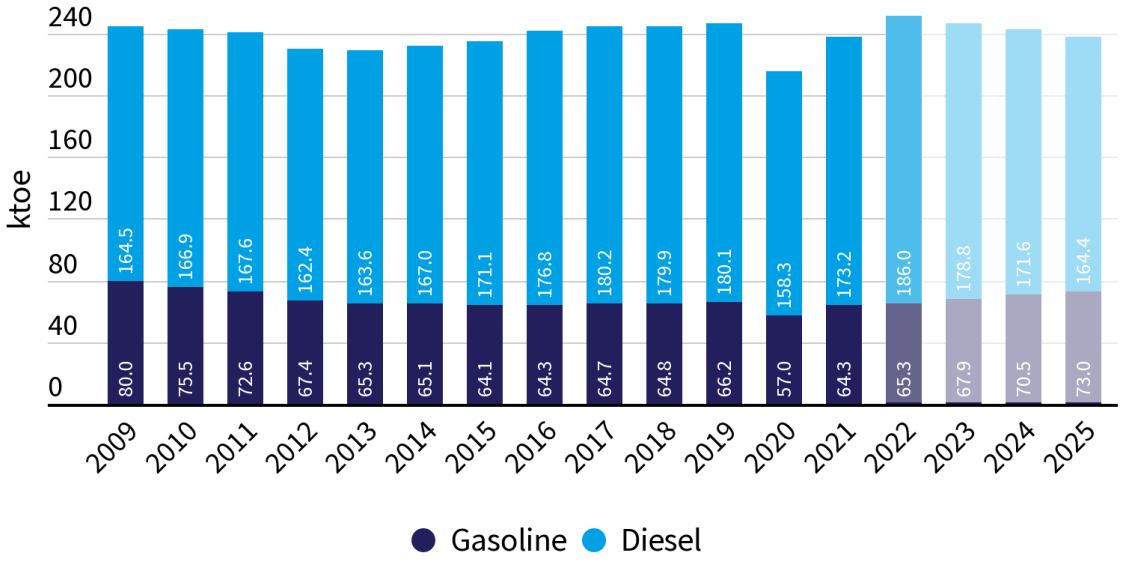
Europe was not able to effectively lock-in the reduction in fuel demand that changes in mobility and working patterns had achieved. While the impact on aviation fuels is significant - total EU Q1 2022 consumption is trending at just over half of Q1 2019, the impact on fuels consumed in road transport was considerably less. Projecting Q1 2022 consumption in the EU based on seasonal consumption from 2019 shows that, all else being equal, diesel consumption will be slightly higher than in 2019 (Fig. 3). Petrol consumption will still not quite reach 2019 levels, but has largely recovered from the peak 2020 dip in consumption.



Source: Stratas Advisors. *T&E projection from Q1 2022. Includes biofuels

Figure 3: Road transport fuel recovery in the EU

Projecting further into the future, fuel consumption will not dramatically change until 2025 (Fig. 4). We project that petrol consumption will increase slightly while diesel consumption will taper off. Measures for FF55 will not help to reduce oil demand in the next few years. Aside from the problem of continued CO_2 emissions and climate change, this shows that our dependence on oil will not easily subside, and the EU will continue to be in a bind with the diesel deficit.



Source: Eurostat; Stratas advisors, T&E transport modelling. Note: excluding biofuels

Figure 4: Petrol and diesel consumption with projection, EU27

Short term measures to reduce transport oil consumption

Policies have been successfully applied during past energy crises and achieved sizable reductions in oil demand to complement oil embargoes and reduce the risk of shuffling of oil supplies. Examples include measures in the 1970s, particularly in the Netherlands, and in Japan with electricity savings after the Fukushima nuclear disaster in 2011. For the latter case, in a national movement called *setsuden*, citizens and companies were able to cut electricity consumption by 20% compared to the same time in the previous year and prevented blackouts[5]. This was largely by reducing inefficiency or unnecessary electricity consumption, such as over use of air conditioners to unplugging devices.

The transport sector is highly inefficient. On average, it takes 10 cars to transport 15 people; trucks drive around empty for around a fifth of their total travel, and are rarely fully loaded; aircraft have up until recently being flying at very low load factors (so called ghost flights) to maintain airport slots, something that is also seen in the hub system to feed long haul flights; ships sail at full speed across the ocean only to sit in queues at crowded ports; next day deliveries result in suboptimal delivery routes and load factors of vans. In a hypothetical and idealised case, doubling the occupancy rate of cars would cut emissions in half, of around 75 Mtoe. Increasing the average load factor of trucks by 25% would save 15 Mtoe. Many of these inefficiencies can be addressed by short term measures.

Short term measures are ways that we can rapidly reduce emissions and oil consumption from transport that can have an impact this year. Short term solutions will most effectively be actioned at local, individual and corporate levels but their effectiveness can be embedded and greatly enhanced by national and European policies complemented by public awareness raising. Short-term measures focus on three principal approaches:

1. **Reducing** the need to travel. For example, increased working from home to reduce commuting and reduced business travel (particularly flying).
2. **Increasing transport efficiency.** Transport is inefficient. Doubling car occupancy to 3 people per car and increasing truck filling rates by a quarter would cut transport oil demand by 26%. Measures that go in this direction include reducing speed limits for road vehicles, eco-driving, and increasing car sharing particularly for repeat trips like commutes and travel to school with ride matching schemes, and a retrofitting programme for truck aerodynamic devices.
3. **Shifting** from private car use to transport modes that are fossil free (like walking and cycling), or more efficient (public transport), and shifting some freight to rail or in urban areas to electric or cycle delivery vehicles. This can be encouraged by car-free days, reduced public transport ticket costs, and increased bus only lanes for priority access in cities.

[5] Wikipedia. Accessed April 2022. Available: https://en.wikipedia.org/wiki/Setsuden

INFOBOX - Increasing biofuels will make a bad situation worse

Russia's invasion of Ukraine is causing serious concerns over food security across the world. Russia and Ukraine together supply about a quarter of the world's globally traded wheat and barley with export destinations including low income countries as well as highly dependent hunger hotspots.

In Europe, we use food crops, including wheat, to produce biofuels. Biofuel lobby groups claim that this improves both energy and food security as co-products are most commonly used for animal feed. The animal feed sustains our high demand for meat & dairy products, which provide a highly inefficient conversion of plant proteins into proteins for final human consumption.

In our briefing Food not Fuel[6], we estimated that the current use of wheat in biofuels in Europe corresponds to about 20% of Ukrainian wheat exports and could be used to produce 15 million loaves of bread per day instead. While some countries struggle to secure sufficient food supplies for their people, increasing the use of food crops in biofuels would exacerbate the situation. The use of biomass, land and resources should be prioritised for the production of food for human consumption over feed and bioenergy and areas set aside for biodiversity conservation should not be used until all other options have been exhausted.

The IEA has produced two recent studies on how to rapidly reduce oil in *Saving Oil in a Hurry* (SOIAH)[7] and *A 10-Point Plan to Cut Oil Use*[8]. We draw on the most relevant points from those studies and add more granular information for cities, aircraft, freight, and shipping. There are options that can make the situation worse, despite being suggested in SOIAH: the increased use uptake of crop-based biofuels can make a bad situation worse (see Infobox above). Finally, we have had a look at how more tailored policy choices and action in the UK could completely eliminate that country's dependence on Russian diesel.[9] In the following, we describe measures that can be taken in Europe.

INFOBOX - Avoiding rebound

The implementation of short term measures to reduce demand can result in rebound effects that may reduce or completely cancel out the initial positive outcomes in reducing oil consumption. To take additional working from home as an example, the initial impact will be that less cars will be on the road. However, in the absence of other complementary measures, driving a car will become more convenient and attractive, as traffic jams are eased and travel times reduced. To lock in these reductions, measures need to be applied in holistic ways and to take into consideration local geography, existing infrastructure, climate, and wealth of their citizens. The most important measure is

[6] Transport & Environment (2022) Food not fuel. Available: https://www.transportenvironment.org/discover/food-not-fuel-why-biofuels-are-a-risk-to-food-security/
[7] IEA (2018) Saving oil in a hurry. Available: https://iea.blob.core.windows.net/assets/194d57e4-9126-425f-a1b3-7a25e097b677/Insights_Series_2018_Saving_Oil_in_a_Hurry.pdf
[8] IEA (2022) A 10-Point Plan to Cut Oil Use. Available: https://www.iea.org/reports/a-10-point-plan-to-cut-oil-use
[9] Transport & Environment (2022) Eliminating the UK's Reliance on Russian Oil. Available: https://www.transportenvironment.org/wp-content/uploads/2022/03/2022_03_briefing_Eliminating_UK_reliance_Russian_oil.pdf

to not reduce fuel prices by cutting fuel excise duty. Other measures may include reducing the amount of car lanes by converting them to bus only lanes or separated bike lanes, parking restrictions, and congestion charges. Secondary effects of working from home can lead to higher energy costs for households. Where heat is supplied by gas boilers, for some regions this may not necessarily result in a net reduction in Russian energy imports. Measures to support households in the context of high prices should include progressive measures to help the most needy, for example giving cash payments to households and small companies to help cover the additional costs. While working from home can curb fuel use, it will also reduce congestion, which could encourage more drivers onto the road.

Actions from national governments

To counteract the high prices for fuel, 18 of the 27 member states of the EU have implemented short-term price relief measures through excise duty and VAT cuts. The announced cuts already tally €16 billion in costs and would reach €52 billion a year if the cuts are extended. By making fuel cheaper, these policies also invariably increase demand for fuel. We estimate that over the duration of the policies, they will result in an additional 3.3 million tonnes of oil equivalent (Mtoe) and 12.9 Mtoe a year if the cuts are extended.[10] To avoid these perverse incentives, a far more effective and egalitarian measure would be to provide households with cash payments.[11]

Actions from cities

Urban mobility is responsible for about 23% of the energy use in the EU's transport sector[12]; Over 30% of car journeys in Europe cover distances of less than 3 km; 50% cover less than 5 km. These distances can be covered within 15–20 minutes by bicycle or 30–50 minutes by walking[13]. This implies considerable potential for swift changes to oil consumption driven from urban mobility. Driving in cities is often when consumption per kilometre is most inefficient (due to cold starts, stop-start at intersections, and congestion). As a result, each 1% shift from automobile to active travel typically reduces fuel consumption 2-4%[14]. An upcoming study by the Clean Cities Campaign will investigate and report on the measures in more depth. Here, we highlight some of the key measures and provide some quantification for them where possible.

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[10] Based on price changes and duration according to T&E's fuel excise duty tracker (accessed April 2022) and using country-level elasticities from *Eurostat* for passenger cars and *CE Delft (2011) Price sensitivity of European road freight transport: towards a better understanding of existing results.* for vans and trucks. Available: https://www.transportenvironment.org/challenges/climate-tools/fuel-taxes/cuts-to-fuel-taxes/

[11] Transport & Environment (2022) A dereliction of fuel duty: Europe's €9 billion gift to Putin and the rich. Available: www.transportenvironment.org/discover/a-dereliction-of-fuel-duty-europes-e9bn-gift-to-putin-and-the-rich/

[12] European Commission (December 2021) Questions and Answers: European Urban Mobility Framework. Available: https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_6729

[13] World Health Organisation (accessed March 2022) Physical activity. Available: https://www.euro.who.int/en/health-topics/environment-and-health/Transport-and-health/data-and-statistics/physical-activity2

[14] Littman et. al. (2022). Evaluating Active Transport Benefits and Costs. Retrieved March 9th, 2022 from: https://www.vtpi.org/nmt-tdm.pdf

Pop-up bike lanes were a feature in many cities during the covid lockdowns; if proven to be effective they can be made permanent, encouraging modal shift to cycling and also reducing space for cars. . It has been estimated that if one out of five urban residents permanently replaced one car trip per day with a bike trip, it would cut emissions from all car travel in Europe by about 8%[15]; if German urbanites cycled like their Dutch neighbours, it could save 2.9% of fuel use in Germany. Covid also caused a drastic deterioration of public transport ridership in European cities, to the tune of 40%-70%[16]. To avoid structural loss, public transport authorities need to urge citizens back, for example by providing discounted ridership or making car lanes bus only lanes to improve punctuality and speed of the service.

Measures in the aviation sector

Pricing for aviation

The aviation sector is one of the most undertaxed forms of transport: tickets are VAT exempt and there is no excise duty paid for kerosene; charges that are due in competing forms of transport like rail. While changes to fuel excise have been proposed in the FF55 package, EU and national governments can impose an **emergency ticket tax levy on all flights,** based on distance and travel class. Fliers are among the wealthiest in society, those who fly in premium classes particularly so. Long distance flights should be differentiated due to the fact that while 6% of flights from Europe are longer than 4000 km, they account for 46% of emissions[17]. Low income households, who rarely - if ever - fly, will be the least affected. Additionally, the revenues from this tax could be set aside to help fund the aviation sector's transition. Additional measures would need to be taken to avoid flights being emptier, rather than fewer, as a result of the more expensive prices lowering demand.

Corporate flying

One of the most feasible ways to reduce oil dependency is to maintain existing demand reductions experienced during the pandemic. Of the 64.4 Mtoe reduction in total EU oil consumption in 2020 compared to 2019, 37% was due to the drop in international aviation, despite only representing 6.3% of transport oil consumption. Corporate travel is one of the biggest drivers of aviation demand, estimated at a 27% share of EU emissions[18]. The pandemic forced businesses to work in new ways, with considerably less flying, while delivering projects, maintaining connections with customers, and even increasing their revenue. By travelling smart, businesses reduce oil dependence, save money, protect employees' well-being, meet climate targets and ensure resilience in the face of travel restrictions.

In order to avoid a sharp rebound in oil consumption from corporate flying, businesses and institutions can take the following measures:

[15] Brand, C. (2021). Cycling is ten times more important than electric cars for reaching net-zero cities. Retrieved March 9th, 2022 from Link.
[16] Gehrs, B., Austrup, T., Stephan, B., Reiserer, M., Bukold, S. (2022) Kein Öl für Krieg. GreenPeace. Available: https://www.greenpeace.de/publikationen/20220309-greenpeace-massnahmen-kein-oel-fuer-krieg.pdf
[17] Eurocontrol (2022) Aviation Outlook 2050. See page 14. Available: https://www.eurocontrol.int/sites/default/files/2022-04/eurocontrol-aviation-outlook-2050-main-report.pdf
[18] Transport & Environment (2022) https://www.transportenvironment.org/discover/2050roadmap/

1. **Adopt targets for absolute reductions in corporate flying, to 50% or less of pre-pandemic levels.** Immediate cuts should be prioritised. Long-haul flights can be substituted with virtual collaboration; businesses can reduce frequent flying and shift from regional air travel to high-speed rail. Companies should improve transparency and report on their air travel, so that this can be assessed in a meaningful way.
2. **Extra days leave for low-carbon travel:** to encourage employees to take low-carbon holidays, large employers could consider granting an extra days holiday to employees who take medium or long-distance train holidays. Alternatively, allowing employees to work while on the train could help encourage this mode of travel.

Measures for trucks, vans and buses

Reducing truck speed limits on highways

In line with the IEA 10 point emergency action plan on reducing oil demand, reducing highway speeds is an impactful short term measure that governments can put in place within days. The EU mandates the use of speed limitation devices for trucks set at 90 km/h (Directive 92/6/EEC). However, many countries have official speed limits of 80 km/h for trucks. In reality these are not enforced and trucks drive closer to 90 km/h[19].

The European Commission could send a strong signal to member states in its energy strategy and strongly recommend that member states reduce the speed limit for commercial vehicles to 80 km/h with proper enforcement. As a second step the EU could review the EU directive on the installation and use of speed limitation devices[20] and set an EU limit at 80 km/h. By implementing the 80 km/h limit, there are also other additional benefits to be expected such as increased road safety by reducing road deaths and injuries. Based on a literature review, we assume that a reduction in diesel use of 5% is feasible in the short term from enforcing real world 80 km/h speed limits for trucks[21] and 100 km/h for vans[22].

Trailer modernisation programme

The EU rules have allowed for the use of aerodynamic devices for trucks since 2019. But contrary to the U.S., few hauliers have so far made investments in these fuel saving devices ment in the EU. For example, as of 2015, 40% of new trailers ins the U.S. had side skirts versus only 10% in the EU[23]. As the

[19] For example, in Brandenburg, Germany, trucks averaged 88 km/h on selected road sections despite the 80 km/h speed limit. See: https://brandenburg.de/cms/media.php/lbm1.a.2239.de/studie_tempolimit.pdf

[20] Directive 2002/85/EC

[21] According to a 2014 study by TNO, Transport & Mobility Leuven (TML), CE Delft, in real world conditions, limiting the speed from 90 km/h to 80 km/h would reduce the consumption by 4%-6% (EU27 wide fleet average excluding urban roads). Table 5-14, page 104. See: https://ce.nl/publicaties/evaluation-study-on-speed-limitation-devices/

[22] 2016 by CE Delft, TNO and TLN calculate that a speed limit of 110 km/h on motorways would lead to a 6.4% reduction of CO2 emissions. Available: https://cedelft.eu/wp-content/uploads/sites/2/2021/04/CE_Delft_TML_4H36_Final_report_1479299164.pdf

[23] Side skirts and automatic tire inflation systems are being included on about 60 percent of new truck trailer sales according to *trucks.com*

payback period for these devices is short (typically less than 1 year), there is a clear need to address this market failure as soon as possible with regulation. These devices can save up to 2%-5% of fuel each for a side skirt, boat tail or cab roof on a typical long haul tractor trailer[24,25,26]. When fitted with side and rear devices fuel burn could be cut by 6% (assuming 3% each as a central estimate).

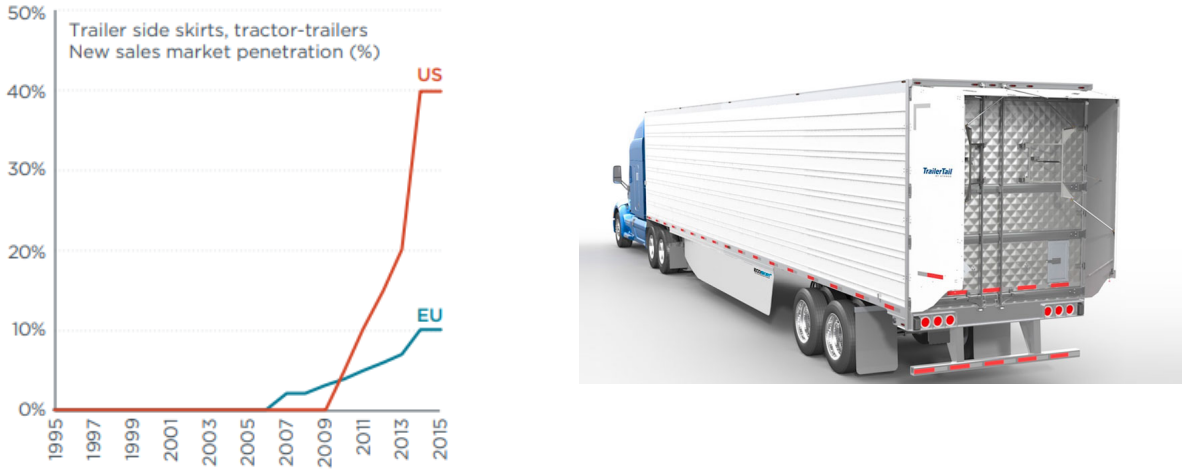


Figure: Trailer side skirt new sales market penetration (left), image of a tractor-trailer with side skirts and boat tail (right)

Along with aerodynamic devices, the mandatory use of higher performing tyres could be mandated at the EU level. The mandate would raise the minimum performance of a tyre for example via a revision of the Tyre Labelling Regulation (EU) 2020/740 (all new tyres to be label A by 2025). The best performing tyres can save up to 5%-8% compared to a mid-range tyre[27]. Regularly checking tire pressure and/or using tire pressure monitoring systems with automatic adjustment can further reduce fuel consumption by a few additional percentage points[28]. Only between 20% and 30% by 2015 of EU's trailers and only 4% of EU's new tractors had tire pressure monitoring systems[29].

[24] Rodríguez, F., Muncrief, R., Delgado, O., Baldino, C. (2017) Market Penetration of Fuel Efficiency Technologies for Heavy-Duty vehicles in the European Union, the United States, and China. Available: theicct.org/wp-content/uploads/2021/06/HDV-market-penetration_ICCT_White-Paper_050917_vF_corrected.pdf
[25] Based on an SRF Optimiser - The Centre For Sustainable Road Freight (csrf.ac.uk)
[26] AeroTruck.eu (accessed March 2022) https://aerotruck.eu/index-eu.php
[27] According to ICCT [see footnote 27], class A for both tractor and trailer would get you between 5% (RD) and 8.4% fuel reduction (LH) compared to class C today.
[28] OptiTire from ZF can deliver up to 2%: https://www.zf.com/products/en/cv/products_64587.html
[29] [see footnote 27]

Germany has a funding programme in place for trailer technologies[30] as part of the fleet renewal scheme (up to 60% of the costs covered, up to €5,000 per trailer)[31]. As part of RePowerEU, the EU should introduce a rapid modernisation incentive program and, for larger fleets, an in-use obligation for side and tail aerodynamic devices (side skirts and boat tails) as well as cab roof fairing, efficient tyres and tyre pressure monitoring and adjustment systems. To maximise short term impact, the implementation and enforcement will have to have ambitious uptake targets.

For the medium term, the EU should set a legal requirement to equip all trucks operating in the EU with side, rear and cab aerodynamic devices as well as the most fuel efficient tyres by 2025. Combining these measures could deliver savings of 5 Mtoe by 2023.

INFOBOX - How to design an EU trailer modernisation program

The EU semi trailer modernisation programme should provide a voucher of €900 per aerodynamic device (60% of the average price of €1,500 for each device, either side skirt or boat tail[32]). Only the first 500,000 trailers could benefit from this voucher under the condition that the trailer is either a new trailer or less than 2 years old. This condition is set in order to ensure that only the most recent trailers are retro-fitted (a trailer has an average life of 10-15 years) and thus prioritise those trailers which will be used most intensively and the longest journeys. The total incentive should be capped at €500k for a given fleet in order to make this programme accessible to SMEs. The total budget would be €450 million and could be spent from the Just Transition Fund or from another program in the EU's general budget. The payback period for fleets would be just a couple of months.

In order to cover the majority of the EU's trailers (there are around 3 million semi trailers), there should be an in-use obligation which goes together with the incentive programme. This obligation should mandate (within a year) the use of at least one side skirt or boat tail on all trucks and should cover all fleets of more than 25 trucks[33].

Eco-driving

Putting in place a training programme on eco-driving could reduce oil consumption by an average of 5% in the short term, according to findings from a 2021 ICCT meta-analysis.[34] Another source states

[30] BMDV (2022) BMDV legt nationales Flottenaustauschprogramm für Lkw auf. Available: https://www.bmvi.de/SharedDocs/DE/Artikel/StV/Strassenverkehr/bmdv-legt-nationales-flottenaustauschprogramm-fuer-lkw-auf.html

[31] Germany is currently considering extending this programme and dedicating it only to trailers (i.e. excluding the scrappage scheme from the scope)

[32] Between €1,300 and €1,700 according to aerotruck.eu

[33] Transport & Environment (2021) Legal study on EU legislation for corporate fleet electrification. Available: https://www.transportenvironment.org/discover/legal-study-eu-legislation-corporate-fleet-electrification/

[34] ICCT literature review of eco-driving pilot programs and studies found that fuel savings for truck fleets can range from 3.5% to 30%. This wide variance in results can be explained by differences in driver experiences and profiles, data collection, monitoring and reporting methods, choice of metrics and goals, time frame of studies, and baseline measurements. For Europe the meta-study finds even higher potential (9.4%). https://theicct.org/sites/default/files/publications/eco-driving-latam-EN-apr2021.pdf

that 3% reduction can be obtained from one single training, 6% with regular training, and 10% with an eco-driving performance management system designed to sustain the programme and maintain the gains in consumption over time (e.g. managing drivers performance via the use of telematics)[35]. Other sources find contribution in the 10%-20% range (Odyssee[36], IRU[37]). The payback period of an eco-driving training seminar for individual drivers is less than a year. Eco-driving does not happen only during vehicle operation. It includes pre- and post-driving activities like route planning, vehicle inspection, and maintenance.

The European Commission should require member states to put in place eco-driving programme guidelines which transport companies above a certain size would have the obligation to put in place within 1 year. Today, some transport companies or shippers already have in place voluntary incentive schemes for eco-driving training for their carriers, but this could be regulated and mandated via the procurement terms.

Reducing the frequency of home deliveries, particularly next day deliveries

Last-mile deliveries are typically conducted by vans, taking a parcel from a distribution centre to a pick-up point or specified delivery address. Delivery vans tend to drive emptier and for greater distances when conducting next day deliveries to exact locations, rather than timely deliveries to centralised pick-up points[38]. While only 2% of vans in Europe are used to deliver goods to consumers[39], they have a disproportionate climate impact, driving 51,300 km annually on average, that is 36% more than the average across all industries[40]. These practices contribute to increasing the overall fuel efficiency of logistics during last-mile delivery. Reducing next day deliveries of parcels would require national governments to implement a next day delivery surcharge, in order to disincentive the practice.

More generally, member states should consider putting in place a tax on the most inefficient parts of the logistics sector, notably on disincentivizing just-in-time supply chains practices to encourage online shoppers, businesses or industries to reduce the frequency of deliveries. Such just-in-time practices are wide-spread in businesses and industry to limit stocks and inventory costs but are also one of the main drivers of inefficient freight logistics practices.

[35] Connaissez-vous Objectif CO_2? Available: https://www.objectifco2.fr/
[36] Odyssee-Mure (2021) Eco-driving initiatives – the key for sustainable and energy-efficient use of motorized vehicles. Available: https://www.odyssee-mure.eu/publications/policy-brief/eco-driving-fuel-reduction.html
[37] IRU (accessed March 2022) Save money… and the planet. Available: https://www.iru.org/where-we-work/iru-in-europe/ecoeffect
[38] Prognos (not yet published) Emissions from logistic chains.
[39] Dataforce (2022) LCV registrations in H1 2021.
[40] Transport & Environment (2022) E-vans: Cheaper, greener, and in demand. Why it's time for the EU to ramp up supply. Available: www.transportenvironment.org/discover/e-vans-cheap-green-and-in-demand/

Summary of short term measures

Mode	Measure	Level*	Mtoe oil savings; 2023 vs 2019 (% within mode)	Details
Road	Replace the fuel duty cuts with income support measures.	N	12.9 (5.1%)	Calculated based on national cuts to fuel taxes implemented over a full year.
Cars	Increased teleworking - 3 days per week	N/C	5.0 (3.3%)	Savings from IEA 10-point plan, applied to EU oil consumption
Cars	Shift to public transport, cycling, walking	I/L/N	3.7 (2.4%)	Extrapolating German case of cycling as much as the Dutch as an upper bound for all types of modal shift
Cars	Lowering speed limits on highways to 100 km/h	N	5.0 (3.3%)	Savings from IEA 10-point plan, applied to EU car oil consumption.
Cars	30 km/h speed limits in cities	L/N	-	A second order measure to ensure that driving in cities is safer, quieter, and to dissuade unnecessary car use to avoid rebound
Vans	Reducing next day deliveries to specific addresses	L/N	-	Measure not quantified.
Trucks	Lowering speed limits	N/C	2.5 (4.3%)	80 km/h for heavy duty vehicles and and 100 km/h for vans on highways
Trucks	Aerodynamic fittings to trailers	EU	2.0 (3.4%)	Assuming that (on average) all trucks and trailers are fitted with at least one of the following aerodynamic devices: side skirts, boat tails, and cab roof fairing.
Trucks	Eco-driving	C	1.5 (2.5%)	Assuming half of the truck drivers are trained for eco-driving training including eco-driving performance management system
Aviation	50% reduction in corporate travel	C	6.0 (12.4%)	Up to 13.0 Mtoe saved in 2050 compared to business-as-usual.
Aviation	Emergency aviation ticket tax	EU	[2.13,4.26] (4.4%, 8.8%)	[€10,€20] tax on intra-EEA flights, [€50,€100] tax on extra-EEA flights.

Table 1: Summary of short term measures. *Levels: I=individuals; C=companies, institutions, organisations, universities; L=local/city authorities; N=national government; EU=EU implemented

Medium term measures to reduce transport oil consumption

Medium term measures are essential for locking in a rapid and systemic transition away from oil in the transport system. In this section, we focus on measures that can be taken at the EU and national level. With this Section we focus on the measures that could be implemented with the RepowerEU strategy and a strengthened FF55 package measures that are currently undergoing Trilogue negotiations.

An action plan to accelerate all vehicle electrification in 2022-2025

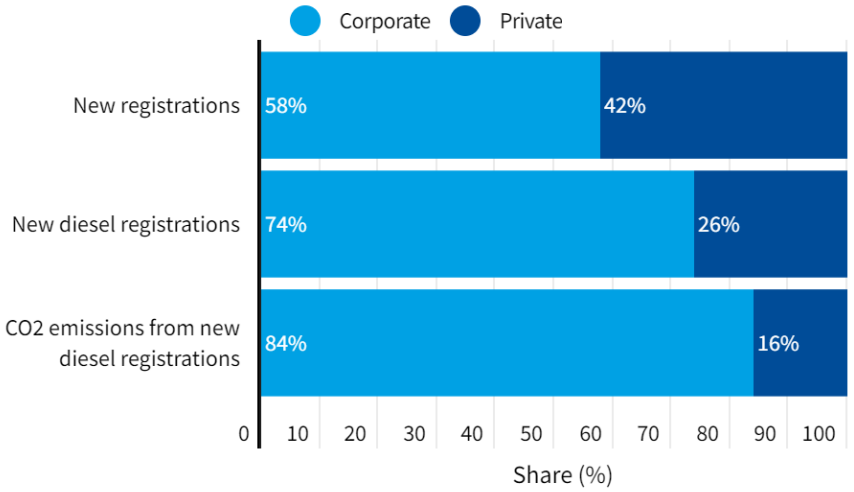
Cars consume 30% of the oil the EU imports from Russia. A coordinated EU action plan, proposed by the Commission, developed with member states, and based on existing regulatory review (e.g. revision of CO_2 emission performance standards for cars and vans), should include a new goal of 15 million fully electric cars on EU roads by 2025 (equivalent to roughly 50% BEV sales in 2025, up from the current goal of 15%).

Specific and extraordinary targets should be set to electrify high mileage vehicles such as company cars, taxis, delivery vans and buses as replacing these fleets with electric powertrains would achieve the largest medium term reduction in oil consumption. RepowerEU is an opportunity to properly address fleets in the Energy Efficiency Directive, for example. On top of this, the Commission should ask national governments to take action, e.g. through implementing legislation under Cars CO_2 to increase penetration directly, and encourage member states to pursue national taxation as a means to achieve such a regulation.

Achieving these targets will require action from EU and national governments. Enabling measures should include greater incentives to promote the uptake of BEVs, scrappage schemes to help low-income households and business replace low fuel economy vehicles with BEVs, and additional measures to enable European carmakers to ramp up production of BEVs right now, including measures to secure supplies of critical battery materials such as nickel where Russia is currently an important supplier.

Mandate fuel efficiency improvements for large corporate fleets

On average, corporate cars are driven over twice as many kilometres in a year as private cars (27,000 km vs 12,000 km). These corporate cars are typically larger, more polluting vehicles. In the case of company cars, employees have no incentive to drive sparingly - their fuel use is covered by their company. Fig. 5 shows the share of corporate car registrations, diesel registrations, and CO_2 emissions. Despite making 58% of all new car registrations, corporate cars make up a disproportionate amount of new diesel cars. Due to their high mileage and larger size, they account for 84% of CO_2 emissions of all new diesel car registrations.



Source: Dataforce (2022). New passenger car registrations 2021. Calculated based on WLTP emissions.

Figure 5: Corporate and private car registrations and CO_2 emissions

A zero-emission vehicle (ZEV) mandate as part of the car CO_2 standards. Just as the CO_2 standards have worked to ensure a supply of BEVs in the EU, a ZEV mandate for corporate fleets would ensure a strong demand for BEVs. Importantly, this demand will be from corporate fleets who are best placed to make the upfront investments and benefit from the lower total cost of ownership generated by electric vehicles. This ZEV mandate should require any company with a vehicle fleet size of 20 cars or more to reach 50% zero-emission vehicles in its new purchases by 2025, and 100% by 2030. For vans and LCVs, all companies (of any size) should be mandated to reach the same level of 50% zero-emission vehicles by 2025, and 100% by 2030.

While this policy is more ambitious than the Commission's CO_2 proposal, many companies have already committed to 100% zero-emission vehicles for their new registrations by 2030. Some companies - including very large fleets - have gone further to commit to 100% zero-emission vehicles for their entire fleet of existing vehicles by 2030 (e.g. ABB, Austrian Post, Deloitte, EDF Group, GlaxoSmithKline, Iberdrola, Novo Nordisk, Siemens) and leading companies have raised the bar higher by committing to an entirely electric fleet by 2025 (e.g. AstraZeneca, IKEA, Orsted, T-Systems).

Our estimates are that for passenger cars, this ZEV mandate policy would save 13.1 Mtoe in 2025 and 27.3 Mtoe in 2030 compared to 2019, of which 7.0 Mtoe in 2025 and 14.6 Mtoe in 2030 is additional to the evolution under the Commission's CO_2 standards for cars.[41] The 2025 reduction is equivalent to a 43% reduction compared to the corporate car fleet in 2019 and 8% compared to the entire car fleet.[42] The 2030 reduction is equivalent to 90% and 17% respectively.

[41] Assumes ZEVs replace ICE vehicles with a linear evolution to meet the ZEV mandate.
[42] From 2019 passenger car emissions (Eurostat) and 2021 corporate fleet emissions (Dataforce; EEA emissions).

While a ZEV mandate presents the most straightforward instrument, an alternative instrument is to target high mileage fleets through a specific mandate for corporate fleets in the Energy Efficiency Directive (EED). In addition to the existing obligation placed on public bodies' to reduce their total final energy consumption found in Article 5 of the EED, a specific measure should target the fuel consumption of new light-duty vehicles operated by all public bodies: a reduction of 50% by 2025 and 100% by 2030 (i.e. a zero-emission fleet). Moreover, the EED should also require member states to put in place measures targeting corporate fleets with more than 20 vehicles: the fuel consumption from the light-duty and heavy-duty vehicle fleets should be equivalent to a 20% reduction by 2025 compared to the fuel used by those vehicles in 2021, and a 50% reduction by 2030 compared to the fuel used by those vehicles in 2021.

Our estimates are that for passenger cars, this EED obligation would save 12.1 Mtoe in 2025 and 20.7 Mtoe in 2030 compared to 2019, of which 5.5 Mtoe in 2025 and 6.3 Mtoe in 2030 is additional to the evolution under the Commission's CO_2 standards for cars. The 2025 reduction is equivalent to a 40% reduction compared to the corporate car fleet in 2025 and 8% compared to the entire car fleet. The 2030 reduction is equivalent to 69% and 13% respectively.

Mandate fuel efficiency of ships in the Energy Efficiency Directive

Ships are a significant source of oil consumption and emissions in the EU. In 2019, EU shipping consumed 28.8 Mtoe of fuel, 12.2% of all fuel consumed in transport. The shipping sector can be inefficient, with ships sailing quickly to their destination only to join a queue outside the port. Additionally, the sector demonstrates lack of willingness to uptake other energy savings technologies, including wind-sails. Shipping fuels will be regulated by the upcoming FuelEU regulation. However, as the regulation only considers fuels and in its current form only requires a 6% reduction in fuel GHG intensity in 2030 compared to a 2020 baseline, half of which will be achieved in Business-as-usual, it misses the significant potential for oil and gas consumption reduction that efficiency measures can make.

RepowerEU gives the EU the opportunity to put fuel efficiency back on the table, given its potential to cut emissions from the shipping sector by 30%. There are several ways to achieve operational efficiency improvements. Speed reduction is a compelling measure to quickly cut fuel use in the sector. It has been found that a 20% reduction in operational speed would reduce fuel consumption by around 34%[43], that can be further optimised by more digitalisation of journeys and port capacities. Other measures include the installation of technology such as propeller optimisation, hull optimisation, and improvements to engines and boilers. This can be achieved by mandating national or regional operational energy efficiency standards that define maximum permissible energy

[43] CE Delft (2019) Study on methods and considerations for the determination of greenhouse gas emission reduction targets for international shipping. Available: https://cedelft.eu/wp-content/uploads/sites/2/2021/03/CE_Delft_7M92_Study_on_methods_and_considerations_for_the_determination_of_greenhouse_gas_Def.pdf

consumption per tonne nautical mile (MJ/t-nm) per ship type and size[44]. An amendment to the EED should be made to mandate energy efficiency improvements to the entire shipping fleet (new and existing ships) to improve their real-life operational energy efficiency using the data from the EU MRV regulation (2015/757). We calculate that together, speed reduction and other efficiency improvements could reduce shipping oil demand by 8.8 Mtoe by 2030. Given the projected growth in global shipping, our recommendations would drive absolute reductions in oil consumption by 7.5 Mtoe compared to 2019.

More ambition in FuelEU and the shipping ETS

FuelEU is a regulation that sets greenhouse gas intensity targets on the fuel. We have shown that an uptake of sustainable fuels would be limited to negligent in 2030 in the proposal[45]. Among other recommendations, we suggest advancing the targets by 5 years, so that the 2035 target becomes the 2030 target. Along with a subtarget of 6% for e-fuels, this would save an additional 8.1 $MtCO_2e$ per year and cut oil consumption by 2.3 Mtoe in 2030 compared to the proposal.

Shore side electrification

The EU needs to adopt more rapid shore side electrification (SSE) targets than have been proposed by the European Commission in its FuelEU Regulation. As shown in , the scope of the current SSE mandate is limited to passenger and container ships only, and is only set to commence in 2030, despite the fact that technology solutions exist today. To foster the rapid deployment of onshore power supply, which will help cut oil demand, GHG emissions and air pollution, T&E recommends that the FuelEU zero emission berth mandate applies to all passenger ships starting from 2025, and be followed by containerships, tankers and refrigerated-bulk carriers from 2030. Finally, all remaining ships should be covered by 2035 (). Compared to the EU's proposal, T&E's recommendation would cut shipping oil demand by an additional 0.7 Mtoe in 2025, 1.0 Mtoe in 2030 and 1.3 Mtoe in 2035. This corresponds to additional CO_2 savings of 2.3 $MtCO_2$, 3.2 $MtCO_2$ and 4.1 $MtCO_2$ respectively.

Shipping ETS

As part of the FF55 package, the European Commission has proposed to include shipping within its EU emission trading system (ETS). Whether the shipping ETS delivers direct oil savings in and of itself is a function of the allowance price. Given the high price inelasticity of demand in shipping, it is unlikely that the ETS will lead to significant emissions reduction in shipping, at least in the short term.[46]

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[44] Transport & Environment (2021) . Decarbonising European Shipping. Technological, operational, and legislative roadmap. Available: https://www.transportenvironment.org/wp-content/uploads/2021/07/202104_Shipping_Technological_Roadmap_to_Decarbonization.pdf

[45] Transport & Environment (2022) FuelEU Maritime: T&E analysis and recommendations. How to drive the uptake of sustainable fuels in shipping. Available: www.transportenvironment.org/discover/the-eus-fuel-maritime-proposal-will-lock-in-gas-until-the-2040s/

[46] Transport & Environment (2020) Q&A: Revision of the Shipping MRV Regulation. Available: https://www.transportenvironment.org/wp-content/uploads/2021/07/Revision%20of%20the%20shipping%20MRV%20regulation%20-%20Q&A.pdf

The EU ETS will instead be important as a revenue source to deploy zero-emission fuels and technologies, with yearly revenues expected at around €5.6 billion (at today's carbon price of €80/tCO_2). Subsidy instruments like carbon contracts for difference (CCfDs) - that pay companies to operate clean technologies at the same price as the conventional technologies - will therefore be important to accelerate the uptake of zero-emission fuels. T&E estimates show that using the revenues from 10 million ETS pollution allowances (1/10th of shipping's yearly emissions) for CCfDs would put between 44 and 293 e-ammonia-powered mid-sized containerships (8,000 - 11,999 TEU) on the water, thereby displacing up to 2.3 Mtoe of fuel oil.[47]

INFOBOX - LNG uptake with FuelEU

While this paper is largely about reducing our oil dependence, the current FuelEU proposal will incentivise an uptake of LNG in the shipping sector, just as EU member states are trying to figure out ways to reduce our dependence on it[48]. Currently shipping uses only about 2.3 Mt (2.95 bcm) of fossil natural gas as fuel and reports suggest that at least some of it is supplied from the Russian Federation. Unless modified, it is projected that demand for fossil natural gas (LNG) would reach 9.3Mt (12.9 bcm) in 2030 and 15.9Mt (20.4 bcm) in 2035. In addition to creating a totally new demand for fossil gas in a sector that traditionally has not relied on LNG, this would further reduce the ability of the EU to reduce its dependence on Russian gas. This is because either some of the diversified LNG volumes will be diverted to the new demand in shipping or ships will rely on Russian gas directly, defeating the purpose of diversification in the first place.

The most effective way to avoid such an eventuality is to mandate green hydrogen uptake under the FuelEU Maritime Regulation. **We recommend a dedicated 6% sub-quota for renewable fuels of non-biological origin (RFNBOs).** RFNBOs are also known as e-fuels, and include green hydrogen, green ammonia, or synthetic hydrocarbons. To reduce Europe's dependence on fossil fuels, especially those sourced in Russia, ships can be used to transport green hydrogen as cargo. This can be further facilitated if ships are also required to consume hydrogen(-based fuels) as fuel for propulsion too. This would create synergies and help the hydrogen industry to reach economies of scales needed to cut the hydrogen production costs and provide predictability for investors. Hydrogen is a future proof technology for shipping. Hence, it is a no-regret option.

Lastly, hydrogen imports via EU ports will help to use the same infrastructure for ship refuelling. This would improve the economics of deployment of this infrastructure, cut down the payback period and ensure predictable market demand for assets.

[47] T&E calculations using fuel consumption data from the EU MRV 2019. Fuel cost assumptions have been taken from CE Delft 'The Availability and costs of liquefied bio- and synthetic methane' and a carbon price of 80 EUR.
[48] Transport & Environment (2022) Now more than ever, powering ships with gas is a terrible idea. Available: www.transportenvironment.org/discover/now-more-than-ever-powering-ships-with-gas-is-a-terrible-idea/

Increasing vehicle CO_2 standards ambition in Fit for 55

Increasing the CO_2 standards for vehicles drives innovation, vehicles driving further on less fuel, but most importantly, zero emission vehicles such as battery electric vehicles (BEVs)

Cars

The FF55 proposal to reduce CO_2 emissions from the new cars and vans sold in 2030 (55% emission reduction for cars and 50% for vans) and 100% emission reduction (so effectively 100% ZEV sales) from 2035 is a good long term strategy and will reduce the consumption of the entire car and vans fleet by 8% in 2030 compared to 2021. However, given the current market development of electric vehicles, including carmakers' own commitments, a much higher reduction for new vehicles by 2030 is reachable - and necessary for Europe's energy security - of at least 75% to 80%. This will reduce the fleet's fuel consumption by 17-19% compared to 2021.

The biggest problem with the proposals on the table is that they will do little to reduce Europe's oil dependency in the short term, as the 2025-2029 CO_2 target remains unchanged (-15%). We have proposed to improve the regulation by setting higher ambition in the car and vans CO_2 regulation targets[49]: 30% emission reduction in 2025 (instead of only -15% in the current regulation), -45% in 2027 and -80% in 2030. The cumulative effect of this early ambition - notably higher 2025 and 2027 CO_2 targets - leads to a much higher impact on oil consumption as it more than doubles the impact of the EC strategy. With this early strategy, the total oil consumption from the EU fleet would be cut by nearly 20% in 2030.

Vans

The vans CO_2 standards are inadequate to drive the rapid electrification in the sector. We have shown that the total cost of ownership of e-vans is already favourable[50] compared to their diesel counterparts; the standards are the main lever to ensure sufficient supply of zero emission vans in the coming decade. The current CO_2 reduction targets of 15% in 2025 and 50% in 2030 are expected to deliver around 2 million e-vans on the road by 2030; our proposal of 25% reduction in 2025, 45% in 2027 and 80% in 2030 would add an additional 4 million e-vans to that[51]. The more ambitious standards would save 13 $MtCO_2$ in 2030 alone compared to the Commission proposal.

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[49] https://www.transportenvironment.org/discover/how-to-get-europes-car-market-fit-for-55/ for cars and https://www.transportenvironment.org/discover/higher-van-co2-reduction-targets-needed-to-deliver-e-vans-in-the-2020s/ for vans

[50] Transport & Environment (2022) E-vans: Cheaper, greener, and in demand. Why it's time for the EU to ramp up supply. Available: https://www.transportenvironment.org/discover/e-vans-cheap-green-and-in-demand/

[51] Transport & Environment (2021) Higher van CO_2 reduction targets needed to deliver e-vans in the 2020s. Available: www.transportenvironment.org/wp-content/uploads/2021/12/van-CO2-standards-position-paper-12-2021.pdf

Trucks and buses

The currently regulated truck categories are responsible for 65% to 70% of total CO_2 emissions from heavy duty vehicles in Europe. The Regulation sets average fleet reduction targets of 15% by 2025 and 30% by 2030 relative to a 2019/2020 baseline. The 2022 review of the CO_2 standards needs to significantly increase the regulatory ambition. The current reduction target for 2030 should be brought forward to 2027, and a new 2030 target should be set to around 65% in order to ensure sufficient ramp up of zero-emission vehicles.[52] The regulatory scope should be extended to the currently unregulated vehicle categories including lighter trucks, trailers, buses and coaches. In particular, the new targets for urban buses should require that 100% of new urban buses are zero emission from 2027. Should these more ambitious measures be implemented, we calculate that HDVs in the EU would consume 10.2 Mtoe less compared to the current regulatory ambition in 2030, and compared to 2019 would save 11.5 Mtoe.

National fiscal policy and tax reform measures

The experience at the national level in increasing the uptake of battery electric vehicles over the past decade has proven the power of fiscal policy. Countries that are leading in BEV uptake - both in the European Union and abroad - all have fiscal policies at the core of their BEV incentives.

Learning from best practices at the national level, an aggressive bonus-malus system should be implemented across the EU by all member states to boost the uptake of zero emission vehicles in Europe. These systems pair grants for BEV purchase with registration taxes for ICE vehicles (sometimes designed to be revenue neutral). Based on the precedent of the French system, any new registration of a passenger vehicle emitting 20 gCO_2/km or more would therefore be subject to a malus payment as registration fee, with a cap at 50% of the car's value. The malus fee starts at €500 and progressively increases up to €20,000 at 125 gCO_2/km, and €50,000 for 200 gCO_2/km and above. Furthermore, any vehicle emitting 0 gCO_2/km would receive a €6,000 subsidy, to be deducted directly from the sales invoice at the point of sale. Some countries have calibrated their bonus-malus systems to be revenue neutral, whereas some countries further along in the transition are now phasing out BEV purchase grants and generate a positive fiscal balance from car registration taxes.

By targeting taxes at the point of first sale, these systems ensure that incentives are considered upfront, whereas the long-term costs of fuel use and the savings from electrification may be discounted in the minds of those purchasing vehicles. Most national governments also apply annual ownership taxes linked to emissions, engine size, or fuel use. These annual measures ensure incentives remain throughout the vehicle's lifetime and in second-hand markets and generate additional revenues from passenger transport.

Company cars - as creations of fiscal policy advantages - are particularly influenced by changes to national fiscal policy. Here, a set of additional fiscal policy levers are available to national governments

[52] Transport & Environment (2022) Review of the HDV CO_2 standards. Available: https://www.transportenvironment.org/wp-content/uploads/2022/02/2022_02_TE_HDV_CO2_consultation_response_final.pdf

and should be fully utilised. Fiscal benefits in the form of depreciation write-offs and VAT deductions are the largest benefits for company cars and Belgium is now phasing out depreciation for all emitting vehicles so that from 2026 onwards only zero-emission vehicles will be eligible for these tax benefits. To provide an incentive to employees, the income tax on company cars as a benefit-in-kind can be based on vehicle emissions. Here the UK provides the most progressive example with a tax rate as low as 2% on zero-emission vehicles that steadily increases to 36% for high-emission vehicles.

Another innovative approach to target the corporate fleet is to offer an electric vehicle interest-free loan funded by member states to help high mileage drivers – i.e. personal hire vehicle (PHV) and taxi drivers, urban delivery drivers– purchasing new battery electric vehicles. Such a policy could cover up to €45,000 with a repayment term of up to 8 years and guaranteed by the state for a value between 0% and 55% based on the revenue of the driver.

Economic modelling of select fiscal policies targeting the corporate fleet have shown the power of targeting this channel of vehicles. Results from targeting depreciation and benefit-in-kind in Germany produced 1.1 million more BEVs, improved the fiscal balance by €42 billion, and saved 17.6 $MtCO_2$ emissions - equivalent to 5.7 Mtoe in fuel consumption (1.1 Mtoe in 2030).[53] Results from targeting depreciation, benefit-in-kind, and annual taxes on corporate cars in France produced 1 million more BEVs, improved the fiscal balance by €9 billion, and saved 15.9 $MtCO_2$ emissions - equivalent to 5.2 Mtoe in fuel consumption (1.2 Mtoe in 2030).[54] As these car markets represent 35% of the total EU market,[55] a similar level of impact across all other EU countries would deliver a reduction in oil consumption by 6.6 Mtoe in 2030.

Measures in cities

A recent study looked at the most efficient measures for reducing car use in European cities.[56] The most effective measures were found to be congestion charges (pay to enter), parking & traffic control (taking space for cars for bicycles and buses), and limited traffic zones (resident access only). Each of these measures have been shown to reduce car traffic in city centres by around 10% to 20% (up to 33% for congestion charges). Zero emission zones would work to either prevent or have a high charge for cars that have tailpipe emissions from entering cities. It would work as a supplementary measure for fleets (for example transportation network companies and taxis) and higher CO_2 standards that would

[53] Transport & Environment (2021). Klimaschädliche Subventionen für Dienstwagen abbauen. Available: https://www.transportenvironment.org/discover/klimaschadliche-subventionen-abbauen/ Million tonnes of CO_2 savings adjusted to toe using a factor of 0.326

[54] Transport & Environment (2022). Électrification des voitures de société, une réforme fiscale est nécessaire. Available: https://www.transportenvironment.org/discover/electrification-des-voitures-de-societe-une-reforme-fiscale-est-necessaire/ CO_2 savings adjusted to mtoe using a factor of 0.326

[55] ACEA (2022). Vehicles in use Europe 2022. Available: https://www.acea.auto/files/ACEA-report-vehicles-in-use-europe-2022.pdf

[56] Kuss, P., Nicholas, K. A. (2022) A dozen effective interventions to reduce car use in European cities: Lessons learned from a meta-analysis and Transition Management. Available: https://doi.org/10.1016/j.cstp.2022.02.001

improve the supply of BEVs. In Germany it was found that 14 Mt CO_2 could be saved by putting zero emission zones in the five biggest cities in Germany[57].

The key for cities is locking in the reduced and more efficient car travel that the above measures could bring. Increased public transport, cycling, and walking in cities requires coordinated and detailed plans. Most cities are currently quite far from realising their potential for fully sustainable urban mobility[58]. Our partner organisation the Clean Cities Campaign will be releasing a more comprehensive analysis of measures in the coming months that will go into these measures in more detail.

Increased logistics efficiency in road freight

In 2019, in the EU, light duty trucks (i.e. vans) accounted for 8% of oil consumption in transport, heavy duty commercial vehicles (i.e. trucks) accounted for 17% and buses for 3%. Together, vans, trucks and buses thus accounted for 27% of the oil consumption from transport, also equivalent to 18% of the EU's total oil consumption. Structural measures to shift away from conventional vehicles and towards zero emission vehicles are the most effective to wean ourselves from our oil dependency, as described above in our proposals for the FF55 packages. Contrarily to cars, commercial vehicles (vans and trucks) are almost exclusively operated as businesses. Measures tackling their oil consumption will therefore have minimal impact on individuals.

The logistics sector is underperforming in Europe as 20% of the total distance travelled by trucks is done empty loaded. The total distance travelled by trucks can be reduced by optimising freight logistics efficiency and better utilising the existing vehicle capacity. Such increase in logistics efficiency would result in an increase of the average load carried by trucks which would result in fewer kilometres (v.km) travelled for a given amount of freight transported (t.km), thus reducing the average fuel consumption for a given amount of freight transported. As a result vehicles would be bigger (e.g. small trucks instead of vans, and large trucks instead of medium trucks) and more optimally loaded.

There is great potential to increase road freight efficiency via the following levers: load optimisation, and consolidation; reducing the number of empty trips; modular packaging and boxes; open transport networks and warehousing; pooling/sharing vehicles between operators; optimising the volume to weight ratio of trucks; reducing the rate of shipments[59]; reducing demand for very short delivery times, and; using double floors, where load volume or floor space rather than weight determines the number of trucks required.[60]

[57] Prognos (2021) Key Measures to reduce RoadTransport Emissions in Germany. Available: www.transportenvironment.org/discover/key-measures-to-reduce-road-transport-emissions-in-germany/
[58] Clean Cities Campaign (2022) Benchmarking European cities on creating the right conditions for zero-emission mobility. Available: https://cleancitiescampaign.org/city-ranking/
[59] Might require a wider societal change on the frequency of logistics flows and a more practical change on the evolution of storage space.
[60] International Transport Forum (2020) Moving Freight with Better Trucks. Available: https://www.itf-oecd.org/sites/default/files/docs/freightbettertrucksfullreport.pdf

There are some limitations[61] to the increase in road freight efficiency, notably because a significant share of transport is volume-constrained or surface constrained rather than mass constrained. T&E assumes that a 10% increase in the average truck load is feasible in the medium term (within three years), if the right measures are put in place.[62] The European Commission energy strategy should require the following:

- **Encourage swift and ambitious road pricing reforms:** One key reason why hauliers can afford empty and partially loaded trucks is the currently low cost level of road haulage. Charges would need to increase significantly in order to meet the polluter-pays principle and cover the externalities which are caused by road freight to a greater extent. member states need to be ambitious in the implementation of the Eurovignette directive (T&E press release[63]) and should opt to levy extra CO_2-based charges on fossil fuel lorries (on top of giving discounts to zero emission vehicles) to at least 100 EUR/tCO_2 (minimum required under the Directive) gradually increasing to the maximum permitted of 200 EUR/tCO_2. Paying for external costs (and removing fuel rebates) would create a strong incentive for operators to increase average loading capacity, and shift freight volume to rail and inland waterways. Countries that still have tolling concessions in place should swiftly move to tolling with a CO_2 variation or a CO_2 external charge[64].
- **Standardisation of data and information with mandatory use of digital software and booking platforms**: Dedicated digital tools and softwares to optimise the load and the trip and avoid empty trips are already being used but there are huge discrepancy challenges in between them which limits their use. The EU should standardise the data and information exchange, based on which platforms could offer interoperable booking services providing the necessary visibility on the freight and vehicle movements. In order to monitor, regulate and improve the efficiency of big transport companies and shippers, the European Commission should consider a single data platform similar to the one used for the maritime Monitoring, Reporting and Verification (MRV) system. This shipping MRV platform monitors data on cargo transported on an annual basis and is used to measure load factor and efficiency of different companies. A similar, tailor made system for trucks would allow to monitor, regulate and improve the efficiency of big transport companies or shippers.

[61] In some cases, empty and underutilised runs cannot be avoided due to technical or operational reasons. Other factors such as regional trade imbalances, practical limitations to consolidate consignments or just-in-time manufacturing (which favours smaller transport units and requires carriers to respond with flexibility to short-term needs of shippers) will always result in some level of suboptimal utilisation of freight capacity.

[62] A 20% increase would be consistent with a French project involving the transport industry, French government and environmental agency ADEME which has aimed for a 20% increase in truck load (from 9.8t average to 12t) and reasonable in the light of differences observed between countries (e.g. France: 12t versus Italy: 17t). This is also supported by the findings of the study 'Objectif CO_2' which assesses the impact of different emissions reduction measures (and payback time frame): Optimising the volume/weight ratio of trucks: 3-20%, <1 year; Mutualising transport between clients: 7-10%, <1 year; double floor: 14-21%, 1-3 years; software to improve the load: 7-14%, <1 year; transport plan tools: 5-15% CO_2 reduction; 1-3 years; geolocalisation tools: 1-10%; 1-3 years

[63] Transport & Environment (2022) Watershed moment for green trucking as EU adopts new tolling rules. Available: www.transportenvironment.org/discover/watershed-moment-for-green-trucking-as-eu-adopts-new-tolling-rules/

[64] Member states can seek to agree with concessionaires to add CO_2 charges to the tolling rates even before concessions are substantially amended or renewed.

Demand reduction measures in Aviation

In addition to the RefuelEU proposal and our recommendations to strengthen it, there are several important measures that should be taken to meet some of the demand reduction (or demand limitation) in the sector that are necessary for mid-century decarbonisation. They are:

1. **Integrate air travel into requirements for corporate climate transition plans and reporting.** In the medium term, this can be implemented under the proposed EU Corporate Sustainability Due Diligence Directive. The latter can be done immediately within standards being drafted for the EU Corporate Sustainability Reporting Directive.
2. **Pause planned airport expansion.** Governments should require detailed estimates for increases in oil use. Demand forecasts should be revised to reflect projections for sustained lower levels of business travel. Airport expansion plans, particularly those in view of servicing business travellers or long-haul flights, should be paused or cancelled.
3. **Include international aviation in national climate and energy plans and carbon budgets:** Excluding such a major source of oil demand from climate plans has no justification and is one of the reasons the sector has been able to increase its emissions and oil consumption.

Using the existing high speed rail has the potential to replace short haul flights in the continent, particularly for business trips. While not immediately available for all short haul city pair routes, a recent study showed that 4 to 7 $MtCO_2$ could be saved on intra-EU flights[65]. While fair pricing of aviation is one of the key drivers for getting short haul aviation passengers onto trains, companies should consider these travel options which also allow for increased productivity, as employees can often work on the train during the journey. To implement this, national governments could introduce similar measures as France, which recently banned flights that can be made by train under certain conditions.

Public charging infrastructure for road vehicles

Cars

Charging infrastructure will keep pace with the growth in the number of electric vehicles resulting from the EU tightening its clean car rules, new analysis shows. Up to 2.9 million public charging points could be installed across Europe by 2025 if car CO_2 targets are strengthened in line with the EU's Green Deal commitments, according to the modelling by Transport & Environment. The current Fit for 55 proposal would require only 3.3 million chargers at a total of 90.8 GW by 2030. Under an accelerated electrification scenario as described herein, we show that the EU requires 5.1 million chargers at a total of 120.9 GW[66].

[65] Bleijenberg, A. (2019) Air2Rail: Reducing CO_2 from intra-European aviation by a modal shift from air to rail. Available: www.transportenvironment.org/wp-content/uploads/2021/07/2020_03_Air2Rail_Koios_strategy_rev.pdf

[66] Transport & Environment (2022) Charging for phase-out. Available: https://www.transportenvironment.org/discover/charging-for-phase-out/

Trucks

The next few years will also be crucial for the deployment of electric truck public charging infrastructure. The EU charging infrastructure law (AFIR) currently under discussion is the opportunity to plan and coordinate a quick deployment of a public charging network for trucks. As T&E and ACEA have been calling for in April 2021 and the European Commission has included in its AFIR proposal, the EU should set binding targets for electric truck chargers from 2025 onwards at least along the main highways (TEN-T core network)[67]. Such an initial coverage in 2025 is essential for the fast market uptake of electric trucks during this decade and thus to curb fuel consumption in the road freight sector in the short- medium and long term. Due to the novelty of the technology and the lead time necessary for grid connection, member states need to start planning as of today for the deployment of this network.

Safeguard the EU Taxonomy

It is estimated that the green transition in the EU will require an additional €480 billion of investments each year[68], nearly three times the yearly EU budget. The gap will have to be filled mostly by private finance. The financial industry is investing heavily in the green transition but it is currently plagued by the lack of science based standards and rampant greenwashing. As a result, investment in fossil fuels have actually increased since the Paris Treaty was signed[69].

The EU has a once-in-a-decade opportunity to properly provide standards that will reduce greenwashing and ensure the much needed 'green capital' flows to initiatives that are actually green. Specifically, the EU Taxonomy Regulation (and later in 2023 the reform of sustainability-ESG ratings) will determine what constitutes environmentally sustainable economic activities. In determining what can be classified as sustainable, the taxonomy plays a key role in emancipating from fossil fuels in both the energy and transportation sectors.

As far as transport is concerned, the criteria set into law in January 2022 contain possibly the strictest conditions for land transport, defining zero (tailpipe) emissions vehicles as the only ones worthy of the 'green' label. The criteria for water and air transport are strong. Aviation, in particular, envisages a cap on fleet and an average yearly reduction of emissions by 2% to 3% obtained by variable mix of fleet replacement and sustainable fuels. Regarding transport fuels, first generation biofuels are excluded and only advanced ones are considered to be green.

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[67] Transport & Environment (2021) Making AFID fit for zero-emission heavy-duty vehicles. Open letter. Available: www.transportenvironment.org/wp-content/uploads/2021/07/2021_04_letter_TE_ACEA_trucks_AFID_FINAL.pdf

[68] European Commission (2021) Strategy for Financing the Transition to a Sustainable Economy. SWD(2021) 180 final. Available: https://eur-lex.europa.eu/resource.html?uri=cellar:9f5e7e95-df06-11eb-895a-01aa75ed71a1.0001.02/DOC_1&format=PDF

[69] Rainforest Action Network, BankTrack, Indigenous Environmental Network, Oil Change International, Reclaim Finance, Sierra Club, and urgewald (2022) Banking on Climate Chaos. Fossil Fuel Finance Report 2022. Available: https://www.bankingonclimatechaos.org/

The real problem lies in the energy sector, and in particular with the labelling of gas as a 'clean' substitute for coal and oil, effectively promoting a generation (until 2035) of investments in gas turbines. This green labelling of gas will not just mislead consumers and investors, but will further entrench Europe's dependence on gas imports. Green funds destined to renewables can now be redirected to gas turbines. Furthermore, the EU has effectively created 'gas-green-bonds' that will intoxicate the market and damage its already dwindling credibility.

Boost national mitigation through the Effort Sharing Regulation

By setting national climate targets for 2030, the ESR provides the regulatory framework to drive the adoption and the implementation of national and EU measures that bring down emissions in sectors such as road transport and buildings, waste, agriculture and small industry. These non-ETS sectors contribute to around 60% of EU GHG emissions and their decarbonisation could translate into the end of the fossil fuel era in a large part of the economy. An ambitious ESR should keep the remaining climate-damaging emissions still permitted up to 2030 to the minimum. As such, it could give an extra push to member states to get off of Russian oil. If T&E recommendations[70] to improve the ESR's design are implemented, European countries will have to commit to put in place additional energy and climate measures to cumulatively cut 1277 $MtCO_2eq$ by 2030. In 2030, this would amount to a reduction of 725 $MtCO_2e$ compared to 2019, a reduction of 33%.

Other enabling measures

EU level

Many measures to influence what car companies, public authorities and consumers lease are at the national level. However, there are a number of actions that the European Commission and other institutions can take to support and accelerate this momentum. These include:

- The 2020 Sustainable and Smart Mobility Strategy (SSMS) already committed to proposed measures to accelerate the electrification of commercial and urban fleets, but no action has happened since. While it will take a long time to review the EU Clean Vehicles Directive or propose a new regulation as previously suggested by T&E[71], the current review of the EU car CO_2 regulation can be used to propose additional measures via delegated acts. Notably, the implementing legislation can be used to propose additional measures, including targets on companies and authorities with large vehicle fleets, to increase the sales of electric cars to the leasing channel above and beyond the minimum targets in the Car CO_2 regulation in 2025-2030.

- The European Investment Bank can also oversee and fund a number of measures designed to increase the penetration of zero emission vehicles in commercial, urban and public fleets

[70] Transport & Environment (2021) Fit to lose the climate challenge. Available: https://www.transportenvironment.org/discover/fit-to-lose-the-climate-challenge/
[71] Transport & Environment (2021) Why the EU needs a ZEV Fleets Regulation & how to do it. Available: https://www.transportenvironment.org/discover/electrifying-corporate-and-urban-fleets/

across Europe. For example, similar to the idea announced[72] by president Macron in France, EIB can support leasing of electric cars to low income families and SMEs/authorities in low GDP countries by either underwriting loans or subsidising 0% rate contracts. Loans distributed to low-income households would ideally be secured by an EIB guarantee (up to 55% for lowest income households) as lowest income households are generally not bankable. A new EIB fund could also be set up to financially support the development of companies working in car-sharing, clean and sustainable mobility designed to reduce private car ownership of company cars and individuals. This can provide loans and grants to help car sharing businesses develop their business models, apps, services and visibility.

- Fleets of public authorities across Europe, e.g. local authorities, housing associations and public health institutions, should lead by example and switch their fleets to electric cars and vans a lot sooner than foreseen under the Clean Vehicles directive. With support of the EU funds and EIB where required, all new procurement of vehicles from 2025 should be zero emission.

National support for the development of active and shared mobility

- A sustainable mobility check paid 50% by the member state and 50% by the company. The amount should be up to €500 per year and allow for the purchase and maintenance of an electric bike, public transportation tickets/subscriptions, and the use of carsharing.
- Two funds to boost car sharing
    - Loans and grants to help car sharing develop their business models, apps, visibility
    - A fund to the local administrative entities to support car sharing in the way they find the most relevant (support to car sharer, set up public car sharing lines)
- Two funds to boost bicycle use
    - Direct subsidy to repair your bike (*Coups de Pouce Vélo* developed in France)
    - Fund to the local administrative entities to develop bike lanes

[72] Patel, T. & Nussbaum, A. (2022) Macron Pledges Electric-Car Leasing to Wean Drivers Off Gasoline. Available: https://www.bloomberg.com/news/articles/2022-03-18/macron-pledges-electric-car-leasing-to-wean-drivers-off-gasoline?sref=M2YKkTZ6

Summary of medium term measures

Mode	Measure	Level*	Mtoe oil savings; 2030 vs 2019 (% within mode)		Details of T&E measure
			EC	T&E	
Car fleets	EED obligation for large fleets of cars	EU	14.4 (48%)	20.7 (69%)	Obligation in the EED that fleets with more than 20 light-duty vehicles should cut their fuel consumption compared to 2021 levels by 20% by 2025 and 50% by 2030. **All fleet calculations include the savings as vehicles enter the private fleet.*
Car fleets	ZEV mandate for large fleets of cars	EU	14.4 (48%)	27.3 (90%)	A mandate on fleets with more than 20 light-duty vehicles to reach 50% zero-emission vehicles of their new registrations by 2025 and 100% by 2030.
Car fleets	Strengthening tax measures	N	-	6.6 (29%)	National governments adopt from the leading fiscal policy incentives including a phasing out of depreciation write-offs and VAT reductions for polluting cars and steeply increasing benefit-in-kind taxation for company cars based on vehicle emissions.
Cars	Increased CO_2 standards	EU	13.6 (8%)	30.6 (19%)	Reduction targets of 30% in 2025, 45% in 2027 and 80% in 2030
Vans	Increased CO_2 standards	EU	3.3 (12%)	7.4 (26%)	Reduction targets of 25% in 2025, 45% in 2027 and 80% in 2030
Trucks	Increased CO_2 standards	EU	1.3 (2%)	11.5 (19%)	Reduction targets of 15% in 2025, 30% in 2027 and 65% in 2030
Trucks	Logistics efficiency	C/N	-	7.7 (13%)	Swift and ambitious road pricing reforms and standardisation of data and information with mandatory use of digital software and booking platforms (Assuming payload increase by 10% on average)
Aviation	Tax aviation fuels, prevent airport expansion	N	-	Up to 6.3* (13%)	These would be some of the measures to prevent growth in passenger numbers. *Savings refer to a 2030 baseline, assuming leisure traffic levels are kept to 2019 levels.
Aviation	Shifting short haul flights to HS rail	EU/N/C	-	2.3 (4.8%)	Substantial improvements in connection, speed, and pricing of high speed rail
Shipping	Technical and operational efficiency measures	EU	-	7.5 (25.9%)	Engine improvements, hull and propeller optimisation, wind assist and a 20% reduction in speed. Additional oil consumption due to the increase in shipping demand is deducted from the savings.

Shipping	Shore side electrification	EU	1.0 (3.2%)	2.0 (6.6%)	Zero emission berth mandate applied to all passenger ships starting from 2025, then containerships, tankers and refrigerated-bulk carriers from 2030 and finally all remaining ships by 2035.
Shipping	Clean fuel uptake	EU	1.3 (4.4%)	3.5 (12.3%)	Values assume no speed reduction or efficiency measure, since no proposal has been made in that direction. Note that savings include waste-based biofuels and that LNG is not counted as "oil saving" as it is still fossil fuel. EC scenario compared with shifting targets forward 5 years and 86PJ e-fuels sub-target.
Shipping	CCfD from the shipping ETS	EU	-	2.3 (8.0%)	An explicit mechanism for shipping is legislated

Table 2: Summary of medium term measures. *Levels: I=individuals; C=companies, institutions, organisations, universities; L=local/city authorities; N=national government; EU=EU implemented

Combined impact of short and medium term measures

In the previous two sections, we described and quantified measures for short and medium term reduction measures for reducing oil demand in transport. The measures within a mode cannot be directly added to each other, as they either reduce the baseline emissions or they are or they are the mutually exclusive policy options that target the same reductions. For example, rolling back fuel excise duty cuts will lower the impact of all other road transport measures (for vehicles running on fuel); the medium term measures for car fleets have mutually exclusive policy options, so only one of the options could be implemented. To deal with overlapping policy measures, we take the IEA approach of halving the impact of each subsequent complementary measure. Additionally, we assume that all short term demand reduction measures are locked in by changes in behaviour, infrastructure, and policy. The total savings are presented in Fig. 6. By 2030, our analysis shows that oil consumption in transport can be reduced by 111.5 Mtoe (a 34% reduction, equivalent to around 335 Mt CO_2), completely offsetting Russian imports.

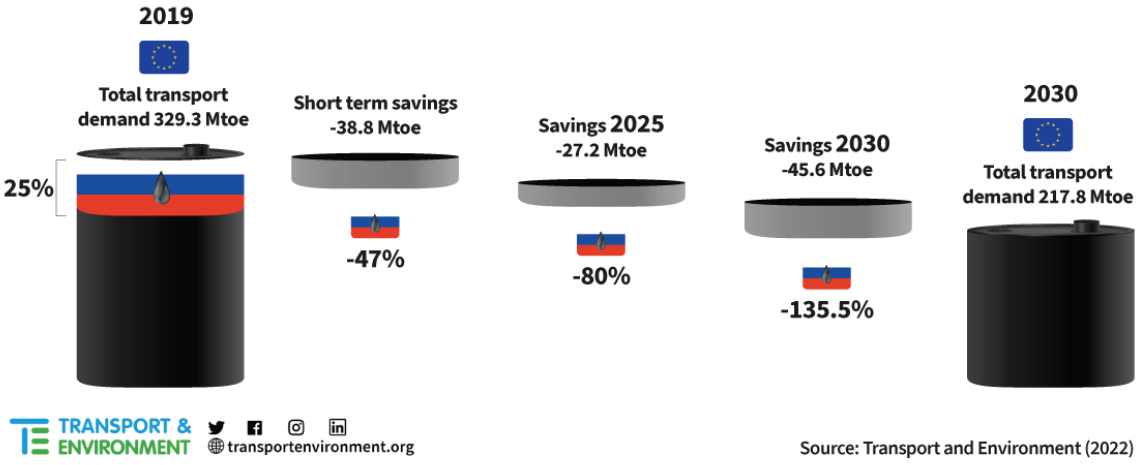

Figure 6: Transport oil savings for short and medium term measures

Long term measures to end transport oil consumption

An economy-wide strategy is needed to drastically reduce oil consumption. The medium term measures described in the previous Section set the sector on the right trajectory. By locking in the long term 2050 target *now*, governments and industries will have ample time to prepare and deliver on a truly sustainable transport system.

The transition to a complete electrified road transport system will be mainly driven by CO_2 standards; national fiscal policies for fleets can give an early boost that can play a crucial role in short term oil demand reduction and for getting battery electric vehicles quickly into the second hand market. This will need to be in-step with a continued ambitious roll out of charging infrastructure with AFIR and supportive measures such as a credit mechanism for renewable electricity under the Renewable Energy Directive, which will improve the business case for charging infrastructure and help accelerate electrification in general. For aviation and shipping, a full transition away from fossil fuels will require an ambitious strategy for hydrogen electrolysers powered by dedicated renewable electricity sources to create the sustainable and scalable fuels the sectors need.

Phase out the sale of most internal combustion vehicles by 2035

The European Commission has set the phase out of light duty vehicles with combustion engines to 2035. Several countries have pledged to accelerate the phase-out to 2030. This measure is crucial to reach zero emissions by 2050 and to end oil dependence for the largest consumer of oil: light duty vehicles. Similarly, a full transition to zero emission vehicles for trucks and buses and away from combustion trucks is by far the most effective way to reduce oil consumption in the road freight sector. This transition would be driven by the CO_2 standards for heavy duty vehicles. By setting a date by which all new vehicles need to be zero emission, we can ensure that all vans, buses and trucks on the road in 2050 are zero emission. This date should be 2035 for all buses and trucks with the exemption of harder to electrifying trucks (e.g. construction vehicles), which can go to 100% zero emission in 2040. As described above, early action in the road transport sector is key.

To ensure that there are no more internal combustion engine vehicles on the road by 2050, type approval for these vehicles could be limited to 2050 at the latest. This would effectively make it illegal for them to be on the road, and ensure a fully zero emission sector.

Increasing the share of rail and inland waterway freight

Shifting from road freight to lower emission and energy intensive transport modes such as inland waterways, maritime transport and electrified rail is beneficial for our energy security and for the climate. The European Green Deal set an objective of increasing rail freight traffic by 50% by 2030 and double by 2050 and an objective of a 25% increase in inland waterways and short sea shipping by 2030 with a 50% increase by 2050[73]. To achieve these objectives, in particular for rail freight, a set of improvements will need to be carried out, including: increased rail capacity, strengthened cross-border coordination and cooperation between rail infrastructure managers, better overall

[73] European Commission (2020) A fundamental transport transformation: Commission presents its plan for green, smart and affordable mobility. Available: https://ec.europa.eu/commission/presscorner/detail/en/ip_20_2329

management of the rail network, and the deployment of new technologies such as digital coupling and automation.

To ensure delivery on its objectives to increase the share of rail and inland waterway freight, the EU should work to:

- **Remove barriers:** swiftly deliver on lifting barriers to rail freight and improving its attractivity, as laid out in the EU's Smart and Sustainable Mobility Strategy and described as "quick wins". This includes for example the completion of the TEN-T rail network and ensure its interoperability and that it is fully freight capable.
- **Support and fund programs:**
    - Rail and multimodal infrastructure investment programmes. In the short term, ongoing and upcoming public tenders for EU-funded rail projects must be supported and maintained.
    - Introducing economic incentives for operations. This can take the form of a mode-shift revenue support scheme to assist companies with the operating costs associated with running rail or inland water transport.
- **Electrify all rail:** deployment of the adequate infrastructure should be ensured (electric recharging points for battery electric trains and hydrogen refuelling points for hydrogen fuel cell electric trains).
- **Effective framework for intermodal transport:** The ongoing revision of the Combined Transport Directive (proposal planned in Q3 2022[74]) is the ideal opportunity to revamp the current EU framework for intermodal transport. At the moment, the use of combined transport solutions is the result of voluntary company decisions and strategies (mostly encouraged by public authorities by education, information and tool sharing). This is not sufficient to drive a transformation and binding measures or requirements should be considered to increase the share of combined transport.

Greening the grid

The ongoing electrification of cars, vans and trucks will already reduce oil consumption by 2030 significantly, by more than one third. An 'all hands on deck' ambition to electrify the road transport sector as outlined above can accelerate this trend. To maximise the benefits of electrification, which on a life cycle basis assessment reduces car emissions by 63% compared to an ICE[75], the REpowerEU has increased the 2030 target in the Renewable Energy Directive (RED) from 40% to 45%. A 40%

[74] European Commission. Sustainable transport - revision of Combined Transport Directive. Available: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13010-Sustainable-transport-revision-of-Combined-Transport-Directive_en

[75] Transport & Environment (2020) How clean are electric cars? Available: https://www.transportenvironment.org/wp-content/uploads/2020/04/TEs-EV-life-cycle-analysis-LCA.pdf

renewable target in the RED will lead to 65% share of renewables in power generation in 2030[76], so this recent announcement is welcome news. More ambition is possible however. ENTSO-E and ENTSO-G jointly[77] projected a scenario of 61% RES-E; Germany increased its level of ambition to deploy more renewables and achieve 100% renewable power mix by 2035.[78] While Germany starts from a more advanced level than other countries, it makes clear that higher ambition is still feasible if action is taken now.

Green fuels for shipping and aviation

In non-road transport, with the exception of ferries and short-haul flight, direct electrification in aviation and shipping will not be feasible. Green hydrogen and e-fuels will be needed to provide more energy-dense fuels to replace the use of heavy fuel oil in shipping and kerosene in aviation. The EU should invest and plan a rapid uptake of hydrogen electrolysers and direct air capture (DAC) this decade to ensure sufficient deployment in the 2030s and 2040s. The implications of this transition for EU transport has recently been quantified in terms of energy consumption and land and water use[79].

Aviation will require not just hydrogen for its green fuels, but CO_2 too. The deployment of DAC will be crucial to this transition, as CO_2 extracted from point sources such as from heavy industry is not carbon neutral and discourages those industries from transitioning off fossil fuels[80]. To overcome the market barrier of the price premium of DAC CO_2, policy instruments such as ReFuelEU should specify that any project receiving public support requires a minimum share of 30% DAC, increasing over time to 100%.

Conclusions

This paper has investigated short, medium, and long term measures to reduce and eventually end oil consumption in European transport. Short term measures will require effort from all actors in society, however the responsibility to implement these measures primarily rests with governments of all levels. Voluntary action by citizens or companies alone cannot be relied upon to reduce oil demand by the volume which is needed in the short term. By taking effective action to reduce transport oil demand governments will reduce the price and supply shock of the embargo on Russian oil.

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[76] See page 51 of: European Commission (2021) Directive of the European Parliament [..] as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652. Available: https://ec.europa.eu/info/sites/default/files/amendment-renewable-energy-directive-2030-climate-target-with-annexes_en.pdf

[77] ENTSOG & ENTSO-E (2021) TYNDP 2022 Scenario Report. April 2022. Available: https://2022.entsos-tyndp-scenarios.eu/

[78] Hampel, C. (2022) Germany aims for 100% renewables by 2035. Accessed April 2022. Electrive. Available: https://www.electrive.com/2022/02/28/germany-aims-for-100-renewables-by-2035/#:~:text=The%20German%20government%20wants%20to,energy%20was%20planned%20by%202030.

[79] Ricardo Energy & Environment (2020) Renewable electricity requirements to decarbonise transport in Europe with electric vehicles, hydrogen and electrofuels. Available: https://www.transportenvironment.org/discover/electrofuels-yes-we-can-if-were-efficient/

[80] E4Tech (2021) Role of DAC in e-fuels for aviation. Available: www.transportenvironment.org/discover/why-direct-air-capture-holds-one-of-the-keys-to-sustainable-aviation/

The EU is currently concluding the most important climate legislation in the Fit For 55. Increasing ambition on light and heavy duty vehicle CO_2 standards, clean fuels in aviation and shipping will ensure transport structurally end oils dependence. RepowerEU has paved the way for even greater ambition, by highlighting the importance of prioritising fleets for vehicle electrification and efficiency measures in trucks. This strategy should also include efficiency measures for international shipping where huge gains can be made along with ambitious e-fuel targets for both aviation and shipping. Member states should implement in a holistic manner the short term fuel saving recommendations such as increased home working and speed limits. Companies should also do their bit by reigning in business air travel thus ensuring it does not rebound post pandemic.

Critically, it is imperative that the EU and national government actions don't make a bad situation worse by relying on false solutions. Biofuels will put more strain on grain and vegetable oil prices and supply and risk further environmental degradation; the current FuelEU maritime proposal will increase natural gas use in shipping. National governments should avoid inducing road fuel demand by cutting fuel duty. Direct cash payments or mobility cheques, and reducing the cost of public transport, is a better way to help the most vulnerable households deal with high energy prices. Finally, the taxonomy and green finance should not be undermined by including gas power plants as a sustainable investment. The green labelling of gas will not just mislead consumers and investors, but will further entrench Europe's dependence on gas imports.

Further information

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