7 myths about fuels and electric trucks from the oil and gas industry

October 2023

The European Union is currently revising its CO_2 standards for heavy-duty vehicles (HDVs). This regulation will irreversibly cut the trucking sector's dependence on diesel. As a result, the oil and gas (O&G) industry is eager to create room for so-called 'alternative fuels' in the new law, in spite of the opposition from most truckmakers[1]. To make their case, the O&G industry has been spreading myths to shed a positive light on biofuels and synthetic fuels and to discredit electric trucks.

This briefing aims to debunk the most common myths on trucks included in three recent publications from fuels groups: the European Research Institute for Gas and Energy Innovation's (ERIG) study on renewable long-haul transport (the ReHaul report)[2], Concawe's lifecycle analysis HDV comparator tool[3], and UNITI's compilation of 17 factsheets about e-fuels[45]. We focus on three different types of fuels: e-diesel (a so-called "e-fuel"), Hydrotreated Vegetable Oil (so-called "renewable diesel", or HVO) and biomethane, as these are the alternatives to zero-emission trucks most touted by the O&G industry.

1. Seeing fuels through rose-tinted glasses

Myth 1. "Sustainable biofuels and e-fuels are plentiful."

Fuels lobby groups tend to dismiss concerns regarding the feedstock availability of fuels and related resources. For example, Concawe's lifecycle analysis (LCA) tool only mentions availability in an easy-to-miss information page[6], giving the user the impression that all options in the tool are available at large scale and competitive costs.

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[1] European Commission. (2022). *Review of emission standards for heavy-duty vehicles.* Retrieved from https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13168-Reducing-carbon-emissions-review-of-emission-standards-for-heavy-duty-vehicles/public-consultation_en

[2] ERIG. (2023) *Renewable Long-Haul Road Transport Considering Technology Improvements and European Infrastructures.* Retrieved from https://www.cng-mobility.ch/wp-content/uploads/2023/08/ReHaul-Report-logos-V2.pdf

[3] Concawe. (2023). *Life Cycle Assessment (LCA) of greenhouse gas emissions from Heavy Duty Vehicles. September 2023 version.* Retrieved from https://hdvco2comparator.eu/

[4] UNITI. (2023). *UNITI informiert. 17 Fakten rund um E-Fuels.* Retrieved from https://www.uniti.de/fileadmin/user_upload/17_Fakten_E-Fuels_Sammlung.pdf

[5] For brevity, we refer to individual factsheets simply by their number in the compilation and their subtitle.

[6] The page in question can be accessed from the "fuel page", which itself can be accessed from the methodology page or from the fuels panel in the tool.

In reality however, most sustainable biofuel and synthetic fuel options are only limitedly available. Looking first at HVO, in 2022 35% of HVO was still produced from palm oil and derivatives (crop biofuels), while used cooking oil (UCO) and animal fats respectively accounted for 21% and 22%[7]. The Renewable Energy Directive (RED III) caps the amount that can be used for both crop biofuels and UCO. This is because crop biofuels compete with food production and cause indirect land use change (ILUC) emissions. With UCO there is an associated fraud risk, as virgin oil can be passed as waste oil[8]. As a result, truly sustainable HVO quantities are necessarily limited. For biomethane, ERIG considers three pathways in its ReHaul report: manure, biowaste, and corn. But manure already has competing uses in agriculture, while corn's use is capped as it is a crop biofuel. This therefore also severely limits the potential for biomethane to replace fossil gas in gas trucks at competitive prices.

Availability will also be an issue for e-diesel in the short- and mid-term. Running diesel trucks on e-diesel would require three times as much electricity than directly electrifying trucks[9], meaning three times more solar panels and wind turbines required. This is very inefficient, and additional renewables would be better used to directly charge trucks or decarbonise the grid.

The O&G industry often dances around this by assuming e-diesel will be imported from abroad, cementing Europe's dependence on imports for its energy. UNITI lists both Patagonia and the Middle East and North Africa (MENA) as potential exporters, citing low population density as a factor[10]. Both UNITI and the eFuel Alliance have produced maps of the Sahara with large squares in the middle, indicating the solar PV area needed to produce enough e-fuels for Europe[11][12]. Not only do such maps portray the Sahara as an empty space to be used by and for Europe, they also ignore the fact that theoretical technical potential does not equal economic competitiveness and feasibility, which is affected by considerations such as the lack of freshwater supply (or even saltwater if desalination is envisaged), unstable political environments, and lack of (or costly) export infrastructure.

The potential scalability of e-fuel production is more relevant than their theoretical abundance. ERIG scores e-diesel highly on their "technology readiness level" scale, citing one synthetic gasoline plant in Chile which opened in December 2022[13], which is in reality a demonstration plant relying on a biogenic source of CO_2 instead of direct air capture (DAC)[14]. In practice, securing investments and scaling up additional renewables, electrolysers, DAC and e-fuel production facilities will take time. Large e-fuel

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[7] Stratas Advisors. (2023). Global Biofuels Outlook.
[8] T&E. (2021). *Europe's surging demand for used cooking oil could fuel deforestation.* Retrieved from https://www.transportenvironment.org/discover/europes-surging-demand-used-cooking-oil-could-fuel-deforestation/
[9] T&E. (2020). *Electrofuels? Yes, we can … if we're efficient.* Retrieved from https://www.transportenvironment.org/discover/electrofuels-yes-we-can-if-were-efficient/
[10] UNITI Fact 4: *Mit dem Import grüner Energie zu mehr Akzeptanz für die heimische Energiewende*.
[11] UNITI Fact 3: *Warum Deutschland auf den Import grünen Stroms in Form von CO_2-neutralen E-Fuels angewiesen ist*.
[12] eFuel Alliance. (*no date*). *Global Energy Potentials & Efficiency*. Retrieved from https://www.efuel-alliance.eu/efuels/global-energy-potentials-efficiency
[13] ERIG mentions 4 other pilot projects to produce e-fuels elsewhere in the ReHaul report, but does not explicitly consider them in the section on technology availability.
[14] HIF. (*no date*). *Haru Oni Demonstration Plant.* Retrieved from https://hifglobal.com/location/haru-oni/

quantities are therefore unlikely to be available before 2040[15]. Potsdam Institute for Climate Impact Research (PIK) has projected that by 2035 the e-fuel production of all planned projects worldwide would be enough to meet just one-tenth of German demand for fuels in sectors where electrification is not possible; and even if global e-fuel production grew as fast as solar power deployment, it would only meet German demand for fuels from aviation and shipping, leaving nothing to chemical industries or the rest of the world[16]. Therefore, it is unrealistic to assume that there would be much or even any e-fuels left over for the road sector, where electromobility is a cheaper alternative[17].

Myth 2. "Biofuels and e-fuels are cleaner than battery-electric trucks."

The O&G industry is keen to argue that its so-called alternatives to fossil diesel and fossil gas are just as clean as (if not cleaner than) electric trucks.

Looking first at HVO, the O&G industry often touts a reduction potential up to 75%–95% compared to fossil diesel, though in practice the actual reduction depends on the actual feedstock mix, as a footnote clarifies[18]. Concawe's LCA tool assumes that HVO produced in 2017 only caused 30 gCO_2eq/MJ on a well-to-wheel (WTW) basis. But as a buried paragraph on the study's limitations explains[19], this excludes emissions caused by direct and indirect land use change. Once ILUC is taken into account, ICCT analysis shows that HVO produced from vegetable oils actually causes more lifecycle greenhouse gas (GHG) emissions than fossil fuels. While the reference for fossil diesel is 95.1 gCO_2eq/MJ, HVO produced from rapeseed or sunflower oil is above 100 gCO_2eq/MJ, soybean oil is almost 200 gCO_2eq/MJ, and palm oil 275 gCO_2eq/MJ[20].

For biomethane, Concawe's tool includes the option to select biomethane based on the EU mix in 2017, or entirely produced from waste feedstocks (either livestock manure, municipal waste, or waste wood). In practice, biomethane is still mostly produced from unsustainable feed crops. In 2018, half of EU biomethane production was from silage maize, which does not substantially reduce GHG emissions

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[15] Odenweller, A., Ueckerdt, F., Nemet, G.F. *et al*. (2022). Probabilistic feasibility space of scaling up green hydrogen supply. *Nature Energy.* Retrieved from https://www.nature.com/articles/s41560-022-01097-4

[16] PIK. (2023). *E-Fuels - Aktueller Stand und Projektionen.* Retrieved from https://www.pik-potsdam.de/de/aktuelles/nachrichten/e-fuels-wahrscheinlich-noch-lange-knapp-pik-analyse-papier

[17] T&E. (2020). *E-fuel would be wasted on cars while it's badly needed to decarbonise planes and ships.* Retrieved from https://www.transportenvironment.org/discover/e-fuel-would-be-wasted-cars-while-its-badly-needed-decarbonise-planes-and-ships-study/

[18] Neste. (*no date*). *Neste MY Renewable Diesel™.* Retrieved from https://www.neste.com/products/all-products/renewable-road-transport

[19] The page in question can be accessed through the orange information button on the "fuels page", which itself can be accessed from the methodology page or from the fuels panel in the tool.

[20] Baldino, C., Mulholland, E., Pavlenko, N. (2023). *Assessing the risks of crediting alternative fuels in Europe's CO_2 standards for trucks and buses*. Retrieved from https://theicct.org/publication/crediting-alternative-fuels-europe-co2-standards-trucks-buses-oct23/

compared to fossil gas[21]. In Germany (Europe's largest biomethane producer[22]), maize and other crops respectively accounted for 49% and 19% of biomethane production in 2022[23]. In addition, methane leakage rates are higher for biomethane than for natural gas[24]. In some cases, this can make biomethane more polluting than the fossil fuels it's replacing, or further diminish the already unsubstantial savings[25].

Finally, for e-diesel Concawe's LCA tool assumes a GHG footprint of 13 gCO_2e/MJ WTW. This is in line with T&E's own estimate for e-diesel, but only when it's produced from 100% additional renewable power and using direct air capture as its CO_2 source[26]. Yet, there is currently no requirement for e-diesel to be fully produced from renewable power. Thanks to lobbying by the O&G and other industries relying on fossil fuels as a feedstock or energy source[27], the RED introduced exemptions that undermine the environmental credibility of green hydrogen and e-fuels (e.g. delaying the requirement for additional renewables to be used in "renewable fuel of non-biological origin" (RFNBO) production), and allows e-diesel to emit up to 28 gCO_2e/MJ (i.e. 70% less than fossil diesel) and be labelled as a RFNBO.

Myth 3. "Biofuels and e-fuels are cheap."

The O&G industry often passes their fuels as cheap. Both UNITI and the eFuel Alliance describe e-diesel as affordable, based on a 2018 Prognos study[28][29]. In practice, they avoid showing pure e-fuel prices for end consumers in their campaign materials, preferring to visualise only production costs, or prices at the pump for a blend of fossil and synthetic diesel. This is because pure e-diesel is still prohibitively expensive today and will remain so despite any potential cost reductions in the future. ERIG finds that e-diesel is the most expensive option after synthetic methane for hauliers to decarbonise, even when assuming e-diesel

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[21] Searle, S., Baldino, C., Pavlenko, N. (2021). *What is the role for renewable methane in European decarbonization?* Retrieved from https://theicct.org/wp-content/uploads/2021/12/biomethane-potential-europe-FS-jun2021.pdf

[22] European Biogas Association. (2020). *The 'European Biomethane Map 2020' shows a 51% increase of biomethane plants in Europe in two years.* Retrieved from https://www.europeanbiogas.eu/the-european-biomethane-map-2020-shows-a-51-increase-of-biomethane-plants-in-europe-in-two-years/

[23] DENA. (2023). *Branchenbarometer Biomethan 2023.* Retrieved from https://www.dena.de/fileadmin/dena/Publikationen/PDFs/2023/ANALYSE_Branchenbarometer_Biomethan_2023.pdf

[24] Bakkaloglu, S., Cooper, J., and Hawkes, A. (2022). *Methane emissions along biomethane and biogas supply chains are underestimated.* Retrieved from https://www.sciencedirect.com/science/article/pii/S2590332222002676

[25] Zhou, Y., Swidler, D., Searle, S., Baldino, C. (2021). *Life-cycle greenhouse gas emissions of biomethane and hydrogen pathways in the European Union.* Retrieved from https://theicct.org/publication/life-cycle-greenhouse-gas-emissions-of-biomethane-and-hydrogen-pathways-in-the-european-union/

[26] T&E. (2022). *E-fuels in trucks: expensive, scarce, and less green than batteries.* Retrieved from https://www.transportenvironment.org/discover/e-fuels-in-trucks-expensive-scarce-and-less-green-than-batteries/

[27] FuelsEurope. (2022). *Joint statement of the EU industry: Pragmatic regulatory framework necessary for hydrogen market.* Retrieved from https://www.fuelseurope.eu/publications/publications/joint-statement-of-the-eu-industry-pragmatic-regulatory-framework-necessary-for-hydrogen-market

eFuel Alliance. (2022). *EU industry calls for pragmatic regulatory framework necessary for hydrogen market*. Retrieved from https://www.efuel-alliance.eu/fileadmin/Downloads/E_PM_eFA_JointLetter150722.pdf

[28] UNITI Fact 6: *Das werden CO_2-neutrale Kraftstoffe zukünftig kosten.*

[29] eFuel Alliance. (*no date*). *Costs & Outlook*. Retrieved from https://www.efuel-alliance.eu/efuels/costs-outlook

is produced from solar PV in MENA. Notably, even if a region could produce e-fuels cheaply (such as MENA, Australia, or Patagonia according to UNITI[30]), sales price would be determined by supply and demand and would be set higher than the cheapest production cost.

In practice, HVO currently costs almost double the tax–free price of fossil diesel[31][32], with its production incentivised through the RED, which obliges fuel suppliers to supply a certain amount of biofuels (or renewable electricity) to the transport sector[33]. By 2030, ERIG assumes that HVO will cost around 0.8€/kg if produced from UCO (or 0.6€/l), and cost slightly more than 1€/kg if produced from rapeseed (or 0.8€/l). However, Stratas Advisors (who are leading market analysts on the topic of biofuels) forecast a much higher price of respectively 1.8€/l (UCO and animal fats) and 1.6€/l (crop-based HVO) by 2030[34]. Meanwhile, BETs will already be cheaper than diesel trucks on a total cost of ownership basis by the mid-2020s[35].

Regarding biomethane, ERIG's ReHaul report assumes fuel costs of approximately 0.5€/kg for biomethane from manure and 1€/kg for biomethane from crop-based in 2030. However, the German Energy (DENA) estimates higher long-term prices: respectively 32 ct/kWh (i.e. 4.4€/kg[36]) and 9 ct/kWh (i.e. 1.2€/kg)[37].

2. Making electric trucks look dirty

Myth 4. "Batteries need to be replaced during the lifetime of the truck."

A single battery pack can last the entire lifetime of a truck, as reported by Daimler Truck regarding its new long-haul truck eActros 600[38]. Indeed, a long-haul truck drives around 1,490,000 km over its lifetime, which would only require under 2,700 Equivalent Full Cycles[39] (EFC)[40]. That is less than the durability of

[30] UNITI Fact 12: *Synthetische Kraftstoffe: Wertschöpfungs- und Arbeitsmarktpotenziale für Europa*
[31] Stratas Advisors. (2023). Global Biofuels Outlook.
[32] European Commission. (2023). *Weekly Oil Bulletin.* Retrieved from https://energy.ec.europa.eu/data-and-analysis/weekly-oil-bulletin_en
[33] T&E. (2023). *RED III and renewable electricity.* Retrieved from https://www.transportenvironment.org/discover/red-iii-and-renewable-electricity/
[34] Assuming a conversion rate of 1 USD = 0.95 EUR.
[35] BCG. (2023). *Impact Assessment of the Transition to Zero-Emission Trucks in Europe*. Retrieved from https://www.transportenvironment.org/discover/impact-assessment-of-the-transition-to-zero-emission-trucks-in-europe/
[36] Assuming an energy density of 13.64 kWh/kg for methane.
[37] DENA. (2023). *Branchenbarometer Biomethan 2023.* Retrieved from https://www.dena.de/fileadmin/dena/Publikationen/PDFs/2023/ANALYSE_Branchenbarometer_Biomethan_2023.pdf
[38] Daimler Truck. (2023). *Mercedes-Benz Trucks celebrates world premiere of the battery electric long-haul truck eActros 600*. Retrieved from https://media.daimlertruck.com/marsMediaSite/en/instance/ko.xhtml?oid=52428265
[39] An Equivalent Full Cycles corresponds to one full charge (0% to 100%) and one full discharge (100% to 0%).
[40] TNO. (2022). *Techno-economic uptake potential of zeroemission trucks in Europe.* Retrieved from https://www.transportenvironment.org/wp-content/uploads/2022/10/202210_TNO_-techno_economic_uptake_potential_of_zero_emission_trucks_in_Europe.pdf

lithium-ion batteries[41], meaning a truck would be retired well before its battery would need to be replaced.

Yet, Concawe's LCA tool assumes by default a value of 2 battery packs per truck lifetime. But then the tool also incorrectly assumes long-haul trucks are retired after only 750,000 km on the road[42], i.e. half of their actual lifetime mileage. Under such assumptions, each long-haul truck would need 4 battery packs over its lifetime, clearly painting BETs as much less green than they really are.

Myth 5. "Heavy batteries lead to lower payloads."

Fuel groups also use alleged payload penalties to portray electric trucks as less practical than diesel trucks, despite evidence that payload penalties will disappear[43]. Conveniently, they generally ignore the regulatory extra-weight allowance for electric trucks, improvements in energy density leading to lighter batteries, and the potential for rightsizing batteries.

For instance, ERIG's ReHaul report mentions that regulation allows electric trucks to weigh 2 tonnes extra, but still lists payload penalties among evidence that BETs are impractical. Meanwhile, Concawe's LCA tool ignores the 2-tonne allowance altogether by capping the gross vehicle weight of the long-haul truck at 44 tonnes, regardless of powertrain. With the extra-weight allowance[44], the payload penalty (observed when running the tool assuming max payload capacity[45]) disappears for the smaller battery and is much lower for the other two battery sizes. Notably, the European Parliament and Member States are currently debating a Commission proposal to further increase the extra weight allowed for zero-emission trucks from 2 tonnes to 4 tonnes, and no longer limit the extra weight allowed to the actual extra weight of the battery. If such a proposal is adopted, it means electric trucks could actually carry more payload than diesel trucks.

Concawe's LCA tool also makes outdated technological assumptions. It considers a battery pack density of 150 Wh/kg, which cannot be changed. This corresponds to the average pack energy density five years ago, in 2018[46]. By assuming outdated values for battery density and ignoring the 2-tonne extra-weight

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[41] NMC batteries can go through a maximum of 3,000 EFC before needing to be replaced, and LFP batteries are even more durable. TNO. (2022). *Techno-economic uptake potential of zeroemission trucks in Europe.* Retrieved from https://www.transportenvironment.org/wp-content/uploads/2022/10/202210_TNO_-techno_economic_uptake_potential_of_zero_emission_trucks_in_Europe.pdf

[42] Information on lifetime distance can be found on the methodology page for vehicle manufacturing emissions, which is accessible from the overall methodology page.

[43] TNO. (2022). *Techno-economic uptake potential of zeroemission trucks in Europe.* Retrieved from https://www.transportenvironment.org/wp-content/uploads/2022/10/202210_TNO_-techno_economic_uptake_potential_of_zero_emission_trucks_in_Europe.pdf

[44] European Commission. (2023). *Green Deal: Greening freight for more economic gain with less environmental impact.* Retrieved from https://transport.ec.europa.eu/news-events/news/green-deal-greening-freight-more-economic-gain-less-environmental-impact-2023-07-11_en

[45] The penalty is 1,200 kg for the 400-kWh BET, 2,600 kg for the 600-kWh BET, and 4,700 kg for the 900-kWh BET.

[46] BloombergNEF. (2023). Lithium-Ion Batteries State of the Industry 2023.

allowance, Concawe's LCA tool underestimates the maximum payload of a battery-electric truck[47]. This artificially inflates BETs' emissions, expressed in gCO_2/tkm.

Lastly, battery capacity will also be rightsized. Deploying charging infrastructure throughout Europe will allow for long-haul trucks to be fitted with smaller batteries, thus savings costs and raw materials. In spite of claims by UNITI[48], the Alternative Fuels Infrastructure Regulation (AFIR) will deliver enough charging infrastructure to set higher electric truck targets in 2030[49].

Myth 6. "Electric trucks are charged with dirty electricity."

The O&G industry often portrays electricity as a dirty fuel, thereby suggesting that electric trucks running on grid electricity are not a good climate solution.

Case in point, Concawe's LCA tool sets a default value of 334 gCO_2eq/kWh for grid electricity, corresponding to the carbon intensity for the European Union in 2019. However, Ember reports a much lower value of 275 gCO_2eq/kWh for the EU in 2019[50].

In practice, the carbon intensity of the electricity used throughout the lifetime of the truck —20 years on average[51]— is what matters, rather than looking at a single year. As the grid continues to decarbonise, the carbon intensity of electricity is projected to decline to 160 gCO_2eq/kWh by 2030 and to 87 gCO_2eq/kWh by 2040[52]. Where trucks are charged with renewable electricity, their emissions drop further. Solar PV's carbon intensity is 34 gCO_2eq/kWh, and offshore wind's carbon intensity is only 14 gCO_2eq/kWh[53].

Related to BETs' electricity consumption, truck efficiency cannot be modified in the tool, nor can future improvements be modelled. Concawe assumes an efficiency of 147–155 kWh/100km (depending on battery size) for a long-haul truck with representative payload. These values are higher than what TNO assumes for new BETs in 2020 (130 kWh/100km for a long-haul truck) and in 2030 (107 kWh/100km)[54].

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[47] Assuming today's battery density of 184 Wh/kg fully negates the payload penalty for the 600-kWh BET, as the extra-weight would be under the 2-tonne allowance. By 2030, battery density should reach 280 Wh/kg, thus negating the payload penalty for the 900-kWh BET. Pack density data from TNO. (2022). *Techno-economic uptake potential of zeroemission trucks in Europe.* Retrieved from https://www.transportenvironment.org/wp-content/uploads/2022/10/202210_TNO_-techno_economic_uptake_potential_of_zero_emission_trucks_in_Europe.pdf

[48] UNITI Fact 16: *Schwere Nutzfahrzeuge in der EU — kaum alternative Lade- und Tankinfrastruktur vorhanden*.

[49] T&E. (2023). *Fully charged for 2030.* Retrieved from https://www.transportenvironment.org/discover/fully-charged-for-2030/

[50] Ember. (2023). *Electricity Data Explorer.* Retrieved from https://ember-climate.org/data/data-tools/data-explorer/

[51] ICCT. (2022). Heavy-duty vehicle survival curves.

[52] ENTSO-E. (2022). *TYNDP 2022 Draft Scenario Report.* Retrieved from https://2022.entsos-tyndp-scenarios.eu/

[53] UNECE. (2021). *Life Cycle Assessment of Electricity Generation Options*. Retrieved from https://unece.org/sites/default/files/2021-10/LCA-2.pdf

[54] TNO. (2022). *Techno-economic uptake potential of zeroemission trucks in Europe.* Retrieved from https://www.transportenvironment.org/wp-content/uploads/2022/10/202210_TNO_-techno_economic_uptake_potential_of_zero_emission_trucks_in_Europe.pdf

Myth 7. “Battery production causes high CO_2 emissions.”

Lastly, fuel lobbies question electric trucks’ environmental performance by overemphasising the manufacturing emissions of batteries in the total lifecycle. In practice, the footprint of the battery is quickly offset after one or two years of operations[55], thanks to lower emissions during the use phase[56].

One way fuel groups underplay the climate benefits of electric trucks is by underestimating a truck’s lifetime distance. For instance, Concawe’s LCA tool overestimates the impact of battery manufacturing emissions per tonne-kilometre as it assumes long-haul trucks are retired after only 750,000 km on the road, instead of 1,490,000 km[57].

Another way is to use older values for battery carbon footprint, even though rapid technological improvements are making such values increasingly irrelevant. As Europe can fully produce its own battery packs and cells by 2027[58], the expected footprint of EU-made batteries in 2030 should be emphasised. Instead, Concawe’s LCA tool assumes by default that batteries have a carbon footprint corresponding to the value for NMC batteries made in China in 2020. It also frames this value in a positive light, by comparing it to the median value of carbon footprints of previous battery generations produced in 2005–2020.

Related to battery production, the O&G industry claims that going electric will make Europe dependent on China[59]. This ignores both the fact that, unlike oil, battery raw materials can be recycled and the fact that car and truck manufacturers are already working on securing raw materials. It also ignores that for e-diesel, the solution to availability issues proposed by the industry is actually to import e-fuels. The transition to electric trucks is an opportunity for Europe to become independent from petro-states and oil markets and achieve energy autonomy.

Further information

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[55] Daimler Truck. (2023). *Mercedes-Benz Trucks celebrates world premiere of the battery electric long-haul truck eActros 600*. Retrieved from https://media.daimlertruck.com/marsMediaSite/en/instance/ko.xhtml?oid=52428265
[56] Scania. (2021). *Scania publishes life cycle assessment of battery electric vehicles.* Retrieved from https://www.scania.com/group/en/home/newsroom/press-releases/press-release-detail-page.html/3999115-scania-publishes-life-cycle-assessment-of-battery-electric-vehicles
[57] TNO. (2022). *Techno-economic uptake potential of zeroemission trucks in Europe.* Retrieved from https://www.transportenvironment.org/wp-content/uploads/2022/10/202210_TNO_-techno_economic_uptake_potential_of_zero_emission_trucks_in_Europe.pdf
[58] T&E. (2023). *A European Response to the US Inflation Reduction Act.* Retrieved from https://www.transportenvironment.org/discover/a-european-response-to-us-inflation-reduction-act/
[59] UNITI Fact 14: *Wie die Elektromobilität die Rohstoffabhängigkeit Deutschlands und Europas von China erhöht*