EUROPEAN
ROAD FREIGHT

2023 YEAR IN REVIEW

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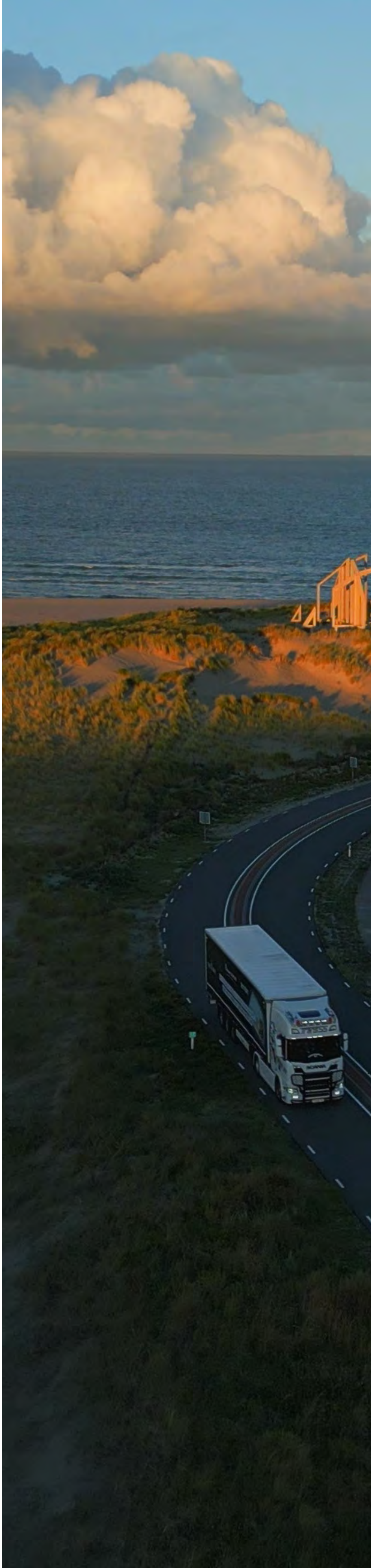

WELCOME TO THE **EUROPEAN ROAD FREIGHT 2023 YEAR IN REVIEW**

In 2023, logistics providers faced challenges across all modes of freight and geographies. The European Road Freight 2023 Year in Review offers a detailed analysis of macro events and trends that impacted the industry and will continue to shape it in the upcoming year.

In the face of strong freight demand in the previous year, 2023 presented a challenging landscape marked by adverse global macroeconomic conditions. High inflation and interest rates contributed to a decline in business confidence and a subsequent reduction in consumer spending, exerting downward pressure on freight demand throughout the year. Despite these challenges, the culmination of the year witnessed a notable upswing in truckload capacity demand during the peak freight season. This, combined with escalating fuel and toll costs, resulted in European road freight rates surpassing the levels observed in January 2023 by year-end.

> “2023 was another unprecedented year for our industry. Against a backdrop of continued market volatility and the ever-present urgency of climate action, we see shippers and carriers seizing technological opportunities and adapting to new environmental and regulatory demands. The year 2024 will raise the bar even higher, and we have analyzed the macroeconomic factors driving this.”
>
> **Julius Koehler**
> **Co-Founder & Managing Director - sennder**

Based on data from the sennder network of approx. 40,000 trucks, this report examines the key drivers of supply and demand in road freight logistics. The aim is to provide analysis of the road freight industry landscape and how it will evolve in the future.

EXECUTIVE **SUMMARY**

Road Freight's Response to 2023 Challenges: In 2023, economies continued their recovery from the global energy crisis and post-pandemic slowdown, with double-digit inflation rates in several Eurozone countries. High interest, high inflation environments led to declining business confidence and reduced consumer disposable incomes. Road freight demand, often a barometer of economic health, witnessed a downturn after the all-time high freight rates seen in 2022. Excess truckload capacity in February and March, up 20% YoY, led to fierce carrier competition, pushing freight rates down.

Persistent challenges in macroeconomic climate resulted in a slack freight market through mid-year, marked by lower shipper demand for truckload volume. The latter half of the year saw rising fuel and toll costs, increasing carrier cost bases, with overall carrier costs finishing up slightly on the year. As recovery continues among major economies, the International Monetary Fund forecasts increased GDP growth for Eurozone countries in 2024, approaching its 10-year average rate.

Key insights you will find in this report:

- Lower freight demand in Europe placed downward pressure on prices throughout the year, as sennder observed road freight rates fall as far as **9%** in Q1 2023, as available truckload capacity in February and March outweighed shipper demand.
- Prices rallied in the second half of the year, with carrier rates ending the year up **1%** above January levels, influenced by the introduction of German toll hikes and heightened truckload demand during peak season.
- The spot market, as a barometer for the freight market as a whole, saw a downturn in 2023, with sennder observing a **47%** decline in spot opportunities YoY.
- Among key corridors, Poland - Germany saw the biggest growth in carrier costs, finishing the year with per-km rates approx. **17%** above January levels.

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MARKET PERFORMANCE

Road freight market costs grew by approximately 1% in 2023. Initial slack demand led to rate declines, driven by an excess of truckload capacity compared to available loads. However, in the second half of the year, escalating fuel and road toll costs contributed to rates surpassing January levels by year end.

SUPPLY

Increasing freight supply

Truck Production | Truck registrations increase as chip and automotive manufacturers align production schedules

Fuel Costs | Fuel prices stabilise as global oil production increases with additional upstream investment

Decreasing freight supply

Availability of Drivers | Continuing structural trends of driver shortages and wage pressures

Toll Costs | Implementation of anti-emissions heavy vehicle road tolls increases road costs for operators

Driver Strikes |Driver strikes in Poland protest unrestricted access to the EU granted to Ukrainian drivers

DEMAND

Increasing freight demand

Economic Growth | Improved GDP growth expected in major Western economies following near-recessionary conditions

Inflation | Real wages and disposable incomes recover as inflation rates are brought under control

Decreasing freight demand

Consumer Sentiment | While consumer confidence remains negative, 2023 trends toward positive and finishes at a 5 month high

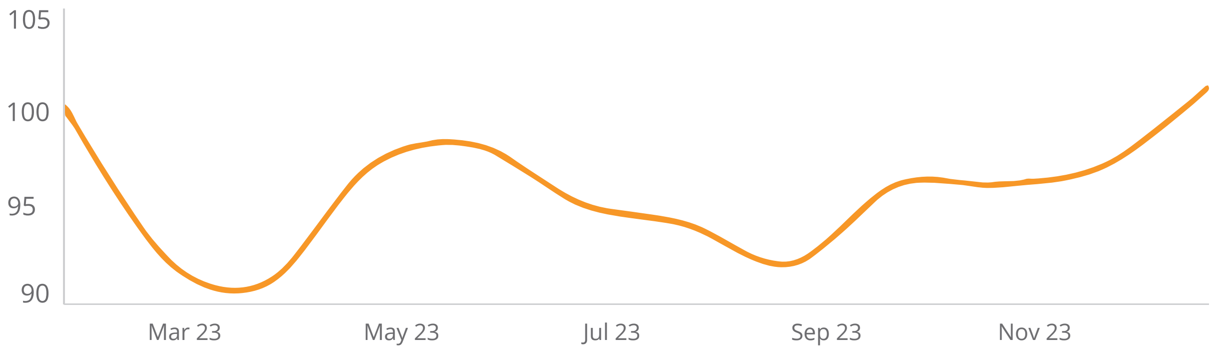
Ukraine |Continued sanctions of Russian trade and ongoing disruptions to Ukraine supply chains

Business Sentiment |Business confidence in the Eurozone turns negative in H2 2023

MARKET PERFORMANCE

sennder's Road Freight Cost Index, which tracks developments in average carrier rates in European road freight markets, rose 1 percent across 2023.

Road Freight Transport Cost Index for Europe



Carrier per-km cost indexed to average cost in January 2023

Source: sennder proprietary data

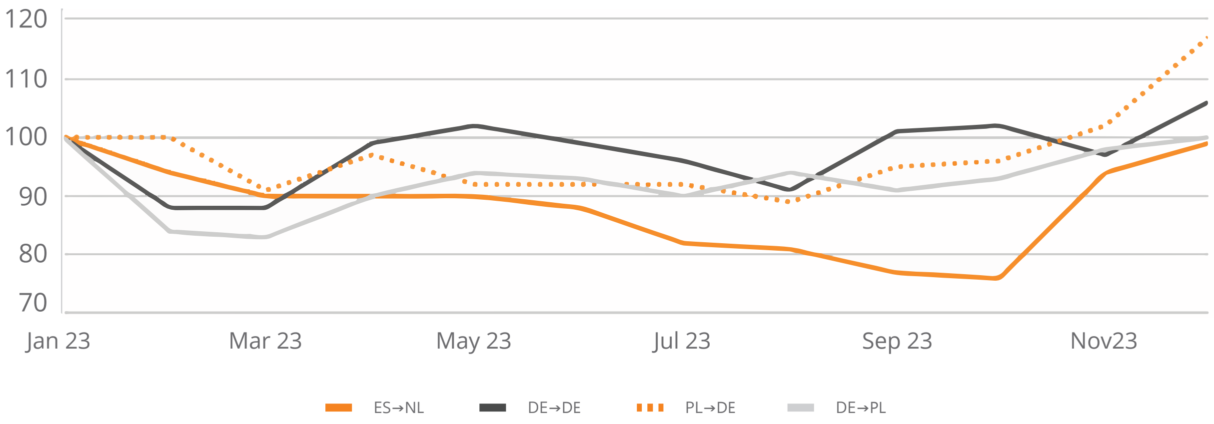
The sennder cost per kilometer index tracks the development of sennder's carrier cost base (including fuel and other surcharges) in the sennder network of more than 40,000 trucks across Europe.

After 2022's peak road freight rates, sennder noted Q1 2023's rate decline due to a 20% YoY increase in truckload capacity, compelling carriers to compete on price for load securing.

Continued challenging global macroeconomic conditions saw a slack freight market persist through mid-year, with lower shipper demand for truckload volume, before rising fuel and toll costs in the latter half of the year increased carrier cost bases, with average carrier rates finishing slightly up on the year.

Country Corridor Performance

Road Freight Transport Cost Index for Europe - Corridor Deep-Dive



Carrier per-km cost indexed to average cost in January 2023

Source: sennder proprietary data

The sennder cost per kilometer index tracks the development of sennder's carrier cost base (including fuel and other surcharges) in the sennder network of more than 40,000 trucks across Europe.

+6%

Germany → Germany

Carrier costs on German domestic lanes fell during Q1, as the oversupply of truckload capacity in the market pushed down rates. Fuel prices spiked in Q3, placing upward pressure on carrier rates, as did ongoing driver shortages. German freight rates finished the year up 6%, as increases to road tolls caused a spike in carrier costs. This increase to freight cost bases outweighed the ongoing effects of macroeconomic challenges lowering shipper demands, including lower manufacturing activity due to prevailing high energy prices (as discussed further in a later section).

A significant proportion of the carriers operating on German lanes employ Polish drivers. This driver composition can create short-term capacity issues, particularly on national holidays when most drivers return home to Poland, causing carrier costs to increase significantly.

December 1 increases to the MAUT toll (discussed in a later section) have significantly raised toll costs for carriers on German roads which were seen to drive carrier costs up 9% between November and December, an increase expected to continue into 2024 as freight contracts continue to be renegotiated, and carriers seek to pass costs to shippers where possible.

+17%

Poland → Germany /
Germany → Poland (no change)

The corridors between Germany and Poland experienced decline in carrier rates in early 2023 due to excess capacity and thus increased carrier price competition, as seen in other geographies. Increasing fuel costs during Q3 affected DE→PL carrier rates faster than the backhaul rate. The delay in fuel cost increases being seen on the PL→DE corridor is likely due to a delay in fuel price increases hitting the Polish market. In the lead-up to the October election in Poland, claims were made regarding the use of Polish fuel reserves by a state-controlled refiner to artificially keep fuel prices low.[1] Following the election, Polish diesel increased 19% above September prices, with a delayed upward shift seen in the PL→DE cost index for carriers refueling at Polish pumps. Further upward pressure was placed on Polish carrier rates through a tightening of capacity due to many Polish truckers commencing industrial action in November, in protest of the unrestricted access granted to the EU for Ukrainian drivers (further discussed in a later section). The recovery of German load volume post-recession, ongoing impact of higher toll costs, and the resolution of the Polish carriers' strike will inform the development of carrier rates along PL←→DE lanes in 2024.

1 www.reuters.com

-1%

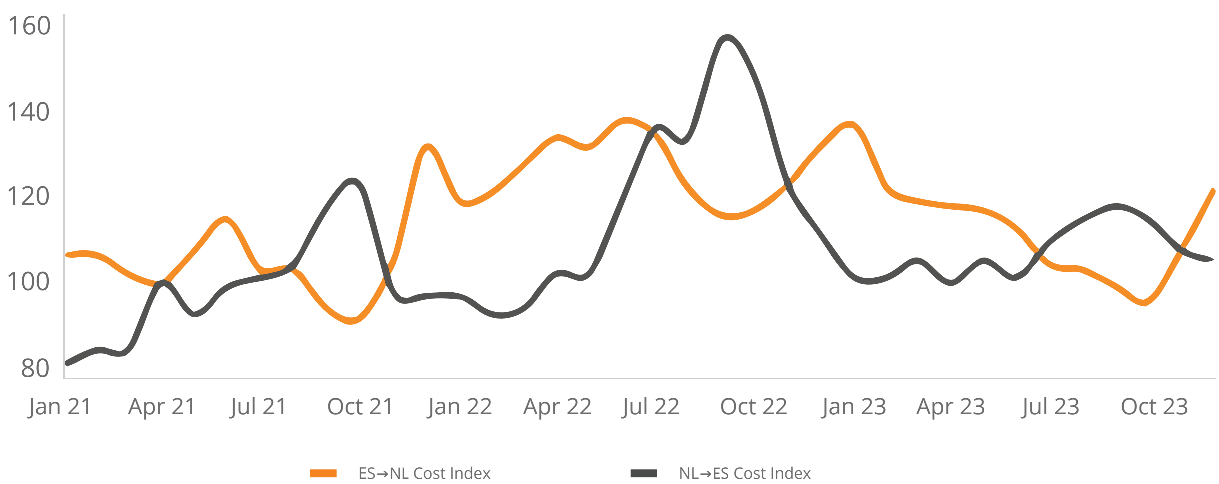
Spain → Netherlands

Freight rates on the ES→NL corridor finished the year relatively stable, with variations in carrier costs influenced by recurring seasonal dynamics. A unique structural feature of Spain - EU freight corridors is caused by the seasonality of the Spanish agricultural sector. Spain exports over 10m tonnes of fresh fruits and vegetables each year, with the majority transported by road. From the beginning of harvest in early November until mid-June there is a dramatic increase in outbound truckload demand, and freight exports heavily outnumber imports.

Imbalance between exports and imports were seen to affect inbound and outbound freight rates. During harvest season, outbound loads outnumbered available truckload capacity, driving freight rates higher as carriers select between loads in a tight market. As far more loads leave Spain than re-enter it, carriers dropping loads at outbound destinations are unlikely to easily find a return load back to Spain.

After harvest season finished in June, the imbalances reversed, import loads began to outweigh exports, and relative carrier rates flipped, as is seen below in sennder's historic cost indices between Spain and the Netherlands.

Road Freight Transport Cost Index for Europe - The Effects of Spanish Agricultural Harvest Season



Carrier per-km cost indexed to average cost in April 2021

Source: sennder proprietary data

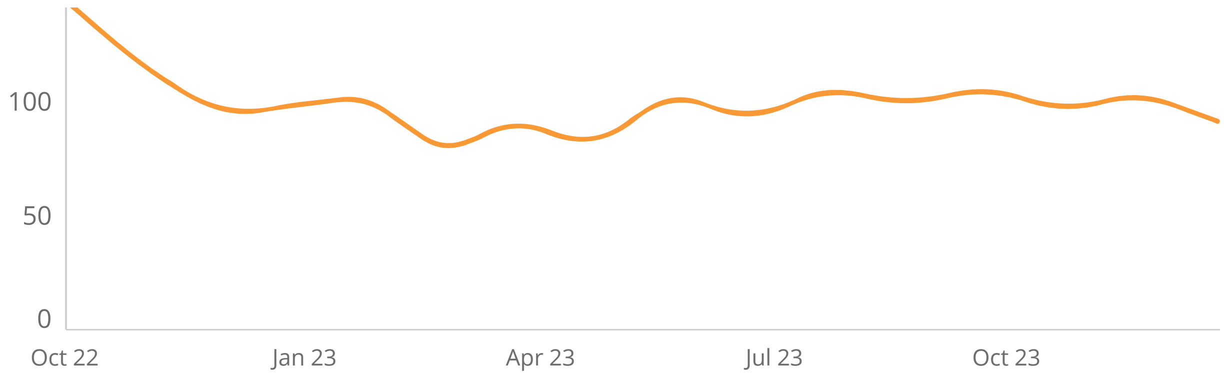
The Spot Market

Spot market transactions, indicative of one-time, immediate shipping needs, serve as a key gauge for the overall road freight market. Following a decline in Q4 2022, road freight demand remained subdued throughout 2023, with total spot opportunities down 47% YoY. Spot opportunities saw a dip in Q1 amid excess truckload capacity but have overall remained relatively stable.

Unfavorable macroeconomic conditions suppressed consumer spending and business orders, leading to sustained excess truckload capacity. Throughout the year, contracted load rejection rates were low, with carriers fulfilling contracted loads in the absence of more lucrative spot market opportunities.

In December 2023, spot opportunities were down by 5% YoY, and spot prices increased with the introduction of German toll hikes and heightened demand during peak season. Anticipated toll increases in Hungary, Austria, and the Czech Republic are expected to drive further spot rate increases in 2024.

Road Freight Spot Opportunity Index for Europe



Volume of spot freight opportunities indexed to January 2023 opportunities

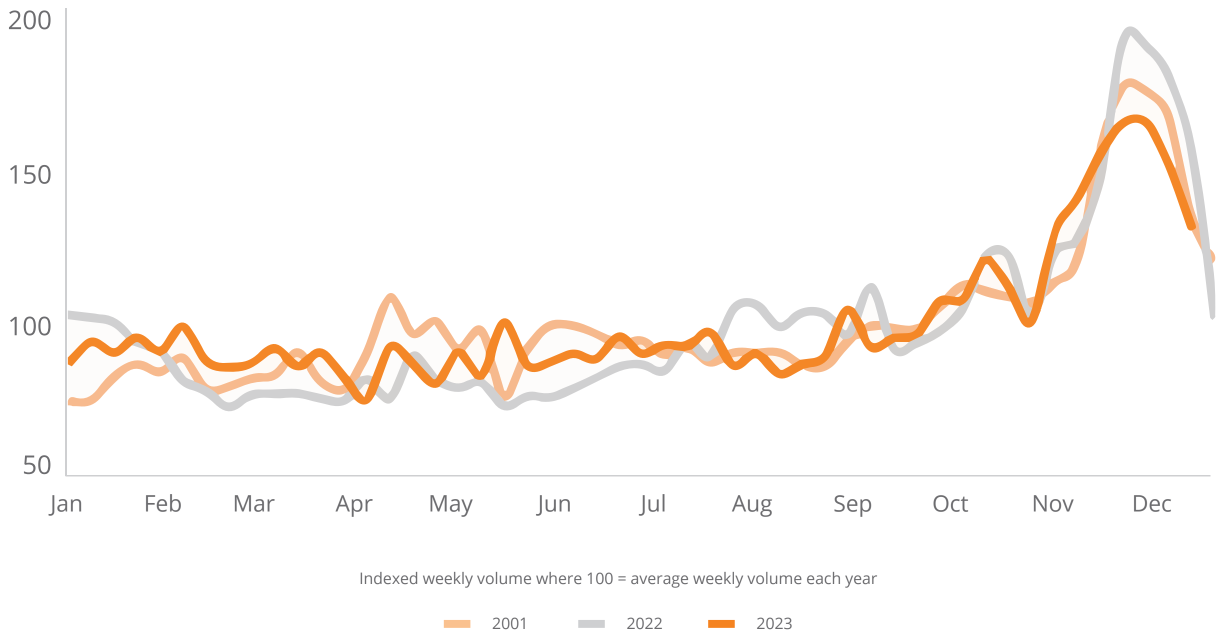
Source: sennder proprietary data

Road Freight Peak Season

Each year, road freight providers experience a surge in freight volumes during the latter half of Q4, known as the freight 'peak season.' This period, spanning the Black Friday weekend to the Christmas shopping season, brings a substantial increase in consumer spending. sennder observes a rise in truckload volume among retail shippers during this period. This surge may be attributed to inventory buildup in anticipation of higher demand, or the need for urgent shipments to meet above average demand at short notice.

The chart below shows sennder's indexed retail shipper loads each week from 2021-2023.

Retail Volume Index for Europe



Volumes indexed to average weekly volume of the same year

Source: sennder proprietary data

The sennder volume index indicates the development of truckload volumes in the sennder network of more than 40,000 trucks across Europe.

In mid-November each year, retail loads saw a significant spike as the seasonal upturn began, reaching a peak of 79% above average weekly loads before easing at the year-end.

In 2023, there was a lower peak compared to the two preceding years, with shipper orders down YoY due to a decline in consumer spending. Despite this, truckload volumes still peaked at 65% above average in the last week of November, with many cost-conscious consumers waiting for Black Friday discounts before making significant purchases.

2023 MACRO TRENDS IMPACTING ROAD FREIGHT

- Ongoing Externalities of Russia-Ukraine Conflict
- Energy and Fuel Prices
- Inflation, Interest Rates & Suppressed Economic Activity
- Driver Shortages
- Truck Production and Semiconductor Availability
- Eurovignette and CO2e Road Tolls
- Green Logistics Market

Ongoing Externalities of Russia-Ukraine Conflict

As the Russian invasion of Ukraine continued in 2023, ongoing sanctions impacted global trade and energy markets. Disruptions to global supply chains continued, while measures supporting Ukraine's economic liberalization caused tension within the EU.

After Russian troops invaded Ukrainian territory in February 2022, the EU implemented wide-ranging sanctions, including a ban on imports of Russian crude oil and refined petroleum products.[2] Notably, half of Russia's total oil exports were directed to the EU.[3] As countries within the EU and beyond endeavored to replace Russian fuel in their blends, the resulting surge in fuel and energy prices exerted significant inflationary pressure on a global scale.

Impact

- After a daily cap on the number of truck drivers permitted to enter the EU from Ukraine was temporarily lifted from July 2022, Ukrainian carriers gained dominant market shares of particular freight corridors.[4]
- In November, Polish truckers began protests in response to the unrestricted access given to Ukrainian truckers. They did so by blockading border crossings, disrupting the transit of thousands of trucks carrying commercial goods, military supplies, and relief packages.[5]
- Complaints of truckers echo those of farmers angered by the EU liberalization of grain imports from Ukraine, which they argue is undercutting national grain markets.

2 www.consilium.europa.eu
3 eu-solidarity-ukraine.ec.europa.eu
4 www.gov.pl
5 www.ft.com

Implications for Carriers

Many Ukrainian truck drivers had returned home to their country at the onset of war, which together with the 2023 industrial action by drivers from Poland and other countries has exacerbated driver shortages, tightening capacity and raising carrier rates. Protesting carriers claim Ukrainian drivers unfairly undercut prices, urging the reintroduction of the EU's permit system for business protection.[6]

Implications for Shippers

Shippers importing key Ukrainian commodities continue to face shortages and higher prices. Russia stepped out of the Black Sea Grain Initiative in June, requiring 40% of Ukrainian grain exports to be rerouted from seaports to overland routes, resulting in a notable spike in grain prices as supply temporarily faltered.

Shipper order volumes continue to be dampened due to the lessened production and consumer spending during gradual economic recovery in major economies. This was partly driven by the inflationary effects of the energy crisis and commodity spikes following the outbreak of war.

Outlook for 2024

The EU continues to condemn the Russian offensive, and has successfully rebalanced its energy portfolio to remove reliance on Russia from its import mix. Having overcome this challenge, the EU may be expected to continue to level and enforce sanctions against Russia, placing ongoing pressure on Moscow.

Recently elected Polish Prime Minister Donald Tusk has vowed to end the blockade of the Ukraine-Poland border as a priority. On 16 January 2024, the Polish government reached an agreement with the truckers to suspend the blockade, pending further talks to reach a final deal by March 1. Conditions of the agreement include measures to improve the situation of EU-registered drivers working in Ukraine, and discussions with the European Commission regarding financial support for Polish carriers impacted by the influx of Ukrainian trucks.

The demands for financial compensation echo those of Polish farmers who had previously joined the truckers' protest, angered by the EU liberalization of grain imports from Ukraine. The Polish Minister of Agriculture agreed to implement the farmers' demands, including subsidies and provision of loans for liquidity. Whether a satisfactory deal can be reached with the striking drivers remains to be seen, with truckers warning the blockade can be reinstated at any time.

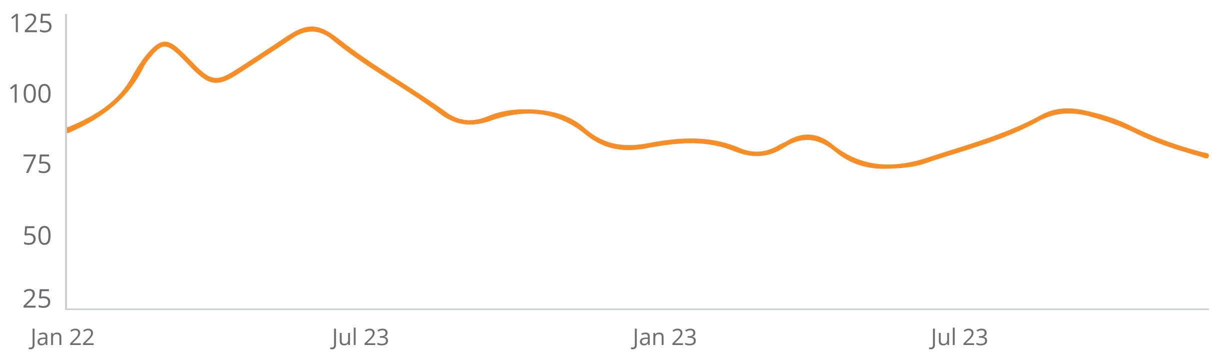
6 apnews.com

Energy and Fuel Prices

Global energy markets continued to stabilize, with supplies and prices recovering from the 2022 energy crisis triggered by EU and US sanctions on Russian energy exports, which caused global prices to soar.

With increased activity in upstream investment and development of oil production and refinement, oil prices were steady through the first half of 2023. In the second half of the year, OPEC and Russian production cuts, along with investor concerns about supply disruption caused by escalating conflict in the Middle East, exerted upward pressure on oil prices. These pressures were offset by easing global demand expectations, as macroeconomic challenges facing major oil importers such as the US and China tempered expected fuel consumption.

Brent Oil Price Development ($/barrel)



Source: U.S. Energy Information Administration

Impact

- Enhanced investment in global oil development saw production step up to meet demand, culminating in a record year for oil production in the US.[7]
- The EU's rebalancing of its oil import mix saw the Russian share of extra-EU imports plummet to 3% in March, down from 31% in January 2022.
- Elevated energy costs have disrupted operations of numerous energy-intensive industries across Europe, prompting many companies to scale back or relocate operations offshore to sustain profitability.

7 www.eia.gov

Implications for Carriers

Fuel costs remain a substantial portion of overall carrier expenses, making carriers vulnerable to fuel price fluctuations. Freight spot rates, being short-term prices, are highly responsive to changes in fuel costs. Carriers on contracted lanes typically have fuel surcharge agreements or engage in frequent price negotiations with customers. Carriers lacking fuel surcharge agreements are exposed to fuel price increases.

In a year of excess freight capacity, many carriers opted to absorb fuel price hikes rather than renegotiating, given the abundance of competing carriers willing to offer competitive prices.

Implications for Shippers

In addition to fuel costs impacting inbound and outbound transport costs for shippers, elevated energy costs have continued to affect industrial production during the year. Industries with high energy consumption, whether as primary consumers (e.g., transport and chemical production) or secondary users relying on inputs from such sectors (e.g., food & beverage and paper production), are most heavily impacted. In Germany, Europe's leading industrial producer, rising energy costs for manufacturers have significantly impacted operational profitability. This has prompted many firms to evaluate or execute offshoring of production to sustain operations.[8]

Outlook for 2024

Global oil prices have stabilized through increased production and downward revision of anticipated global consumption. The Energy Information Administration forecasts US per capita oil consumption will reach its lowest level in two decades in 2024, while China, as the world's biggest crude oil importer, faces economic challenges in the form of slowing GDP growth and contracting consumer prices amid falling demand. The rate at which global economies recover and ramp up production in 2024 will directly inform global energy demand.

8 www.dihk.de

Inflation, Interest Rates & Suppressed Economic Activity

Eurozone economies continued to grapple with the inflationary shock of the prior year, with several countries beginning 2023 with double-digit inflation rates. By year-end, overall Eurozone inflation slowed to 2.9%, approaching the European Central Bank's target figure of 2% p.a.

Impact

- The European Central Bank (ECB) announced interest rate increases at its first 6 meetings of the year, reaching an all-time high refinancing rate of 4.5% p.a in September.
- The ECB's interest rate adjustments have a ripple effect throughout the economy, as higher borrowing costs for banks lead to higher borrowing costs for businesses and consumers, reducing disposable incomes.
- Eurozone economic growth neared stagnation, with GDP expanding by a modest 0.7% for the year, down from the robust 3.3% growth observed in 2022.

Implications for Carriers

Global freight demand stayed subdued all year, reflecting decreases in spending and manufacturing. The reduction in goods manufacturing and production resulted in decreased transport needs across various stages, from factories to warehouses, retail outlets, and final-mile destinations. Many logistics providers, having expanded fleets and operations during the 2022 freight peaks, found themselves with surplus assets and drivers.

Low freight demand in 2023 led to excess truckload capacity, intensifying competition among carriers. Faced with the need to secure loads, carriers engaged in more aggressive pricing strategies, consequently driving down freight rates, which by March had fallen as far as 9% below January 2023 levels. The challenging market conditions led to several carriers and logistics companies struggling to maintain profitability, ultimately resulting in business closures, with multiple high-profile carriers ceasing operations during the year.

Implications for Shippers

High inflation erodes consumer purchasing power as workers' salaries fail to keep up with rising prices. Moreover, many household disposable incomes shrunk as higher interest rates elevated mortgage repayment costs. Many shippers faced lower order volumes as consumer spending dipped amid (near-) recessionary conditions.

Despite Eurozone consumer confidence being negative for most of 2023, sentiment showed improvement in the final two months, trending overall positively for the year. High interest rates also elevated the cost of capital for businesses, leading to reduced investment in expansionary activities

Outlook for 2024

ECB interest rate cuts are expected as Eurozone inflation continues its decline towards the target of 2%. The bank has stressed the need for caution in lowering rates, emphasizing that the final stretch of inflation reduction poses the greatest challenge, and reiterating expectations that 2% inflation will not be reached until the second half of 2025. When interest rate cuts come, they will likely aid in the recovery of Eurozone economic activity, and as spending and production increase, so too will freight demand. The IMF forecasts 1.2% GDP growth in 2024 for the Eurozone, approaching the 10-year Eurozone average of 1.4% p.a.

Driver Shortages

Truck driver shortages continue to impact the ability of carriers to fulfill loads. The aging driver population and a deficiency of new drivers in the pipeline continue to place structural pressure on the road freight market.

Impact:

- The latest International Road Transport Union (IRU) driver survey shows 7% of positions in Europe (233k) were unfilled in 2023, a slight YoY decrease due to the slack road freight market temporarily alleviating driver demand pressure.
- With one third of European truck drivers aged 55 years or above and expected to retire in the next 10-15 years, and only 5% younger than 25, there is a significant risk of a substantial decline in driver numbers.
- Truck driving remains an unappealing profession for young people due to extended periods spent abroad and irregular load-based work schedules, deterring them from the industry.
- High barriers to entry particular to the trucking industry may be deterring otherwise interested entrants, with a wide 'school-to-wheel' gap in the EU, where the minimum driving age for most international freight transport licenses is 21.
- High costs are a further disincentive, with mandatory training programs, licensing fees and examinations costing up to 3x monthly driver minimum wages.

Implications for Carriers

The IRU estimates over 7 million global truck driver positions could be unfilled by 2028. Currently, 62% of EU carrier companies are experiencing severe or very severe difficulties in filling truck driver positions. Due to limited opportunities for organic driver base growth within Europe, carriers will increasingly turn to international driver intake initiatives; recruiting, training and supporting the accreditation of drivers sourced from outside the EU.

Implications for Shippers

In 2023, abundant freight capacity protected shippers from escalating rates due to driver shortages. Yet, with economic recovery and growing demand, shippers may face disruptions, delays, and higher costs if carriers can't fill driver positions.

Outlook for 2024

While technological solutions such as autonomous trucks may provide a future solution to driver shortages, fully autonomous trucking capabilities are still some years away from widespread implementation. Without intervention, the balance of drivers entering and departing the European industry will cause driver shortages to worsen as freight demand recovers in 2024. Europe may look to the US for inspiration in improving the influx of young drivers and representation of women in the industry - 8% of drivers in the US are aged below 25, and 8% of US truckers are women.[9]

'Dock-to-driver' programs offered in the US offer employment opportunities and on-the-job training straight from high school, with drivers aged 18 and over permitted to drive on intrastate routes, and later to carry interstate loads from age 21. US licensing costs are also much more affordable, usually amounting only to just a few days' pay.

In addition, truck stop facilities in the US are superior to those in the EU, with maintenance and repair stations, and well-maintained rest and bathroom facilities, including motels in many locations removing the need for drivers to sleep in vehicles. These approaches to facilitating industry access and improving driver quality of life may be a compelling drawcard in bringing more young people and women to the industry.

9 www.iru.org

Truck Production and Semiconductor Availability

Post-pandemic supply shortages of semi-conductor chips used in automotive production were largely resolved in 2023, which saw vehicle manufacturers building more direct relationships with chip companies.

Impact

- Greater collaboration between semiconductor producers and automotive manufacturers allowed for stable vehicle production, with better prediction of chip availability and alignment with automotive production schedules.
- 2023 saw a resurgence in new EU truck registrations, with 346,986 registrations in the year, a 16% increase from 2022[10].
- Germany led the way with over 94k newly registered trucks, a 24% increase, with Spain, Italy and France also showing double-digit growth in new trucks.
- 95.7% of new truck registrations were diesel powered, while 5,279 new electric truck registrations marked a 234% increase YoY.[11] Over 60% of EU electric truck sales came from Germany and the Netherlands, indicative of the countries' relative advancement in coverage of electric charging facilities.

Implications for Carriers

Adequate new truck supply prevents carriers from facing operational disruptions, enabling them to replenish and expand fleets with cost-efficient, lower-emission vehicles. This reduces the risk of incurring excessive vehicle costs when production struggles to meet demand.

Implications for Shippers

A steady supply of trucks helps avoid disruption to shipping lanes due to lack of truckload capacity. While truckload shortage was not an issue in 2023's landscape of excess truckload capacity, ongoing carrier fleet availability facilitates continuity and more affordable freight rates for shippers in years to come.

Outlook for 2024

Ongoing alignment between semiconductor producers and automotive manufacturers will allow for continued stable vehicle production. The share of electric trucks in new heavy commercial vehicle registrations in the EU will continue to grow as the EU works towards its target of 90% reduction in heavy goods vehicle emissions by 2040.

10 www.acea.auto
11 www.acea.auto

Eurovignette and CO2e Road Tolls

EU greenhouse gas emissions reduction legislation known as the Eurovignette Directive requires Member States to collect road tolls based on vehicle CO2 emissions. Toll levels, and vehicle classification and emission classes are decided by individual countries, with plans required to be announced by 25 March 2024.

From 1 December 2023, substantial new German road tolls came into effect, imposing an additional per-kilometer tax which increased toll costs by up to 83% for carriers operating on German roads. The German tax applies to all trucks with a gross weight over 7.5 tonnes, representing >99% of 2022 German road freight transport by tonne-km.[12] Toll rates are calculated based on the Euro emissions class, gross vehicle weight rating, and number of axles for each heavy goods vehicle.

Impact:

- For 40 tonnes, 5-axle EURO 6 vehicles with diesel engines, this equates to a 83% increase in the per km toll rate, leading to a c. 10% increase in transport costs for customers, all else being equal.
- Zero emission vehicles, including battery electric and hydrogen trucks, are fully exempt from the road roll, which is in effect a subsidy of EUR 0.348 / km for 40t trucks, helping to close the gap between electric and diesel costs.
- Carbon reducing fuels such as HVO, B100 and e-Fuels are not exempt from the increase in road tolls. Existing fossil fuel solutions such as CNG and LNG have had their favored status removed, most likely due to their minimal and questionable reduction in carbon emissions and the growing focus on zero emission solutions.

12 ec.europa.eu

Carrier Impact

In Germany, carriers predominantly deploy trucks with a GVWR of 18+ tonnes, resulting in a significant surge in road tolls. This elevates the toll component of overall carrier costs from 12% to around 20%.[13] Given that shipper prices for contract business are typically locked in 1-2 years in advance, many carriers find themselves absorbing the toll cost increase in the short term. In the longer term, carriers are anticipated to pass increased toll costs onto shippers as freight contracts are renegotiated.

Shipper Impact

Faced with mounting transport costs due to increased emissions taxes, shippers are exploring ways of reducing reliance on high-cost road transport corridors. Methods of avoiding cost increases include use of zero-emission electric trucks, renegotiating supplier contracts to avoid use of German shipping lanes, and intermodal freight options where available. In cases where shippers cannot otherwise avoid raised toll costs, they may choose to increase product prices and pass costs on to end consumers in order to maintain margins, or may bear greater toll costs as overall reduction in inflation rates level out margin impact.

Outlook for 2024

As the effects of the MAUT increase in Germany continue to be felt and shared between carriers, shippers, and end consumers, other EU countries prepare to introduce their own toll increases. From January, Austria will see toll increases of approximately 20-30%, and from March the Czech Republic will increase tolls by 10-15%. Because the Eurovignette allows Member States to decide on the taxation level and emissions classes used in collecting emissions tolls, toll rates can differ widely between countries.

The impact of potential price hikes on the competitiveness of goods from high-toll countries (like Germany) in global markets, as well as the effect on overall exports and whether general economic inflation offsets rising transport costs, is yet to be determined.

13 www.ti-insight.com

Green Logistics Market

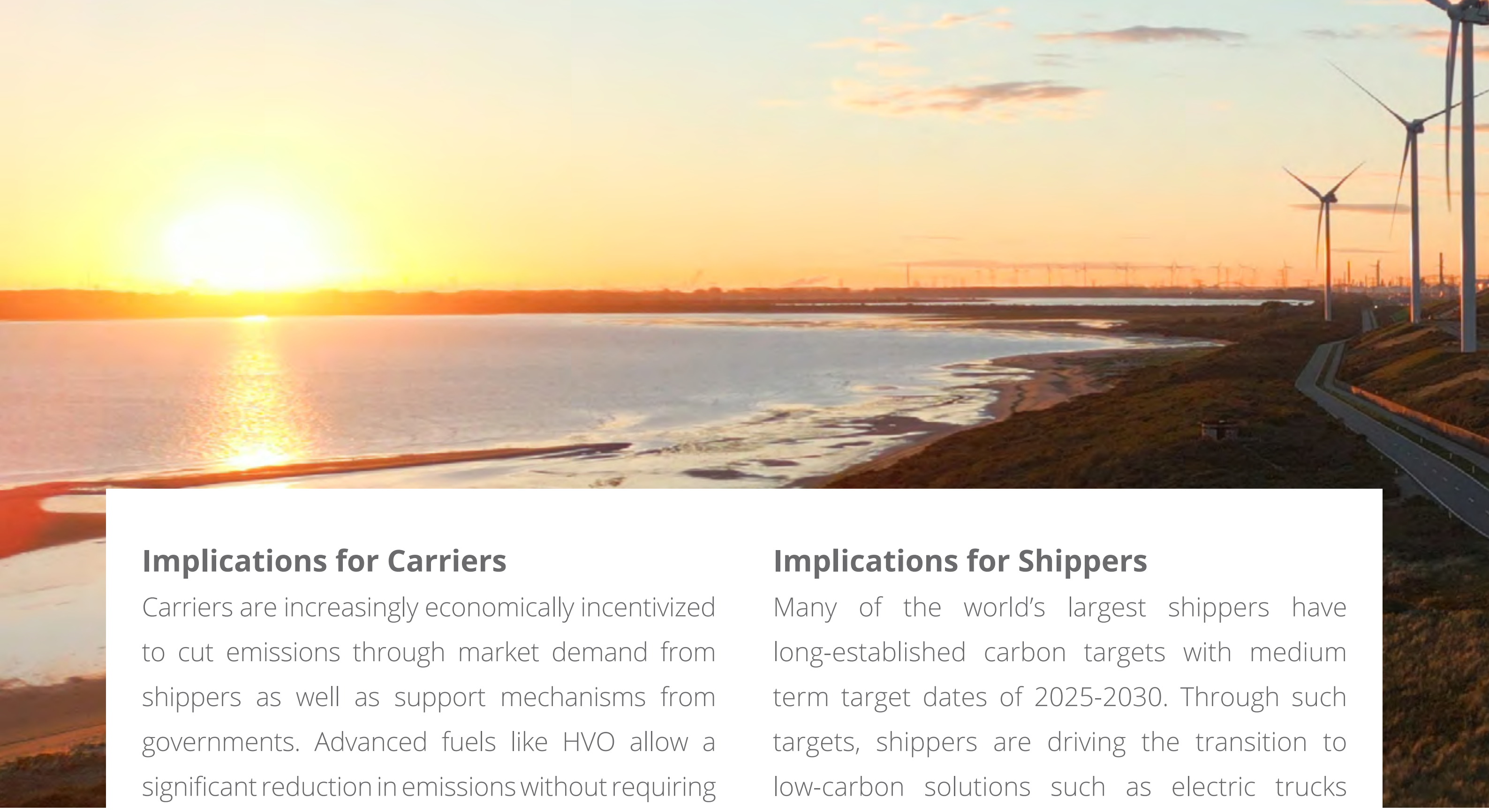
The urgency of decarbonizing global trade heightens each year as companies continue to expand their carbon reduction plans globally and as deadlines for emissions reduction targets and the 2050 net-zero carbon emissions goal approach. All to align with the Paris Agreement's long-term climate stability objective. The Science Based Target Initiative now reports over 7,200 companies have a net-zero or science-based target, an increase of 104% vs. end of year 2022.[14]

In November, the European Parliament intensified reduction targets for new heavy vehicles: 45% by 2030, 65% by 2035, and 90% by 2040, compared to 2019 levels. These strengthened targets formalize and expedite the shift toward zero-emission trucking, and reinforce the need for carriers to decarbonize operations sooner rather than later.

Impact

- Shippers continue to drive decarbonization initiatives throughout their supply chains, including upgrading their flows to low carbon transport solutions such as HVO, other biofuels, intermodal solutions and electric trucks.
- Government policies are providing a framework in which all transport parties can align investment expectations for the adoption of electric vehicles and low-carbon advanced fuels, such as HVO.
- Zero-emissions vehicles may be partially or completely exempt from additional road tolls introduced pursuant to the Eurovignette Directive, providing a clear incentive to fast-track transition to electric vehicles for carriers who may currently pay up to €25,000 p.a. in road tolls per truck.
- Electric truck production and adoption is still ramping up, with only 1.5% of new EU commercial vehicles in 2023 fully or hybrid electric powered.
- Stricter emissions targets and incentives such as toll exemptions will support the broader adoption of electric heavy vehicles, as truck production continues along the path already traced by personal EV sales in the EU, where overall automotive market share of fully electric cars has grown from 2.0% in 2018 to 7.7% in 2023, and the combined market share of electric, plug-in hybrid and hybrid cars has grown from 5.8% in 2018 to 48.0% in 2023[15].

14 sciencebasedtargets.org
15 www.acea.auto



Implications for Carriers

Carriers are increasingly economically incentivized to cut emissions through market demand from shippers as well as support mechanisms from governments. Advanced fuels like HVO allow a significant reduction in emissions without requiring any capital investment, as diesel trucks can seamlessly use HVO without engine modifications.

Although HVO offers a cost-effective means for short-term carbon emission reduction, electric trucks are poised to play a key role in achieving net-zero emissions in road freight in the long run. High capital requirements (with EV trucks costing up to 3x more than diesel trucks), residual value risk, and lack of truck-specific charging infrastructure force EV adopters to rely on fast charging infrastructure designed primarily for cars or to build their own. In order to avoid the economic risk, pay-per-use models are becoming more attractive for carriers.

Electric trucks reduce emissions between 50-100% in the EU depending on the source of electricity and offer additional advantages such as a 50% reduction in noise pollution[16] and near-zero particulate emissions during operations promoting community health. These features make electric trucks particularly attractive to federal and local policy makers.

Implications for Shippers

Many of the world's largest shippers have long-established carbon targets with medium term target dates of 2025-2030. Through such targets, shippers are driving the transition to low-carbon solutions such as electric trucks and HVO. Shippers' initiatives in this regard are being reinforced at the policy level, setting a clear direction for the industry. As such, shippers play a pivotal role in achieving the necessary 55% reduction in greenhouse gas emissions by 2030 as mandated by the EU. The EU's Corporate Sustainability Reporting Directive will enforce rigorous environmental reporting obligations, phased in from 2024 to 2028.

16 thedriven.io

Outlook for 2024

Access to HVO has continued to expand in public fuelling stations throughout 2023, including in Italy, Spain and Portugal. This trend will most likely expand in 2024, with Germany and France relaxing current red tape around the sale of pure HVO, allowing this fuel to be sold at all public fuel stations without restrictions. Initial indications are that both countries will complete the red tape reduction around April 2024, which will vastly increase the availability of HVO in two key markets. As the supply of HVO expands, the monitoring of feedstock qualities continues to be of critical importance to ensure that carbon emissions reductions of up to 90% are truly being achieved in practice.

Electric trucks will continue to grow in 2024, as almost all truck OEMs have targets for 2025 to reduce the CO2 emissions of their fleets. This means that electric truck sales will need to increase significantly to avoid fleet average CO2 penalties in 2025. OEMs will launch new electric truck models in 2024 to meet their targets, while investing in new sales models and the necessary charging infrastructure to remove barriers to sales. The range and charging capacity of the electric truck models coming onto the market in 2024 will gradually improve compared to the models available in 2023.The average range is expected to increase to 350-400 km (33% more than 200-300 km) and the charging capacity to 375 kW (50% more than 250 kW).

> "With increasing regulatory requirements, but especially the enormous push towards cleaner road freight from our partner shippers and carriers, which was reflected in a 6-fold growth in demand for green transport last year . Our forecast for 2024 is clear: green transport will continue to grow, it will be the year for advanced fuels and electric trucks,"
>
> **Graham Major-Ex**
> **Director Green Business & eMobility - sennder**

MARKET OUTLOOK 2024

Looking ahead to 2024, the macroeconomic context takes center stage. The Eurozone economy is expected to witness an uptick in GDP growth, and interest rate cuts are expected as inflation rates continue to be brought under control. Economic resurgence bodes well for consumer purchasing power and business investment, setting the stage for a boost to shipper order numbers. Ongoing implementation by Member States of emissions tolls pursuant to the Eurovignette Directive will impact supply chain dynamics and stoke the industry's transition to zero-emission trucking. Driver availability will remain a key consideration for carriers, who must negotiate structural shortages of new drivers within the industry, and extraordinary events such as the ongoing industrial action by Polish drivers. The freight industry will continue to serve as a proxy for the market as a whole, while its players must remain agile and efficient to continue to respond to the opportunities and challenges the year presents.

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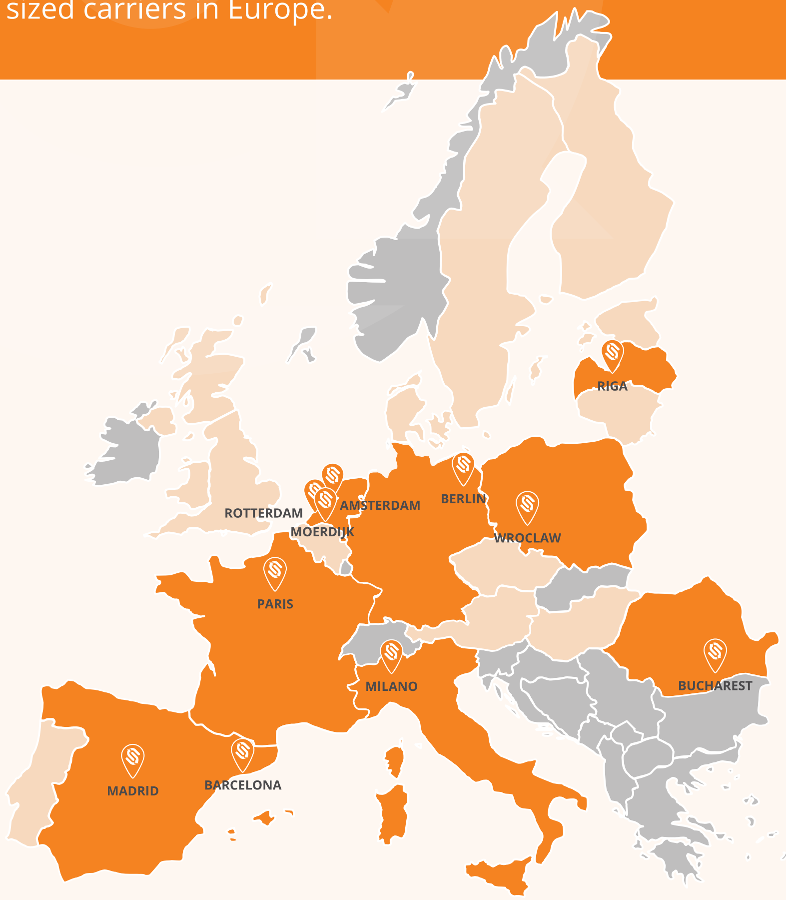

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