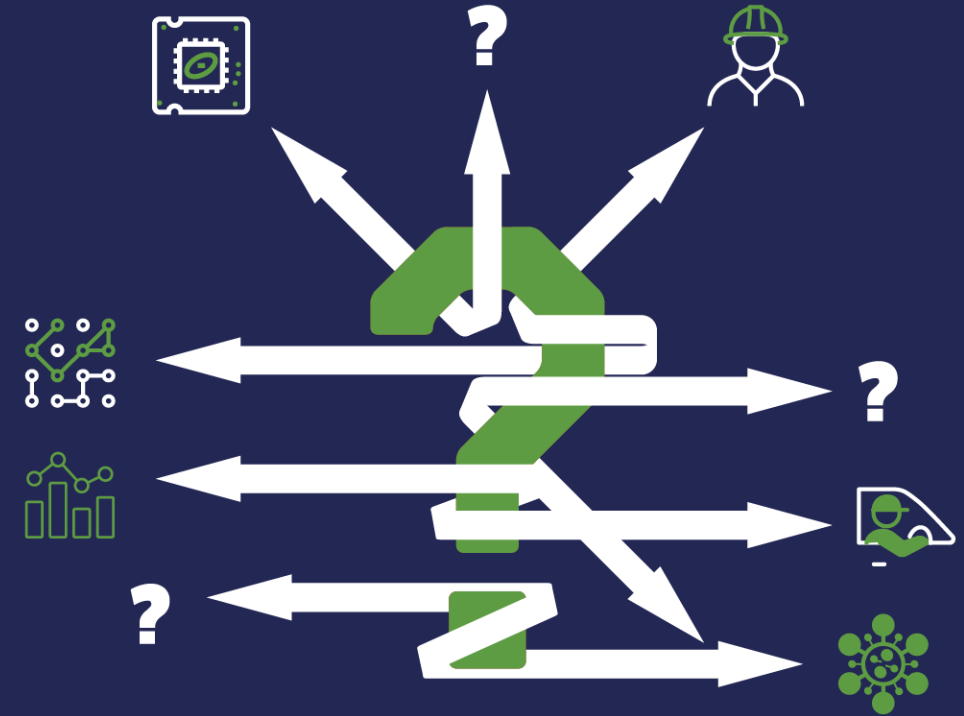


VUCA* events hit, prices soar

Prices & Costs soar as war & Covid-19 hit supply chain

* Volatile, Uncertain, Complex, Ambiguous



Part 1: Materials Prices Soar

Slide 03

- Raw Materials used in vehicle production soar
- Fuel Prices surge
- Energy prices rise
- Associated costs jump, production outlook affected

Part 2: Inflation Rocks Stability

Slide 19

- Inflation rises across Europe
- Cost of living jumps

Part 3: Mitigating VUCA events?

Slide 22

- Ukraine Invasion
- Shanghai Lockdown
- Associated costs shoot up

Contacts

Slide 40

- Contact details

Materials Prices Soar

Raw materials used in auto production soar, as do fuel and energy

Materials Prices Soar

War & Covid-19 cause havoc, while chip shortage still present

War:

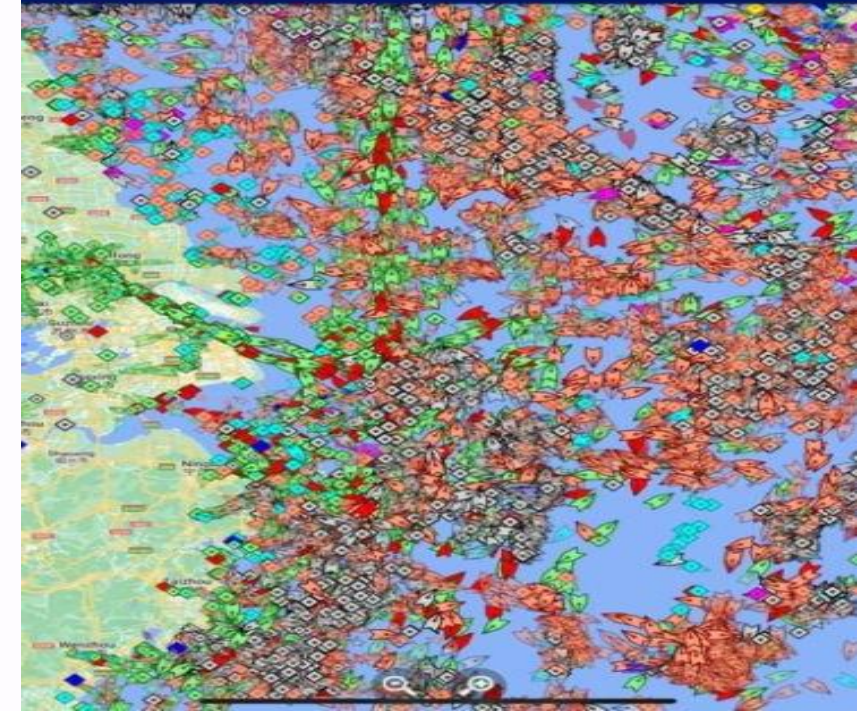
- Components and raw materials sourced from Ukraine & Russia see acute shortages
 - Wire harnesses
 - Palladium, Nickel
 - Software
 - OEMs stop/start production

Covid-19:

- Lockdown in Shanghai due to surge in Covid-19 causes major disruption
 - OEMs halt production
 - Components stuck at ports
 - Cars stuck at ports
 - Backlog at ports
 - Major trucking issue around Shanghai port



Marine Traffic Shanghai –April 2022



Shortages, Price hikes, Uncertainty = New Normal

- New normal is unpredictable and unstable

Materials prices saw peaks in end February/early March, these now are at new, higher levels.

Sourcing of components such as Wire Harnesses initially caused havoc, but alternative sources and some production has restarted.

Fuel prices saw sharp hikes again in March but have fallen, although now at higher levels than previously. Energy prices now also at a new high.

Covid-19 disruptions continue to cause havoc with bottlenecks at ports such as Shanghai where strict enforcement of 'Zero Covid' policy are in force, disrupting auto production

Outlook: While the war and Covid-19 continue to play havoc with raw materials and sourcing, the markets rebound, but often to higher 'new normal' levels.

LME Aluminium Official Prices graph

👁 Bid 👁 Offer



In October 2020, price of aluminium per tonne was between \$1,500 and \$2,000 per tonne, so prices were already rising through 2021, but accelerated in Q1 2022.

LME Copper Official Prices graph

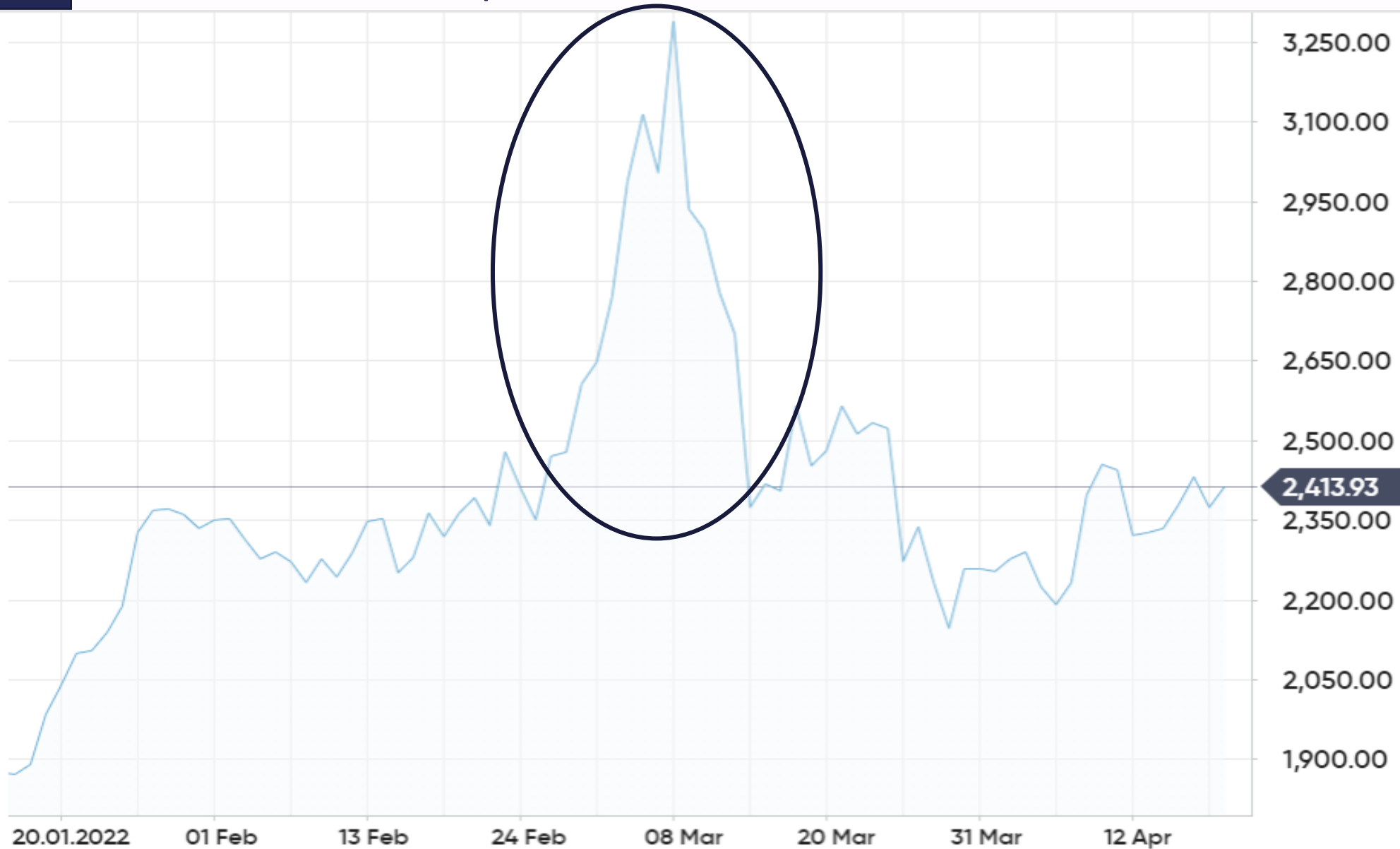
 Bid  Offer



Palladium Prices Graph

Peak Period 24 Feb to 10 Mar

USD, Ozs



Source: Capital Markets

New/Extended VUCA events will cause prices to SOAR ---again---

Base metals prices mixed; outlook muddied by Covid-19 lockdowns, further talk on tapering

 Fastmarkets
MB

New Lockdowns In China Are Hindering Global Steel Supply

By [Ag Metal Miner](#) - May 03, 2022, 1:00 PM CDT

 **OILPRICE**.com
The No. 1 Source for Oil & Energy News

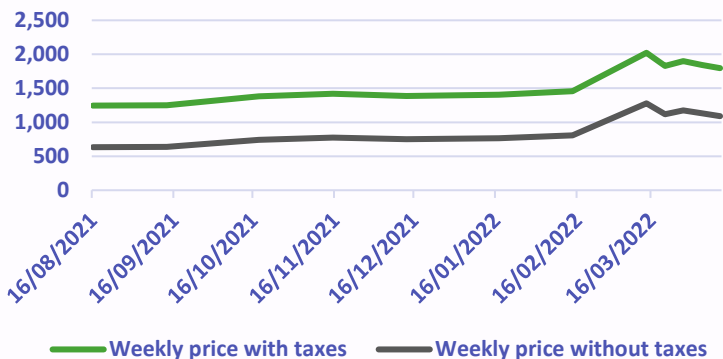
Ship repair queues grow thanks to Chinese lockdowns

 **Splash**
247.com

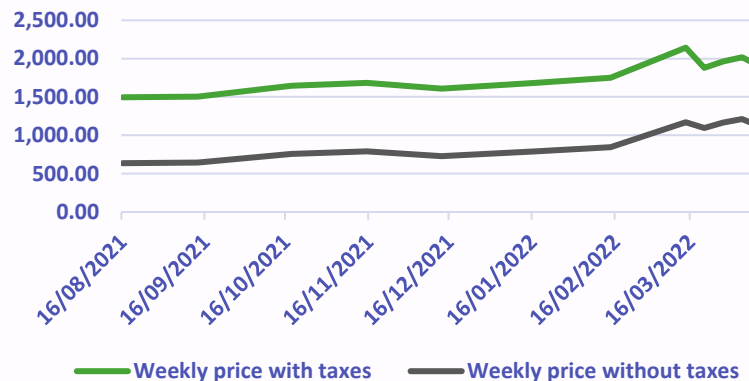
Fuel Prices Surge

AGO* prices across Europe jump, while some absorb soaring rates within taxes, others continue to add taxes to raised fuel prices

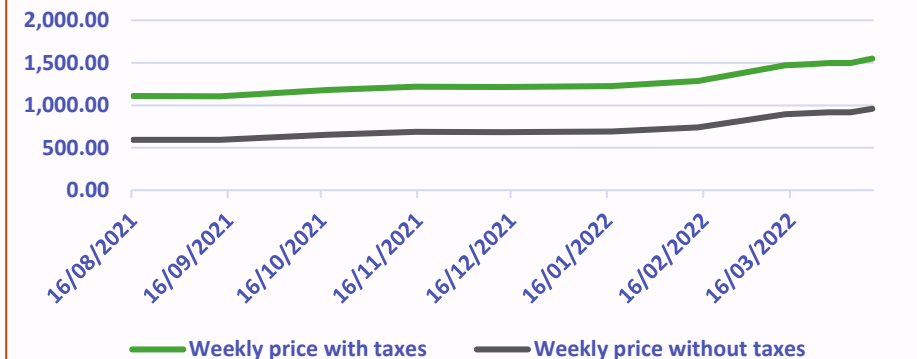
Austria -Automotive Gas Oil, per 100L, in Euros



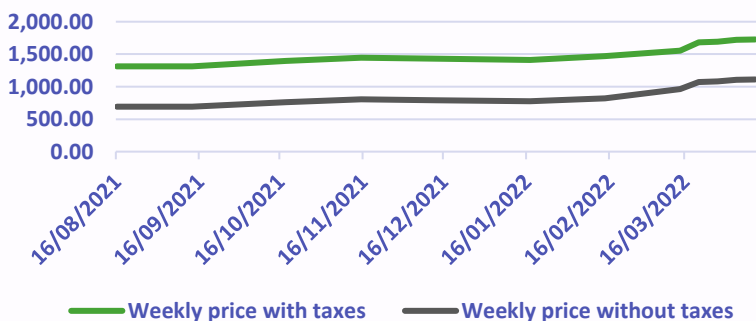
Belgium-Automotive Gas Oil, per 100L, in Euros



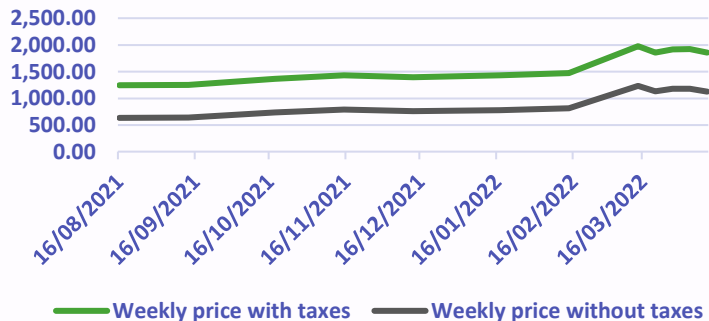
Bulgaria-Automotive Gas Oil, per 100L, in Euros



Cyprus-Automotive Gas Oil, price per 100L in Euros



Czechia-Automotive Gas Oil, price per 100L, in Euros



- Some Member States absorb the fuel price hikes within the ‘taxes’ while others pass it on to the consumer.
- Spikes seen when the war started have led to overall higher AGO prices.

Automotive Gas Oil, or AGO, is the name given to fuel intended for use in road vehicles (trucks, buses, vans and cars) powered by diesel engines.

Member States AGO prices hit

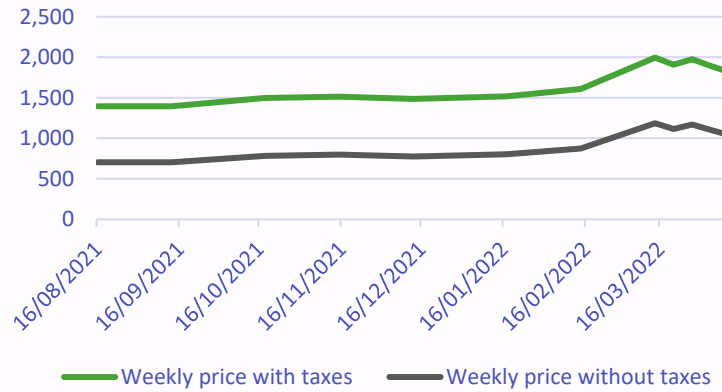
Poland Most Affected, while Hungary best equipped ?

—almost no change

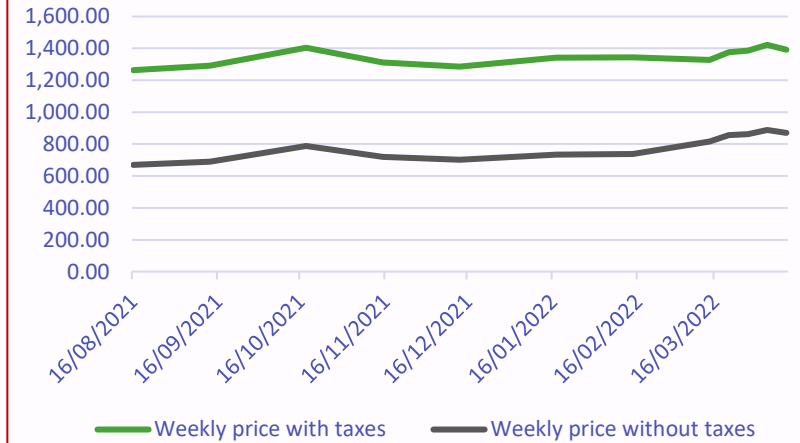
Germany-Automotive Gas Oil, prices per 100L in Euros



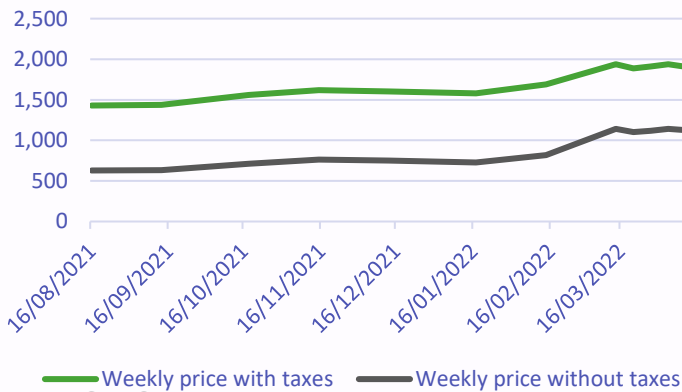
Greece-Automotive Gas Oil, prices per 100L in Euros



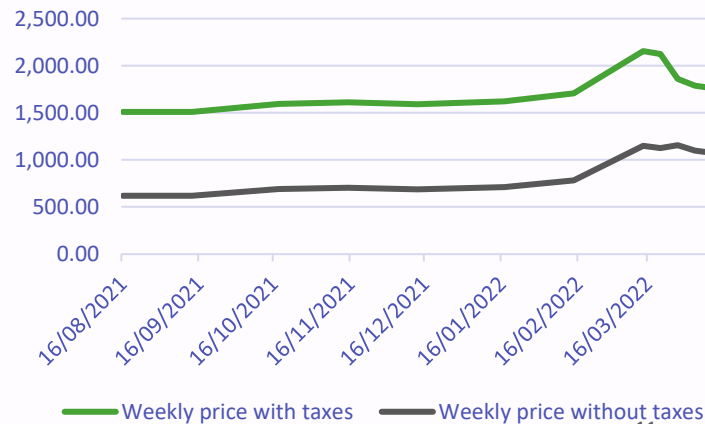
Hungary-Automotive Gas Oil, price per 100L in Euros



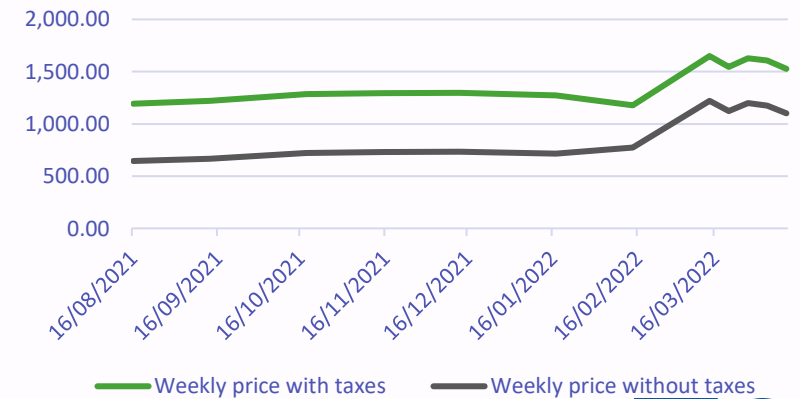
Ireland-Automotive Gas Oil, price per 100L, in Euros



Italy-Automotive Gas Oil, price per 100L, in Euros

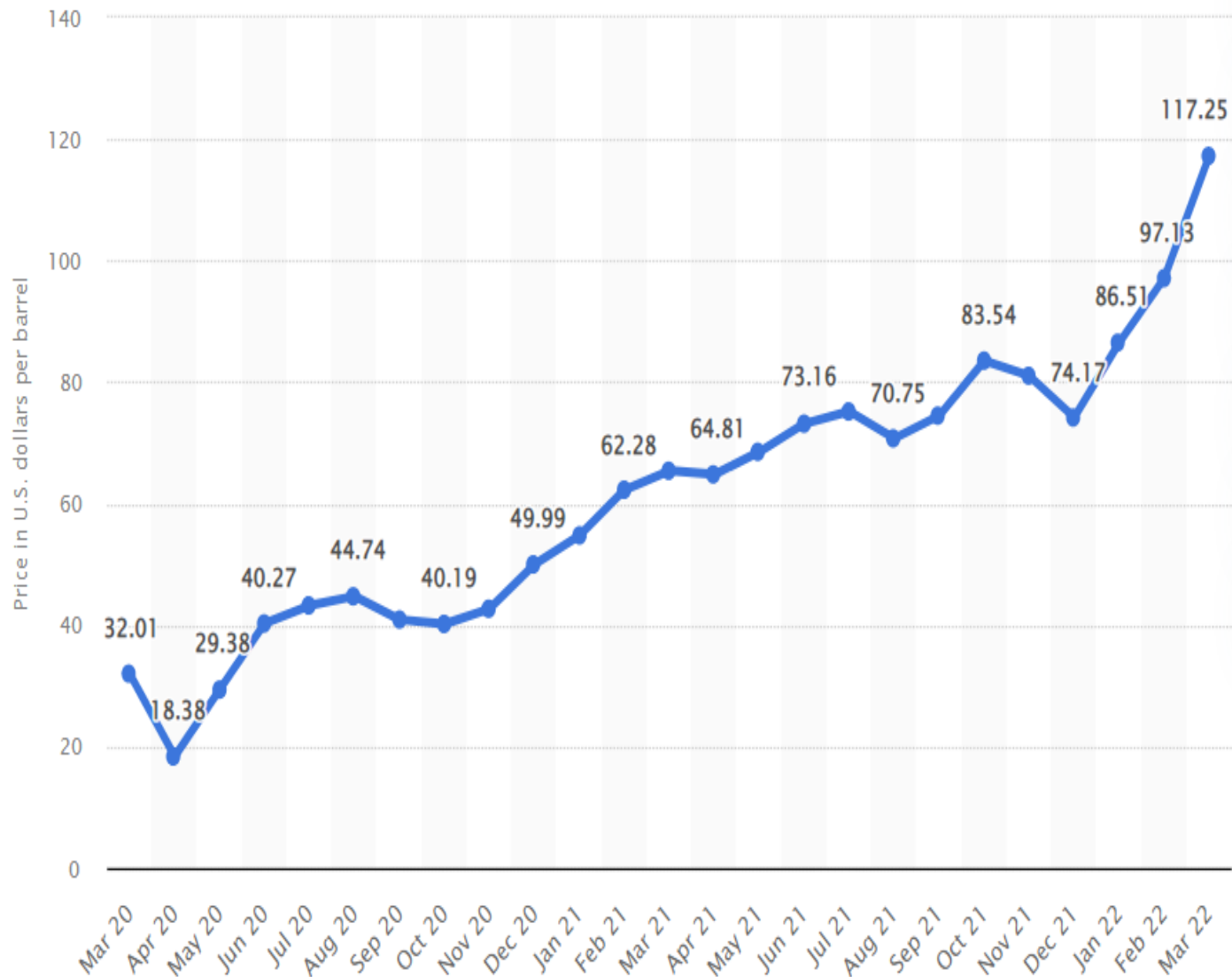


Poland-Automotive Gas Oil, price per 100L in Euros



EU depends 45% on Russia for gas, and 27% for oil

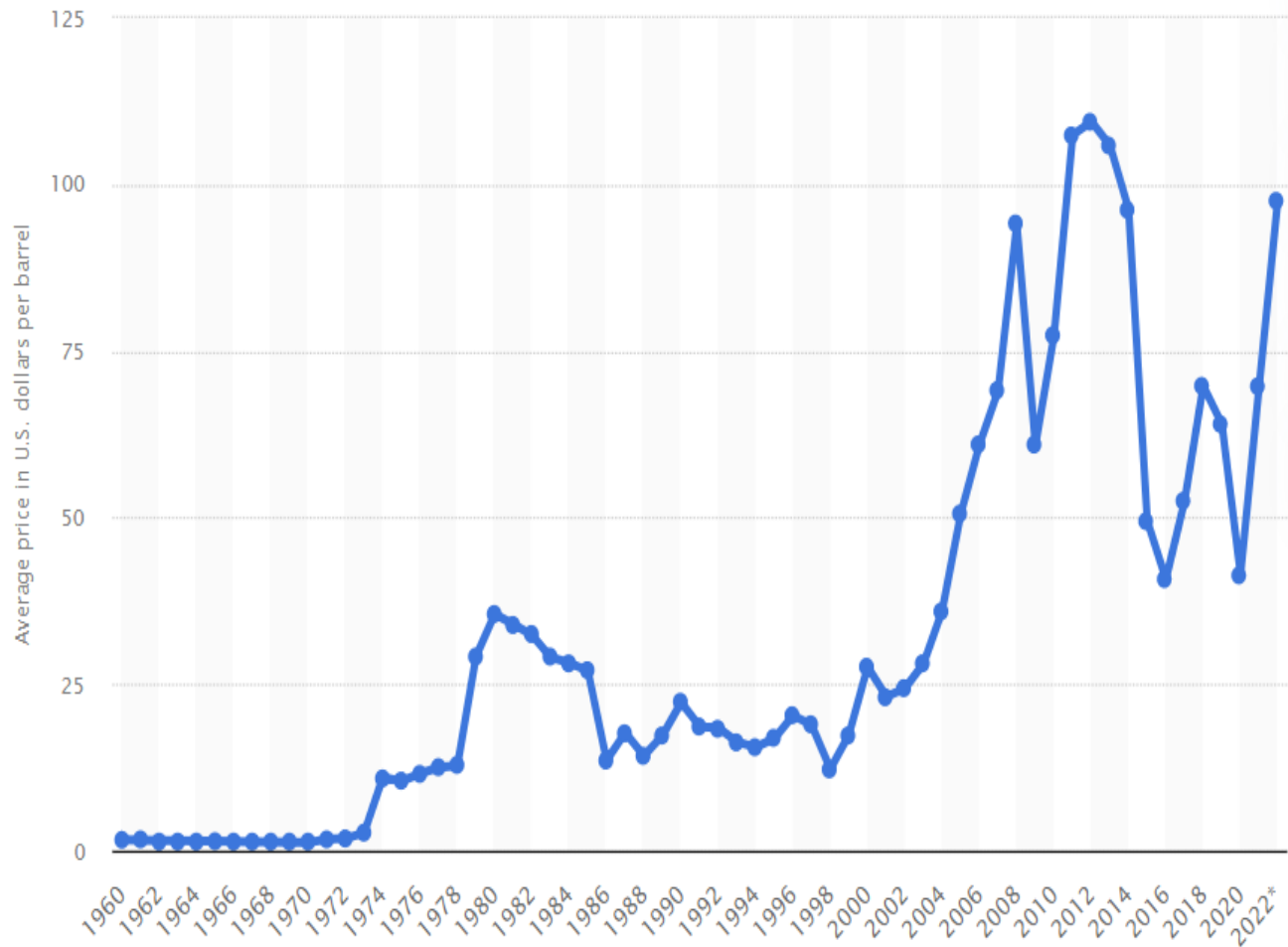
Average monthly Brent crude oil price Mar-20 to Mar-22



- March 2022, the average price of one barrel of Brent crude oil was **117.25 U.S. dollars**.
- This was an increase of **20 US dollars** compared to the previous month and the result of concern by traders over the impact of the Russia-Ukraine war on global oil supply.
- This was also the highest monthly average since 2008.
- Brent is the world's leading price benchmark for Atlantic basin crude oils.

Both Brent & OPEC spike on war

Average annual OPEC crude oil price 1960 to 2022



- The 2022 annual average OPEC oil price stands at **97.7 U.S. dollars** per barrel as of March.
- This is up from **69.72 U.S. dollars** the previous year and comes in the wake of an energy supply shortage and sanctions on Russia following the Russia-Ukraine war
- OPEC stands for Organization of the Petroleum Exporting Countries and as of June 2021 it includes Algeria, Angola, Congo, Equatorial Guinea, Gabon, Iraq, Iran, Kuwait, Libya, Nigeria, Saudi Arabia, Venezuela, and the United Arab Emirates.

Ural Oil sold at 30% discount

Price difference between WTI and Ural crude widens (In dollars per barrel)



Source: Refinitiv, QUICK-FactSet

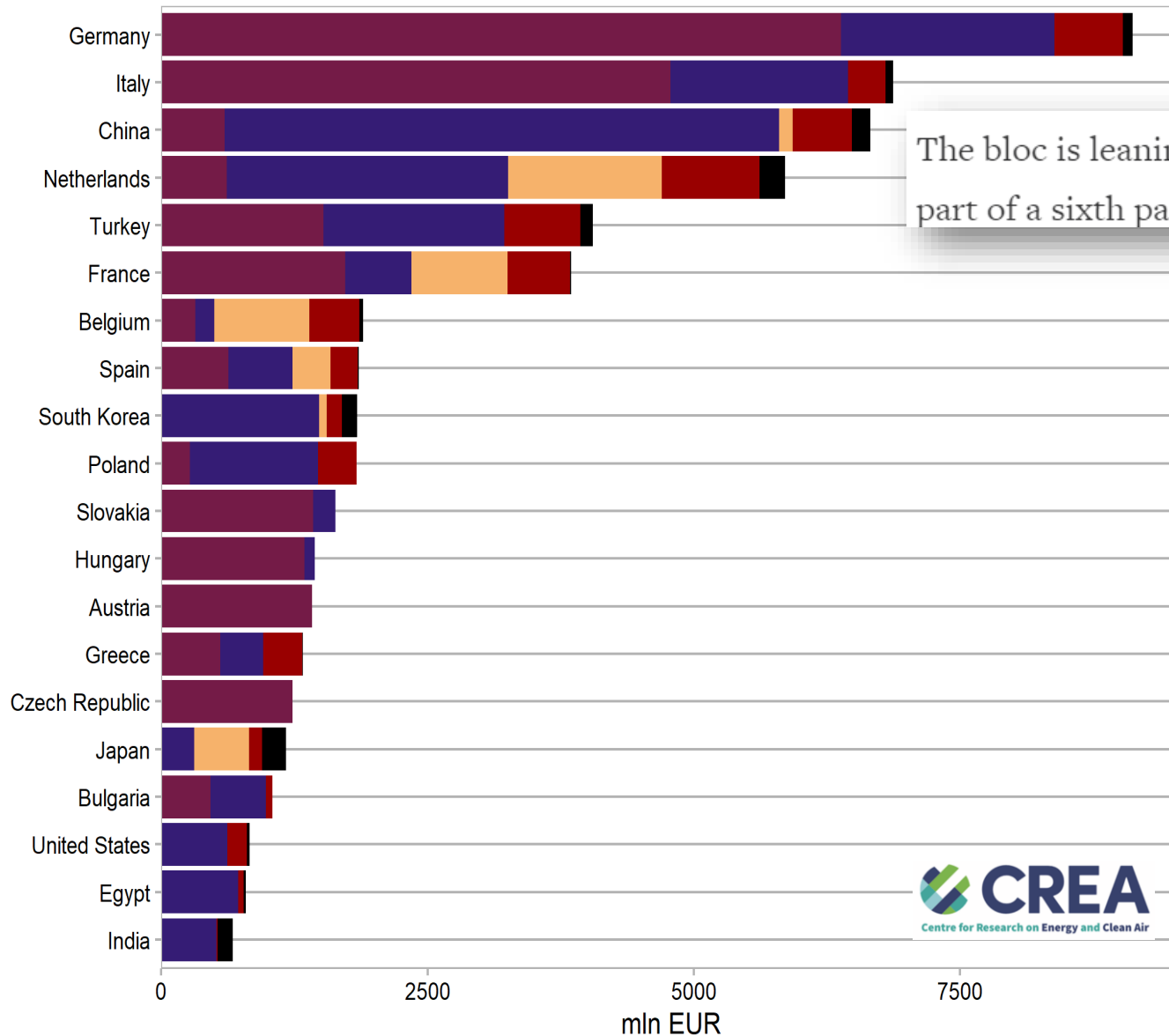
WTI: West Texas Intermediate –oil produced in the US

Ural: Russian oil

Largest importers of fossil fuels from Russia

in the first two months of the invasion

29 April 2022



The bloc is leaning toward a ban on imports of Russian oil by the end of the year as part of a sixth package of sanctions against Russia.

Factbox-Who is buying Russian crude oil and who has stopped

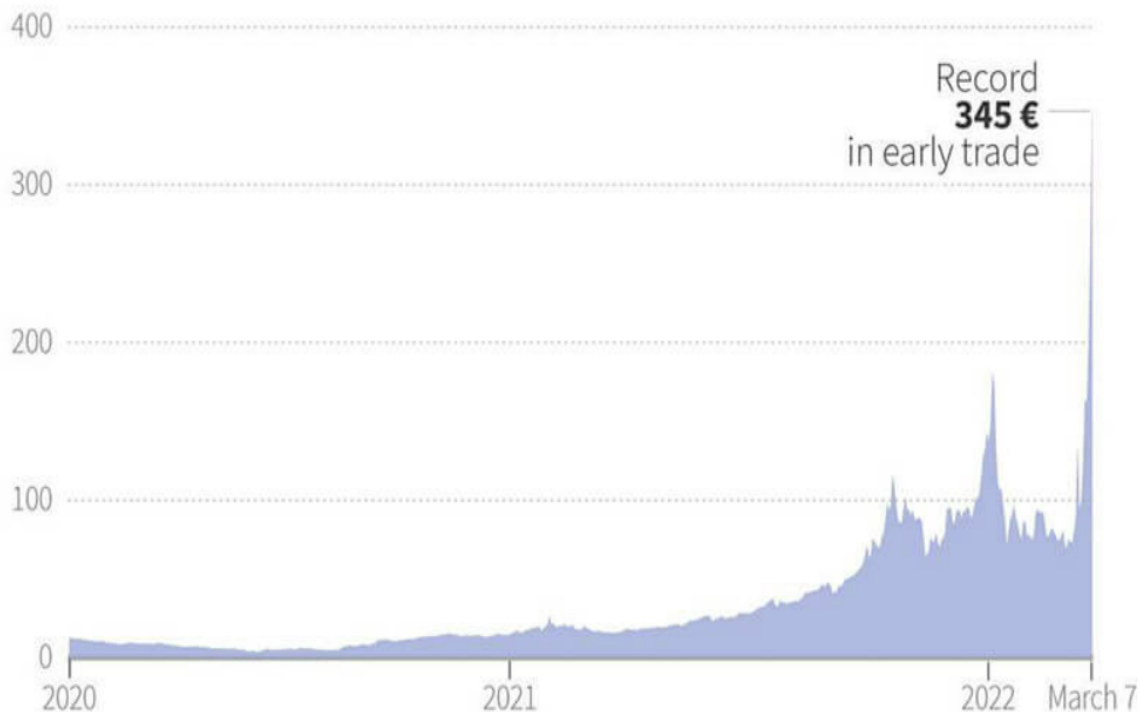


- Many refiners in Europe have 'promised' to stop buying Russian oil and gas when contracts expire
- China & India continue to buy Russian crude—in fact increasing purchases, with traders attempting to entice European traders to buy stock.
- Russian oil sales to Europe will show dramatic decrease now, that is from May, as sanctions come into play.
- Europe braced for further hikes in oil prices as increase in sourcing from WTI and OPEC supplies

Natural Gas used to heat about half of European homes

Natural gas price in Europe

Price changes on reference market* in euros per MWh



*Dutch TTF market (Title Transfer Facility)

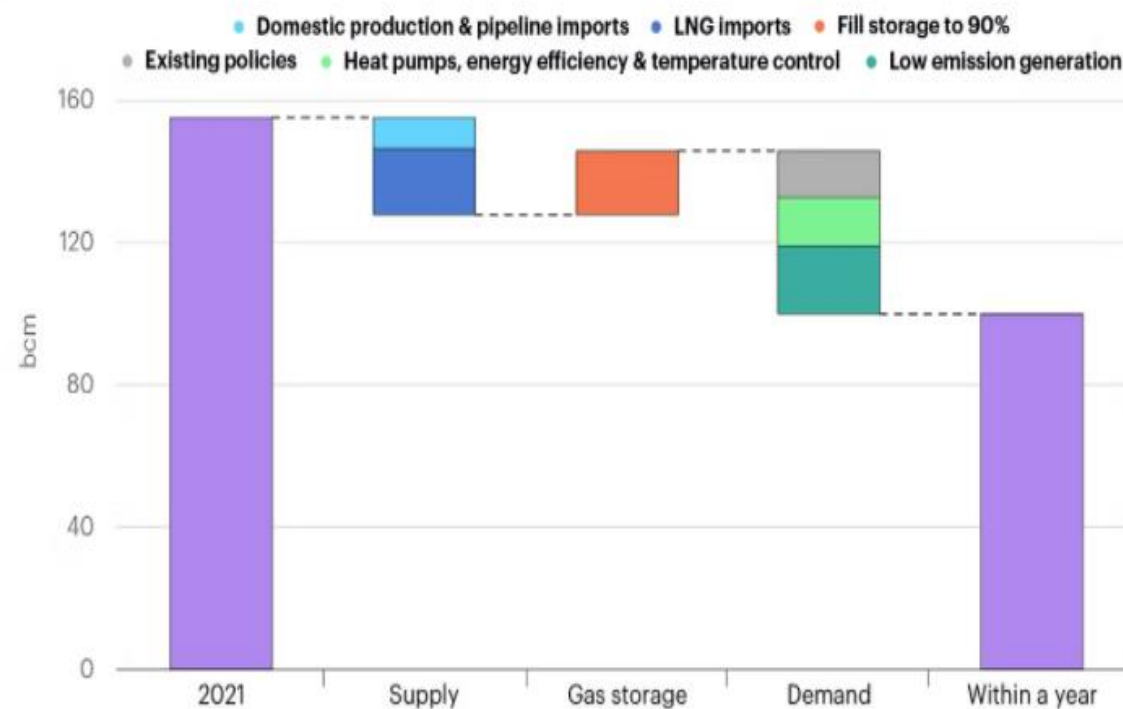
Source: Intercontinental Exchange, prices at market close, except for March 7



AFP/AFP - Chart showing the evolution of natural gas prices in Europe from 2020, in euros per MWh

- In 2021, the European Union imported 155 billion cubic metres of natural gas from Russia, accounting for around 45% of EU gas imports and close to 40% of its total gas consumption.

EU gas imports from Russia



OEMs and Tier suppliers prep for gas hikes & shortages

All plants and processes need heat, and electricity to operate.

- Mercedes: Looking at alternative fuels to keep its car painting operations running, and rationing use of natural gas.
- Bosch: Looking at using 'oil instead of gas for heating and in some cases also for thermal processes.'
- ZF, Conti: preparing and monitoring the situation
- VW: Supply of natural gas to plants is guaranteed until further notice by the German interconnected grid.

April 27, 2022 05:25 AM

Automotive News Europe

BMW, Mercedes, VW prepare for Russian gas supply cutoff amid Ukraine war

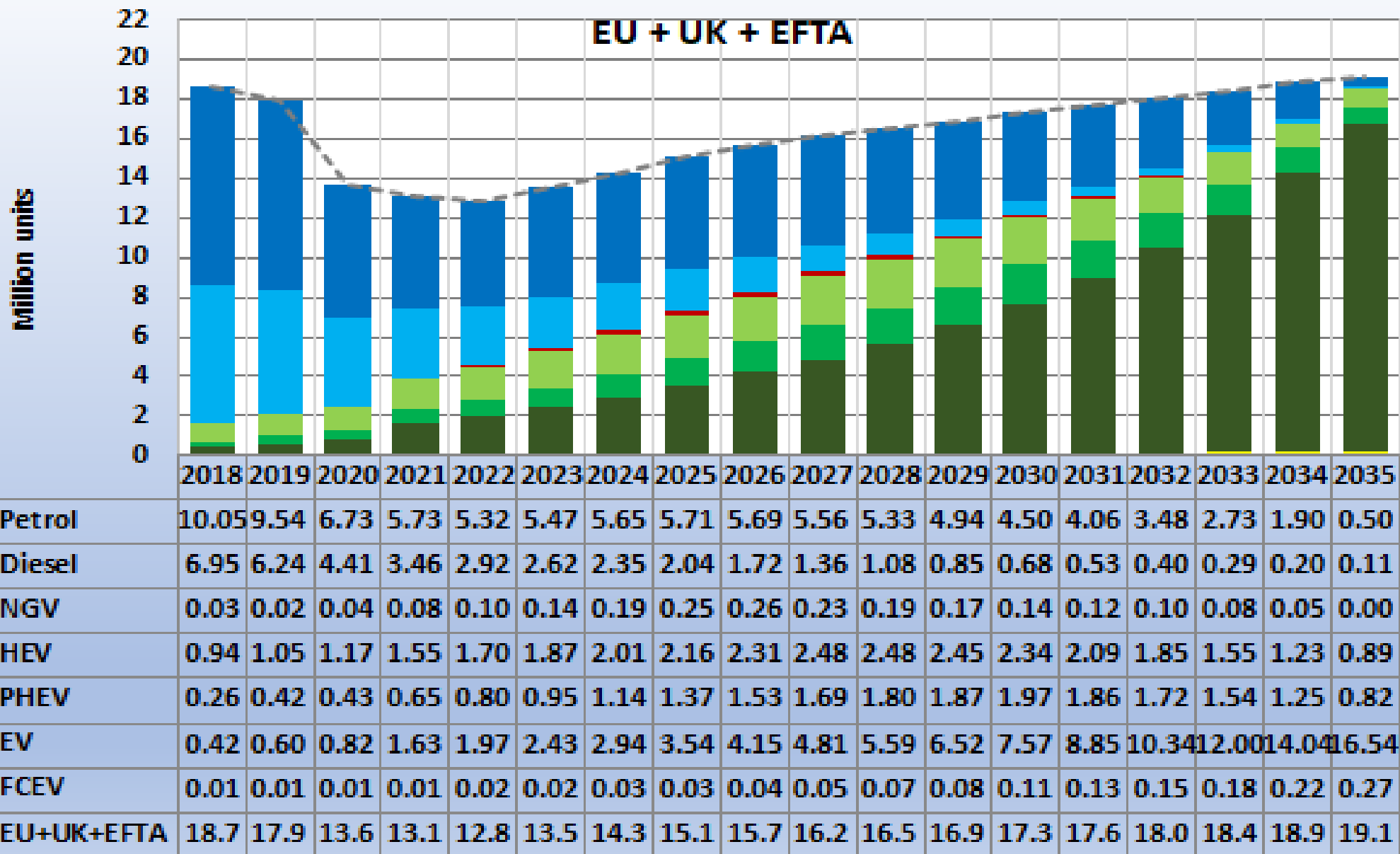
REUTERS®

Mercedes looking at energy options should Russia turn off the gas

Bloomberg

Mercedes Prepares for Gas Shortages in Europe During the Fall

Europe light vehicle production



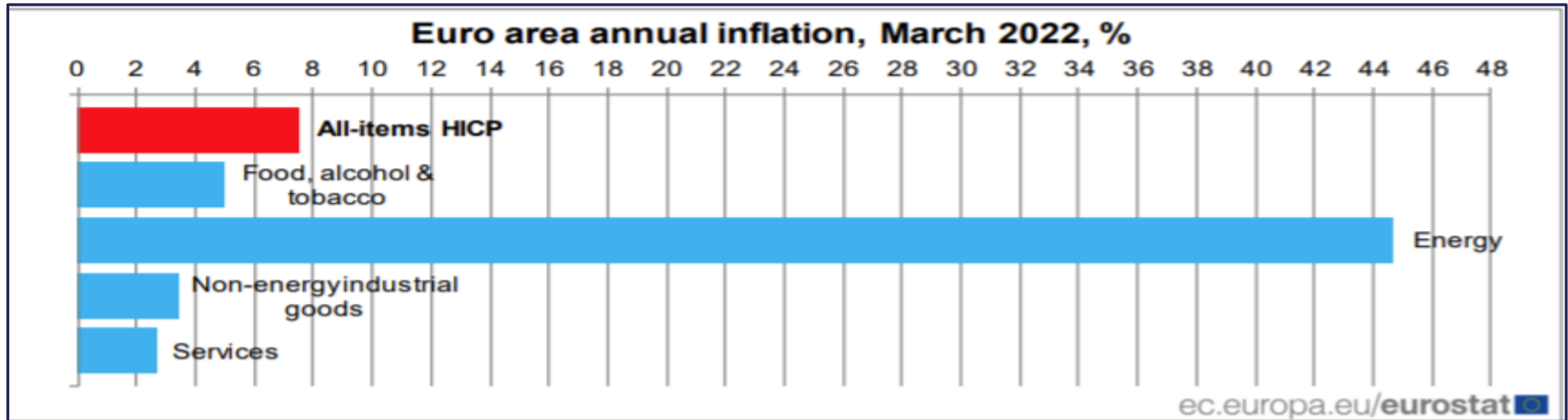
Source: Automotive from Ultima Media

02

Inflation

Cost of living jumps in Europe

Inflation soars across Europe



- Annual inflation for the Euro area to rises to 7.5% in March, up from 5.9% in February according to Eurostat, the official statistics office for the European Union.
- Energy has the highest annual rate of inflation at 44.7% up from 32% in February.
- Food, Alcohol & Tobacco now hit 5.0% up from 4.2% in February
- Inflation rates across EU states vary with Belgium hitting 9.3% in March, Germany 7.6%, Spain 9.8% France 5.1%, Italy 7.0%, Netherlands 11.9% & Lithuania 15.6%
- For comparison in March 2021, Lithuania had an inflation rate of just 1.6% as did Belgium, Germany had a 2% rate.

HICP: Harmonised Indices of Consumer Price- 'basket of goods' used to measure inflation

Inflation revised UP, GDP revised DOWN

- HICP inflation expectations were revised up by 3.0 percentage points for 2022 and 0.6 percentage points for 2023 but unchanged for 2024, standing at 6.0%, 2.4% and 1.9% for 2022, 2023 and 2024 respectively.
- GDP growth expectations were revised down for 2022 and 2023 and slightly up for 2024, to stand at 2.9%, 2.3% and 1.8%
- The war in Ukraine and its effects were the primary factors behind the revisions to their inflation and growth forecasts in 2022 and 2023
- In this round the coronavirus (COVID-19) pandemic was considered a less pertinent factor behind uncertainty and risk assessments here in Europe.



03

How are Logistics Players & OEMs mitigating?

Industry Steps Up to Combat VUCA Uncertainty:

1. Conflict in Ukraine
2. Lockdown in Shanghai

World's Biggest Shipping Groups Suspend Russian Deliveries



SERVICE SUSPENSIONS RUSSIA AND BELARUS

Our inbound services to Russia and Belarus have been suspended, which is why we are also not accepting shipments to those countries until further notice. In addition, DHL has also decided to suspend its domestic operations in those countries until further notice.



Russian Federation

Most carriers (air, sea, road and rail) have stopped their services to/from/through the Russian Federation. Kuehne+Nagel suspended all shipments to/from the Russian Federation pending further notice, except for pharma, healthcare and humanitarian supplies.



✓ Russia: International transport to/from Russia (land transport, air and ocean freight) is suspended. Exceptions apply for medical goods and baby nutrition.



Can I ship cargo to/from Russia at the moment?

No. Maersk, being a responsible market participant, acts in compliance with all applicable legal regulations. Due to the operational challenges and rapidly changing trade and cargo flows, Maersk has decided to orderly wind down operations in Russia.

VW halts EV production in Germany as Ukraine crisis hits supplies

March 01, 2022 05:33 PM

BMW's European production takes big hit from Ukraine crisis supply disruption

BMW is pausing production in its factories in Germany and other European countries because of supply bottlenecks.

March 02, 2022 10:47 AM

Europe's auto production crashes as flow of wire harnesses dries up

Why BMW, VW, Porsche and others are shutting down production lines after supplies of key part from Ukraine are interrupted.

Production across Europe hit

March 05, 2022 02:14 AM

German automakers hit by Ukraine disruption helped by key supplier Leoni's task force

Leoni seeks to counter Ukraine supply disruption battering German automakers.



Russia Ukraine conflict

Automotive industry hit hard by Ukraine invasion



LEONI

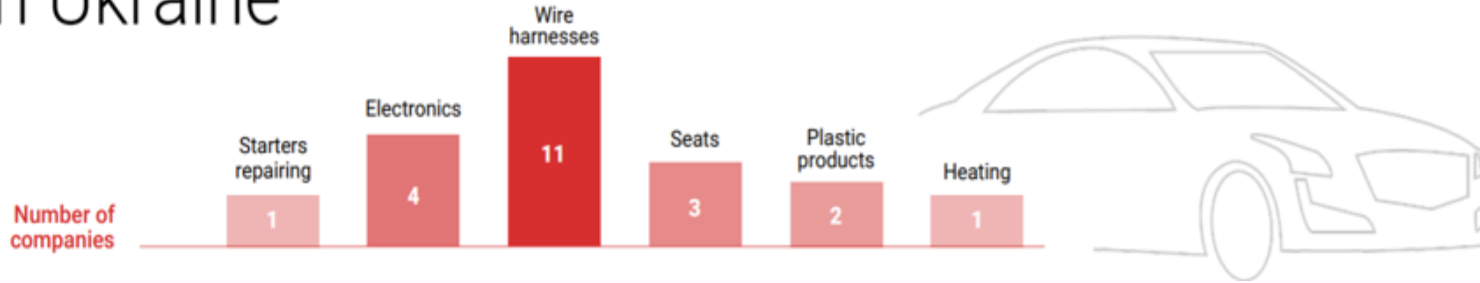
14 March,

“We are working - in close cooperation with our customers and suppliers - at full speed to manage the consequences of the current production interruptions at our two plants in Stryi and Kolomyja, triggered by the Russian war of aggression against Ukraine.

“It is obvious that the production interruptions in Ukraine can have, and in some cases already have, resulted in reduced availability of automotive parts, particularly for the European automotive industry...

“Leoni supplies automotive manufacturers in Europe from its production network in North Africa (including Tunisia and Morocco) and Eastern Europe (including Serbia and Romania).”

FOREIGN AUTOMOTIVE BUSINESS in Ukraine



B[®] BADER

SEBN

PRETTL

Nexans

KROSCHE & SCHUBERT

YAZAKI

Fujikura

LEONI

• APTIV •

CIKLUM
EMPOWERING COLLABORATION

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SOLUTIONS

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infopulse

softserve

DataArt

eleks[®]

GlobalLogic[®]

<LUXOFT

Shanghai's Covid Lockdown Leads to Logistics Disarray, With Quarantined Truckers, Piled-Up Containers

Apr. 21, 2022

Transport of goods into one of China's biggest manufacturing and export hubs has almost ground to a halt

THE WALL STREET JOURNAL.

Port congestion grows as China's capital braces for Shanghai syndrome

April 26, 2022

Lockdowns in China Block Truck Shipments and Close Factories

The New York Times

Splash
B47.COM

Containers Pile Up at China Ports as Lockdown Blocks Trucks

Bloomberg

Refrigerated and hazardous cargo pile up at Shanghai port

Shipping containers are stacking up at China's ports as COVID lockdowns block truck drivers from accessing docks

FORTUNE



Lines start to omit calls to Shanghai, the world's largest container port



Cargoes diverted from Shanghai as port congestion
worsens



MAERSK Covid-19 updates – Greater China Area

Highlights:

15 April 2022

- We will stop all new reefer/dangerous cargo bookings of IMO 2.2 and IMO 3 effective 14th April 2022, into Shanghai until further notice.

Vessels

We regret to inform you that several vessels will be omitting Shanghai. Please refer to the contingency plan outlined as below.

Landside

Shanghai: Warehouses will remain closed from 28th Mar until further notice.

AIR

Hong Kong: Due to the suspension of the trucking service between Hong Kong and Mainland, barge service is taken as an alternative for cargo moving. Airfreight space reservation will not be proceeded until the cargo is delivered to Hong Kong airport warehouse. As a consequence, It will take longer lead time than usual for the airfreight service.

China's Push to alleviate logistics congestion:

National Truck Pass

National Pass System: Announced 18 April, introduced 20 April. Gives companies 'national passes' allowing truckers to move across 22 provinces and municipalities including Shanghai.

Logistics companies and production companies can apply for a national pass.

Truckers still need to clear covid-19 tests, but they are not prioritised to improve goods distribution, especially automotive supply chain across China.

Port Congestion:

20 April: Shanghai Haitong Car Terminal located in the Shanghai Waigaoqiao Area is now running to clear backlog. 56 customs officers now working 24 hours, based within the port.

Vehicles are now able to be moved to the Nangang Wharf area ready for onward journey.

January to March 2022 a total of 272,800 vehicles exported from Shanghai Port, 50% of Chinese exports in Q1.



Tesla's half-idle Shanghai factory exposes strain

- Giga Shanghai's inventory of components can support just a week's worth of production, sources say
- Tesla is assembling 1,000 cars a day – HALF of its usual output, 8000 employees live on site. Lost production accounts for 50,000 units during 22 days of stopped production
- In 2021 plant built 484,130 cars, or 51.4% of total Tesla global volume of 936,000 units.

Tesla note to shareholders issued 20 April, 2022 :

Challenges around supply chain have remained persistent, and our team has been navigating through them for over a year. In addition to chip shortages, recent COVID-19 outbreaks have been weighing on our supply chain and factory operations. Furthermore, prices of some raw materials have increased multiple-fold in recent months. The inflationary impact on our cost structure has contributed to adjustments in our product pricing, despite a continued focus on reducing our manufacturing costs where possible.



Talking to the industry: Volkswagen China

- Is VW / SAIC VW still able to use the port in Shanghai for export of vehicles?

Volkswagen is producing in China for China.

- Has VW moved all car exports to other ports such as Ningbo?

See above for vehicles. Suppliers are shifting to different ports such as Ningbo.

- What about the current ban on movement, specifically for trucks--is this true and therefore how is production continuing if parts cannot be delivered?

Truck resource has improved recently with national pass applied by logistics and key production entities. However, there are still restrictions impacting production.

- I understand VW and other OEMs in China and specifically in Shanghai are using a closed loop system where employees are actually living at the plants--is this correct?

Correct. The safety of our employees remains a top priority. To ensure this, we have introduced appropriate measures such as nucleic acid testing stations in our factories and intensive preventive disinfection of common areas such as company restaurants and sanitary facilities. In addition, we provide sleeping facilities such as tents for employees who remain at the plant during lockdowns /closed loops and ensure the provision and delivery of food and other necessary supplies such as hygiene articles.

VW China Spokesperson.



Talking to the industry: Höegh Autoliners

HÖEGH AUTOLINERS

On the Lockdown in Shanghai

- It is of course a bit challenging with the port situation in Shanghai due to the recent covid lock down, but we are coping and finding solutions.
- We always work closely with our customers and partners to ensure that we handle any changes professionally but will restrain from further comments on certain customers and specific ports, as it should be up to them to go into detail if they wish to.

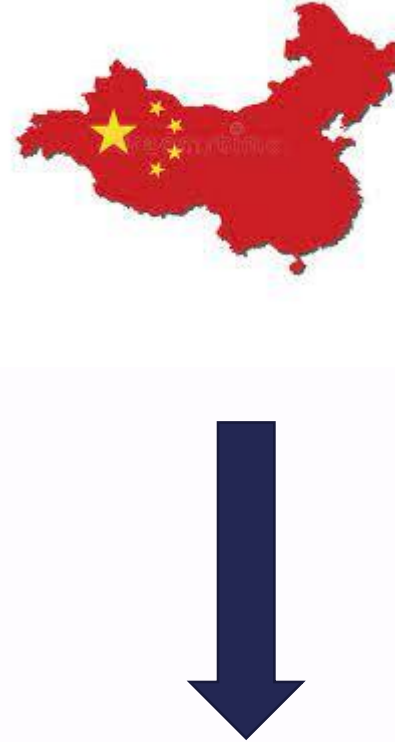
On the Situation in Ukraine:

- Höegh Autoliners is monitoring the escalating situation in Ukraine closely and our thoughts continue to be with those affected. We have discontinued our service to and from Russia, Belarus and Ukraine until further notice due to increased sanctions and war risks causing severe disruptions in our service in the region.
- For cargo presently en route our representatives will reach out to affected customers.

Dealing with the chaos: War & Covid congestion



- LSPs cancel routes to and from Russia, and often neighbouring countries except for medical supplies
- OEM production volume limited due to tight wire harness supply, ongoing chip shortage
- Outlook remains grim on timeframe of Russia's invasion of Ukraine.



- LSPs diverting to alternative ports such as Ningbo while Shanghai lockdown continues
- OEMs try to avert lost production by bringing in 'closed loop' production, but limited due to component shortage
- Outlook remains grim as China sticks to 'Zero Covid' policy

- Raw material prices rise to new higher normal across metals, and associated components
- New higher prices for raw materials, fuel and energy mean OEMs, LSPs and Consumers all face higher costs
- Higher new car sales price tags mean OEMs push supply chain price hikes to new car buyers, with profit per vehicle rising
- Higher wages, higher inflation
- New Normal = Higher prices, Higher uncertainty

'Floating Costs' soar: fuel prices, driver wages rise

- Floating Prices/Costs: part of the contract where certain costs/prices are based on market conditions and can be amended upwards if conditions demand.
 - For example as fuel prices rise, LSPs need to be able to pass on the 'Floating Price' of fuel to their clients. All contracts should include fixed costs/prices + floating costs/prices.
- To ensure they are still turning a profit, trucking companies apply a standard fuel surcharge to each load to cover inflated fuel prices.
- Already facing higher costs from existing supply chain issues, such as the lack of both storage and port space, ocean shipping costs are further ballooning due to the current price of fuel.
- Ocean carriers are offsetting costs with surcharges
- EU Mobility Package update sees wages rise, driving times tighten, rest times enforced

EU Mobility Package: Update Feb 2022

2 February 2022: Mandatory Border Crossings Recorded by Tachographs

- Drivers must register when entering another country

21 February 2022: Added Cabotage Rules

- Cooling off period of 4 days after cabotage load exhausted, only 3 cabotage journeys permitted within a country
- Vehicles must return to depots in 'start' country within 8 weeks
 - to avoid illegal cabotage

WAGES: For drivers entering a EU member state with higher minimum wage, new policy pushes for drivers to receive the higher wage for duration of the trip.

- Eastern European countries of Poland, Romania, Bulgaria to amend taxation structure for HGV drivers, wages rise by over 30%.

31 December 2024: Proof of working hours for last 56 days must be carried by drivers

21 August 2023: All new commercial vehicles over 3.5 tonnes must have version 2 tachograph

2026: Vehicles over 2.5 tonnes must have tachographs that comply with driver hour regulations.

Deep Dive into driver wages in July 2022 ECG Business Intelligence report



Tachographs: device fitted in vehicle to record data such as speed, distance, start country, country entering using EU country codes.

Cabotage: transport of goods between two places in the same country.



Girteka Logistics expands despite inflation

- Girteka Logistics warns of 35% transport cost inflation
 - Girteka Logistics is still expanding with 2,000 new Volvo FH trucks due to be delivered by end 2022.
- Girteka has agreements with many customers that take fluctuations in the diesel price -- including the recent jump -- into consideration. And in the case of customers without that agreement, the company is trying to change contracts so floating prices are included, allowing them to pass on the high cost of diesel.

Published On 09:02 PM IST, 17 Mar 2022

Bloomberg



Diesel Floating (as of March 2022)

Diesel Floating (as of March 2022)

Published on 4 Sep 2017. Modified on 20 Apr 2022.

Costs for petrol and diesel are becoming more and more subject to immense variabilities and thus they constitute an incalculable cost factor. At Schenker Deutschland AG fuel costs continue to constitute about 12 percent of the total haulage costs for general cargo/network transports. The percentage for part and complete loads is significantly higher.



Cost & Capacity



Costs

- **Truckload Rates:** 12% higher as of February 2022 compared to a year ago, on top of major hike in 2021
 - Truckload Rate jumped 28.2% in spot price and 14% rate increase for contracts in 2021 based on 2018 prices.
 - Buyers are being asked to pay spot prices linked to material pricing and actual freight.
 - **Insurance costs:** P&I* insurance to rise 10-15% in 2022/23 in shipping operating costs
 - Ship owners & truck fleet owners postpone non essential maintenance work, reduces operating costs slightly, keep vessels and vehicles in service longer.

P&I: Protection & Indemnity



Capacity

- Bottlenecks saw overall capacity at container terminals down 11% in 2021, while volumes grew 7%. In normal times around 2% of containership capacity is tied up in ports.
- November 11.5% of global container shipping capacity was tied up in delays, down from 12.3% in October 2021.
- Current acceleration in port capacity investment unlikely to keep pace with anticipated growth in cargo demand. In 2021 estimates were that **global container demand was set to rise by 5% on average until 2025, while port capacity set to rise 2.5%. Now global demand expected to between -1% and 1%***.
- Capacity increase to come from existing terminal infrastructure rather than greenfield expansion with leading operators using more digitalisation tools.

Truckload Rates: Base rates rise despite efforts to control costs

- Truckload Rate Factors:
 - **Disparity/Variance:** Large variance in prices due to different size operators in industry (small fleets, large fleets, specialized)
 - **Weight:** Freight weight: more a shipment weighs lower the charge per but higher total costs. As shipment weight rises, moves up toward the next minimum load weight of the next category thus becoming a low weight in that category.
 - **Density:** Calculated by dividing the goods' weight by total cubic feet, and if using pallets then these are used in addition to the weight of the goods.
 - **Distance:** Greater distance implies higher costs as more fuel is needed, and more time.
 - **Floating Costs:** Contracts now often include changing costs such as fuel such that the client is aware that prices can change from original quote.
 - **Urgent/Standard:** Delivery surcharges for premium and urgent delivery.
- Base Rate:
 - **A.** Charge Per Mile, up to 200 miles, based on vehicle needed:
 - 7.5 tonne price Euro 1.78 per mile*
 - 18 tonne price Euro 2.37 per mile
 - 26 tonne price Euro 2.67 per mile
 - 44 tonne price Euro 3.26 per mile
 - **B.** Distance per day: Max 250 miles, consider discounts if over 200 mile journey
 - **C.** Overnight costs: Sleeper cab / accommodation provision say Euro 60 per night
 - **D.** Toll Road Charges/ferry crossing/time & paperwork for borders
 - **E.** Truckload Rate Factors * Weight each of the 6 factors listed earlier* Includes 'Floating Rate' for fuel

$$\text{Base Rate} = (A \times B) + C + D + E$$

Markets tumble, global trade outlook dims, but profits up! (for some).

- Container demand now expected to be between 1 percent growth and 1 percent decline for the year, down from 2-4% previous increase forecast.
- In Q1 2022 shipping volumes have fallen 7% y/y but freight rates are up 71% compared to same time last year.



Maersk warns on trade volumes even as profits balloon

Supply chain problems may curb container shipping volumes this year but will help buoy freight rates

FINANCIAL TIMES

Continental cuts earnings forecast as Ukraine war pushes up costs

Automotive News Europe

Markets tumble as panic grows over China's zero Covid collapse

Jacques Vandermeiren, chief executive of Port of Antwerp-Brugges, said the car industry is particularly vulnerable to delays.

He said: "Shanghai is the biggest port in the world. It's also the port that exports different goods to the world. And especially when it comes to the automotive industry.

"The whole car industry will have to wait before releasing new cars. And you'll see already if you want to buy a new electric vehicle the waiting time is now going from six or seven months to one year. That's an immediate consequence of this."

The Telegraph



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