



DUCKER

Carlisle

# 2022 Supply-Chain Disruptions For Automotive Industry

---



# SUMMARY

## Automotive Supply Chain Recovering from 2021, Uncertainties Remain

The world is walking out of the shadow of the COVID-19 lockdown. However, the pandemic has long-lasting side effects on the automotive industry. In the past 18 months, the supply chain has seen several disruptions that worsened as new geopolitical events occurred. Rising material prices are hitting supplies, while logistics costs remain high, and the availability of major components such as semiconductors remains far below requirements. Moreover, the acceleration of electrification adds a layer of difficulty. Electric vehicles require many more semiconductors and rare earth materials, while the supply is still in shortage. Lately, China's supply chain was hit with lockdowns, slowing down raw material processing and component deliveries that are critical to the automotive industry from a global perspective.

Impact level	Current	End 2022 (Est.)
Chip shortage	■■■■■	■■■■■
Ukraine Crisis	■■■■■	■■■■■
COVID-19	■■■■■	■■■■■

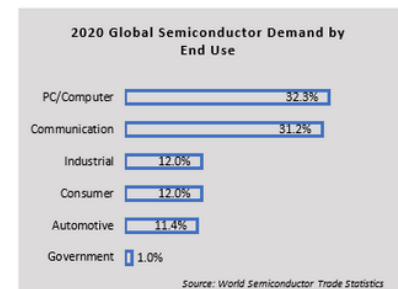
## Chip Shortage Will Not Be Solved in 2022

According to LMC Automotive, the shortage of semiconductors remains the leading cause of disruptions in vehicle production, accounting for over 60% of the total "lost" volume. The situation remains because of chip plant closures and surging demand from the consumer sector. The investment in additional semiconductor production and declining demand for consumer devices may ease the shortage in the automotive industry.

Still, the supplies are unlikely to fully meet automotive demand until mid-2023, when all new chip plants reach total capacity. During this time, automotive production will feel the impact of shortages and demand will continue to outstrip supply.

Meanwhile, OEMs cancel lower segment models to maximize production output to save the chips for higher-margin models.

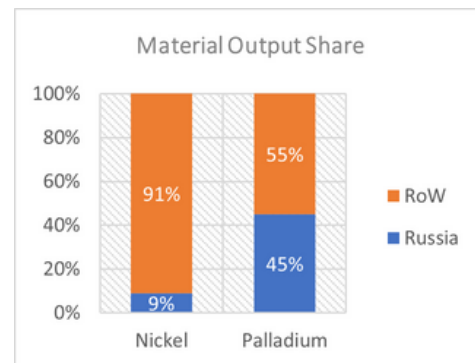
In addition, we also see some features being canceled due to the lack of microchips (e.g., touch screen, power adjustment for seat/steering wheel, key fob, wireless charging etc.). Once capacity becomes sufficient to meet demand, production will need to grow to accommodate the catch-up effect to compensate for lost volume between 2020 and 2023. As economic conditions remain, we expect higher vehicle production in 2024 and 2025 to cope with demand and replace lost volumes. Consumers will look forward to returning models whose life cycle has been stretched by a few years and which have contributed to the increased age of the fleet.



## Crisis in Ukraine is Contributing to Semiconductor Shortage

The Ukraine and Russia play a significant role in several raw material supplies, including palladium utilized in catalytic converters and nickel, critical for batteries. In addition, Ukraine is a major supplier of wire harnesses, shipped mainly to European OEMs, including Volkswagen and BMW, with applications also supplied to North American vehicle productions. The invasion of Ukraine and the subsequent embargo on Russian materials and production negatively impact the automotive industry. Material prices were already on the rise in 2021. Still, the Russo-Ukrainian conflict is adding up and pushing costs for OEMs to new highs, including critical materials such as lithium and aluminum. Oil is joining the fray, but electric vehicles are no less impacted than ICE vehicles, as EV batteries require a more comprehensive range of materials and depend on ample supplies from Russia and China.

Although some may see an opportunity to source from China since Russian companies can still export to China, this trickery comes with serious ethical, economic, and diplomatic considerations. The risks are too high, and the offenders would find themselves, on the one hand, supporting the Russian war effort and, on the other hand, at the mercy of significant fines or even boycotts.



## COVID-19 Restrictions Persist

While most countries are lifting pandemic restrictions, China is sticking to the zero- COVID-19 policy. This has led to a two-month lockdown in Shanghai when the China's economic center and motor town was hit by the worst COVID outbreak in the past two years. Twenty-five million people live in Shanghai, the home to four significant OEMs - SAIC, GM, VW, and Tesla. These automakers have shut down their operations for several weeks since the end of March. In late April, the Shanghai government issued a whitelist of factories, including automotive OEMs and suppliers, that can resume production using closed-loop systems. This means workers will need to stay in the factory even when they are off from shift.

Tesla, for instance, was able to resume production for 20 days but only at 20% of standard capacity (due to supply issues), then had to halt production again because of lockdown in some other cities where their suppliers are located.

The highly contagious Omicron variant is spreading in other regions in China as well, including Changchun (the capital city of the Jilin Province), where another major automotive cluster and the FAW-VW are located (another VW joint-venture producing Audi and Volkswagen models). Furthermore, suppliers in Shanghai's neighboring provinces are also affected by restrictions since positive COVID-19 cases keep rising. Besides factory reopening, logistics create additional issues for the automotive industry. Drivers need a permit to enter COVID-19 hot zones, and if they have entered hot zones, they may face a few days of quarantine when they return to their home city, being seen as potential vectors for the disease. These restrictions make fewer drivers willing to deliver goods to or from COVID hot zones like Shanghai.

COVID-19 disruptions in China have ripple effects that touch every corner of the global economy. A significant side effect lies with the substantial backlog of container ships at Chinese ports, affecting the global supply chain. Over 500 ships await docking at Chinese ports, making up around a third of the global backlog.

Given that the Chinese government has no intention to give up the zero-COVID-19 policy in the short term, a new large-scale lockdown may occur to eliminate the Omicron variant. This could lead to reshoring strategies to ease the multiple layers of issues affecting the supply chain and the sourcing of materials and components from a global perspective. However, such movement takes investments and time to operate. Until then, automotive production will have to face hectic production cadencing.

#### Shanghai

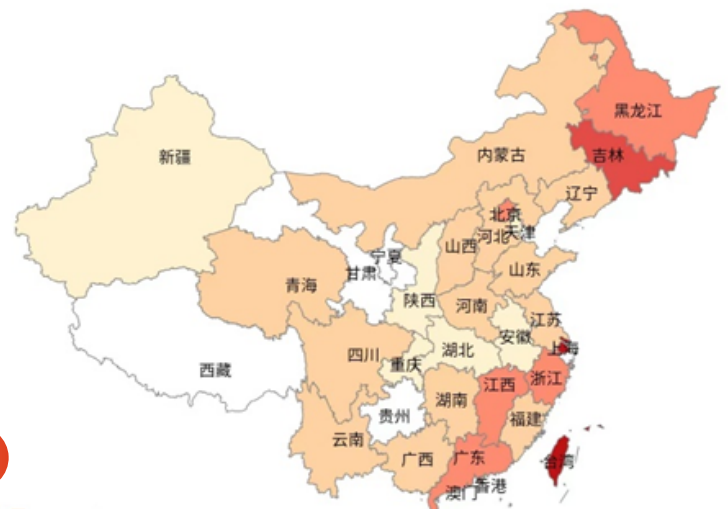


#### Jilin (Changchun)



Fewer Cases

More Cases



Prepared By:

Bertrand Rakoto

Senior Engagement Manager - Global Automotive Practice Leader, Ducker

Leonard Ling

Senior Analyst, Ducker

*The Ducker and Carlisle automotive & transportation team is at the forefront of key trends impacting the industry. Ducker and Carlisle's unique expertise in running custom market research and consulting services helps clients address specific growth questions and business challenges.*

**Contact the Ducker and Carlisle team for the latest insights and implications for global business.**



DUCKER.COM | CARLISLE-CO.COM

DETROIT | BOSTON | LONDON | BERLIN | PARIS | SHANGHAI | BANGALORE

DUCKER

Carlisle