

SILICONEXPERT COMMUNICATIONS

Russo-Ukrainian War Updates | June 2022



A SiliconExpert White Paper

Ukraine-Russia Conflict



The conflict in eastern Ukraine has transitioned to a stalemate after it first erupted in early 2014 when the Crimea peninsula was annexed by Russia and the regions of Donetsk and Luhansk held a referendum to declare independence from Ukraine, where government forces are fighting pro-Russian separatists.

In October 2021, Russia began moving troops and military equipment near the border with Ukraine, reigniting concerns over a potential invasion.

In mid-December 2021, the Russian foreign ministry issued a set of demands which included a ban on Ukraine entering the North Atlantic Treaty Organization (NATO), all part of his effort to protect and enlarge his country's sphere of influence in Eastern Europe.

On January 31st, 2022, The United States and Britain are prepared to punish Russian elites close to President Vladimir Putin with asset freezes and travel bans if Russia enters Ukraine.



Sanctions against Russia by Countries around the World

The US Treasury, State Department, and Department of Commerce freeze assets of more Russian individuals and impose financial sanctions as well as export controls by adding more parties to the Entity List.

Taiwan restricts exports of strategic high-tech commodities to Russia and Belarus. Microprocessors or microcircuits with identified conditions are under the ban. ICs with more than 144 pins or basic gate propagation delay time of fewer than 0.4 nanoseconds are also prohibited.

Under pressure from investors and consumers, a growing number of companies are unwinding their investments within Russia: closing stores, pausing sales and services, temporarily cutting ties, or suspending shipments like Amazon, Siemens, Microsoft, Nvidia, NXP Semiconductors, Samsung, Intel, Henkel, ... etc.

European Union leaders banned the import of Russian oil to their entire 27 member nations. Over two-thirds of all Russian oil exports go to the EU which would be a devastating blow to the Russian economy.

The United Kingdom announced a 35% tariff on all platinum and palladium imports from Russia and Belarus, targeting over £1.7 billion of trade.

Russia has terminated gas supplies to Finland, the third country to be boycotted by Russian gas giant Gazprom to date after the country refused to make its payment in the Russian Ruble. This comes after halting gas supplies to Poland and Bulgaria.

The U.S. Department of Treasury recently issued a new round of sanctions on the Russian Federation, targeting the Russian technology sector. This round of sanctions targets 21 business entities and 13 individuals, most notably, Joint Stock Company Mikron (Mikron Group), Russia's largest chipmaker and manufacturer and exporter of microelectronics.

Russian gold and silver refineries have been banned from the largest global trading markets in gold and silver. The London Bullion Market Association (LBMA) and the Chicago Mercantile Exchange (CME) have both announced a suspension of Russian gold and silver from being traded on their markets.

The Senate passed a major cybersecurity legislation, to force critical infrastructure companies to report cyberattacks and ransomware payments.

The United States issued new sanctions including export blocks on technology that would severely limit Russia's ability to advance its military and aerospace sector. Those sanctions include Russia-wide restrictions on semiconductors, telecommunication, encryption security, lasers, sensors, navigation, avionics, and maritime technologies. Some companies started to comply with these sanctions including US chipmakers Intel, AMD, Taiwan's TSMC, ABB, TT Electronics, and NCAB GROUP.

The EU has imposed a ban on the sale, supply, transfer, or export to Russia of technologies in oil refining, aircraft and aircraft parts, and dual-use goods and technology, including semiconductors.

The Ruble hit record lows Monday, sliding as much as 30% against the dollar, while the Russian central bank more than doubled interest rates to 20%.

The European Union, United States, United Kingdom, Japan, Switzerland, Australia, and Taiwan all hit Moscow with new injunctions, condemning the military incursion.

The United States, the European Union, the United Kingdom, and Canada banned certain Russian banks from SWIFT, a global messaging service that connects financial systems, as part of stricter moves to remove Russia from the international finance system.

Global Supply Chain Impacts

Overview



Russia and Ukraine are key to global supply chains, the conflict between them could put thousands of companies across the globe at risk as there are many U.S.-based firms and European firms that have at least one direct (tier-1) supplier in Russia or Ukraine other than tiers-2 and tiers-3.

Software and IT services account for around 12% of supplier relationships between U.S. and Russian/Ukrainian companies, compared with 9% for trading and distribution services.

Russia supplies about 30% of Europe's oil and 35% of its natural gas. The conflict between them would spark a further massive rise in oil and gas prices, especially in Europe.

Russia is the world's biggest wheat grower and Ukraine fifth. Production of barley, corn, sunflower, and rapeseed would also be seriously affected. While some countries, including Australia, might be able to compensate for some of the loss in supply, they might be facing a handicap: Fertilizers.

Global Supply Chain Impacts

Chip Industry

The White House warned the chip industry to diversify its supply chain in case Russia retaliates against threatened US export curbs by blocking access to key materials.

Gases and rare metals such as helium, neon, argon, krypton, and xenon come from the Russian-Ukrainian region; these gases are key materials for semiconductor exposure and etching processes.

According to TrendForce reports, Semiconductor factories and gas suppliers are stocked and there are still supplies from other regions. Thus, gas production line interruptions in Ukraine will not halt semiconductor production lines in the short term but will lead to higher prices which may increase the cost of wafer production.

Ukraine is a major supplier of raw material gases for semiconductors including neon, argon, krypton, and xenon. It supplies nearly 70% of the world's neon gas capacity. Although the proportion of neon gas used in semiconductor processes is not as high as in other industries, it is still a necessary resource. If the supply of materials is cut off, there will be an impact on the industry. Neon, critical for the lasers used to make chips, is a bi-product of Russian steel manufacturing, according to Techcet. It is then purified in Ukraine.

Liquid helium, an inert gas extracted from natural gas harvesting, has several properties that are leveraged in the semiconductor manufacturing process.

Palladium also is another challenge for the chip industry as it is used in sensors and memory, as well as storing energy and broadcasting equipment, mobile telephones, computers, and other uses.

According to Techcet estimates, over 90% of US semiconductor-grade neon supplies come from Ukraine, while 35% of US palladium is sourced from Russia.

Palladium prices jumped this week to their highest level since mid-August.

Global Supply Chain Impacts

Raw Materials

The price of multiple raw materials, including Crude Oil, Palladium, Nickel, Aluminum, and Copper have skyrocketed to the highest they've been in the past decade as a result of Russia's invasion of Ukraine.

Manufacturing supply chains would also be impacted by a conflict or sanctions against Russia. Russia's share of global nickel exports is estimated to be about 49%, palladium 42%, aluminum 26%, platinum 13%, steel 7%, and copper 4%. That immediately removes half of all global nickel exports for kitchenware, mobile phones, medical equipment, transport, buildings, and power; palladium for catalytic converters, electrodes, and electronics; and a quarter of aluminum for vehicles, construction, machinery, and packaging and would result in huge upside pressure on prices.

Russia supplies about 30 percent of Titanium, which is crucial for the aerospace industry. The country is one of the world's largest titanium producers, with up to over 40,000 metric tons of titanium sponge produced each year. Europe's Airbus, which sources about half of its titanium from Russia, and US rival Boeing both use large amounts of the metal in the manufacture of aircraft. Airbus has said it would "rigorously comply with any sanctions and export control regulations".

Nickel rose to \$25,000 a ton for the first time since 2011, extending a rally driven by dwindling global inventories and concerns that Ukraine tensions could disrupt supplies from key producer Russia.

How could SiliconExpert help your Supply Chain?

SiliconExpert keeps monitoring the situation closely to identify the potential risks and provide its customers with:

Suppliers' Network Visibility

Discovering unknown tier1 suppliers' hidden risks based on suppliers' locations, suppliers' network, and smelters they deal with, that are located in the conflict area (Russia, Ukraine, and their neighboring countries).

Multi-Tier Part Mapping & Raw Materials Monitoring

Mapping the entire supply chain, down to the locations:

- The manufacturing sites.
- The sub-tier part number level.
- Assessing all risks at the raw materials, and noble gases that use in either semiconductors manufacturing process or found inside the part number.
- Providing alternatives to avoid potential risks of being located in the conflict Area (Russia, Ukraine, and their neighboring countries).

Geopolitical Disruptions

24/7 Monitoring and alerting to events that impact customers' supply chain parts and supplier network. Including identifying countries that imposed sanctions on Russia, and suppliers that comply with these sanctions.

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