Russia-Ukraine crisis may worsen global chip shortage

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Russia and Ukraine are important centres of the global semiconductor supply chain, providing rare metals like palladium, and gases like neon, that are needed in the production of the silicon wafers present in almost all modern devices and equipment.

The Russian invasion of Ukraine may worsen the global semiconductor chip shortage. As exports from Ukraine have stopped due to flights being grounded and major ports being under attack or occupied, sanctions on Russia will also reduce the exports.

With Ukraine being a critical supplier of rare gases like neon, used in the production of semiconductor fab lasers, and Russia being a key supplier of rare metals like palladium, there are concerns over the burden on semiconductor chip supply chains in the short term, reported Moody's Analytics in a report.

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"It is important to note that just as Russia supplies the global semiconductor industry with rare metals, Ukraine supplies (speciality) gases required by the chip-making industry. Thus, there is potential to extend the stress in the supply chain of semiconductors, which are key to manufacturing autos and other electronic equipment in the Asia-Pacific region," the report titled, 'Limited Trade Between Ukraine and APAC' said.

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Ukrainian companies like Cryoin are a major part of the semiconductor supply chain. These companies produce speciality gases like neon, helium, xenon, krypton and their isotopes. These gases are then used by the powerful lasers that semiconductor fab units use to etch the microfine engravings in the silicon wafers.

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Rare metals like palladium are often used as alternatives for gold plating due to their conductivity, resistance to corrosion, and high malleability in the semiconductor industry. Russia is the world's largest producer of palladium, the second-largest producer of platinum, and produces nearly 80 percent of all European gold. The prices of spot palladium are already at a six-month high on fears of supply chain shortages.

This is not the first time that the semiconductor industry would face supply chain issues caused due to Russia's aggressive actions. The industry had to deal with a severe jump in prices of gases and metals in the aftermath of the 2014 Crimean invasion, when Russia had been sanctioned and Ukrainian supply logistics faltered.

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However, the impact this time around is harder to predict. Jilted by the 2014 supply chain issues, many companies had already started to diversify their resource acquisitions to prevent such impact on their supply chains, which, however, did not come in too handy when supply chains collapsed again after Taiwan's drought, silicon shortage and the COVID-19 pandemic.

Chipmakers have, however, downplayed any risks for the present.

"There's no need to worry," Lee Seok-hee, CEO of South Korean chipmaker SK Hynix, said last week.

But the recent warnings from the White House suggest a different story on the ground. The White House warned chipmakers about supply chain issues and asked them to diversify their suppliers, reported Reuters.

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The shortage of semiconductors will have a domino effect, and industries like the automotive sector, electronic appliances, smartphones and more will see a consequent increase in costs and slump in production. The world is already trying to move past the blockages created in the semiconductor supply situation caused by the COVID-19, and any further complications may take months to recover from.

"If the Russia-Ukraine conflict drags on, chipmakers in Taiwan, South Korea, Japan, China and other countries will feel the impact. This will likely result in higher chip prices and longer lead times moving forward," Moody's Analytics explained.