

EU Chips Act: The European solution to the semiconductor shortage

Today, technology is at the heart of globalisation, with semiconductors imperative to its success. However, on a global scale, supply chains are facing difficulties in providing these materials which are critical to the production of electronic devices, refrigerators, automobiles and, even, renewable energy.

Semiconductors, also known as chips or circuits, are mainly produced in Asia, and exports from these countries account for around 70% of total trade. For many years, The European Union and other major players have been increasingly dependent on semiconductor imports which are essential for achieving several strategic objectives, specifically with regards to the EU Green Deal.

In the run to achieve strategic independence and ambitious green targets, fluoropolymers play an important part. Perhaps no more so than their irreplaceable role in the semiconductor manufacturing process, the backbone of our electronic and energy systems.

Semiconductors' role in the energy sector

You might be surprised to hear that semiconductors are not only functional in the production of smartphones and laptops, but they also have an extremely important role to play in the correct functioning of many of the most common renewable energy applications.

Semiconductor materials are the basis for solar electric energy systems and are also used to condition power from photovoltaic panels (PV) and wind turbines so the energy can be used by electric equipment and fed onto the electric grid. In addition, chips are playing an increasingly important role in making the electric grid more intelligent through the use of smart meters, sensors, wireless and wireline communications, and control systems. This intelligence enables domestic and industrial utilities to detect malfunctions more easily and integrate renewable and distributed sources of power into the grid.

These are just a few of the ways semiconductors are helping achieve our Green Deal objectives and supporting the transition towards a carbon-neutral economy.

Fluoropolymers and semiconductors

You might be wondering about the role of fluoropolymers in this process. Fluoropolymers are an integral component of the semiconductor production infrastructure and the wider electronics industry thanks to their excellent chemical resistance, high dielectric strength, resistance to high temperatures and higher purity.

They can stand up to aggressive etching chemicals and provide the purity required in the production of microchips wafers, where contaminants could severely affect production yield and overall performance. Quantifiably, the annual benefits of fluoropolymers in semiconductor manufacturing are substantial, estimated at approximately €10 billion per year.

Fluoropolymers have a host of unique properties that make them irreplaceable for many electrical applications, including improving the performance of high-volume data transmission cables. They are critical for the manufacturing infrastructure of microprocessors used in personal, industrial, and professional high-tech electronic devices. Today, semiconductors are used in millions of increasingly powerful and compact products. Fluoropolymers also help meet the needs of the ever-evolving design complexities and miniaturization in semiconductors for a wide range of electronic devices and the data transfer between these devices.

What is driving the semiconductor shortage?

In 2020, the demand for semiconductors increased exponentially due to the demand for more advanced electronics for consumers applications, including in the computer industry. In addition, by mid-2020, the auto industry increased its demand for semiconductors, driven by the development of new technologies, like autonomous driving, electric vehicles, and driver assistance systems.

The supply side was, however, not ready to meet this surge. With 70% of the world's chip production taking place in East Asia and with the COVID-19 pandemic obstructing the smooth movement of goods and services, several industries requiring highly efficient circuits experienced a stall in production.

As more industries continue their digital transformation, it is inevitable that demand for semiconductors will continue to surge. The chip industry and global governments are scrambling for immediate solutions to tackle the problem and get ahead of the game.

The European solution

“There is no digital without chips... this is not just a matter of our competitiveness. This is also a matter of our European tech sovereignty.”

Ursula von der Leyen – State of the European Union 2021

In the race for semiconductor strategic independence, the European Union is no spectator. Over a year ago, at the start of 2021, the President of the EU Commission Ursula Von der Leyen laid out the vision for Europe's chip strategy, to “jointly create a state-of-the-art European chip ecosystem”, including production, research, and innovation.

One year after the announcement, the European Commission presented the European Chips Act, a comprehensive set of measures aimed at ensuring the security of supply, technological leadership and resilience in the semiconductor sphere. The highly ambitious strategy would require the European Union to mobilise more than €43 billion in public and private investments to bolster the industry, while developing the right set of skills, fundamental for the creation of an independent local production.

In the Executive's mind, the Bloc should be able to double its global market share of semiconductors by 2030. Currently, it accounts for a fairly modest 10%, with imports being predominant and industries extremely dependent on price fluctuations and shortages.

The European move towards strategic independence is not only an economic move, but also another way of ensuring the European Green Deal objectives are achieved.

Fluoropolymers will be critical to this by continuing to contribute to a wide range of sustainable solutions across industries, e.g. in the case of electronics and smarter use of energy resources through

digital transformation. The optimization of energy uses as well as the integration of renewable energy are key enablers of the sustainable energy transition and the fight against climate change. Moreover, fluoropolymers can continue to play an essential role in the European Union's strategic independence, and foster the EU economy, job market and society.