

Transatlantic Business & Investment Council (TBIC) Quarterly: Transatlantic Foreign Direct Investment Analysis & Trends

2nd Quarter 2023
[Data for Q4 2022]

The Transatlantic Business & Investment Council (TBIC) is the official European representative for selected counties, cities, and corporations from over 30 U.S. States. It is our mission to promote transatlantic trade and investment. To that end, TBIC bridges the gap between U.S. Economic Development Organizations (EDOs) and European investors looking to enter or expand in the U.S. market.

This latest issue of our quarterly features an analysis of the newly published preliminary (p) data for Q4 2022 and partially revised data (r) for Q3 2022, as recently released by the [U.S. Bureau of Economic Analysis \(BEA\)](#). With \$71.6 billion worth of investment, fourth quarter preliminary FDI inflows were significantly weaker than the inflows of Q3 2022, which, according to the latest revised figures, came up to \$97.8 billion. The majority of FDI inflows in the fourth quarter of last year went into holding companies (\$48.1 billion), followed by manufacturing (\$13.6 billion), finance (except depository institutions) and insurance (\$10.6 billion).

Within manufacturing, declines were observed from Q3 to Q4 2022 in the food and machinery sectors, while transportation equipment experienced a relatively modest increase of FDI. Investment in the food sector decreased by \$1.0 billion, after having increased by \$1.2 billion from Q2 to Q3 2022. Investments in the machinery sector continue to lead all sectors in absolute value in Q4, despite declining by \$4.2 billion from Q3 2022. Q4 2022 investment levels in machinery were still higher than Q1 and Q2 2022 levels combined, despite their decline. Preliminary numbers for the transportation equipment sector suggest an increase in inflows of approximately \$700 million from Q3 to Q4 2022.

This edition includes a time series focusing on German foreign direct investment into the United States. Germany's stock of FDI in the United States amounted to \$403.6 billion in 2021. While the overall stock is comparatively small when considering the approximately [\\$573.9 billion invested by the UK in 2021](#), Germany comes in fifth in total foreign direct investment into the United States, despite being Europe's economic powerhouse. Germany's strengths lie in its high quality of life, highly skilled labor force, and its investments in digital and scientific research. Furthermore, Germany has a very good strategic position between Eastern and Western Europe. Thanks to these advantages, Germany is considered by many outside investors to be the prime location for establishing a foothold on the Continent.

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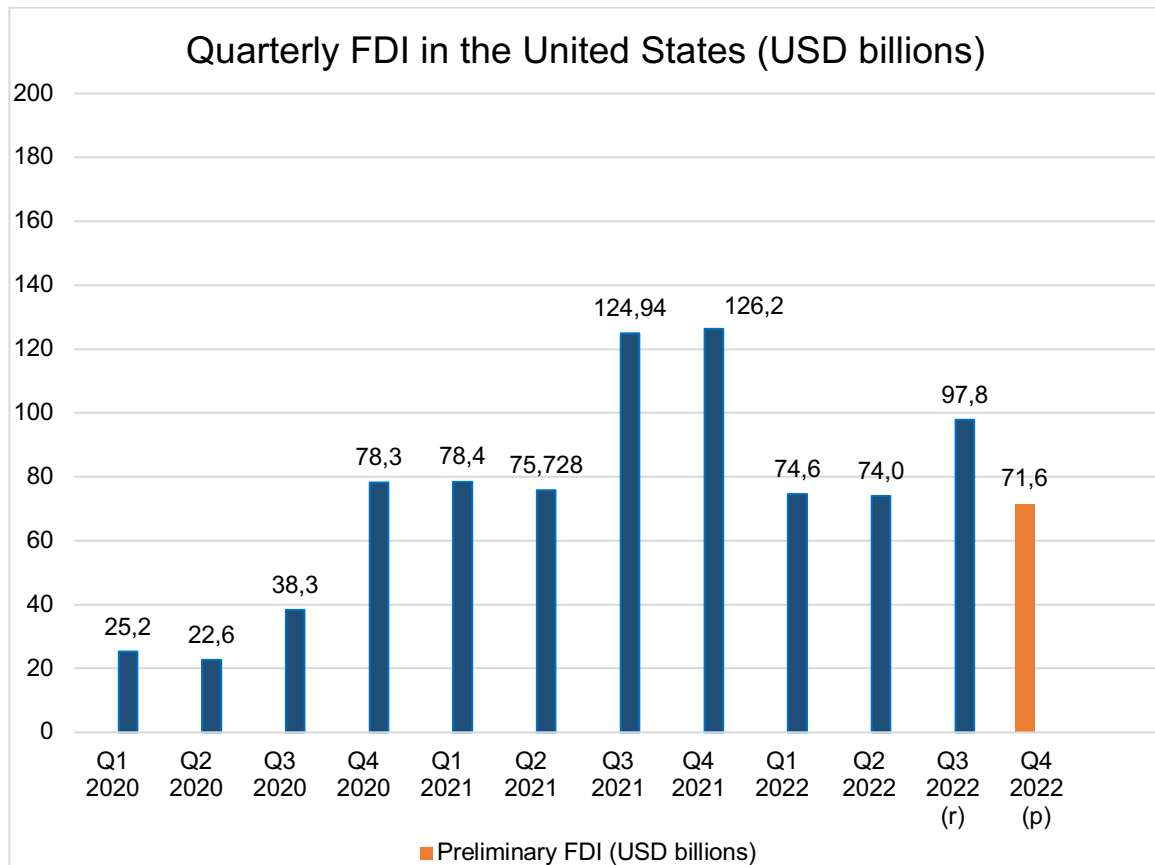


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This edition also includes our spotlight analysis of the CHIPS & Science Act, which creates a wealth of opportunities for European investors in America's high-tech sectors. The salience of this groundbreaking act is likely to prove itself in discussions with European companies as exploring their entry into the U.S. market. As the observed trend of heightened FDI into American semiconductor manufacturing continues in 2023, it is important that economic developers are sufficiently briefed on what the CHIPS & Science Act's incentives may be able to offer European companies in the future.

Foreign Direct Investment in the United States: Key Figures



Source: Bureau of Economic Analysis (BEA), U.S. International Transactions, Fourth Quarter 2022, March 2023.

In the recently published data of the [Bureau of Economic Analysis](https://www.bea.gov/), the FDI inflows for the third quarter of 2022 were revised upward from \$84.9 to \$97.8 billion.

Preliminary data for the Fourth Quarter of 2022 projects a volume of inward investment of \$71.6 billion, a decrease of over \$20 billion, and the lowest figures for 2022. In fact, in the same time period, namely Quarter Four of 2021, at which point the volume of inward investment into the US stood 76.3% higher, at \$126.2 billion. FDI inflows appear to be on the same trajectory this quarter as the first two quarters of 2022.

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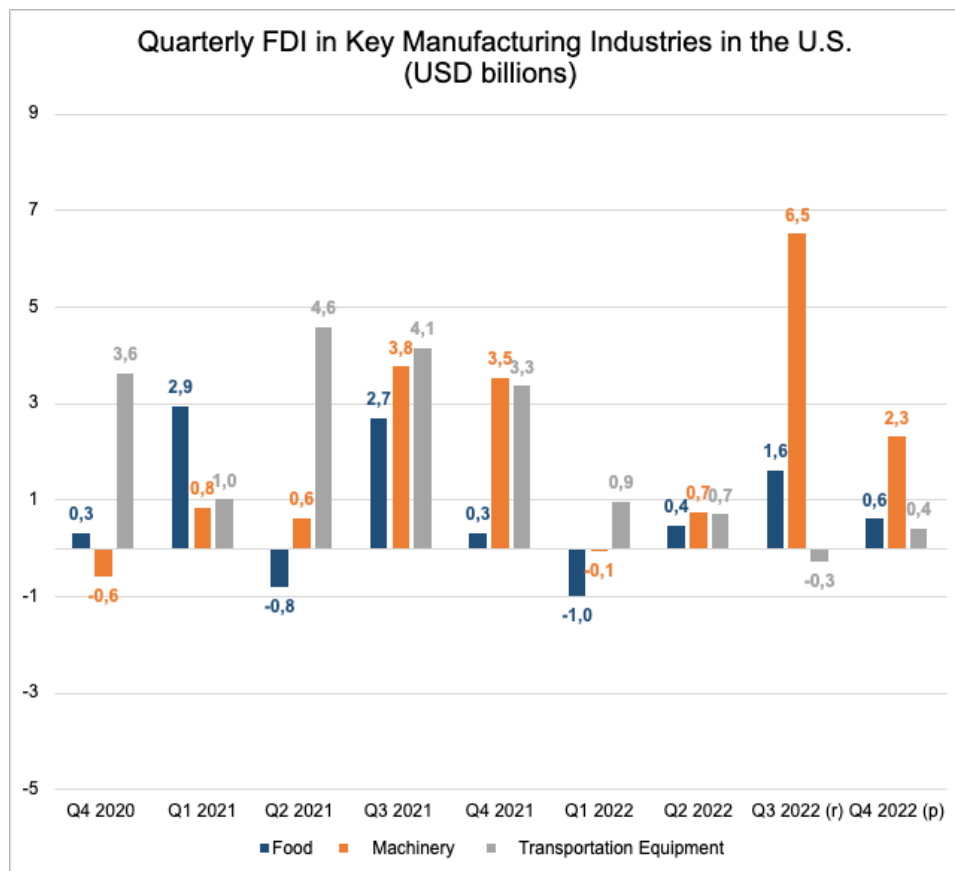
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U.S. FDI Flows by Key Industry Sector



Source: Bureau of Economic Analysis (BEA), Foreign Direct Investment in the United States: Country and Industry Detail for Financial Transactions, March 2023.

The newly released BEA preliminary data for Q4 2022 shows a return to relatively normal preliminary levels of net FDI flows in the food, machinery, and transportation equipment sectors since 2020. In Q4, investment flows in the food sector dropped by \$1 billion compared to the previous quarter and investment flows in the machinery sector dropped by \$4.2 billion. Transportation equipment investments grew by \$700 million from Q3 to Q4, 2022.

Despite its decline since Q3 2022, the machinery sector continued to lead in terms of absolute numbers, with almost \$2.3 billion USD in total investments in Q4. This is greater than anything observed in 2021 or 2022.

Investments in the food industry contracted to levels similar to those observed in Q4 2021 and Q2 2022. Q4 2022 data for the transportation sector are consistent with the sector's low levels of investment observed throughout 2022; the transportation sector has yet to return to 2021 levels of investment in which per-quarter investments over \$3 billion were regularly observed.

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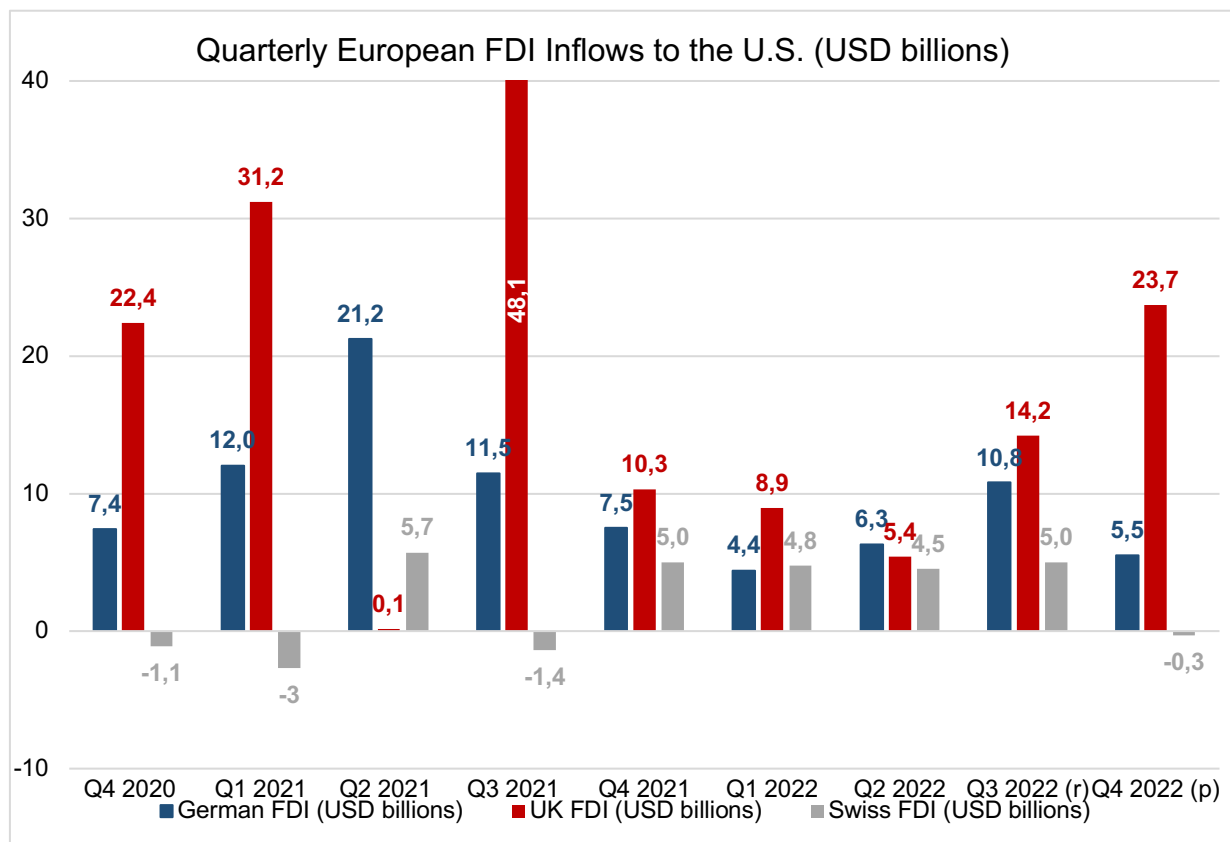
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U.S. FDI Inflows by Key European Source Countries



Source: Bureau of Economic Analysis (BEA), Foreign Direct Investment in the United States: Country and Industry Detail for Financial Transactions, March 2023.

Quarterly inflows from Germany, the United Kingdom and Switzerland for Q3 2022 were revised by the BEA. British and German FDI was adjusted significantly upwards from \$7.8 to \$14.2 billion in the British case and \$5.3 billion to \$10.8 in the German case. By comparison Swiss FDI by was adjusted from \$6.8 to \$5 billion.

Nonetheless German FDI is expected to fall from \$10.8 billion to \$5.5 billion this quarter. FDI inflows from Europe's largest economy are thus lower than last Quarter's but are still higher than Q1 investment levels.

With a revised \$14.2 billion in investments in Q3 2022, FDI from the United Kingdom appears to be on a slight uptick following a slight decline observed in the previous three quarters. After exceptionally high investment in Q3 2021, preliminary numbers suggest FDI flows from the United Kingdom fell to an estimated \$5.4 billion in Q2 2022 but picked up for Q3 in 2022. This positions the UK as the potential leader among the three countries in terms of FDI in the US during Q3 and Q4. Meanwhile, German FDI appears on track to come in second place among the three countries during this quarter.

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On a year-to-date basis, the quarterly investment flows in the second half of last year show the United Kingdom continuing to rank first among the three countries with a projected total investment of \$37.9 billion in the last six months, which is to be expected given its outsized role in international finance. Germany's investment projects \$16.3 billion and Switzerland is expected to have \$4.7 billion in 2022 for the last six months in 2022.

Historical Series – German FDI Inflows to the U.S.

German FDI in the United States (U.S.) has a long and rich history, dating back to the 19th century. German investors have traditionally been attracted to the U.S. due to its large and stable market, skilled workforce, and favorable business climate.

The largest German investments in the U.S. include companies such as Siemens, BMW, Volkswagen, and BASF. Siemens, a global technology powerhouse, has invested over \$40 billion in the U.S. since the 1980s, with a particular focus on the energy and infrastructure sectors. BMW, a leading luxury carmaker, operates a manufacturing plant in South Carolina and has invested over \$9 billion. Furthermore, [BMW has announced to invest \\$1.7 billion](#) into building electric vehicles and Signed an agreement with Envision AESC for the supply of battery cells at the Spartanburg plant. Volkswagen, another major carmaker, has invested over \$7 billion, with a focus on manufacturing facilities in Tennessee and Virginia. BASF, a leading chemical company, has invested over \$5 billion, with a focus on expanding its manufacturing and research capabilities.

Since, Germany is the U.S. fifth-largest trading partner (2020), it maintains a strategic position. German companies have invested heavily, with a particular focus on research and development (R&D) and innovation. Many German companies have established R&D centers to take advantage of the country's highly skilled workforce and favorable business environment. In addition, German companies have formed strategic partnerships with U.S. firms to jointly develop new technologies and products. Geographically, German-U.S. trade is focused particularly the Midwest and Southeast. This is due to the concentration of automotive and manufacturing industries in these regions, as well as the availability of skilled labor and infrastructure. Finally, Germany is known for its "hidden champions" - small and medium-sized companies that dominate niche markets and are often leaders in their industries. Many of these hidden champions are active in German-US trade, providing innovative products and services to American customers. Examples of these companies include [Wacker Chemie](#), a leading producer of silicones and polymer products, and [Festo](#), a global leader in automation technology.

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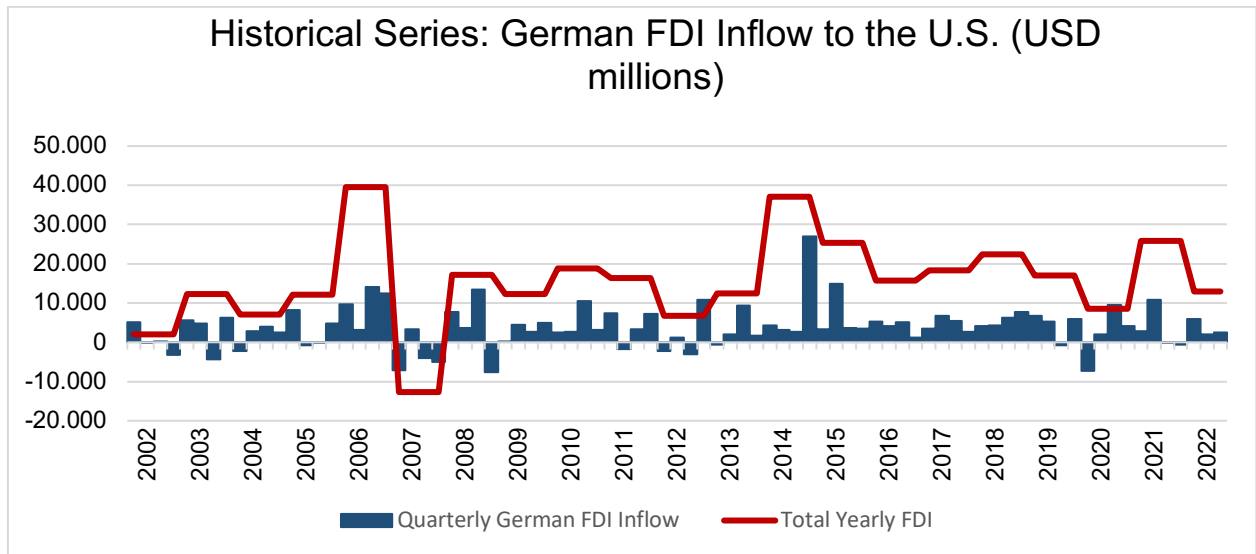


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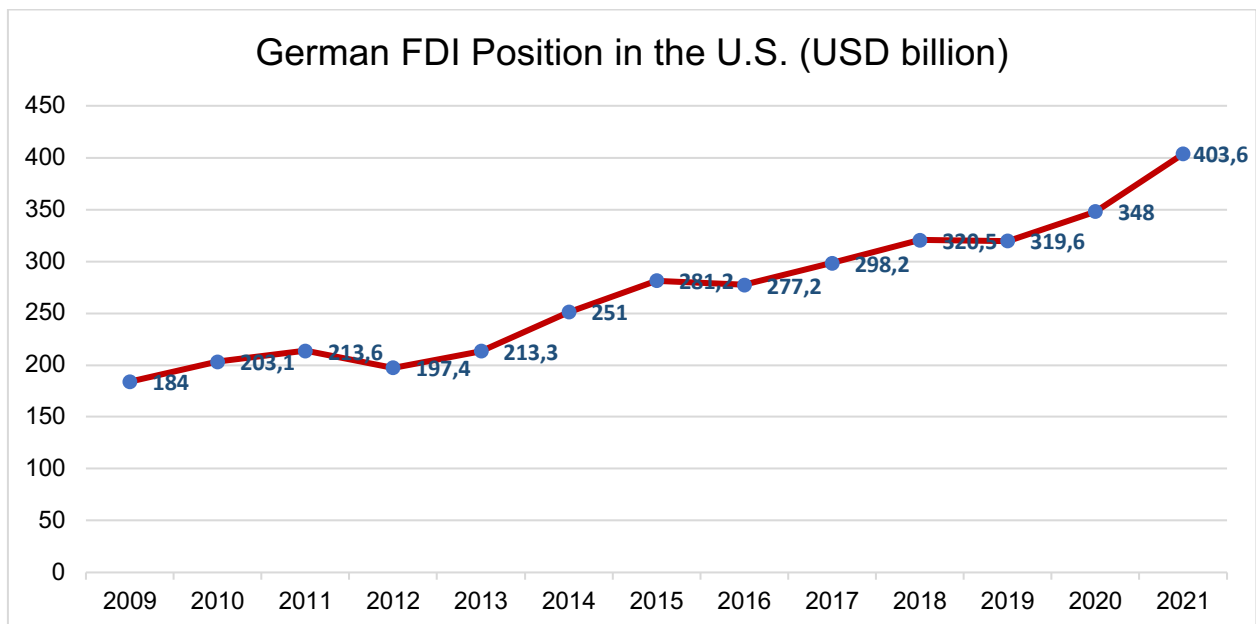


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Source: Bureau of Economic Analysis (BEA), Foreign Direct Investment in the United States: Country and Industry Detail for Financial Transactions, March 2023.



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Spotlight Article: The Chips & Science Act of 2022 - Impact on European Investment in the U.S. Semiconductor Industry

In our last TBIC Quarterly issue, we shed light on the Inflation Reduction Act, a key piece of legislation which creates incentives for America's renewable energy sector. In this issue, we will shed light on The Chips & Science Act, another watershed incentive package passed under the Biden Administration, which seeks to boost domestic production of semiconductors and semiconductor inputs. This legislation is particularly salient for the European market, as European FDI into US semiconductor manufacturing is playing a growing role in recent years. For us at TBIC, the Act is sure to feature heavily in our discussions with leading European manufacturers in the automotive and high-tech sectors in our upcoming FDI Trip #3 through Germany, our visit to the Hannover Messe, and our visit to this year's upcoming SelectUSA Investment Summit in Washington, DC.

The U.S. semiconductor industry is getting a much-needed boost. After years of supply chain issues driven by geopolitical risks and the COVID-19 pandemic which saw semiconductor shortages impact numerous industry sectors including aerospace, defense, automotive, and energy, the United States appears poised to restabilize its domestic semiconductor industry with the passage of the *Creating Helpful Incentives to Produce Semiconductors and Science Act of 2022* (CHIPS ACT). In this article, we'll discuss the background of the American semiconductor industry amid the geopolitical challenges and contemporary security risks that it has faced. We'll break down the funding contained in the Act itself and analyze how it will boost the competitiveness of the U.S. semiconductor industry. Above all, we will emphasize the opportunities that the Act is creating for European semiconductor producers and suppliers looking to expand into the U.S. market.

The Beginnings of an Industry

The roots of America's semiconductor industry go back to the late 1940's and 1950's, when companies such as Bell Labs, Texas Instruments, and Fairchild Semiconductor developed the first commercially viable transistors. In the following decades, the industry boomed, leading to the creation of microchips and the development of the personal computer. Increasingly however, more and more American companies began offshoring semiconductor manufacturing to Asia, particularly to China, Taiwan, and South Korea, due to their lower labor costs. This trend continued into the late 1990's, leading to a [decline in the share of semiconductors produced in the U.S.](#) as a percentage of the global total. Where in 1990, the U.S. (37%) and Europe (44%) accounted for 81% of global chip production, by 2020, that total share had declined to 21%. As of 2020, the United States accounted for just 12% of total chip manufacturing worldwide, while Japan (15%),

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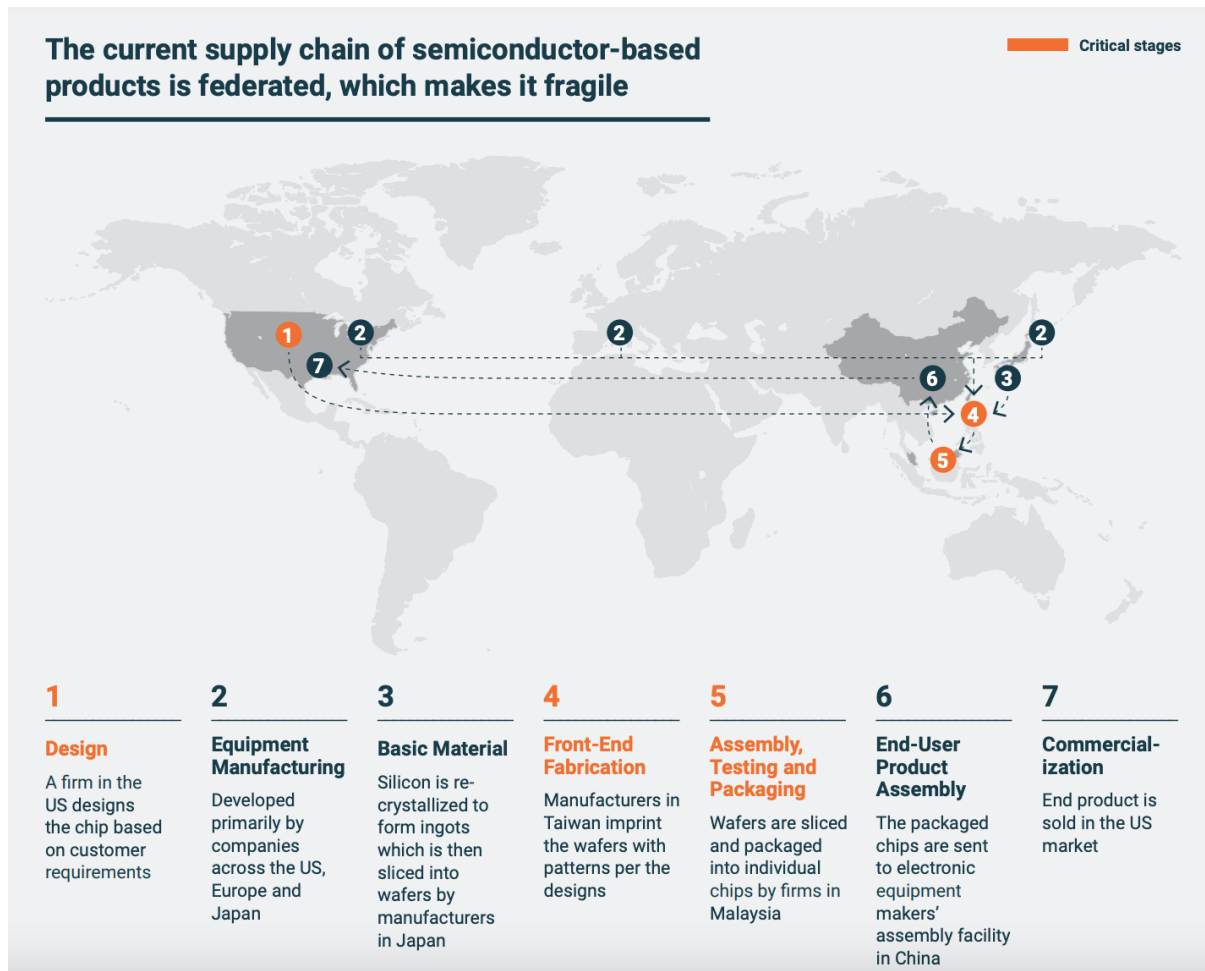
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China (15%), Taiwan (22%), and South Korea (21%) accounted for a combined 73% of global production.



Source: Eightfold.AI, 2022.

A Supply Chain on the Brink

This offshoring of American semiconductor manufacturing has posed various supply chain and national security risks, as the U.S. has become [increasingly dependent on foreign sources for crucial components in advanced fields](#) including the aerospace, defense, automotive, and energy industries. In recent years, there have been growing concerns about the potential for intellectual property theft and the risk of supply chain disruptions, as well as the loss of critical technology know-how and expertise. The COVID-19 pandemic highlighted the [high potential for disruption to various industries](#) that semiconductor shortages can hold with factories being forced to close and work-from-home orders prompting a boom in demand for consumer electronics. Coming out of the pandemic, experts remain

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fearful of prolonged chip shortages due to a wide array of ongoing geopolitical risk factors. The Russian invasion of Ukraine has halted the production of key inputs for semiconductors including [neon and palladium](#). The U.S.-China trade war and tensions over Taiwan, which produces the single-largest share of chips on Earth, are leading experts to fear the concentration of chip production in East Asia. Recently, the occurrence of [natural disasters in East Asia](#), frequent threats to power and water supply, and prolonged labor shortages, have also inspired a reconsideration of the benefits of the current chip supply chain structure.

U.S. CHIPS & Science Act

The U.S. CHIPS & Science Act was signed into law on August 9th, 2022, by President Biden, and is designed to revitalize American chip production, restimulate innovation, and address these supply chain concerns head-on. The Act provides [a total of \\$278.2 billion over the next ten years](#) to jumpstart investment into boosting America's domestic semiconductor manufacturing capacity. Of the total funding set aside in the Act, approximately \$200 billion is to be used for scientific research & development and commercialization. Importantly, much of this funding will go toward workforce development, including boosting STEM programs, which will address a key need for industry talent in positions including production engineers, logisticians, and technicians. Eightfold.ai estimates that the U.S. will need to [increase its current workforce in the industry](#) by about 50% to meet domestic demand for semiconductors, equating to roughly 90,000 new jobs. To achieve national self-sufficiency in chip production, a total of approximately 300,000 new industry workers would be required.

Central to the Act is \$52.7 billion which is being set aside to directly boost domestic manufacturing of semiconductors, including the building of new semiconductor manufacturing facilities in the U.S., called fabs. Fabs require an average of two years to design and build before becoming operational, and [yield significant value as greenfield investment projects](#), especially due to the high number of jobs which they create. A study undertaken by SIA-Oxford found that each U.S. semiconductor job creates [5.7 other jobs in the broader economy](#), on average.

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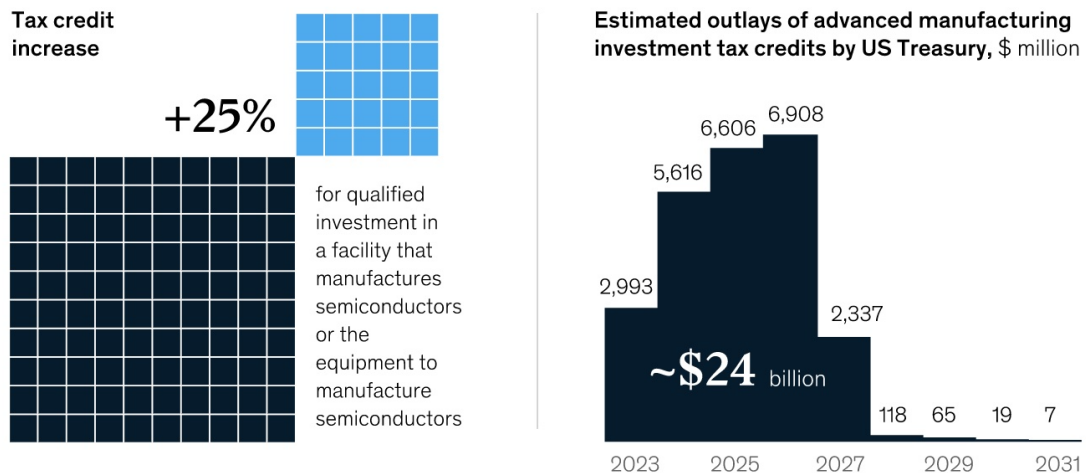


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The CHIPS and Science Act establishes a semiconductor investment tax credit of approximately \$24 billion to spur private investment until January 1, 2027.

Advanced manufacturing investment tax credit



Source: Congress.gov; Congressional Research Service; Creating Helpful Incentives to Produce Semiconductors (CHIPS) and Science Act of 2022, H.R. 4346, 117th Cong. (2022); "Estimated budgetary effects of H.R. 4346, Divisions A and B," Congressional Budget Office; William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021, Public Law 116-283

Source: McKinsey & Company, 2022

The act contains a further \$24 billion in tax credits dispersed over the next five years to directly spur private investment in domestic semiconductor manufacturing. The Act creates an Advanced Manufacturing Investment Tax Credit, which is equal to 25% of a qualified investment in a taxable year, provided the construction of the facility begins before January 1, 2027. This credit is available for facilities which manufacture semiconductors or facilities which manufacture semiconductor equipment. Already, the CHIPS & Science Act is prompting individual states to adopt their own incentives for chips production to increase their regional competitiveness, including [Ohio, Idaho, and New York](#).

FDI and Chips Production in the U.S.

Prior to the passage of the CHIPS & Science Act, foreign direct investment accounted for a significant portion of growth in the U.S. semiconductor industry. From 2019-2020, the [U.S. attracted 31 greenfield FDI projects in semiconductors](#), placing it third that year behind China (42) and Germany (38). Since 2020, [investments into semiconductor manufacturing](#) in the U.S. have totaled over \$186 billion, promising nearly 35,000 jobs, and investments by semiconductor suppliers and input manufacturers have totaled a further \$9.64 billion, promising over 5,500 jobs. Of these investments, a significant amount is foreign direct investment from European companies, many of which have sought financial relief in the form of the incentives provided by the CHIPS & Science Act. Notably, Netherlands-based [NXP](#)

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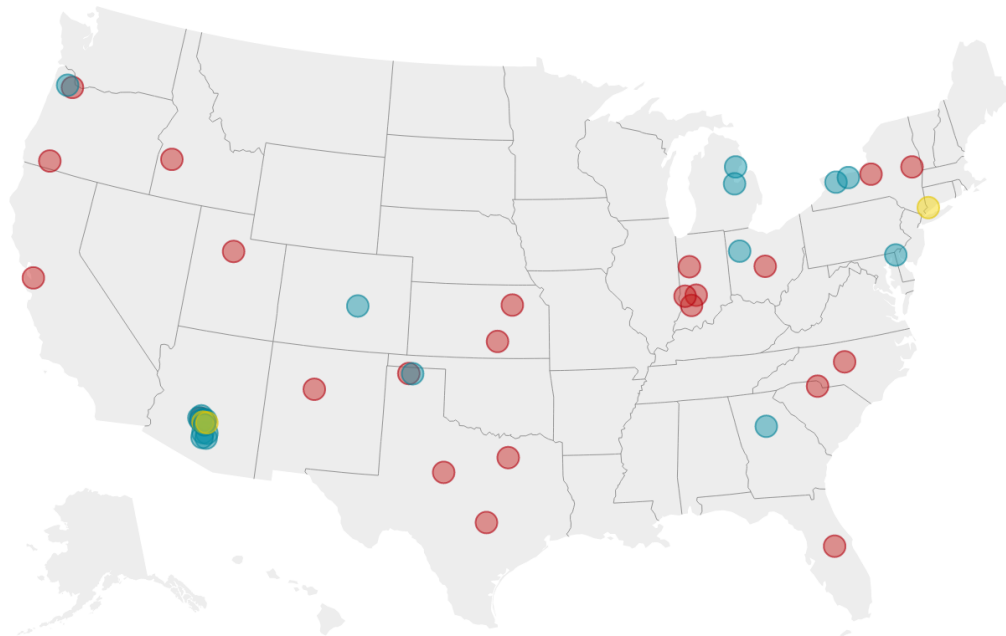


[Semiconductors N.V.](#) has recently considered a \$2.6 billion expansion of its Austin, TX manufacturing facility, which would create up to 800 new jobs, in part driven by incentives made available under the CHIPS & Science Act.

The CHIPS Act in Action

Semiconductor supply chain investments announced from May 2020 to January 2023

■ Manufacturing ■ Equipment ■ Materials



Source: Semiconductor Industry Association analysis • Created with Datawrapper

Source: Semiconductor Industry Association, December 2022.

European suppliers of semiconductor materials appear equally eager to break into the U.S. market. Suppliers of gases for semiconductor manufacturing including the German [Linde](#) and French [Air Liquide](#) have recently announced new operations in Phoenix, AZ, with total investments of \$600 million and \$60 million, respectively. Further investments by European materials suppliers announced in Arizona recently include [Solvay](#), from Belgium, who plan to create 30 new jobs by investing \$60 million into creating a new chemicals facility in Casa Grande, and UK-based [Edwards Vacuum](#), who are planning a new vacuum equipment facility in Chandler, which will create 200 new jobs. [Edwards Vacuum](#) also recently announced plans to invest \$319 million into creating a new vacuum equipment facility in Genesee County, NY, which will create 600 jobs. Finally, Netherlands-based [ASML](#) announced in late 2022 their plans to invest \$200 million into expanding their Wilton, CT equipment manufacturing site, which will create 1,000 new jobs. Considering the indirect job creation which greenfield semiconductor investments spur, and the benefits to other industries that increased domestic output of chips

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will have in the United States, these announcements signify huge wins for America's local communities looking to contribute to the revitalization of a critical national industry. As the funding provided by the CHIPS & Science Act becomes cemented going forward, it is likely that European companies will continue exploring ways of entering the U.S. market, providing no shortage of opportunities for foreign direct investment into America's semiconductor industry in the future.

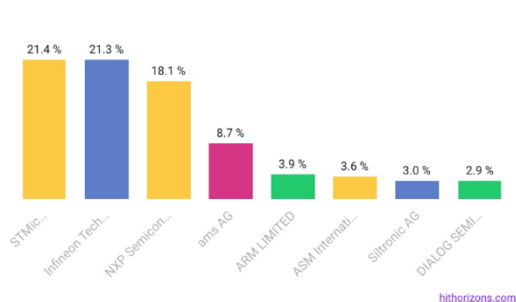
European Semiconductor Industry

As of 2020, Europe accounted for approximately 9% of all semiconductor manufacturing worldwide. In 2030, that figure is expected to drop to 8%, despite relevant efforts to boost investment in the industry through Europe's own [European Chips Act](#), also passed in 2022. Data from 2020 reflect that Europe's semiconductor industry [boasted roughly €54 billion in revenue in 2022](#), with projections of a similar figure for 2023. These are the highest figures since 2006, signaling the advent of a period of significant growth in the industry.

Out of a total 470 companies which produce semiconductors in Europe, 358 are located in Germany, and 49 are located in Austria. However, Netherlands-based semiconductor manufacturers, despite their low market share, have the highest average sales in Europe, with over €4.4 billion, as compared to Germany's €40 million. Together, German and Dutch semiconductor producers account for 82% of all sales generated in Europe. Currently, Europe has eight companies which generate more than €1 billion in revenue:

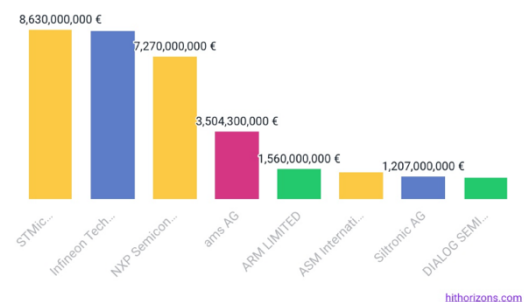
Top 3 companies generate more than 60% of all sales generated by European semiconductor manufacturers

Share of individual companies' sales in total sales of the semiconductor industry



STMicroelectronics N.V. (the Netherlands) has the highest sales among all European semiconductor producers

Companies with sales over 1B EUR



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Company	Country	Sales	Share of all sales
1. STMicroelectronics N.V.	• NETHERLANDS	€ 8,630,000,000	21.4%
2. Infineon Technologies AG	• GERMANY	€ 8,567,000,000	21.3%
3. NXP Semiconductors N.V.	• NETHERLANDS	€ 7,270,000,000	18.1%
4. ams AG	• AUSTRIA	€ 3,504,300,000	8.7%
5. ARM LIMITED	• ENGLAND	€ 1,560,000,000	3.9%
6. ASM International N.V.	• NETHERLANDS	€ 1,440,000,000	3.6%
7. Siltronic AG	• GERMANY	€ 1,207,000,000	3%
8. DIALOG SEMICONDUCTOR PLC	• ENGLAND	€ 1,160,000,000	2.9%

Source: HitHorizons.com. August, 2021

Semiconductor manufacturing facilities also use [significantly more energy](#) in their daily operations than even automotive plants or oil refineries. Amid an energy crisis in Europe which is prompting many industrial manufacturers to rethink parts of their supply chain, semiconductor producers may see the benefit of producing their chips in a location with more reliable access to cheaper energy.

Benefits of Increased Investments in Chips Production

It is no surprise that many of Europe's top players in the semiconductor industry have sought to expand their U.S. footprint in light of the funding made available in the CHIPS & Science Act. As part of a broader trend of increased investment in America's chip production, this European FDI will contribute to a [burgeoning U.S. semiconductor industry](#), which already accounts for \$250 billion and employs 1.85 million people domestically, as of 2020. Given the semiconductor industry's importance as an input for other industry sectors, the benefits of increased chip production in the U.S. will surely be a boon to other industries as well. [A Statista study](#) has determined that the CHIPS & Science Act could yield a gross value added of approximately \$147.7 billion through 2026.

In terms of economic development, these increased investments in the U.S. semiconductor industry will have [enormous "spillover" benefits](#) for local communities and industries. For one, semiconductor manufacturing plants often serve as the center of innovation "clusters", areas in which technology-intensive companies, a highly skilled workforce, and research and training centers are concentrated. Traditional economic development planning holds that once a chip fab is established, a tech cluster will form around it, in time. As is being currently observed in communities around the country including in Texas and Arizona, once a fab is established, suppliers of chemicals, fuels, and equipment necessary for chip manufacturing will flock to the area, often creating thousands of additional jobs. Chip manufacturing also fuels the development of offshoot industries which spurs innovation. Recently, Netherlands-based [QuTech and Intel announced plans](#)

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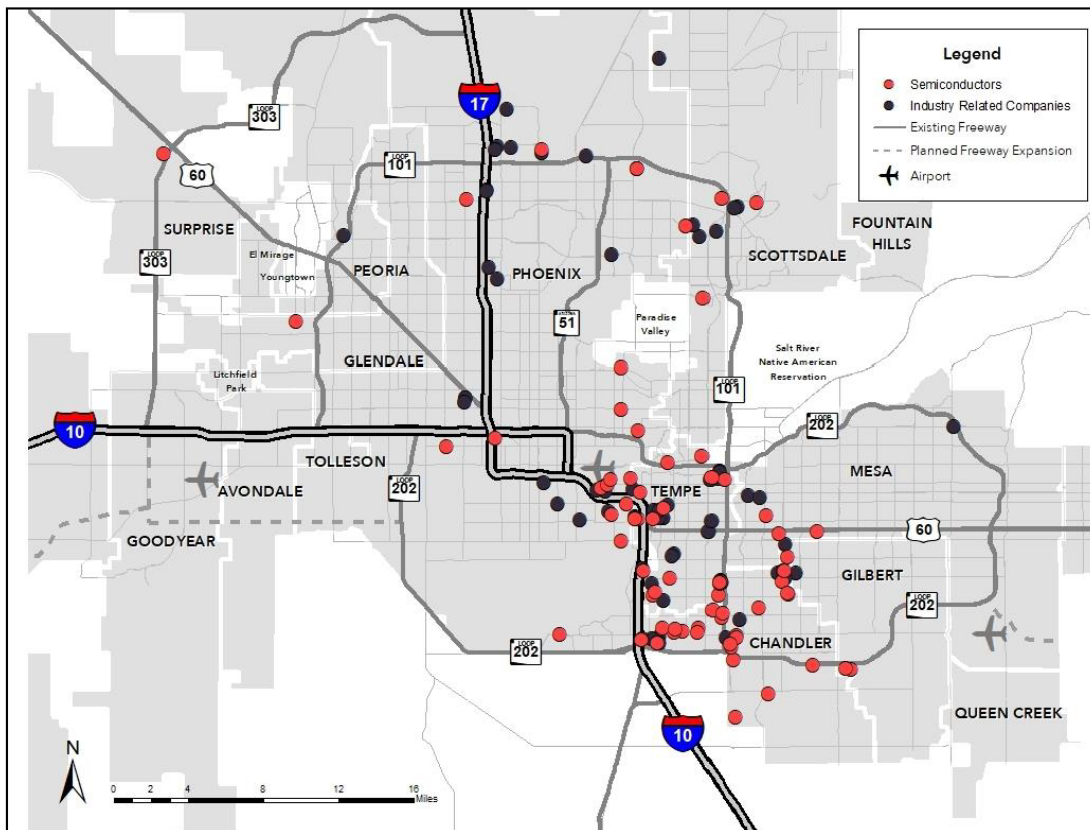
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[to manufacture silicon qubits](#) for quantum computing purposes by repurposing traditional silicon manufacturing processes. Naturally, all this innovation and the skill which advanced technological manufacturing demands leads to significant growth in the skilled workforce in areas which play host to new fabs. Whether through new talent attraction or up-skilling the existing workforce, local areas must find a workforce capable of operating fabs, which inevitably leads to development in an area's skilled workforce.



Example: A Map of Phoenix, AZ's Growing Semiconductor Cluster
Source: Greater Phoenix Economic Council

Finally, the increased investment in U.S.-produced chip production means that manufacturing-intensive industries will be less vulnerable to supply chain issues and can better meet demand for their products. Likely to benefit from the increased chip production, in part driven by European FDI, and a more robust domestic chip supply chain in the U.S. are the aerospace, automotive, energy, and life sciences sectors, among others. In these industry sectors, in which chips play such a crucial role in the functioning and safety of the products developed, production downturns driven by breakdowns in a supply chain heavily concentrated in East Asia [have caused enormous disruptions](#), forcing factories across industries to close production lines, and putting people out of work. With a

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more resilient supply chain of domestically produced chips spurred by the CHIPS & Science Act's investments in the industry, these industry sectors are likely to not only rebound from recent supply chain shocks, but better meet demand for their products in the future.

As mentioned, our team continues to engage with advanced manufacturers throughout Europe to open their eyes to opportunities available in the U.S. market, including those created by the CHIPS & Science Act. At our upcoming visit to the [Hannover Messe](#), the Act is sure to feature heavily in discussions with high-tech companies and advanced manufacturers across a broad range of industry sectors. It will also surely feature in TBIC's discussions with European companies at this year's annual [Select USA Investment Summit](#) in May and other events. Please do not hesitate to reach out to a TBIC team member to share your experience or comments on this highly dynamic industry or to get involved in upcoming events.

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