10 The Transatlantic Energy Economy

The transatlantic energy economy continues to be robust. The United States is Europe's most important supplier of crude oil and liquefied natural gas (LNG), and its 2nd largest supplier of coal. Europe has become America's most important export market for each of these three commodities. U.S. and European companies are the largest foreign investors and foreign suppliers of jobs in each other's energy economy. The transatlantic energy innovation economy is thriving.

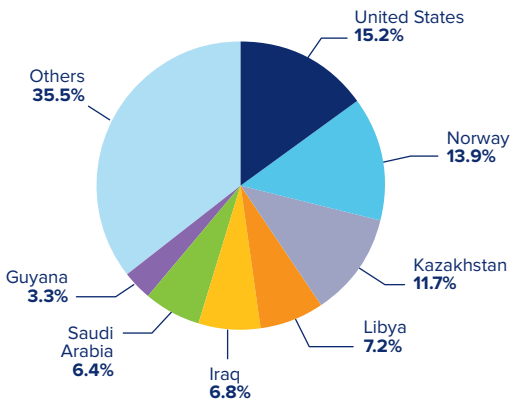
The Energy Ties That Bind

Since Moscow's full-scale invasion of Ukraine in February 2022, Norway and the U.S. have replaced Russia as Europe's biggest gas suppliers. In 2024 Norway provided 30.3%, and the U.S. an additional 19.4%, of Europe's total gas imports (Table 1). Of that total, LNG's share was 29%, up from 18% in 2019. The U.S. is the biggest LNG supplier to Europe, and the U.S. share of Europe's total LNG imports is growing – from 27% in 2021 to 44% in 2022 and 48% in 2024.[1]

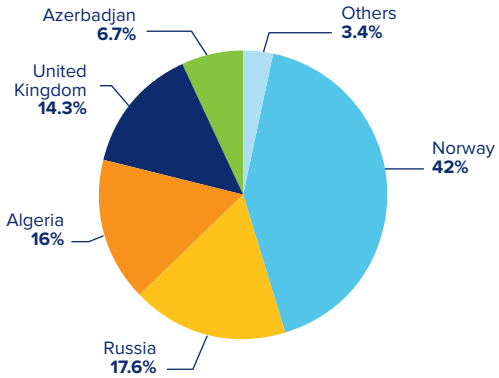
Europe, in turn, has become America's most important LNG export market, accounting for 55% of total U.S. LNG exports in 2024, ahead of Asia (34%) and Latin America (11%) (Table 2).[2] This is a big change. During the five years before Russia's 2022 full-scale invasion of Ukraine, the top three importers of U.S. LNG were South Korea, Japan, and China, which collectively imported 34% of U.S. exports, in comparison to 28% imported by Europe.[3]

Table 1. **EU Imports of Energy Products by Partner** (% of Trade in Value)

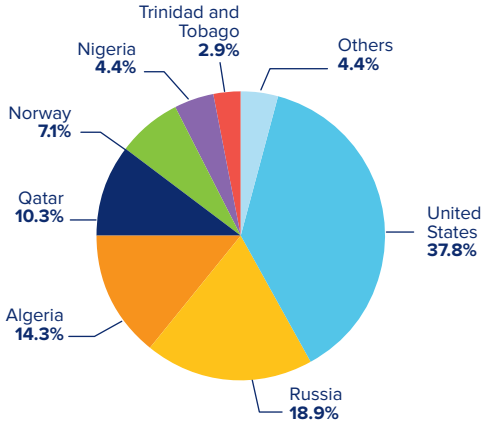
Petroleum Oil



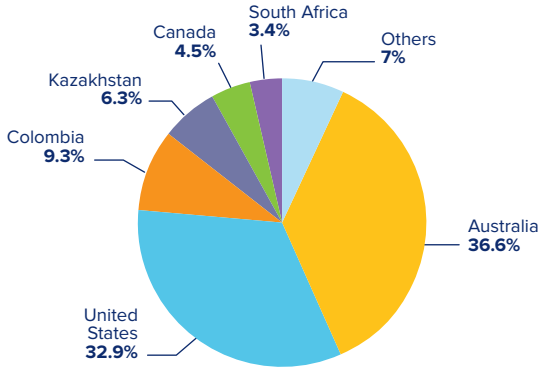
Natural Gas in Gaseous State



Liquefied Natural Gas

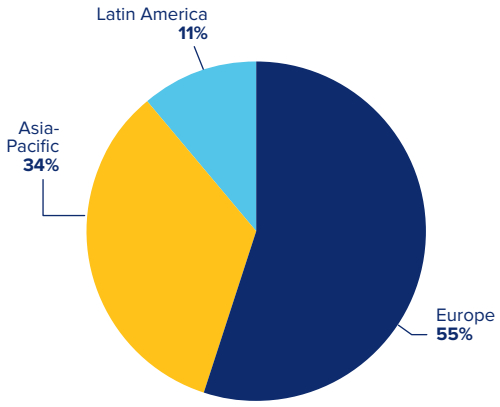


Coal



As of 3Q 2024. Source: Eurostat.

Table 2. U.S. LNG Exports by Destination, 2024



Source: LSEG; Euractiv, "US LNG exports soar, Europe remaining the main destination," January 3, 2025, https://www.euractiv.com/section/eet/news/us-lng-exports-soar-europe-remaining-the-main-destination/.

Europe's global LNG imports fell 18% in 2024, as demand declined, lower storage injections were needed, and pipeline gas deliveries strengthened. For some months, this meant that European hub prices fell below Asian spot LNG prices, which motivated LNG cargoes to flow to Asia. This changed later in the year, as Europe's winter turned colder and customers anticipated a cut-off of Russian pipeline flows as Ukraine's transit agreement with Russia lapsed on December 31 (Box 1).[4] Although the U.S. kept its position as Europe's largest LNG supplier, U.S. exports fell by 18%.

Pipeline gas from Russia now accounts for only 5% of the EU's total supply.

Europe's LNG imports are expected to surge again in 2025, perhaps by as much as by 25%, as the continent copes with a colder winter, replenishes its vast storage facilities, and compensates for lower Russian pipeline gas deliveries. In January European LNG imports surged to their highest level since April 2023. European demand has been so high that LNG cargoes on their way from the United States to Asia have turned abruptly around in the Atlantic and headed toward Europe, where gas prices are higher.[5] Chinese tariffs on U.S. LNG, imposed in February, are likely to drive more U.S. shipments to Europe.

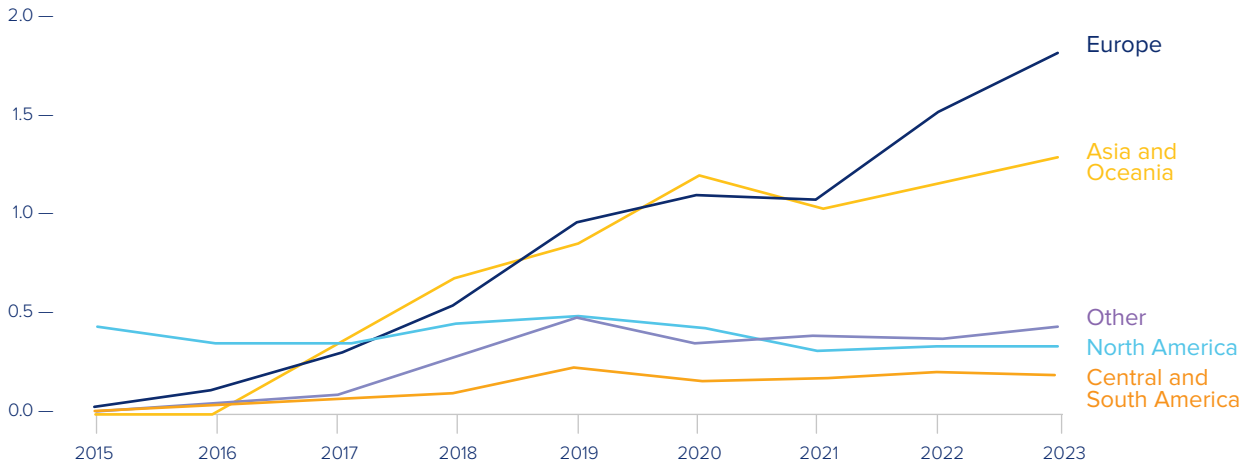
Europe's other energy markets have also been transformed. U.S. oil shipments to Europe have jumped 82% since Russia's 2022 invasion of Ukraine, according to Kpler. The United States is the EU's largest supplier of crude oil and related products, accounting for about 15% of EU imports, followed by Norway (14%) and Kazakhstan (12%) in the third quarter of 2024 (Table 1). Three years earlier, Russia had been the EU's top supplier, accounting for 18% of EU imports. Its share now hovers at about 2%.[6]

Europe, in turn, is the largest destination for U.S. crude oil exports, ahead of Asia-Pacific and other world regions (Table 3). The Netherlands receives more U.S. crude oil exports than any other country.

U.S. share of Europe's total LNG imports

27%
2021
48%
2024

Table 3. Annual U.S. Crude Oil Exports, by Destination Region (Million Barrels per Day)



Sources: U.S. Energy Information Administration, Petroleum Supply Monthly and Petroleum Supply Annual.

The United States is also the EU's 2nd largest source of imported coal, with a 33% share, trailing Australia's share of 37% (Table 1). Meanwhile, Norway has displaced Russia as the EU's largest supplier of natural gas in a gaseous state. Norway accounted for 42% of the EU's natural gas imports for the first nine months of 2024, followed by Russia (17.6%), Algeria (16%), the UK (14.3%), and Azerbaijan (6.7%).

By 2032, EU imports of U.S. energy are predicted to almost double in value, to around $114 billion.[7]

The Russian Connection

The EU has committed to fully eliminating its dependency on Russian fossil fuels by 2027. It has banned most imports of Russian coal and oil. It has diversified its supplies, chiefly through LNG imports. It has accelerated renewables deployments, built new gas import terminals, boosted its storage reserves, improved its energy efficiency, and simply used less gas. Pipeline gas from Russia now accounts for only 5% of the EU's total supply, although it remains important for several European countries.[8]

Despite these measures, Russian LNG continues to flow. In fact, Russian LNG exports to the EU reached an all-time high in 2024.[9] Russia shipped 18.47 million tons of LNG to EU ports last year. 2.55 million tons of that total were transshipped/re-exported to non-EU ports elsewhere in the world. The EU thus imported 15.92 million tons of Russian LNG in 2024, a 19.3% increase over 2023. Russia displaced Qatar, whose LNG exports fell by 30%, to become Europe's second-largest LNG supplier after the United States. The main EU countries importing Russian LNG are Belgium, France, Spain and the Netherlands. Other EU countries rely on indirect purchases.[10] Further Russian LNG transshipments via EU ports are banned as of March 2025. But EU member states have proven unable to agree on how to halt Russian LNG flows. The EU's 16th sanctions package, passed in February, only stops Russian LNG from going to EU terminals not connected to the EU's gas system - a restriction that would not affect most LNG imports.[11]

Box 1. Russian Pipeline Gas to Europe Throttled but Continues to Flow

On January 1, 2025, Russian gas accounting for 5% of the EU's gas supply stopped flowing to Europe through Ukrainian pipelines after Kyiv decided not to renew a five-year transit agreement between Russia's Gazprom and Ukraine's Naftogaz.[12] EU members Austria, Hungary, and Slovakia had developed significant dependencies on Russian gas via this transit route. EU neighbor Moldova has been hit hard, and its pro-Russian separatist region of Transnistria, which was 100% dependent on free Russian gas, has suffered the most. Stop-gap help has been provided by neighboring Romania and the EU, but more sustainable energy solutions will be needed. Moldova has a contract with Gazprom that expires in September 2026; if pro-European parties remain in power, they will probably terminate the deal.[13]

Russia's last pipeline gas routes to Europe are now TurkStream and Blue Stream, which run under the Black Sea to Türkiye and on to supply Bulgaria, Hungary, Romania, Serbia, Türkiye, Greece, North Macedonia, and Bosnia and Herzegovina.[14] Ukraine is prepared to transit gas from Azerbaijan to Europe. Yet parts of the critical infrastructure needed to transport this gas to the EU is owned by Lukoil, a sanctioned Russian energy company. In addition, Azerbaijan has limited capacity to pump additional gas to the EU. In fact, in 2024 Baku agreed with Russia's Gazprom to supply Russian gas to Azerbaijan. This means that so-called "Azeri gas" flowing to the EU could be re-branded Russian gas.[15]

Energy Innovation in the Transatlantic Economy

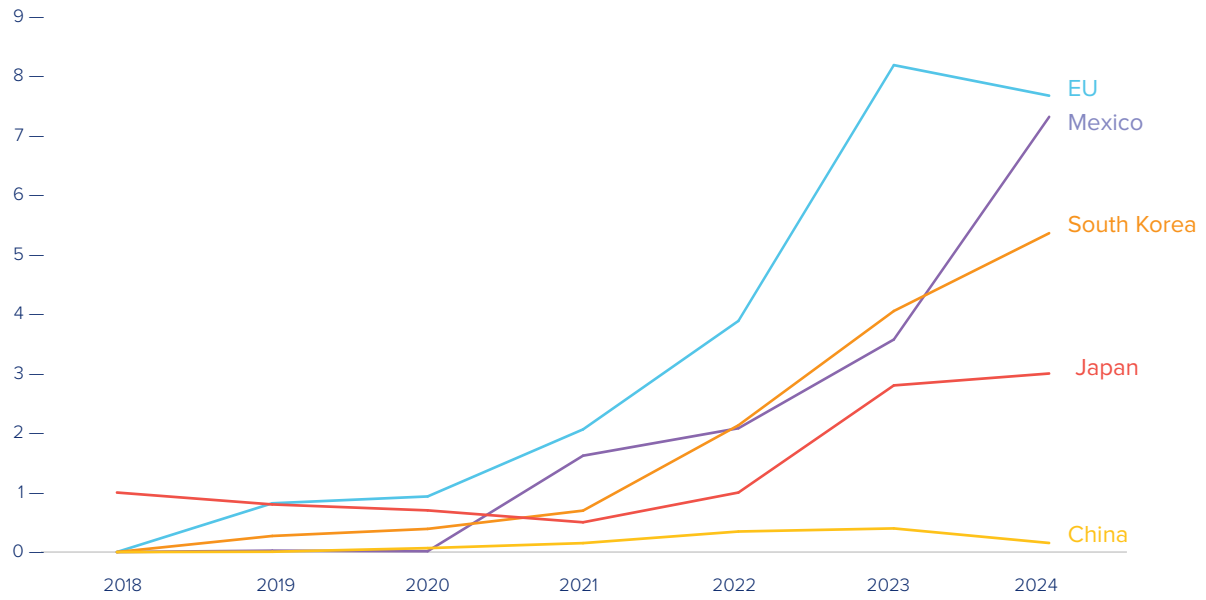
Transatlantic energy ties are not limited to fossil fuels. Energy innovation is robust on each side of the Atlantic, powered in part by dense transatlantic commercial and R&D linkages. Payoffs are evident: both the U.S. and the EU have cut emissions from energy production while growing their economies.

In recent years European politicians and pundits have expressed three concerns about how the U.S. energy innovation economy might affect Europe. First there was concern that the United States was not doing its part to address the energy transition. Next came worries that the Inflation Reduction Act would penalize European companies. Now there is concern that U.S. energy innovation could stall, with negative repercussions for European investors. Few of these concerns hold up under closer scrutiny.

First, emissions are on a downward trajectory despite a growing economy. Emissions in 2023 were 18% lower than they were in 2005, and 2024 emissions were stagnant while the economy grew by 2.7%. U.S. business and consumer investment in clean technologies and infrastructure has been robust, totaling $493 billion from the second half of 2022, when the Inflation Reduction Act (IRA) was enacted, through the first half of 2024. That's a 71% increase from the two-year period preceding the legislation. Investment in manufacturing clean energy and transportation technology of $89 billion was more than quadruple the $22 billion invested in the two years prior to the IRA's enactment. Investment in clean energy production and industrial decarbonization reached $161 billion – a 43% increase relative to the preceding two years. American businesses and households invested over $242 billion in the purchase and installation of zero-emission vehicles, heat pumps, and distributed renewable generation, fuel cells, and storage systems. That's a 58% increase relative to the previous two-year period.[16]

Second, when the IRA was passed, European electric vehicle manufacturers complained that their exports would be hit by its provisions limiting tax credits to EV makers that complete "final vehicle assembly" in North America. This argument ignores the dense transatlantic linkages that underpin the auto industry. The main European automakers already conduct "final vehicle assembly" at their plants in the United States. BMW, for instance, has been the largest U.S.-based auto exporter by value for a decade. Nearly 60% of its vehicles made in America are shipped to about 120 markets around the world, including Europe. Two of BMW's electric vehicle brands are produced at its plant in Spartanburg, South Carolina, which is bigger than its home plant

Table 4. **EU Largest Exporter of Electric Vehicles to the U.S., Despite the IRA** (Value of U.S. Electric Vehicle Imports, by Source, $Billions, 12-month Trailing Sums)



Source: U.S. International Trade Commission Dataweb. Note: Harmonized Tariff Schedule Code: 8073.80. Annual Nov-Nov.

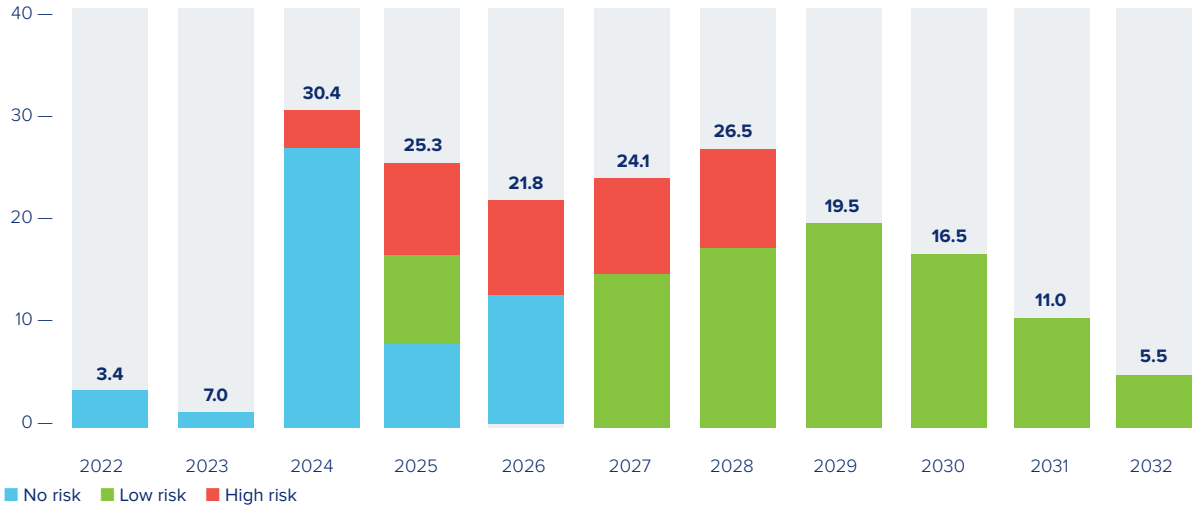
in Munich. Volkswagen is the largest European seller of electric vehicles in the U.S. and was the first foreign carmaker to qualify for the IRA's full EV tax credit of $7,500 because its best-selling model, the ID.4, is produced in Chattanooga, Tennessee. Mercedes produces its electric EQS and EQE in Tuscaloosa, Alabama.

Moreover, there is no evidence that the IRA suppressed EU exports of electric vehicles to the United States. In fact, they have grown. U.S. imports of EVs from EU rose dramatically between the announcement of the IRA in late summer 2022 and the end of 2024, and were substantially greater than those from other world regions (Table 4). EU automakers remain the top electric vehicle exporters to the United States. Only EV imports from Mexico are in the same league, and since Mexican automakers do not export to the U.S., almost all these cars are actually from U.S., Asian and European producers.

Considerable uncertainty surrounds the U.S. energy innovation economy following the November 2024 elections. Several European investors have paused their cleantech projects in the United States.[17] President Trump has frozen clean energy-focused grant and loan disbursements for 90 days until the budget office confirms they align with the administration's priorities. Nonetheless, these steps do not herald an end to the U.S. energy innovation economy or the opportunities it brings for U.S. and European investors. A closer examination of the $146 billion worth of solar, battery and EV subsidies paused by the U.S. administration reveals that only $40 billion is at high risk of being cancelled in 2025, according to BloombergNEF (Table 5). The IRA's EV production tax credit, for instance, is likely to remain available, even if eligibility requirements might be tightened.

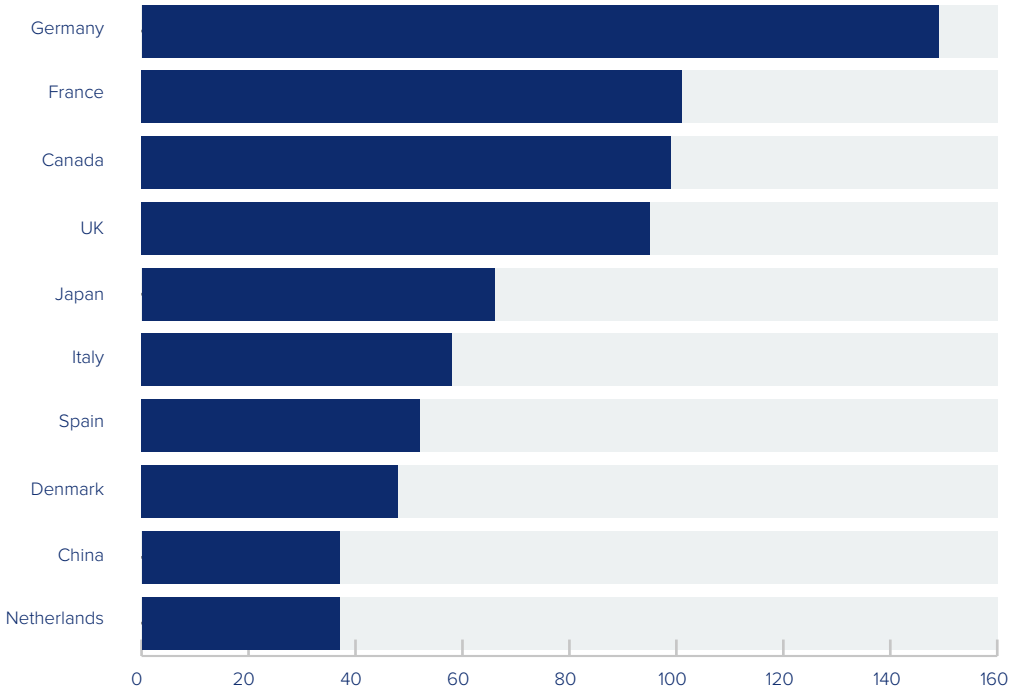
European and other investors appear to be retaining their commitment to the U.S. energy innovation economy, even as some readjust to align their investments with what they perceive to be the administration's priorities.[18] These developments are significant for the transatlantic energy economy, since the United States has become the leading destination for foreign clean energy investments, and European companies are by far the leading source of FDI in the U.S. energy sector, accounting for almost three-quarters of FDI greenfield investments over the past decade.[19] German investors lead with 20% of the total, followed by French investors at 14% (Table 6).

Table 5. Estimated Annual Subsidies Available for U.S. Solar, Battery and EV Factories, by Risk of Removal ($Billions)



Source: Matthew Hales, Antoine Vagneur-Jones and Derrick Flakoll, BloombergNEF.
Note: No risk: funding already committed or disbursed. Low risk: subsidies expected to remain available, even if harder to access. High risk: subsidies expected to be removed.

Table 6. Top Sources of FDI in U.S. Energy (994 Total Announced Greenfield Projects, July 2014-June 2024)



Sources: U.S. Bureau of Economic Analysis; SelectUSA, U.S. Department of Commerce.

Powering the Transatlantic Energy Innovation Economy

Transatlantic investment is not a zero-sum game, as we demonstrate throughout this book. That is particularly true regarding the transatlantic energy economy. U.S. and European firms are deeply embedded in each other's fossil-fuel and renewable energy markets – through trade, foreign investment, cross-border financing, and collaboration in research and development (R&D).[20]

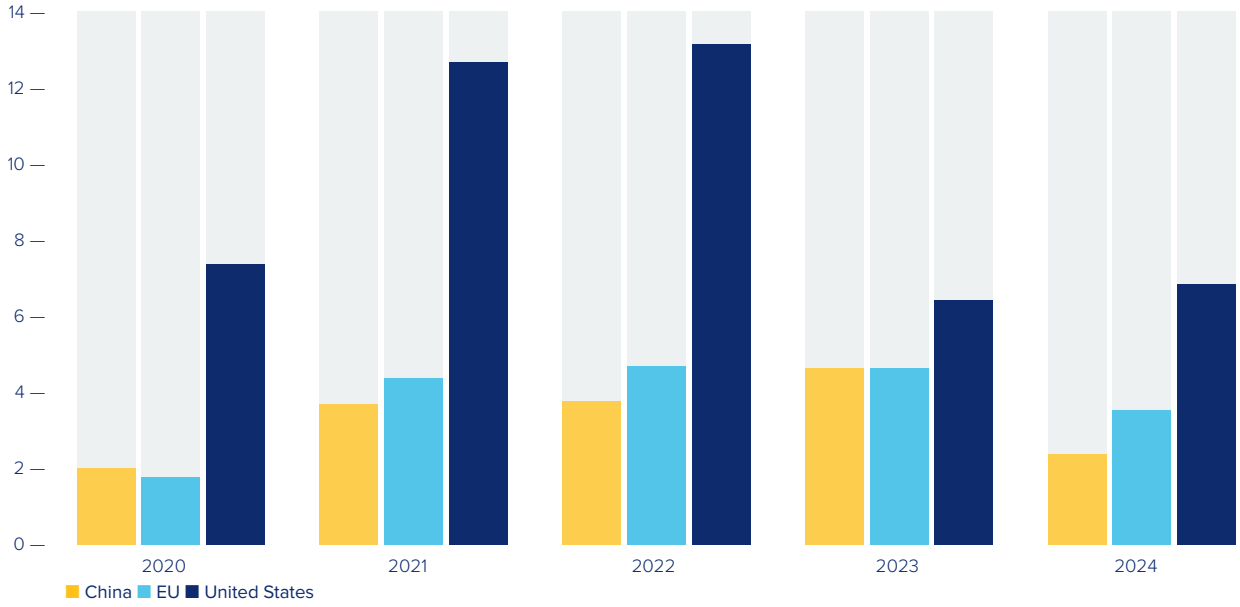
The U.S. and the EU share both interest and capacity to accelerate innovative frontier energy technologies. The potential is significant. Global investment in the energy transition surpassed $2 trillion for the first time in 2024, more than double the level of 2020.[21]

Transatlantic flows of risk capital are critical to energy innovation. EU investors are tapping into U.S. innovation and U.S. venture investors are providing scale-up capital for EU startups, as we have documented in previous surveys. U.S. and EU companies that receive transatlantic investments tend to reach growth stage, and receive growth funding, faster than those that do not. Deal sizes for EU innovator investment rounds that included risk capital were significantly larger than those that do not involve a U.S. investor. U.S. innovator investment deals are typically larger if they involve a European investor.[22]

China is a major competitor for U.S. and EU energy innovators. Yet venture capital cleantech investment is larger in both the U.S. and the EU than it is in China (Table 7.) The U.S. accounts for 42% and the EU for an additional 22% of global cleantech venture capital, each ahead of China's 14% share. Four EU countries – Estonia, Sweden, Finland, and Belgium – exceed the U.S. level of per capita cleantech investment. Moreover, U.S. and European cleantech venture capital flows easily across the Atlantic.[23]

The U.S. accounts for 42%, and the EU for an additional 22%, of global cleantech venture capital, each ahead of China's 14% share.

Table 7. **Cleantech Venture Capital by Region** ($Billions)



Source: Clean Tech for Europe.

Notes

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