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When the Strait Closes: Trade Dependencies and Shipping Disruption Scenarios for the Strait of Hormuz

Research Brief

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Executive Summary

The Strait of Hormuz is one of the world's most critical maritime chokepoints for global trade. Roughly one-fifth of global oil shipments pass through this narrow waterway between Oman and Iran, making any disruption to transit through the strait a matter of worldwide economic concern. This brief examines two key dimensions of its disruption: global trade dependencies on Hormuz-dependent Gulf exporters, and shipping disruption scenarios simulated using an agent-based maritime transport model.

Our analysis finds that roughly USD 1.2 trillion in annual trade flows from five Gulf countries (Iran, the United Arab Emirates, Qatar, Kuwait, and Bahrain) could be affected by a prolonged closure. Energy products dominate these trade flows, with crude oil, liquefied natural gas, and refined petroleum products together accounting for nearly USD 800 billion. The shipping model reveals an important finding: while short disruptions of two weeks or less would likely have limited economic consequences, disruptions extending beyond four weeks generate disproportionately larger effects as cascading schedule delays accumulate across the global shipping network.

For the European Union, total exposure amounts to approximately USD 47 billion per year (2022-2023 average), with Italy representing the largest share at nearly USD 9.8 billion per year due to its reliance on Qatari LNG and propane. The United Kingdom imports approximately USD 13 billion per year. Austria's direct exposure is minimal at USD 0.3 billion per year, though indirect energy price transmission through European markets warrants monitoring.

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1. Introduction

The Strait of Hormuz serves as the vital artery for global oil and gas exports from the Persian Gulf. Located between Oman and Iran, this narrow waterway, approximately 33 kilometers wide at its narrowest point, handles roughly 20 percent of global oil supply daily, making it indispensable to world energy security.

In late February 2026, tensions in the Middle East escalated significantly. Israel and the United States conducted coordinated attacks on various critical sites in Iran. In retaliation, Iran launched drones and ballistic missiles targeting Israel and U.S. military bases across the region, including in Jordan, Kuwait, Bahrain, Qatar, Iraq, Saudi Arabia, and the United Arab Emirates. Iran also closed the Strait of Hormuz, disrupting global shipments. While the severity of this disruption to global oil and gas supply is undoubted, questions have emerged about the broader economic consequences, particularly regarding other commodity flows such as fertilizers and industrial materials.

This analysis focuses on five countries whose maritime exports require passage through the Strait of Hormuz: Iran, the United Arab Emirates, Qatar, Kuwait, and Bahrain. If not stated otherwise, Saudi Arabia, and Oman are excluded from the analysis because are not entirely dependent on Hormuz transit and can at least partially compensate the disruption using alternative export routes via pipelines to the Red Sea and northern ports, respectively. For similar reasons we did not include Iraq (access to the Kirkuk–Ceyhan pipeline through Turkey, which bypasses the Strait), which can also partially mitigate the Hormuz closure and might not be similarly affected for the export of other goods. In any case, our estimates are conservative by focusing only on countries that entirely depend on the strait for their maritime exports.

The brief combines two complementary approaches. First, a trade dependency analysis identifies which countries and industries depend on exports from these five Gulf states. Second, a shipping disruption analysis using an agent-based model simulates how maritime traffic flows would be affected under different closure scenarios lasting 14, 28, and 56 days.

Several caveats apply throughout. Trade volumes are based on 2022-2023 bilateral trade data from BACI (Base pour l'Analyse du Commerce International), which tracks customs-reported trade flows. The actual share transported through the Strait of Hormuz may be lower than reported bilateral trade due to pipelines, land routes, and air freight. All monetary values are expressed as annual averages for 2022-2023 unless otherwise noted. Finally, shipping model results should be interpreted as scenario analysis, not forecasts, with inherent uncertainty reflected in confidence intervals.

2. Global Trade Dependencies

2.1. Overview and Scale

The scale of trade flowing through Hormuz-dependent Gulf states is substantial. Using international trade databases[1], we identified all country-product pairs where one of the five identified exporters is the primary supplier, with trade values exceeding USD 5 million per pair. Global imports from Hormuz-dependent Gulf states (Iran, UAE, Qatar, Kuwait, Bahrain) total approximately USD 670 billion per year based on 2022-2023 trade data. This substantial flow encompasses a diverse range of products, from crude oil and natural gas to gold, diamonds, construction materials, and agricultural commodities, see Figure 1.

[1] Gaulier, Zignago (2010) BACI: International Trade Database at the Product-Level. The 1994-2007 Version.

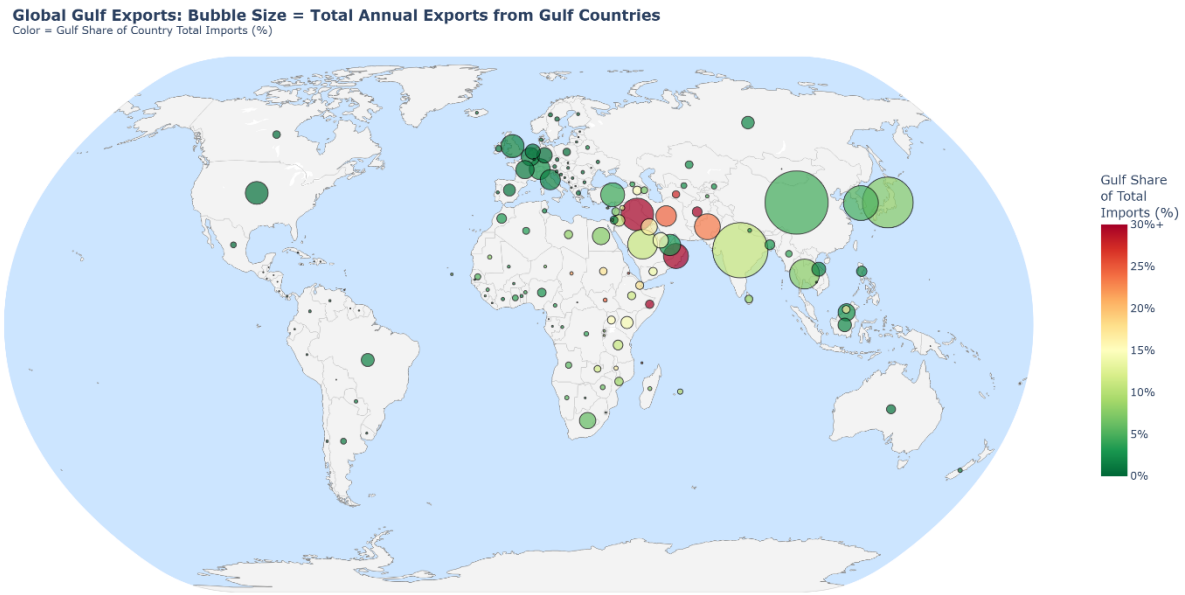

Figure 1: Global trade dependencies on Hormuz-dependent Gulf exporters (Iran, UAE, Qatar, Kuwait, Bahrain). Bubble size represents total trade value; color indicates share from gulf.

The risk score is a composite indicator derived from three underlying metrics using Principal Component Analysis (PCA). First, exposure measures the degree to which an importing country depends on imports of a given product, expressed on a scale from 0 to 1, where higher values indicate greater dependence. Second, the Herfindahl-Hirschman Index (HHI) quantifies supplier concentration. If a country imports a product from many different sources, the HHI is low; if it relies on just one or few suppliers, the HHI is high. Third, Systemic Trade Risk (STR) captures the global supply landscape for each product, flagging cases where alternative suppliers are limited worldwide, making disruption particularly consequential. These three indicators are combined through PCA, which weights them according to their statistical contribution to explaining overall risk variance, producing a single score where positive values indicate elevated risk relative to the average trade relationship. On the maps, countries are colored green for scores below 0 (meaning they have more diversified supply options), orange for scores between 0 and 2 (moderate concentration), and red for scores above 2 (high concentration with limited alternatives).

2.2. Regional Patterns

The geographic distribution of Gulf imports reveals clear patterns of concentration. Asia represents the largest destination region, with major economies showing substantial annual import volumes: China leads at USD 97 billion per year, followed by India at USD 74 billion, Japan at USD 63 billion, South Korea at USD 30 billion, and Thailand at USD 22 billion. These economies have built substantial supply chains around Gulf energy and materials imports, making them vulnerable to any sustained disruption.

The Middle East itself represents a significant destination region, reflecting intra-regional commerce with the UAE and Qatar serving as suppliers to neighboring countries. Iraq imports USD 30 billion per year, Saudi Arabia USD 21 billion, Oman USD 15 billion, and Pakistan USD 16 billion, particularly of petroleum products, LNG, and construction materials.

European Union imports from Gulf exporters total approximately USD 47 billion per year (2022-2023 average). Italy leads with USD 9.8 billion annually, predominantly liquefied natural gas and propane from Qatar. Belgium and France follow at approximately USD 8 billion per year each—Belgium importing Qatari LNG via Zeebrugge and UAE diamonds through Antwerp, France diversified across multiple Gulf suppliers. Germany and the Netherlands each import USD 5-6 billion annually across diversified product mixes. The United Kingdom imports approximately USD 13 billion per year.

Beyond these major regions, the United States imports USD 13 billion per year from Gulf countries, Turkey USD 14 billion, and other countries across Africa, Latin America, and smaller Asian economies show varying levels of dependence on specific Gulf products.

2.3. Product Composition

The product composition of Gulf trade is dominated by energy commodities. Crude petroleum, refined petroleum products, and liquefied natural gas together account for the majority of trade value. Qatar dominates LNG exports, supplying Asian markets (China, Japan, South Korea, India) and European importers (Italy, Belgium, UK, France). The UAE and Iran export crude oil and refined products, primarily to Asian destinations.

Beyond energy, the UAE serves as a major trading hub for gold and diamonds, with significant re-export flows to India, Hong Kong, Switzerland, and Belgium. Propane and butane serve industrial and heating applications across Europe and Asia. The Gulf countries also export industrial gases (Qatar), aluminum products (Bahrain, UAE), construction materials and steel (Iran to neighboring countries), and agricultural products (Iranian pistachios, dates, and saffron to European and Asian markets).

3. Product-Specific Analysis

3.1. Energy Products

Energy products constitute the largest and most strategically significant category of trade through Hormuz, accounting for the majority of the USD 670 billion in annual Gulf exports. Crude oil, refined petroleum products, and liquefied natural gas dominate this trade.

The concentration of energy flows through this single chokepoint creates inherent vulnerability. Asia's major economies show substantial annual energy imports from Gulf sources: China imports energy products worth tens of billions annually, as do India, Japan, South Korea, and Taiwan. These countries have built their economic strategies around reliable access to Gulf energy, and any disruption would have immediate implications for industrial activity and economic growth.

Liquefied natural gas deserves particular attention. Qatar is the world's largest LNG exporter, and nearly all Qatari exports flow through Hormuz. Asian destinations include China, Japan, South Korea, India, Thailand, and Singapore. For European readers, Italy's position is notable: Italian imports from Qatar total USD 11.5 billion per year (2022-2023 average), with the majority being LNG at USD 4.4 billion per year and propane at USD 3.2 billion per year. Belgium imports USD 5.8 billion per year in Qatari LNG via the Zeebrugge terminal, and the UK imports USD 5.9 billion per year in Qatari gas products.

The fundamental challenge with energy products is their irreplaceability in the short term. Unlike many manufactured goods, crude oil and natural gas cannot easily be substituted from other sources when supplies are disrupted. While strategic reserves can buffer short-term shocks (typically 90-180 days of import cover for IEA members, though individual countries might have more limited reserves), extended disruptions would require tapping reserves at unsustainable rates or activating emergency demand reduction measures.

3.2. Fertilizers and Urea

The region is also a main exporter of fertilizers, see Figure 2, which raised concerns and debate about potential food shortages. On average from 2019 to 2023, 31% of all global exports of urea originated from the gulf countries, with Oman supplying around 10%, Qatar 8%, Saudi Arabia 6% and Iran 4%. Saudi Arabia is also one of the largest exporters of Diammonium Phosphate (DAP) and Monoammonium Phosphate (MAP), supplying around 20% and 10% of global exports, respectively.

The Gulf Arab states and Iran are also important exporters of the base material for these fertilizers, including anhydrous ammonia. Saudi Arabia accounts for around 16% of global exports, Qatar and Oman around 3%, and Bahrain and Iran around 2% each. The five Hormuz-dependent Gulf states together supply about 8 to 10 percent of global fertilizer exports, totaling approximately USD 13.5 billion across 43 countries.

However, fertilizers are typically purchased several months before agricultural application. The disruption beginning in late February 2026 would affect future planting season, not the current spring planting season. This advance purchasing creates a buffer against short-term disruptions.

The historical precedent from the Russia-Ukraine crisis offers additional insights. During 2022, fertilizer prices increased substantially as Russian supplies faced disruption, but limited effects on crop yields were observed. Farmers might have reduced application rates in response to higher prices, affecting margins rather than total production. This suggests the primary impact of any Hormuz-related disruption would be on farm profitability through price increases, not physical shortages affecting food production.[2]

The United States and Brazil are the largest importers of fertilizers from Hormuz-dependent Gulf states, together accounting for over USD 5.3 billion. For Europe, exposure is minimal, no EU country receives more than 0.5 percent of its fertilizer imports from these sources.

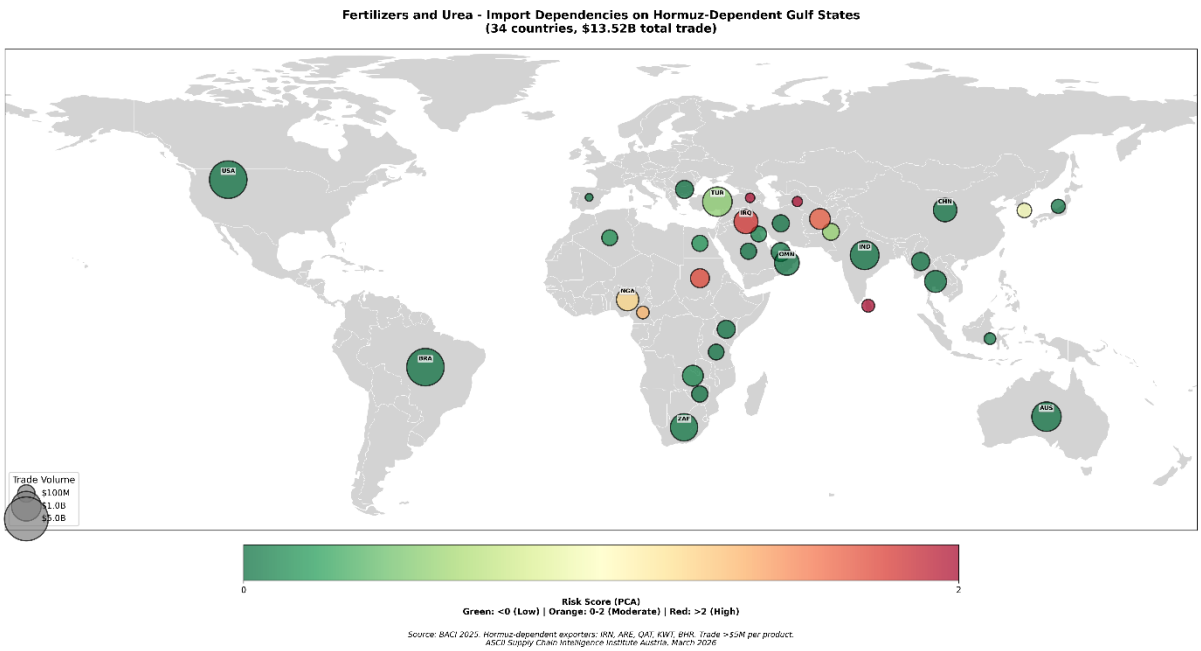

Figure 2: Global trade dependencies for fertilizers and urea from Hormuz-dependent Gulf exporters. Bubble size represents trade value; color indicates risk score. Key finding: USA, Brazil, and Australia are largest importers but face limited short-term impact due to advance purchasing.

[2] Verschuur, J., Vittis, Y., Obersteiner, M. et al. Heterogeneities in landed costs of traded grains and oilseeds contribute to unequal access to food. Nat Food 6, 36–46 (2025). https://doi.org/10.1038/s43016-024-01087-7

3.3. Iron and Steel Products

Iron and steel products represent a moderate-risk category, with trade flows spread across 93 importing countries. While trade volumes are substantial, most countries have access to alternative suppliers, limiting the potential for severe supply disruptions.

Regional concentration is notable. Middle Eastern countries account for the majority of imports, reflecting ongoing construction booms. Iraq, Saudi Arabia, Oman, and the UAE import significant volumes of construction steel, reinforcing bars, and semi-finished products. Asian destinations include India, Indonesia, and Thailand.

The product mix spans from raw materials to finished goods. Iran exports construction steel bars, reinforcing rods, and semi-finished steel products primarily to neighboring countries. The UAE re-exports steel products and ferrous scrap. Product categories include iron ore and concentrates, semi-finished products like ingots and slabs, ferrous scrap, and finished construction steel.

Certain countries face higher exposure than others. Turkmenistan, Pakistan, Armenia, and Tajikistan show near-total dependence on Iranian construction steel bars for specific product categories. Iraq relies significantly on Iranian steel for post-conflict reconstruction. These landlocked Central Asian countries face more limited substitution options in the short term compared to coastal nations with easier access to seaborne imports from China, India, Turkey, or European producers. For most countries, the primary impact of a disruption would be project delays rather than supply crises. Construction timelines could slip by days to weeks, and prices might rise in an extended disruption scenario, but alternatives from China, India, Turkey, and European producers remain available.

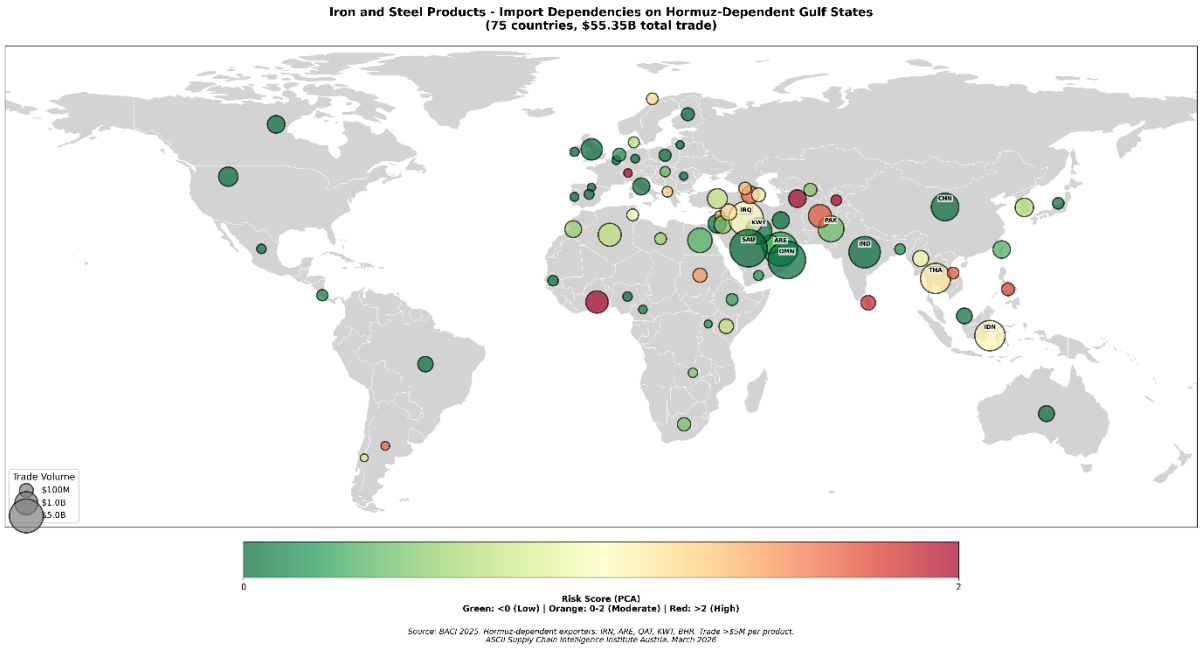

Figure 3: Global trade dependencies for iron and steel products from Hormuz-dependent Gulf exporters. Bubble size represents trade value; color indicates risk score. Key finding: Central Asian countries (Turkmenistan, Pakistan, Tajikistan) show high risk due to near-total dependence on Iranian construction steel.

3.4. Specialty Gases for Semiconductor Production

A strategically important category often overlooked in broader trade analyses involves specialty gases used in semiconductor manufacturing, particularly neon, helium, argon, krypton, and xenon. These rare gases are essential inputs for lithography, etching, and other critical processes in chip fabrication.

Annual trade from Gulf states in this category totals approximately USD 3 billion across 26 importing countries (2022-2023 average). Unlike many other product categories, this market shows remarkable concentration on the supply side. Qatar dominates with roughly 98 percent of Gulf specialty gas exports, reflecting the country's position as a major producer of industrial gases as a byproduct of its massive LNG operations. The gas separation processes used in LNG production naturally yield rare gases as byproducts.

The geographic distribution of imports reveals the global semiconductor manufacturing landscape. Major semiconductor-producing countries show annual imports from Qatar: China (hundreds of millions annually), Singapore, Taiwan, South Korea, the United States, Germany, and Japan. These figures align with known concentrations in semiconductor fabrication capacity, though it is important to note that these countries also produce specialty gases domestically and import from multiple sources.

Despite Qatar's dominance among Gulf exporters, the overall risk profile remains low. All major importing countries maintain diversified supply options beyond the Gulf. The global specialty gases market includes significant production capacity in the United States (Air Liquide, Linde, Air Products facilities), Europe (industrial gas companies), Russia, China (domestic production expansion), and other regions. Ukraine was historically a major neon supplier (producing roughly 50 percent of global semiconductor-grade neon before 2022) until the Russia-Ukraine conflict disrupted production, demonstrating both the vulnerability of concentrated supply chains and the semiconductor industry's demonstrated capacity to adapt through alternative sourcing, strategic inventory drawdowns, and demand rationing.

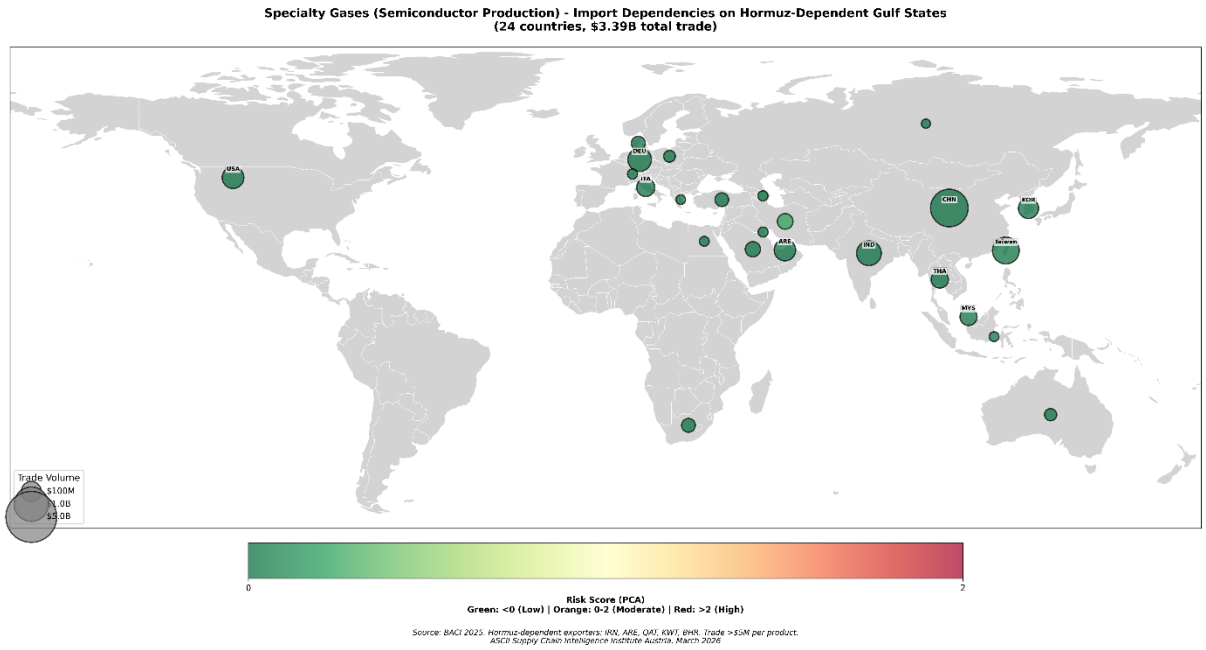

Figure 4: Global trade dependencies for specialty gases (helium, neon, argon, krypton, xenon) from Hormuz-dependent Gulf exporters. These rare gases are critical inputs for semiconductor manufacturing. Qatar dominates with 98% of exports. Key semiconductor producers shown: China (USD 2.3B), Taiwan (USD 0.7B), South Korea (USD 0.3B), USA (USD 0.4B). Total trade: USD 6.2 billion across 26 countries. All show low risk scores due to diversified global supply options.

For the semiconductor industry specifically, a Hormuz disruption would create price pressures and potential short-term allocation challenges, but the existence of alternative suppliers globally, combined with the industry's practice of maintaining strategic inventories for critical inputs, suggests resilience against anything other than prolonged disruption. The more significant concern would be if a Hormuz closure coincided with other supply disruptions affecting specialty gas production elsewhere in the world.

4. Shipping Disruption Analysis

4.1. The TIDES Model

To understand how a Hormuz closure would affect global shipping, we employed the TIDES model (Trajectory-Informed Discrete-Event Simulation), an agent-based maritime transport model.[3] It simulates 10,000 individual tankers as agents, each with fixed identities and travel histories derived from Automatic Identification System (AIS) data spanning 2019 to 2024. These ships navigate a network of 1,315 ports connected by global sea lanes, with routing behavior estimated using a second-order Markov process. The simulation is event-driven, capturing how capacity constraints and queue formation emerge when disruptions occur.

This approach captures dynamics that simple trade statistics cannot reveal: how delays propagate through interconnected schedules, how port congestion develops as vessels line up, and how network-wide spillovers spread effects beyond directly affected routes.

4.2. Scenario Results

The model examined three closure scenarios: 14, 28, and 56 days. The primary metric is delivery delay due to shipping days lost, a cumulative measure of vessel delay across the network. One day of lost shipping means that the total number of tankers arriving over the entire period, including any post-closure catch-up, is reduced by the average number of tankers arriving on one day without closure.

For China, see Figure 5, the most exposed region, the central metric suggests approximately 0.5 shipping days lost during a 14-day closure, rising to 1.7 days for a 28-day closure, and 4.3 days for a 56-day closure. For East Asia more broadly (Japan, Korea, and Taiwan combined) the estimates are slightly lower at 0.7, 1.2, and 3.0 days respectively. The European Union and United Kingdom together show the lowest exposure at 0.7, 1.0, and 2.2 days across the three scenarios, see Figure 6.

[3] https://maritimestudies.nus.edu.sg/maritimeredi/magazine/articles/v3n2/, accessed 03/10/2026

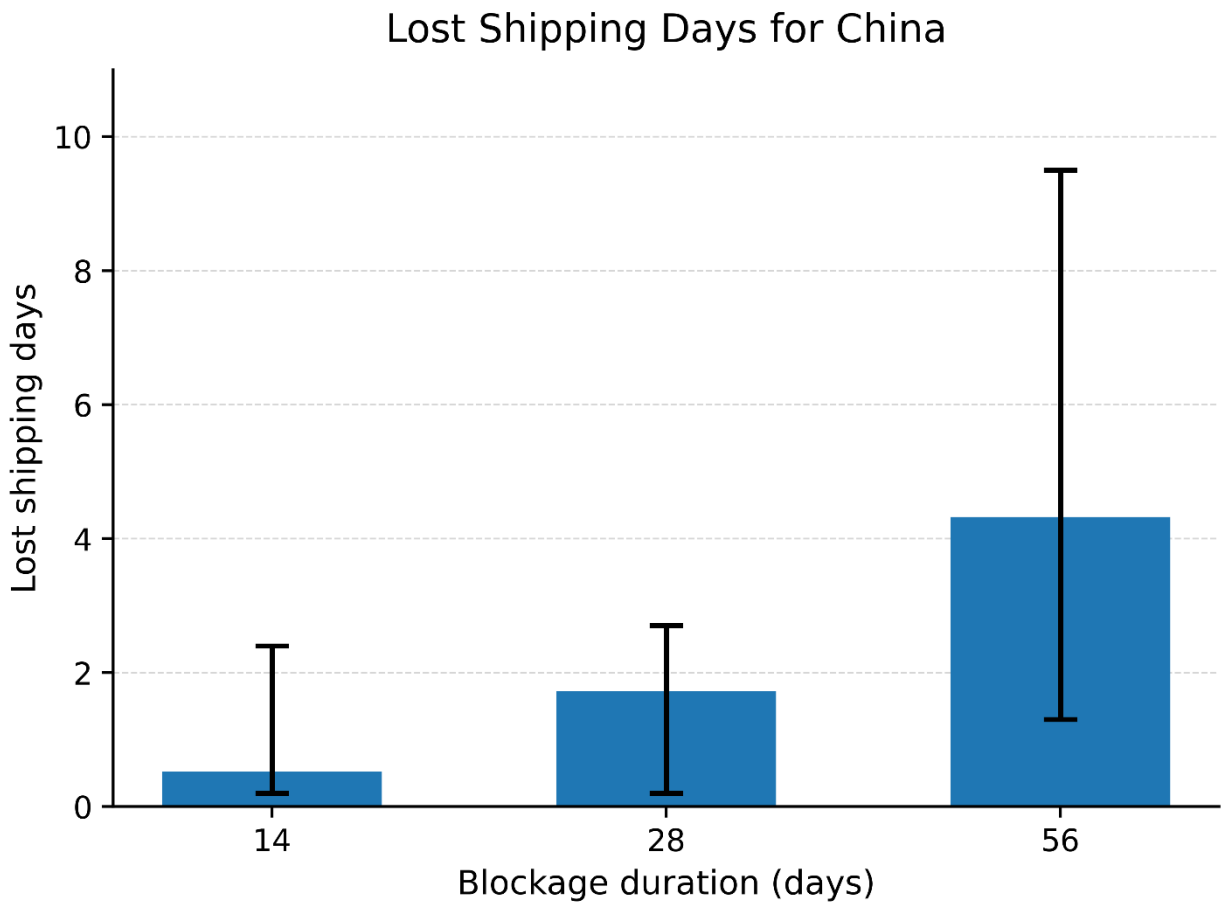

Figure 5: The plot shows the days of lost tanker shipping for ports in China for blockages of the strait of Hormuz across different durations. Error bars show 95% confidence intervals. Disruptions increase disproportionately with blockage duration.

Figure 6: Days of lost tanker shipping for ports in the EU and UK. For durations of 4 weeks or below, results are indistinguishable from noise.

These central estimates represent the most likely outcomes, but the confidence intervals are substantial. For China's 56-day scenario, the range spans from 1.3 to 9.5 days lost. This wide range reflects genuine uncertainty in scenario analysis. The model reveals that disruption will occur, but the exact magnitude depends on many factors that cannot be precisely predicted at this time.

4.3. Cascading Failures

An important finding emerges from comparing the scenarios. The impact does not scale linearly with duration. A 56-day closure leads to more than twice the shipping disruption of a 28-day closure, even though the duration only doubles.

This disproportionate scaling reveals a critical insight: the shipping network has a tipping point. Once disruption persists beyond approximately four weeks, cascading failures begin to accumulate. Missed port calls create schedule backlogs that compound over time. Vessels fall behind their rotation schedules, affecting subsequent voyages across multiple routes. Port congestion develops as delayed vessels arrive together, overwhelming terminal capacity. These effects spread through the network, creating spillovers beyond routes directly affected by the Hormuz closure.

The practical implication is significant. A short disruption of under two weeks would likely have limited cumulative impact, with shipping schedules recovering quickly. A medium disruption of about a month would create noticeable but manageable effects. However, an extended disruption of two months or more would generate disproportionately severe consequences, with impacts potentially two to three times worse than a simple linear extrapolation of losses would suggest.

Another role of ports in the region is transshipment. In this case containers are transferred between vessels moving between Asia and Europe or in the opposite direction. Disruptions in the region could therefore affect not only local shipping activity but also broader container flows linking the two regions. A prolonged disruption could increase shipping costs between Asia and Europe and create bottlenecks in global container shipping as vessels are forced to reroute or adjust schedules. However, the results of our model suggest that even in the 56-day scenario such effects remain limited and do not generate large additional congestion in the other parts of the global container network.

This finding has direct policy implications. Every week of continued disruption matters disproportionately, meaning rapid resolution should be the priority objective while contingency planning for extended scenarios is also warranted.

4.4. Limitations

These reported estimates should be considered conservative because the model does not include certain adaptive behaviors. The model assumes a fixed fleet without temporary chartering or vessel redeployment. It also assumes no additional supply response from alternative exporters.

In reality, operators would shift to alternative suppliers where possible, reroute vessels around Africa (adding two to three weeks to journeys), and charter additional ships. This adaptive behavior would reduce actual impacts compared to model estimates but would also drive price increases. The model therefore represents a baseline disruption scenario rather than a full adaptation scenario.

5. European Union and United Kingdom: Country-by-Country Assessment

The European Union's annual imports from Gulf countries (Iran, UAE, Qatar, Kuwait, Bahrain) total approximately USD 47 billion per year based on 2022-2023 trade data. Including the United Kingdom brings the figure to approximately USD 60 billion per year. This section provides detailed assessments for EU member states and the UK, organized by exposure level.

5.1. Major European Importers

United Kingdom – USD 12.9 billion per year. The UK shows the highest European exposure to Gulf imports. Qatari LNG and propane dominate at USD 5.9 billion per year, representing 46 percent of UK Gulf trade. UAE exports contribute USD 3.8 billion annually, primarily gold and diamonds through London's financial markets. Kuwait adds USD 2.9 billion in petroleum products. This energy sector concentration creates genuine vulnerability, LNG cannot easily be substituted in the short term.

Italy – USD 9.8 billion per year. Italy faces substantial exposure concentrated in energy products. Qatar supplies USD 6.3 billion annually, predominantly liquefied natural gas (USD 4.4 billion per year average) and propane (USD 3.2 billion per year in 2023). The UAE contributes USD 2.6 billion, primarily gold through Italian financial centers. Italian energy infrastructure relies heavily on these Qatari gas flows, creating vulnerability. Alternative LNG suppliers exist (United States, Algeria, Egypt, Norway) but expanding import capacity might require infrastructure investments at existing terminals and contract renegotiations.

Belgium – USD 8.2 billion per year. Belgian exposure differs qualitatively from Italy and the UK. Qatari LNG dominates at USD 5.8 billion per year, reflecting Belgium's role as a European gas hub through the Zeebrugge terminal. UAE exports total USD 2.1 billion annually, primarily diamonds through Antwerp's role as a global diamond trading center. While LNG imports matter for Belgian energy security, the diamond trade represents financial flows rather than critical supply chains, alternative diamond sources exist globally, and trading patterns can shift more readily than energy infrastructure.

France – USD 8.1 billion per year. French imports show moderate diversification across Gulf suppliers. Qatar leads at USD 3.1 billion per year (propane and petrochemicals), followed by UAE at USD 2.6 billion (gold, machinery), and Kuwait at USD 2.0 billion (petroleum products). France's multiple LNG import terminals and diversified energy sources (nuclear, renewables) provide buffering capacity. The geographic spread across suppliers reduces concentration risk compared to Italy or the UK.

Germany – USD 5.7 billion per year. German exposure shows notable diversification across both products and Gulf suppliers. The UAE dominates at USD 4.2 billion per year, reflecting purchases of maritime vessels, yachts, and industrial equipment rather than consumption goods. Qatar contributes USD 0.6 billion (propane and specialty gases), Kuwait USD 0.4 billion, and Iran USD 0.3 billion (carpets, pistachios). German specialty gas imports from Qatar used in semiconductor fabrication and industrial processes represent a small but strategically important component. The diversified composition and lower reliance on irreplaceable energy products place Germany in a more resilient position than Italy or the UK.

5.2. Moderate Importers

Netherlands – USD 5.5 billion per year. Dutch imports reflect Rotterdam's role as Europe's largest port and trading hub. Qatar supplies USD 2.8 billion annually (LNG and petrochemicals), the UAE USD 1.7 billion, and Kuwait USD 0.8 billion. The Rotterdam LNG terminal (Gate terminal) provides import flexibility, and the country's position as a European gas distribution hub means disruptions would affect broader European markets through pipeline interconnections.

Spain – USD 3.5 billion per year. Spanish imports show balanced distribution across Gulf suppliers. The UAE leads at USD 1.3 billion per year (petroleum products, machinery), followed closely by Qatar at USD 1.3 billion (propane). Kuwait contributes USD 0.4 billion and Bahrain USD 0.3 billion (aluminum). Spain's diversified energy mix, Mediterranean LNG terminals, and alternative gas pipeline connections to Algeria provide substantial buffering capacity against Gulf supply disruptions.

Poland – USD 1.4 billion per year. Polish exposure concentrates on energy products, particularly Qatari propane at USD 0.6 billion per year used for heating and chemical feedstock. The UAE contributes USD 0.5 billion (steel structures, tin), Kuwait USD 0.2 billion, and Bahrain USD 0.1 billion. The concentration on propane creates vulnerability, though propane has more flexible sourcing options than LNG, with alternative suppliers in the United States, Russia, and Norway.

5.3. Other EU Member States

Beyond the countries with major or moderate exposure, the remaining EU member states show limited dependencies on Hormuz-dependent Gulf trade, with individual country exposures ranging below USD 1.0 billion. Common patterns emerge across these smaller exposures.

Energy products appear frequently, particularly Qatari propane and LNG imports to Portugal, Bulgaria, Greece, Croatia, and several Nordic countries. These reflect Europe's broader energy diversification efforts and the role of Gulf suppliers in balancing seasonal demand fluctuations. However, the modest volumes involved, typically a few hundred million dollars per country, represent small fractions of national energy consumption with multiple alternative sources readily available.

Industrial inputs and intermediate goods dominate many smaller dependencies. The UAE supplies electrical equipment, machinery parts, and industrial materials to Ireland, Netherlands, Hungary, and the Baltic states. Bahraini aluminum and glass fibers flow to several countries supporting manufacturing sectors. Iranian petrochemicals and plastics serve construction and packaging industries in Romania, Bulgaria, and Greece. None of these dependencies represent critical bottlenecks, alternative suppliers across Europe, Asia, and North America can readily substitute.

Specialty and luxury goods round out the picture. Iranian dates and saffron appear in Danish, Swedish, and Spanish imports reflecting culinary preferences. UAE artwork, goldsmith wares, and porcelain flow to Greece, Denmark, Luxembourg, and Cyprus, representing high-value trade in non-essential goods. These dependencies reflect market preferences rather than strategic necessities.

Aerospace and maritime equipment create specific dependencies for some countries. UAE and Bahraini aircraft engines and parts supply Ireland, Luxembourg, and France, while maritime vessels and equipment flow to Netherlands and Sweden. These reflect established supply chain relationships in high-value sectors where alternative suppliers exist but switching involves transaction costs and certification requirements.

5.4. Austria

Austria shows minimal direct exposure at USD 0.3 billion per year (2022-2023 average). The UAE dominates at USD 0.2 billion annually (primarily industrial equipment, machinery, and re-export trade through Dubai), followed by Bahrain at USD 0.05 billion (aluminum products), Iran at USD 0.02 billion (carpets, pistachios), Qatar at USD 0.02 billion, and Kuwait at USD 0.005 billion. None of these represent strategic dependencies with limited substitutes.

Austria has no critical dependencies on Gulf imports. The main economic channel for potential impact would be indirect, through energy price transmission via integrated European markets. If Italian, Belgian, or British LNG supplies face disruption and European gas prices rise accordingly, Austrian energy costs would

increase through pipeline interconnections with Germany and Italy. Austria imports the vast majority of its natural gas via pipeline from Russia, Norway, and domestic production, with no direct LNG imports from Gulf countries. This indirect exposure through European gas market integration cannot be precisely quantified from bilateral trade data but represents Austria's primary vulnerability.

5.5. EU Summary Assessment

The European Union shows highly uneven exposure distribution across member states. Annual imports from Gulf countries total USD 47 billion (2022-2023 average), with the top five countries—Italy, Belgium, France, Germany, and the Netherlands—accounting for USD 37 billion or 79 percent of the EU total.

The majority of EU member states face annual exposure below USD 1 billion each, representing negligible shares of their total imports (typically less than 0.5 percent). For these countries, including Austria, direct supply disruption would have minimal economic impact. The primary transmission channel would be through energy price effects if Italian, Belgian, or British LNG imports face sustained disruption, transmitting through Europe's integrated gas pipeline networks and electricity markets.

The overall EU picture suggests concentrated vulnerability in specific countries (Italy, UK, Belgium) for specific products (Qatari LNG), with the broader Union relatively insulated from direct trade disruption. Policy coordination should focus on Italian and British energy security, Belgian gas hub resilience, and preparing for potential price transmission effects across integrated European energy markets. The diversified supplier base for most other products (machinery, industrial equipment, metals) and the availability of alternative European, Asian, and North American sources suggest manageable adaptation pathways for non-energy imports.

6. Putting the Findings Together

6.1. Duration Matters Most

The combined analysis reveals that the duration of any disruption is the critical variable determining economic impact. For energy products, the impact would be substantial regardless of duration because these commodities cannot be easily replaced in the short term. Prices would spike immediately, and strategic reserves could only buffer short-term shocks.

For fertilizers, the current 2026 planting season is already secured through advance purchasing. The main concern would be procurement for the 2027 season if disruption extends to, say, September or later. The impact would likely manifest as price increases affecting farm profitability rather than physical shortages affecting food production.

For iron and steel, most countries have alternatives. The main impact would be project delays and price increases rather than supply crises, with substitutions possible within weeks to months.

Specialty gases for semiconductor production (neon, helium, argon, krypton, xenon) total approximately USD 3 billion annually, with Qatar providing 98 percent of Gulf exports as LNG production byproducts. Major semiconductor producers (China, Taiwan, South Korea, the United States, Germany, and Japan) all maintain diversified supply options beyond the Gulf. The industry's 3-6 months strategic inventories, combined with alternative suppliers in the United States, Europe, Russia, and China, suggest resilience against anything shorter than disruptions of several months duration. The 2022 Ukraine crisis (affecting 50 percent of global semiconductor-grade neon) demonstrated the industry's adaptation capacity through inventory management, alternative sourcing, and purity specification adjustments.

A consistent pattern emerges across all product categories examined, oil, gas, fertilizers, aluminum, iron, steel, and specialty gases. Uncertainty transmits first through price increases rather than immediate physical shortages. For short blockage durations of a few weeks, markets experience price volatility but physical supplies would likely remain available as strategic inventories buffer immediate needs and alternative sourcing activates. Prices would be expected to revert toward normal levels once the situation normalizes and shipping schedules recover.

The picture changes fundamentally for prolonged disruptions that last several months. While outright physical shortages remain less likely than initially feared, given the existence of alternative suppliers and the market's demonstrated capacity for adaptation, sustained elevated prices would create different challenges. European industries directly or indirectly on Gulf inputs would face competitiveness pressures as their production costs rise relative to competitors accessing cheaper alternatives. These sustained price increases could amplify recession risks, particularly for energy-intensive manufacturing sectors already operating on thin margins. The primary economic threat from an extended Hormuz closure would therefore manifest through macroeconomic channels, cost-push inflation, reduced industrial competitiveness, and demand destruction, rather than through the physical unavailability of critical goods.

The shipping model reinforces this duration-dependent pattern. Short disruptions create small, recoverable delays. Medium disruptions generate noticeable effects. Extended disruptions trigger disproportionate escalation as the network's cumulative memory of delays compounds.

6.2. What This Means for Policy

The analysis suggests several implications for decision makers in Europe.

- First, very short disruptions have very limited long-term impacts, so rapid resolution is crucial. The results suggest that closures lasting a few weeks can be offset by the global shipping system, thereby limiting economic consequences. Therefore, keeping disruptions brief reduces the likelihood of delays propagating through supply chains and escalating into broader economic effects.

- Second, contingency planning for extended scenarios makes sense. Given the disproportionate scaling of impacts, preparing for disruptions lasting a month or more is worthwhile, even if the probability seems low.

- Third, communication matters. Historical precedent from the Russia-Ukraine crisis shows that markets adapt to supply disruptions, but panic buying and hoarding can amplify effects. Clear communication from authorities can help prevent unnecessary turbulence.