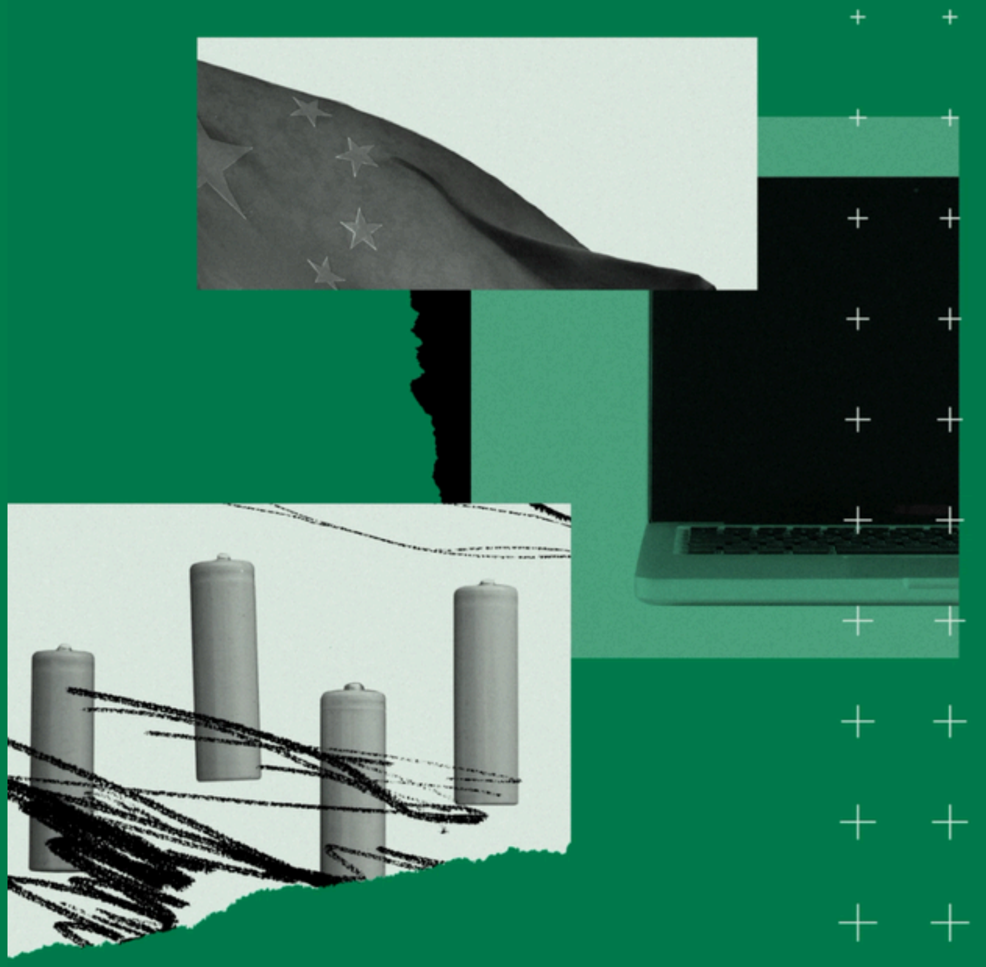
Altana

Official Report

Analyzing Vast Critical Minerals Exposure in U.S. Value Chains



Read the Full Analysis

2025

About **Altana**

THE ONLY PRODUCT NETWORK.

Altana is the only product network connecting buyers, suppliers, logistics providers, and government agencies to drive resilience, compliance, and efficiency across the global supply chain. Customers like Boston Scientific, General Atomics, L.L.Bean, Maersk, US Customs and Border Protection, and the UK Department of Business and Trade use Altana to design optimal product lines, protect national security, and promote economic growth through collaboration. To learn more, visit altana.ai

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Key Findings

Key findings from Altana's China battery and magnet analysis:

- China dominates the total value of global trade in lithium ion batteries and permanent magnets, with up to **30X more export value than the U.S.**

- Billions of dollars of Chinese lithium ion battery trade value comes from capital goods and direct inputs for the manufacturing of lithium batteries. This indicates **unmatched Chinese manufacturing capacity for product components made of rare earth metals**.

- American industries, including autos, energy, electronics, and medicine, have **hundreds of billions of dollars of dependence on permanent magnets** newly subject to Chinese export restrictions. Quantifying this dependence requires upstream visibility beyond Tier 1 suppliers.

Overview

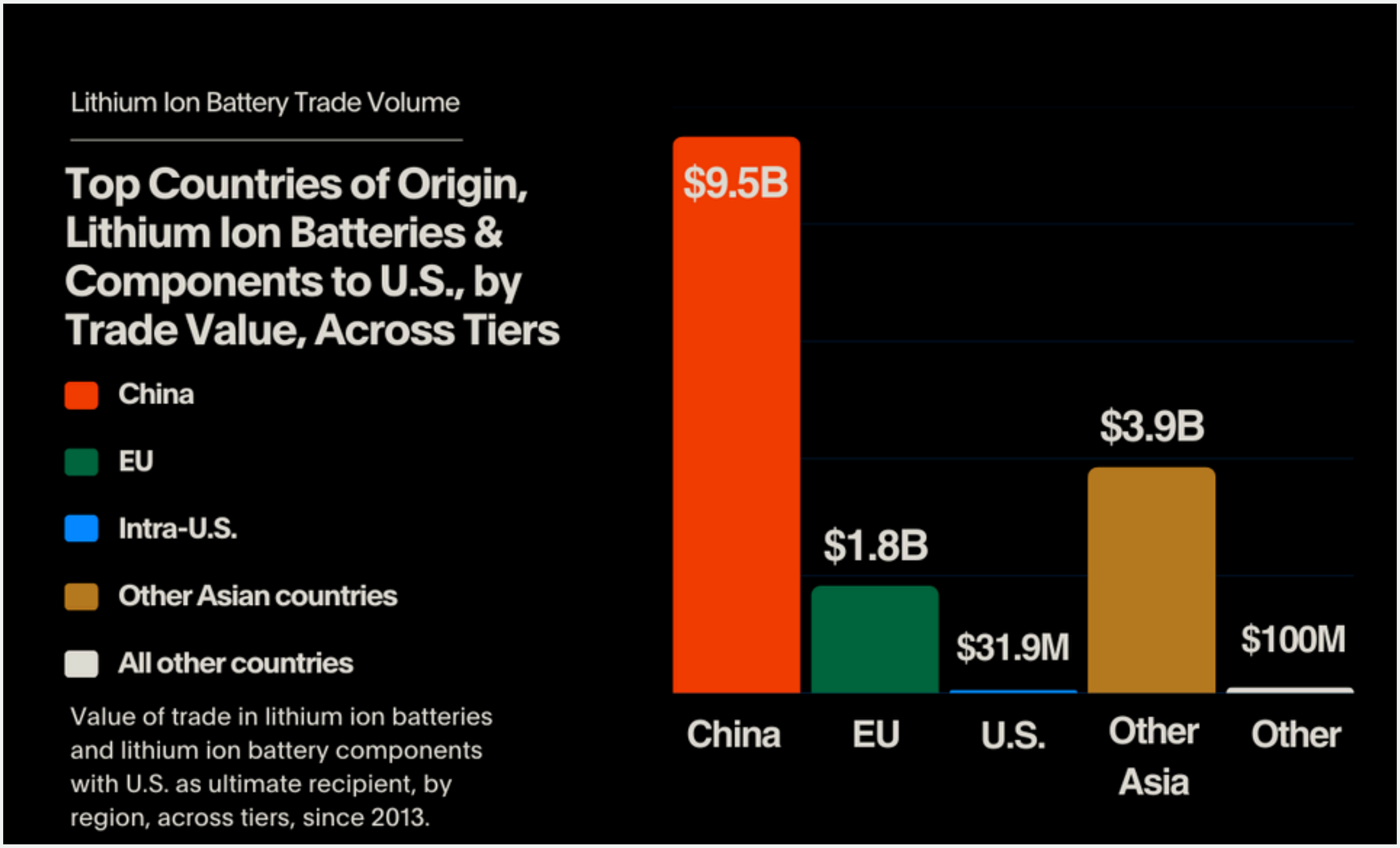
Amid global trade fragmentation and escalating great power conflict between the U.S. and China, vast upstream exposure of Chinese lithium ion batteries and permanent magnets presents significant strategic and economic challenges for the U.S. and U.S. industry, an Altana analysis reveals.

Critical mineral dependence is not merely a matter of trade imbalance; it is a profound, multi-tier challenge that exposes U.S. industry to heightened tariffs, results in product value chains that rely on Chinese components subject to new export restrictions by Beijing, and raises national security concerns, as connected vehicles, vital medical equipment, and more depend on Chinese materials and manufacturing.

Read on for Altana's full analysis of tens of thousands of shipments, hundreds of billions of dollars of trade value, and thousands of product imports and exports by American companies to learn about U.S. exposure to and dependence on Chinese critical minerals.

Across trade tiers, a preponderance of total lithium ion battery trade value destined for the U.S. originates in China

Altana's analysis demonstrates that most of the value of U.S.-bound trade of lithium ion batteries traces back to China. Substantial trade value registers elsewhere in Asia and the European Union.



Chinese Dominance in Lithium Ion Battery Trade

$9.5 billion in lithium ion trade value bound for the U.S. originates in China; $3.9 billion originates elsewhere in Asia; $1.8 billion in the EU; $100 million elsewhere globally; and only $31.9 million in the U.S.

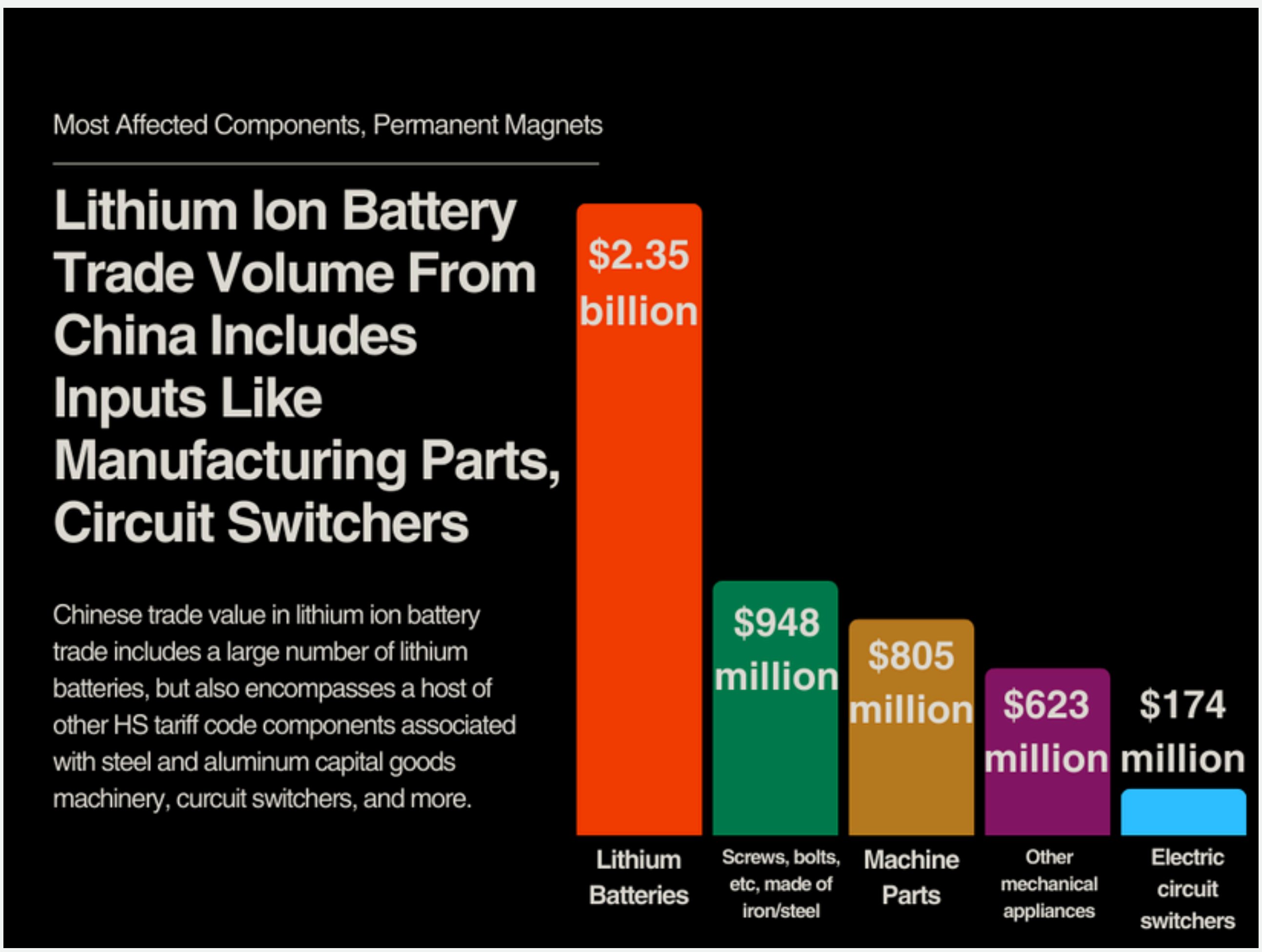
These values reflect inputs, manufacturing, and products across all tiers of the lithium ion battery supply chain. Chinese dominance across tiers indicates not just a stranglehold on lithium ion battery products, but also a huge amount of capital invested in upstream manufacturing activities associated with the production of lithium ion battery products bound for the U.S.

Chinese Dominance in Lithium Ion Battery Trade

The analysis reveals that American businesses don't merely have Chinese lithium ion batteries present in product value chains, but also vast upstream exposure to sensitive components and inputs that funnel into the batteries and could pose regulatory and financial challenges.

Only with Altana's unique, product-level dataset is it possible to evaluate the trade of lithium ion batteries and:

1. Map and visualize the value of lithium ion batteries.
2. Quantify the upstream value of direct inputs for the manufacturing of these batteries, including raw materials and capital goods.



The total value of trade of lithium ion batteries bound for the U.S., originating in China, includes $2.35 billion of actual lithium batteries. But a roughly equivalent amount of trade value comes from capital goods that go into the manufacturing of lithium batteries: $948 million of screws, bolts, and other derivative parts made of aluminum, iron, and steel; $805 million of machine parts; $623 million of mechanical appliances, including specialty oxidizers; and $174 million of electric circuit switchers, tailor-made to transform electrochemical energy into electrical energy and transmit that energy as a current, making the battery operational.

In addition to demonstrating China's developed manufacturing capacity for lithium ion batteries, the trade value linked to goods and inputs that go into lithium batteries could indicate enduring tariff exposure for U.S. businesses considering onshoring or friend-shoring battery supply chains. Chinese lithium ion batteries themselves are already subject to a Section 301 tariff rate of at least 7.5% when imported into the U.S. Without capacity for lithium ion battery manufacturing, a U.S. company attempting to build a battery facility and import materials may face tariffs on multiple levels, swapping exposure to tariffs on the battery to exposure to tariffs on:

- Raw materials not generally available in the U.S., such as lithium, required for battery production
- Steel and aluminum derivative products, like screws, bolts, nails, and pre-fabricated structures that already face an elevated Section 232 tariff rate
- Specialized machinery for manufacturing lithium ion batteries
- Newly increased tariff rates on products originating in countries across the world other than China

Certain Chinese suppliers driving large percentages of total lithium ion battery shipment volume, infecting value chains of multiple U.S. companies

A number of Chinese suppliers are responsible for a disproportionate value of lithium ion battery shipments and infect hundreds of companies' value chains, the analysis demonstrates.

Chinese Supplier Breakdown, Lithium Ion Batteries

Top Chinese Suppliers of Lithium Ion Batteries & Components

Chinese Supplier	Value of Shipments	Total U.S. Recipients
Ningde Times, Ltd.	$3.43 billion	93
Hong Kong EcoFlow	$263 million	12
Jiangsu Aside Energy	$145 million	5
Xiamen Hithium Energy Storage	$139 million	6
Shenzen Kelu Electronic	$123 million	2
Anker Innovations	$87 million	17
Hubei Yiwei Power	$59 million	14

Certain Chinese suppliers driving large percentages of total lithium ion battery shipment volume, infecting value chains of multiple U.S. companies

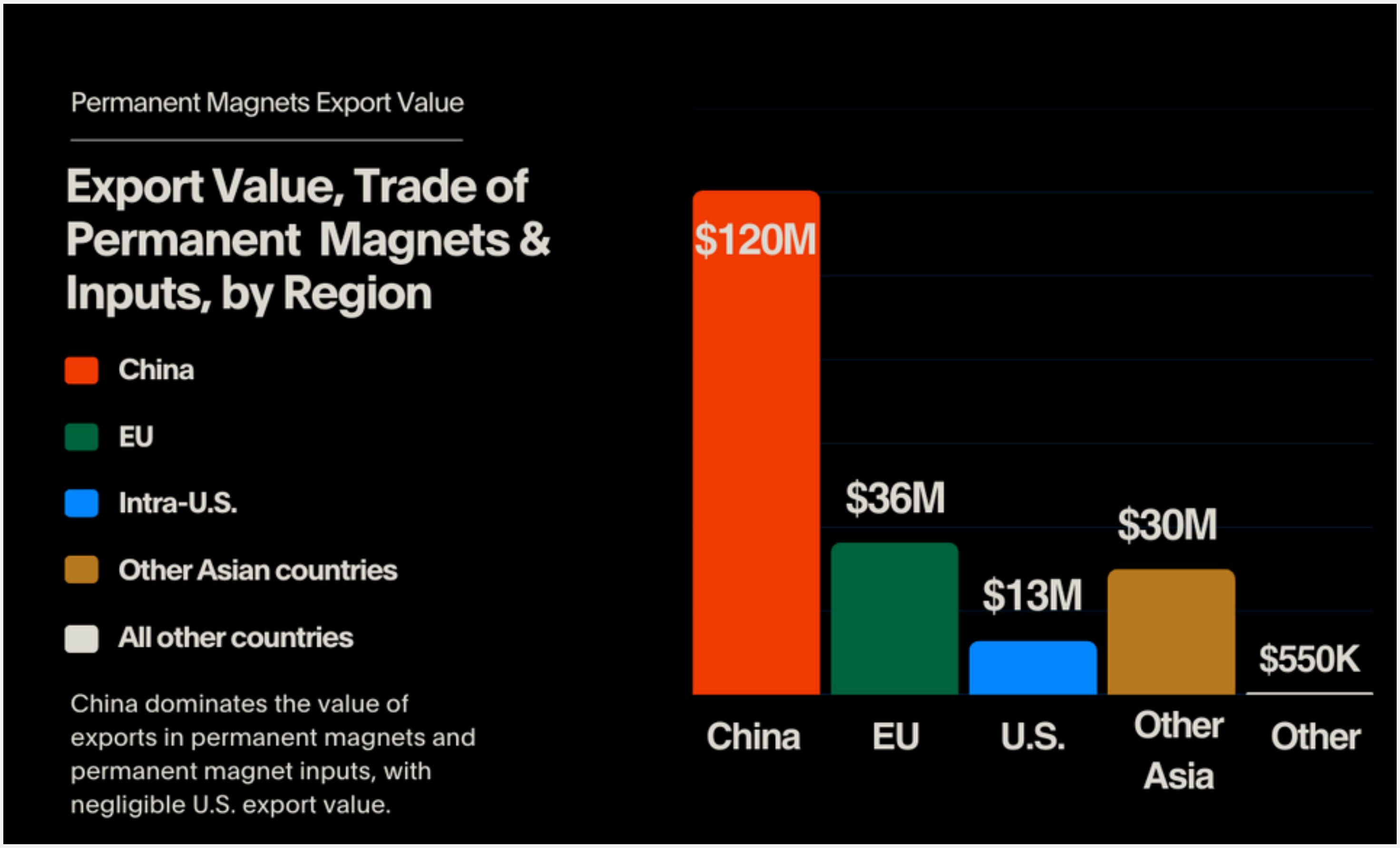
One specific Chinese supplier, Ningde Times, Ltd., is responsible for total lithium ion battery trade of $3.43 million, and has 93 direct U.S. recipients.

Other Chinese entities are the suppliers for hundreds of millions of dollars worth of lithium battery shipments, and have up to 17 U.S. recipients.

These significant shipment values, and large number of U.S. recipients, indicate the vital role Chinese enterprises play in U.S.-bound product value chains that include lithium-ion batteries.

China dominates export value of the trade of permanent magnets, with a fraction of magnet and magnet input trade value coming from other geographies

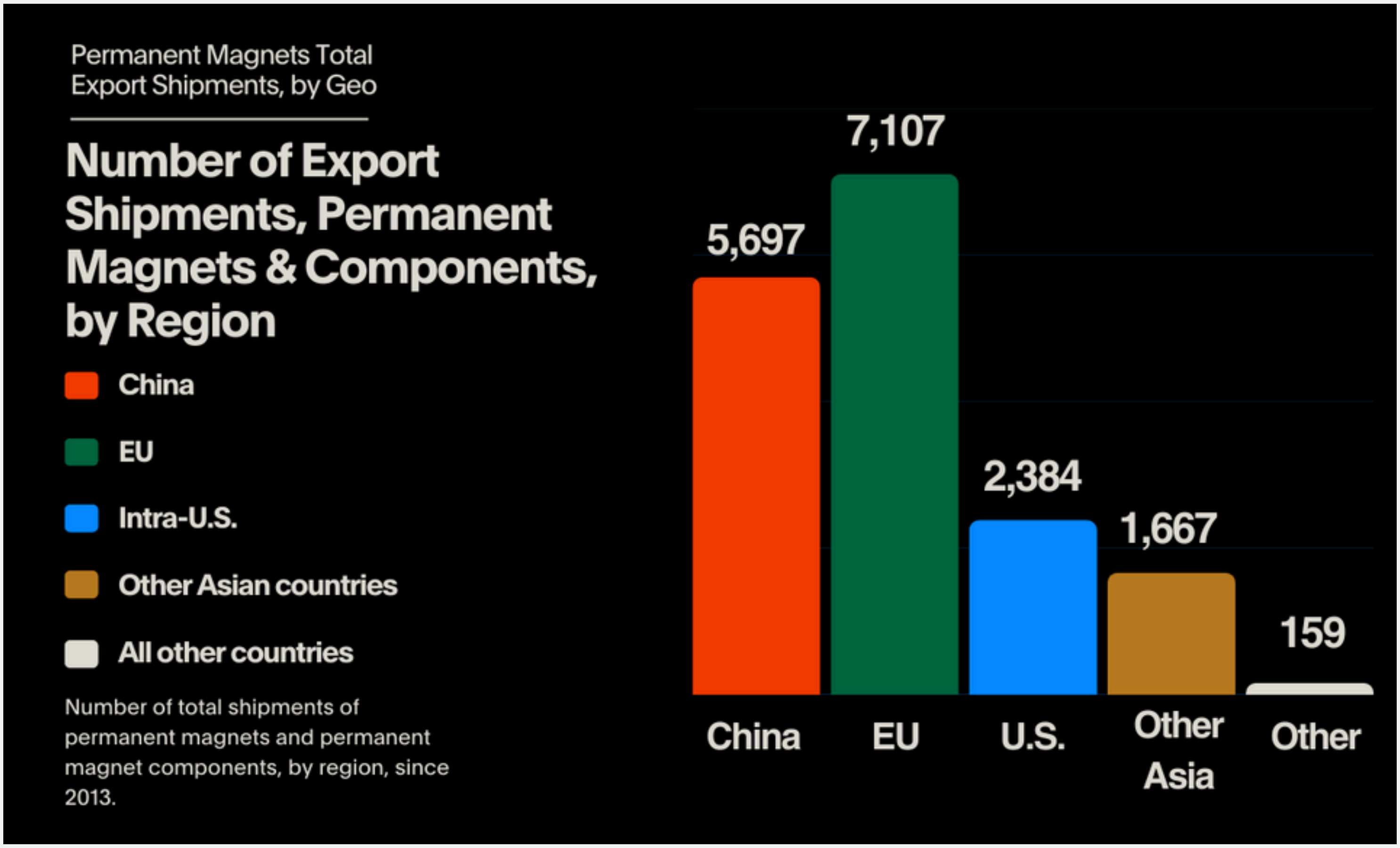
Across trade tiers, Altana's analysis demonstrates that the preponderance of the value of permanent magnet trade comes from Chinese exports.



Permanent Magnet Trade Flow

$120 million in value of permanent magnets is present in Chinese exports, with only $36 million in exports from the EU, $30 million from elsewhere in Asia, and $13 million from the U.S. Across tiers, the data represents that China exports huge volumes of permanent magnets and permanent magnet inputs, while the U.S. has limited export value associated with permanent magnets.

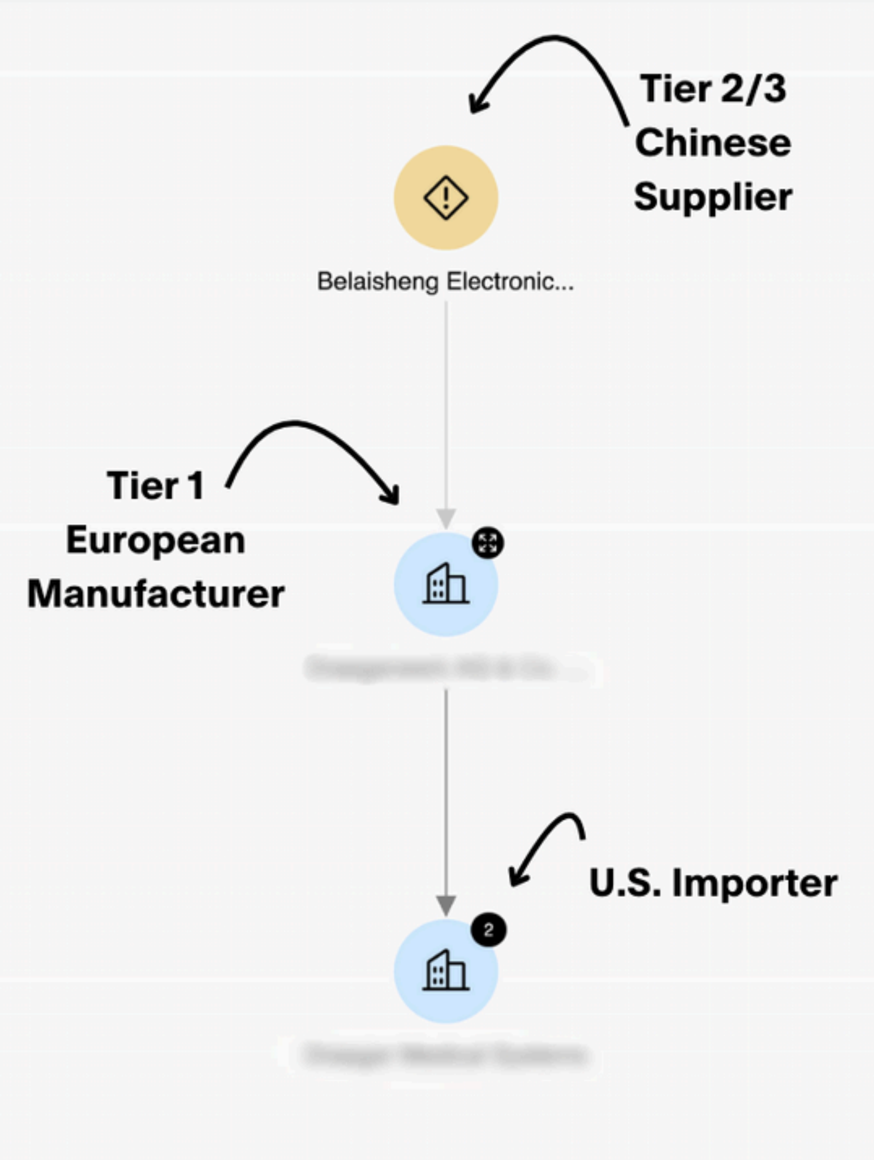
Interestingly, there are a large number of export shipments of permanent magnets and magnet inputs that come from the EU, even though the value of multi-tier permanent magnet exports comes primarily from China.



Permanent Magnet Trade Flow

Since 2013, there have been 7,107 EU export shipments of permanent magnets and inputs, compared to 5,967 from China, and 2,384 from the U.S. The geographic disparity between the total number of export shipments and the value of permanent magnet exports is explained by the upstream presence of Chinese permanent magnets in product value chains that travel from China to the EU to the U.S.

Within Altana's product network, there are ample examples of upstream Chinese suppliers transshipping permanent magnets and permanent magnet components through Europe, where they are transformed by Tier 1 European manufacturers. These manufacturers then send products that include permanent magnets to U.S. subsidiaries and end buyers.

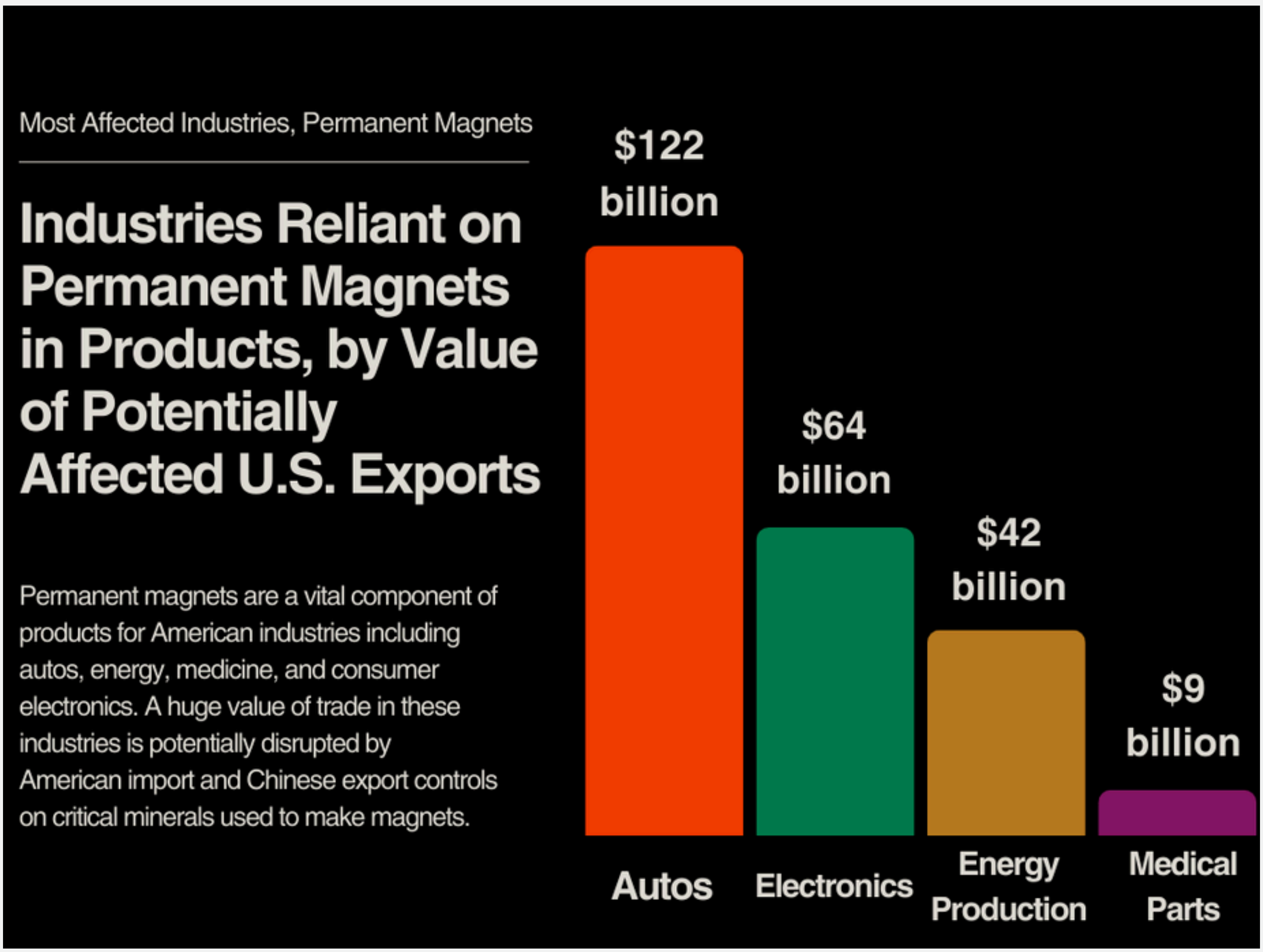


Permanent Magnet Trade Flow

This insight reveals that **without visibility beyond Tier 1 suppliers**, and a clear view of where inputs occur along the value chain of products, U.S. importers risk not having an honest accounting of Chinese permanent magnet components in products that rely on them.

American industries that rely on permanent batteries include autos, energy, medicine, consumer electronics; Businesses could face rippling downstream exposure to new Chinese export controls

What American products rely on permanent magnets? The analysis reveals that among U.S. exports of products in which permanent magnets are inputs, value is concentrated in autos, electronics, energy production, and vital medical parts.



American Companies’ Downstream Exposure to Chinese Export Controls

The U.S. industry with the most trade value tied to exports of products made of permanent magnets is autos, with $122 billion of exports. Permanent magnets are an especially integral component of electric vehicles. Electronics, including consumer electronics such as speakers, microphones, laptops, smartphones, and wireless chargers, have $64 billion in exports. $42 million of exports of American energy also rely on permanent magnets, with magnets playing a vital role in energy and gas production, including hydraulic fracturing. Medical parts, including MRI machines, rely on permanent magnets; there are $9 billion of U.S. medical equipment exports that rely on permanent magnets as a product component.

A challenge for American businesses in these industries: **New Chinese export controls** on rare earth materials. These export controls apply to both seven categories of medium and heavy rare earths, some of which go into the manufacturing of permanent magnets, and permanent magnets as a finished product.

For American businesses across industries, these export controls cut off direct shipments of Chinese permanent magnets that are vital to product value chains. But with a limited number of direct Chinese shipments of magnets, and the way magnets often pass from China to third countries and then to the U.S. as they are transformed into products, American businesses must have a full accounting of product value chains to quantify their dependence on Chinese rare earth materials. Without knowing where in the value chain Chinese product inputs occur, American businesses could see the manufacturing and assembly of hundreds of billions worth of products compromised.

How Altana Can Help American Businesses

As the United States seeks to bolster its economic security, Altana can be used to rapidly discover global suppliers of generalized goods, as well as more specific components. Ongoing work will soon enable scenario modeling, allowing users to answer **what if** questions about disruptions and policy, such as:

- If China places export restrictions on a certain good, which US companies downstream will be most impacted?
- Where in product value chains does Chinese dependency lie?
- And what alternative sourcing options are available?

Methodology

Altana's unique dataset allows supply chain analysis and risk mitigation across multiple supplier tiers. To conduct this analysis, Altana first found all shipments of lithium ion batteries (represented by the HS code 850760) to the United States starting in 2013. Altana surfaced over 53,000 shipments that meet this criteria to 3,500 U.S.-based companies

To construct the secondary tier, Altana first leveraged proprietary data to identify HS codes used as inputs for lithium ion batteries, including both direct inputs and capital goods.

Then, Altana found shipments of the aforementioned HS codes, and of lithium ion batteries to the senders identified in the supplier chain tier.

For permanent magnets, Altana applied a similar approach, using proprietary data to determine the volume of US exports that rely on permanent magnets as inputs.

While Altana focused on national-level concentration risks in this analysis (i.e. the preponderance of China and Hong Kong-based companies in a network), Altana data allows analysis at both the company and address-level as well.

Navigate the new supply chain normal.

The global trade map is being redrawn before our eyes, forcing business leaders to fundamentally refocus on how they manage their components to maintain profitability.

Altana connects global supply chain partners into a shared product network, making it possible to:

- Automate compliance to avoid penalties
- Build resilience to protect revenue
- Control tariff costs to protect margins

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