Niron Magnetics

In today's technology-driven world, rare earth elements have become indispensable components of the devices we rely on daily. These raw materials are used to make consumer electronics such as cell phones, TVs, computers, appliances, and automobile electronics, as well as many industrial products.

The production of rare earth elements has long been concentrated in China, raising significant concerns about the security and availability of global supply. Then the 2010-2011 trade dispute between China and Japan over rare earth elements, the U.S.-China Trade War, and the COVID-19 pandemic illuminated the vulnerabilities in these supply networks, prompting a wave of U.S. investment in alternative technologies.

In response, to reduce dependence on foreign sources the U.S. Department of Energy (DOE) spearheaded initiatives to direct resources toward research and development of alternative technologies.
The focused effort has spurred growth in new sectors, including the development of non-rare earth permanent magnet technology. Additionally, with more companies seeking domestic sources for materials and parts, many are revising their supply strategies to include reshoring and nearshoring.

In this evolving landscape, Niron Magnetics provides a compelling alternative to traditional rare earth magnets.

Reshoring Institute®
Non-profit and Non-partisan

Industrial Magnets

The $54 billion market for industrial magnets plays an increasingly vital role in modern technologies. Common devices that we use daily, such as computers, appliances, and automobiles are powered by permanent magnets. With increasing demand, there has been a growing interest in alternatives to the unsustainable rare earth magnets commonly used today. Niron's Clean Earth Magnet™ technology will enable mass production of high-performance permanent magnets based entirely on abundant, sustainable raw materials.

The production of traditional magnets is costly because rare earth elements are primarily sourced from China. The mining, extraction, and manufacturing processes are labor-intensive, expensive, and environmentally damaging. The U.S. Department of Energy (DOE) estimates that China currently controls approximately 90% of global rare earth refining and production, with the remainder coming primarily from Japan.

Currently, magnets imported from China are subject to a Section 301 penalty tariff of 25% in addition to the regular tariff rates of 5% on imported rare earth elements. The tariff rate on natural graphite and permanent magnets will increase another 25% in 2026. These high tariff rates make imports of magnetic raw materials economically untenable.

Research Grant from the U.S. Department of Energy

In 2011 a research grant from the Department of Energy was awarded to the University of Minnesota which led to the creation of the world's first rare-earth free permanent magnet in 30 years, and the founding of Niron Magnetics. Niron developed the first iron nitride magnet, revolutionary because the raw materials needed for Niron magnets -iron and nitride - are found abundantly throughout the world. Niron's magnets are cheaper and stronger and have a higher magnetization level than traditional rare-earth magnets.

Sustainability

The refining of raw materials for traditional rare-earth magnets is extremely harmful to the environment. For every ton of rare earth materials extracted and processed for use in traditional magnets, roughly 2,000 tons of toxic waste is generated. For this reason, most processing of the traditional rare-earth elements for magnets is done in remote areas of China.

Niron magnets are environmentally sustainable. Manufacturing of Niron magnets does not rely on rare earth elements. The key components iron and nitride are found almost anywhere in the world, so manufacturing and processing facilities are not limited to specific regions. The sustainable nature of the manufacturing process allows Niron manufacturing plants to potentially be established in any region in the world, including the U.S. This alleviates the volatile and risky nature of the current global supply and monopolization of the manufacturing process. Reducing volatility to supply chains due to disruptions and geopolitics also creates more stable and predictable pricing.

Rare Earth vs. Clean Earth

	Rare Earth (Neodymium)	Niron Clean Earth Magnet
Performance (Tesla)	High	High
Temperature Stability	Low	Very High
Price Stability	Very Low	Very High
Environmental Issues	High	Extremely Low

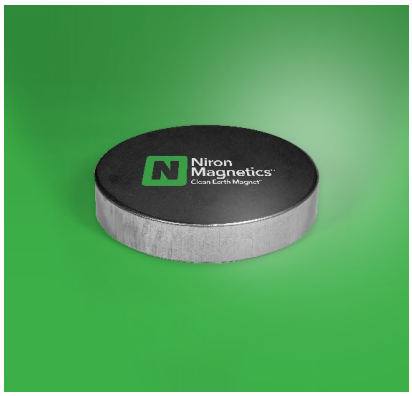
Source: https://www.nironmagnetics.com

Reshoring

As companies rethink their global sourcing and manufacturing, the availability of domestic raw materials and parts becomes an important decision factor. Reshoring decisions often start with a cost-comparison of labor and materials. Labor costs are reduced through automation and process reengineering. Reduction of raw materials costs is achieved through breakthrough technologies such as iron-nitride permanent magnets. A reduced product cost structure can lead to a positive reshoring or nearshoring decision.

Applications

The applications of Niron's magnets address requirements across the consumer, automotive, commercial, and industrial markets. For the consumer markets, Niron's magnets are used in household appliances, audio speakers, and power tools. In the commercial and industrial markets, Niron's magnets are used in wind turbines, elevators, HVAC systems, and more. Niron is attracting investment partially because of the wide range of applications.



Industry associations also play an important role in the adoption of new technologies. These associations can be the pathway to introducing new materials across many member companies. Barry Vogel, Executive Director of the Audio & Loudspeaker Technologies International Association (ALTI) said, ***"All of our members use imported magnets in their products. Niron magnets, made in the U.S., represent a less expensive alternative, mitigate the risk of international supply chains, and avoid import tariffs. One of the key functions of our organization is to introduce these kinds of new technologies to our members."***

Funding

As of 2024, Niron has received $86.3 million in funding from outside sources. Niron is using these investments to scale. Niron has been recognized as "one of the greatest inventions of 2023" by Time magazine. Niron's critical path includes continuing to pursue funding for high-volume factory construction and scaling in 2026. Current investors include Samsung, Magma, GM, Stellantis, Volvo, and Western Digital.

Leadership Team

Niron has assembled an interdisciplinary team with expertise in material physics, metallurgy, and semiconductor technology. CEO Jonathan Rowntree brings over three decades of experience leading global advanced materials companies and is spearheading the effort to scale up production of the company's innovative rare earth-free magnets to meet the surging demand for clean energy solutions. Rowntree holds a Master's degree in Chemical Engineering from the University of Nottingham and an MBA from Henley Business School.

Complementing Rowntree's leadership, Niron's leadership team includes experts in magnetics, global supply chain management, advanced manufacturing, and finance. Together, this team is driving Niron's mission to transform the magnetics industry while contributing to a more sustainable future through a more stable and secure supply chain.

"Niron is a catalyst, a trailblazer with significant breakthrough technology. By creating these new magnets and by revolutionizing the manufacturing process, Niron has solidified itself as a pivotal company of the present with an eye on the future."

Jonathan Rowntree, CEO

ABOUT THE AUTHOR

Jacob Wenzel is a graduate of the University of San Diego with Bachelor degrees in Political Science and International Business. He is currently attending law school at UC Davis.

Jacob has been an intern and researcher at the Reshoring Institute since 2023.

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We provide information, research, and consulting for companies endeavoring to reshore manufacturing back to America and nearshore to Mexico. This includes topics and projects such as site selection, tax incentives, marketing, public relations, cost comparison development, consulting, and case studies.

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