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Breaking the Monopoly: Why Only China Can Produce Neodymium Magnets – And How Radial Magnets Is Changing That

Executive Summary

Neodymium magnets are essential to modern technology, powering everything from electric vehicles and wind turbines to smartphones and medical devices. Yet, over **90% of the world's supply of Neodymium magnets** comes from **China**, making the global supply chain vulnerable to geopolitical shifts, trade restrictions, and supply shocks. This whitepaper explores the reasons behind China's dominance, the risks it presents to manufacturers worldwide, and how **Radial Magnets** is strategically investing in reshoring and diversification efforts to redefine the global magnet industry.

1. Introduction: The Backbone of Modern Tech

Neodymium Iron Boron (NdFeB) magnets are the strongest type of permanent magnet commercially available. Their exceptional strength-to-weight ratio and temperature resilience make them indispensable in critical industries such as:

- **Electric vehicles**
- **Aerospace and defense**
- **Medical imaging (MRI)**
- **Consumer electronics**
- **Green energy (wind turbines)**

Despite their global demand, production of these magnets is overwhelmingly concentrated in **one country: China**.

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2. Why China Controls the Global Neodymium Magnet Market EX2014 - Page 2

2. Why China Controls the Global Neodymium Magnet Market

2.1 Rare Earth Resource Control

China possesses:

- **~60% of the world's rare earth reserves**
- Over **85% of rare earth refining and separation capacity**

This resource control allows China to dominate every step of the Neodymium magnet supply chain – from mining to alloying to magnet fabrication.

2.2 Government Support & Industrial Policy

Chinese government policies have:

- Invested heavily in rare earth infrastructure
- Enforced **export restrictions** on rare earth raw materials
- Created vertically integrated state-supported enterprises

These strategies make Chinese magnets **cheaper and faster** to produce, undercutting foreign competition.

2.3 Environmental Loopholes

Many Chinese operations historically operated with **looser environmental regulations**, especially in refining and waste disposal, drastically reducing their production costs compared to Western producers.

3. The Risks of Overreliance on China

Relying on one country for strategic materials presents numerous challenges:

- **Supply Chain Fragility:** Trade wars, export bans, or conflicts can halt shipments instantly.
- **National Security Concerns:** The U.S. Department of Defense has identified Neodymium magnets as a strategic material.
- **Price Volatility:** China has previously restricted exports, causing global prices to

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spike up to **750%** (e.g., 2010 rare earth crisis).

4. Why Other Nations Struggle to Compete

Despite growing awareness of the risk, few countries have successfully entered Neodymium magnet production because:

- **High capital costs** for setting up mines and separation plants
- **Technical barriers** to refining and magnet fabrication
- **Lack of vertical integration** from mine to magnet
- **Permitting delays** and **stricter environmental compliance** in the U.S., EU, and others

5. Radial Magnets: Pioneering Reshoring & Innovation

At **Radial Magnets**, we're actively working to **redefine the global magnet landscape** by investing in:

5.1 Advanced Manufacturing in the U.S.

We are developing **U.S.-based production** capacity focused on:

- High-performance **magnets**
- Custom NdFeB assemblies

5.2 Strategic Supply Partnerships

While China remains a key source, we are:

- **Diversifying raw material sources** (Vietnam, Australia, U.S.)
- Partnering with **non-Chinese refiners**
- Stockpiling critical inventory to **buffer against disruptions**

5.3 Innovation in Magnet Design

Engineers specialize in **magnet** technology, enabling:

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- Higher motor efficiency
- Better thermal performance
- Compact form factors for next-gen applications

5.4 Commitment to Sustainability

Unlike many legacy producers, Radial Magnets is committed to:

- **ISO-certified environmental compliance**
- Waste recycling and **closed-loop production** methods

6. The Road Ahead: Breaking the Monopoly

While China's dominance won't disappear overnight, companies like Radial Magnets are:

- Building resilient supply chains
- Advancing localized production capacity
- Creating alternatives that reduce global risk

Through continued investment, collaboration, and innovation, Radial Magnets is helping **decentralize** the global NdFeB magnet industry — paving the way for a more **secure, sustainable, and balanced** future.

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