



Magnets—the Invisible Key Industry

Why a Resilient Magnet Supply Chain Is Key to the Competitiveness of German SMEs and German Industry

Position Paper by INNOMAG e.V., Innovation Platform for Magnetic Microsystems

Industry Association for Magnetic Microsystems and Sensors

98–99 % The rare-earth magnets used in European industry come from China	~47.6 % ¹⁾ of global rare earth demand is for Magnets	Up to 12 months Preliminary steps for qualifying an alternative supplier	< 100 € Magnetic material is essential for machines costing 100.000 to 250.000 €
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1. Small Components, Big Leverage

Permanent magnets often cost only a few cents or euros—and yet they are critical to the system. If the magnet is unavailable, the entire value chain comes to a standstill. This leverage extends far beyond the well-known applications in motors, automobiles, and wind power:

- **Semiconductor manufacturing:**
High-precision lithography and wafer steppers (e.g., in ASML's equipment) require magnet-based drives, actuators, and sensors. To put it simply: no magnets—no wafer steppers—no chips. This dependence on magnets thus lies, unseen, even before the much-discussed dependence on chips.
- **Medical Technology:**
MRI scanners, surgical robots, and infusion and ventilator pumps rely on magnetic drives and sensors—supply shortages directly impact patient care.
- **Industrial Automation & Robotics:**
Servomotors, rotary encoders, and magnetic sensors are the backbone of “Industry 4.0” automation and physical AI. Without them, production comes to a standstill—across nearly all sectors.
- **Energy Transition:**
Heat pumps, generators, and industrial drives used in the energy transition depend directly on the availability of magnets.
- **Defense:**
Drives, actuators, and sensors in flood control and security technology depend directly on the availability of magnets.

A typical example from the mechanical engineering sector illustrates just how critical this leverage is: **A single missing magnet worth less than €100 can halt the completion and delivery of a machine worth between €100,000 and €250,000.** Qualifying an alternative supplier typically takes 6 to 12 months in this industry—and if you wait until a crisis hits to start looking, it will be too late. At the same time, the dependence is extreme: 98–99% of the magnets used by European industry come from China, and this figure continues to rise. Rare

earth elements—neodymium, praseodymium, dysprosium, terbium, and samarium—which are now subject to export controls, are needed primarily for magnet production.

2. A medium-sized industrial sector without a lobby

The magnet manufacturing and magnet application industries in Germany are dominated by small and medium-sized enterprises—many of these companies are “hidden champions” with global market positions in specialized applications. Unlike the semiconductor or battery industries, however, the magnet industry lacks a powerful trade association, a clearly defined lead market, and its own funding program. Individual SMEs have neither the market power nor the market overview to act on their own; they react late and each acts independently.

The result: For many decision-makers, the vulnerability caused by dependence on China is simply not apparent.

Political attention is inversely proportional to actual dependence—even though entire value chains, and thus jobs, depend on these unassuming components.

3. Why Time Is Running Out

- **The crisis is looming quietly:**
Delivery times are getting longer, minimum order quantities are rising, and technical support is falling apart—those who wait until the crisis is in full swing to react will no longer have the 6–12 months needed for training.
- **The first options are already closing:**
Strategic stockpiling of SmCo has been effectively blocked by Chinese export restrictions.
- **New capacity is now being allocated:**
The few new European magnet and metallization plants are currently being built—their capacity is quickly being tied up by large customers; the specialized needs of small and medium-sized enterprises (SMEs) risk being left behind.
- **The inspection extends all the way to the machine**
Since 2024, magnet manufacturing technologies have also been subject to export restrictions; even equipment procured independently cannot operate without Chinese support.

4. The Action Plan: Five Levels

Together with other associations—both nationally and internationally as part of “Joint Action Magnetics”—INNOMAG has launched an action plan based on five dimensions:

- 1. Diversification:**
Establishing alternative, non-Chinese sources of supply in Japan, Europe, and North America.
- 2. Strategic Stockpiling:**
Buffers for critical materials—especially those for which China has already imposed export restrictions (e.g., SmCo).
- 3. Recycling:**
Closing Material Loops in Europe and Securing Material Flows.
- 4. Redesign / Substitution:**
Reducing or replacing the use of magnets in products as a medium- to long-term safeguard.

5. Facilities & Expertise:

Securing Europe's machinery and equipment base for magnet production ("buy local," similar to the Chips Act 2.0).

The common thread is the **consolidation of demand**: Many small, individually insignificant SME needs are aggregated—through a neutral body, in a manner that complies with antitrust law—into negotiable volumes that can be utilized nationally and are compatible with the EU Raw Materials Mechanism.

5. What We Ask of Our Politicians

Individual SMEs cannot meet this challenge on their own. We therefore ask for support at all three levels:

- **At the state level:**
Cluster and network funding (e.g., Magnet Cluster Hessen), establishment of recycling and production facilities, provisions for small and medium-sized enterprises in regional funding programs.
- **At the federal level:**
Grant magnets the same status as chips—leading market, funding program, and voting rights; eligibility for funding for magnet-related redesigns; "buy local" for equipment manufacturers; a national stockpiling framework; building trust to consolidate demand.
- **At the EU level:**
Explicitly include magnets in the "Made in the EU" flagship markets; resilience-strengthening contracts for strategic quantities; recycled content targets; integration with the EU Raw Materials Mechanism and the European Critical Raw Materials Center.

INNOMAG e.V. is available to serve as a discussion partner. **We welcome any political support at the state, federal, and European levels.**

About Us: INNOMAG e.V. is the industry association for magnetic microsystems and sensor technology, with members spanning the entire value chain. As part of "Joint Action Magnetism" (JAM), INNOMAG also coordinates with more than ten magnetism associations from several European countries.

Contact: Dr. Rolf Slatter, Chairman of the Board INNOMAG e.V. · R.Slatter@itknet.de · www.innomag.org

1) Share of magnets in rare-earth *demand*: 47.6%

Natural Resources Canada identifies magnets as the largest application for 2024, accounting for 47.6% of global demand, in a chart (Source: *Natural Resources Canada, "Rare earth elements facts", 2026*). (Link: [Rare earth elements facts - Natural Resources Canada](#))