Solar container superimposed on rare earth permanent magnets

Do rare earth permanent magnets have a supply chain?
This report focuses on the supply chain for rare earth permanent magnets, specifically sintered neodymium-iron-boron (NdFeB) magnets, used in clean energy technologies.

Which solar energy projects use rare earth magnets?
The Solar Wind Energy Tower projectin Arizona,for instance,relies on rare earth magnets in its turbines to generate electricity. Another example is the SolarReserve's Crescent Dunes Solar Energy Project in Nevada,which uses rare earth materials in its molten salt storage system.

What are rare earth permanent magnets used for?
s have a wide range of military,energy and industrial applications,with permanent magnets representing the largest application. Rare earth permanent magnets are important components for technologies that are driving the energy transition,namely wind turbinesand b

Are permanent magnets sustainable?
The high energy consumption and greenhouse gas emissions associated with rare earth mining and REO processing are also a concern for the sustainability of the energy transition using downstream products, such as permanent magnets (Binnemans et al., 2013; Kullik, 2019).

Is magnet-to-magnet recycling carbon-intensive?
Extraction of rare earths,iron,and other magnet materials is also carbon-intensiverelative to magnet-to-magnet recycling. Recycling of magnets,technologies that require smaller magnets or use fewer materials,and process improvements may all be able to reduce these environmental impacts.

Will recycling help meet the future demand for rare earths magnets?
dependency and rising geopolitical tensions,he EU's ability to meet the future demand for rare earths magnets is at risk. Recycling can help secure some of this demand. However,permanent magnets recycling is n

Reducing Rare Earth Permanent Magnet Content in Electric Machines for Transportation Applications: Advances and Design Challenges First published: 26 July 2025 Last ...

Abstract Samarium-cobalt rare-earth (Sm-Co-RE) permanent magnetic materials with large magnetic energy product, high coercive force, high Curie temperature, good thermal ...

New methods of increasing magnet stability at elevated temperature are being developed, and integrated multifunctionality of hard magnets with other useful properties is now ...

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Tapping into magnet waste flows is a critical challenge for scaling up recycling. Demand for rare earth permanent magnets (REPMs) has grown drastically the past decades and is ...

OverviewPropertiesTypesApplicationsHazards and legislationEnvironmental impactAlternativesSee alsoAccording to Lucas et al, "To produce ferromagnetism and then a magnet the first condition is to select materials having a high concentration of paramagnetic atoms. A paramagnetic atom contains unpaired electrons, each of them being equivalent to a local magnet due to the orientation of the electronic spin." The RE sequence of metals are characterized by a gradual filling of the 4f level, resulting in a large number of unpaired electrons. For instance, neodymium has three unpaired electrons, while samariu...

Good Day! We are considering using strong rare earth magnets to mount flexible solar panels to our bimini . We will use Reflectix between the Sunbrella and the panels to keep the heat ...

Building upon the lessons learnt during the EU-funded INSPIRES project, as well as interviews with experts in the permanent magnets value chain and own quantitative assessments, this research ...

The competitive situation of rare-earth magnets relative to other permanent magnets is discussed. The consequences of limited samarium supply and the recent cobalt crisis on projected use patterns of ...

Circular Economy: Japan"s Daido Steel has developed 100% recycled NdFeB magnets, promoting industry sustainability. Conclusion: The "Golden Era" of Rare Earth Permanent Magnets As global ...

Rare earth permanent magnets are vital in various sectors, including renewable energy conversion, where they are widely used in permanent magnet generators. However, the global supply and ...

Demand for rare earth permanent magnets (REPMs) has grown drastically the past decades and is expected to increase further due to their use in electronics, electric vehicles and wind ...

Abstract Rare earth permanent magnets constitute a mature technology, but the shock of the 2011 rare earth crisis led to the re-evaluation of many ideas from the 1980s and 1990s about possible new hard ...

Rare earth magnets are known for their superior magnetic properties--high induction, and coercive force. These properties arise due to the extremely high magnetocrystalline anisotropy made possible ...