

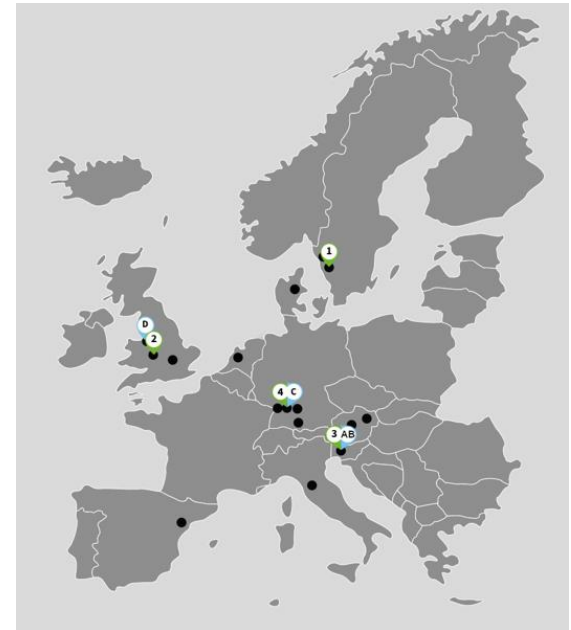


SUSMAGPRO

SUSTAINABLE RECOVERY, REPROCESSING AND REUSE
OF RARE-EARTH MAGNETS IN THE CIRCULAR ECONOMY



Introducing the EU-Project **SUSMAGPRO** Creating a European Circular Economy of Rare Earth Magnets



- 18 partners from 9 European countries
- Duration: June 2019 to November 2023
- Coordination: Pforzheim University, Germany



SUSMAGPRO has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 821114



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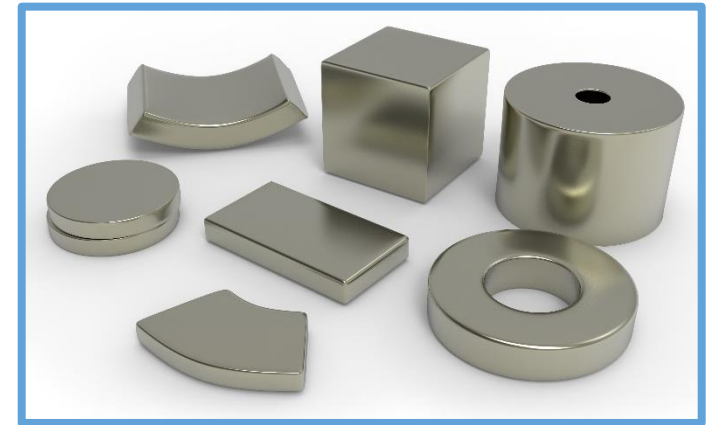
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What Are Rare Earth Magnets?

- Permanent magnets based upon [Rare Earths](#) (RE) are essential components of products such as loudspeakers, e-cars, laptops, smartphones, wind turbines, flat screen TVs, dishwashers and many more
- They are crucial to achieve the transition to a green and digital economy in Europe
- Despite their name, RE are not really rare. Even in Europe, RE deposits exist in various countries such as Sweden, Greenland, Finland and Spain



However, RE are linked to a number of challenges.



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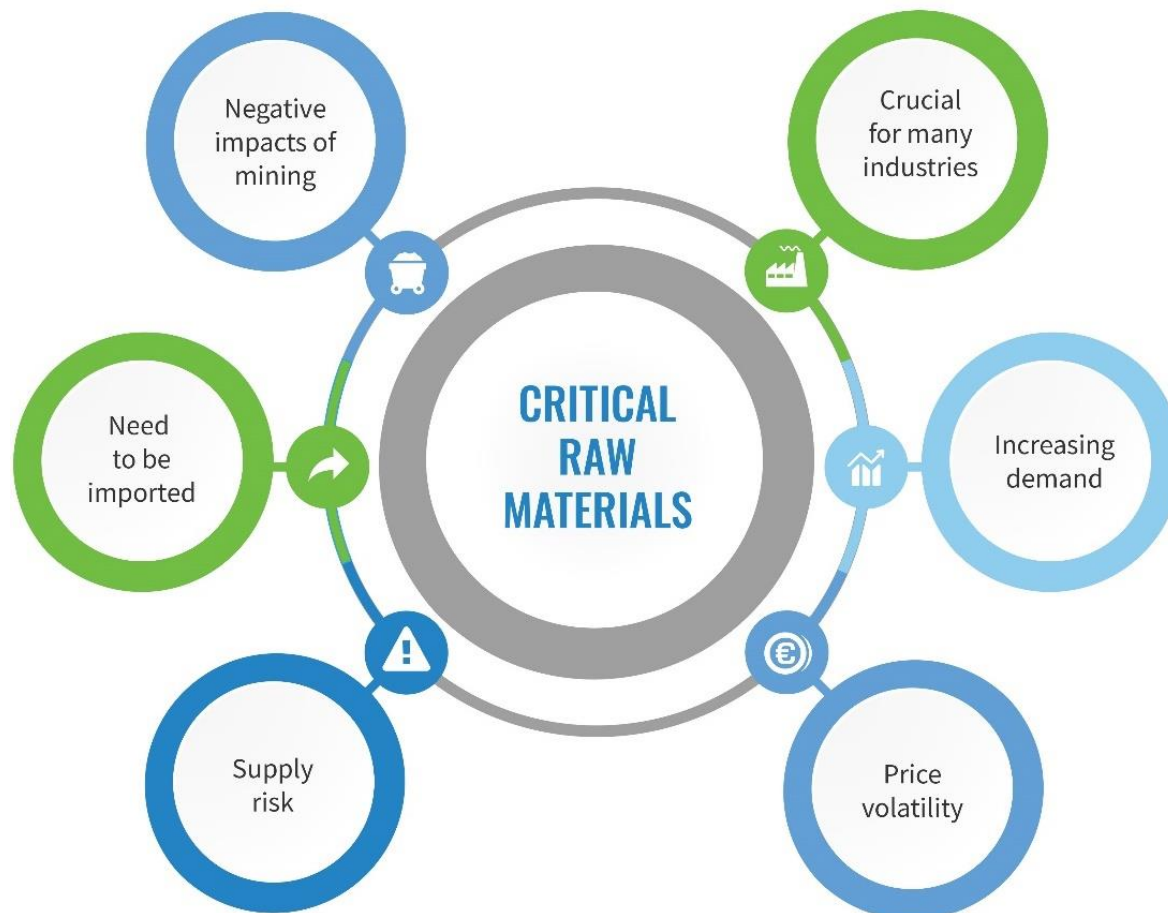
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The Challenges around Rare Earths



- Less than 10% of the RE magnets needed in Europe are also produced here
→ mainly imported from China
- Current RE mining and treatment methods still cause damage to the environment and health, even if efforts are made towards their sustainability

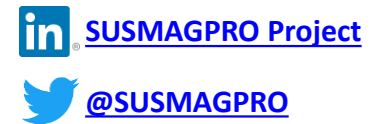


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What about Recycling?

Recycling is necessary but still not widely in use (<1-3%)

- Products are not [designed for recycling](#), and magnetic content of components is sometimes low
 - End-of-life products which contain magnets are often shredded, so RE cannot be extracted efficiently anymore
- Recycling readiness is insufficient, [Urban Mining](#) (the recovery, recycling and reuse of waste electronics) lacks attention
 - Too many valuable products still end up in basements or (wild) landfills

To address these challenges, SUSMAGPRO aims to demonstrate the Sustainable Recovery, Reprocessing and Reuse of Rare Earth Magnets in a Circular Economy.



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SUSMAGPRO: A Circular Economy for RE Magnets

Main goal: identify, separate, reprocess and reuse permanent Rare Earth magnets all over Europe to create a circular economy

- **Produce every fourth RE magnet in Europe from recycled material by 2027:** set up of recycling plants and production lines in several European countries
- **Integrate recycled magnets in new products:** automotive motors, water and heating pumps, loudspeakers



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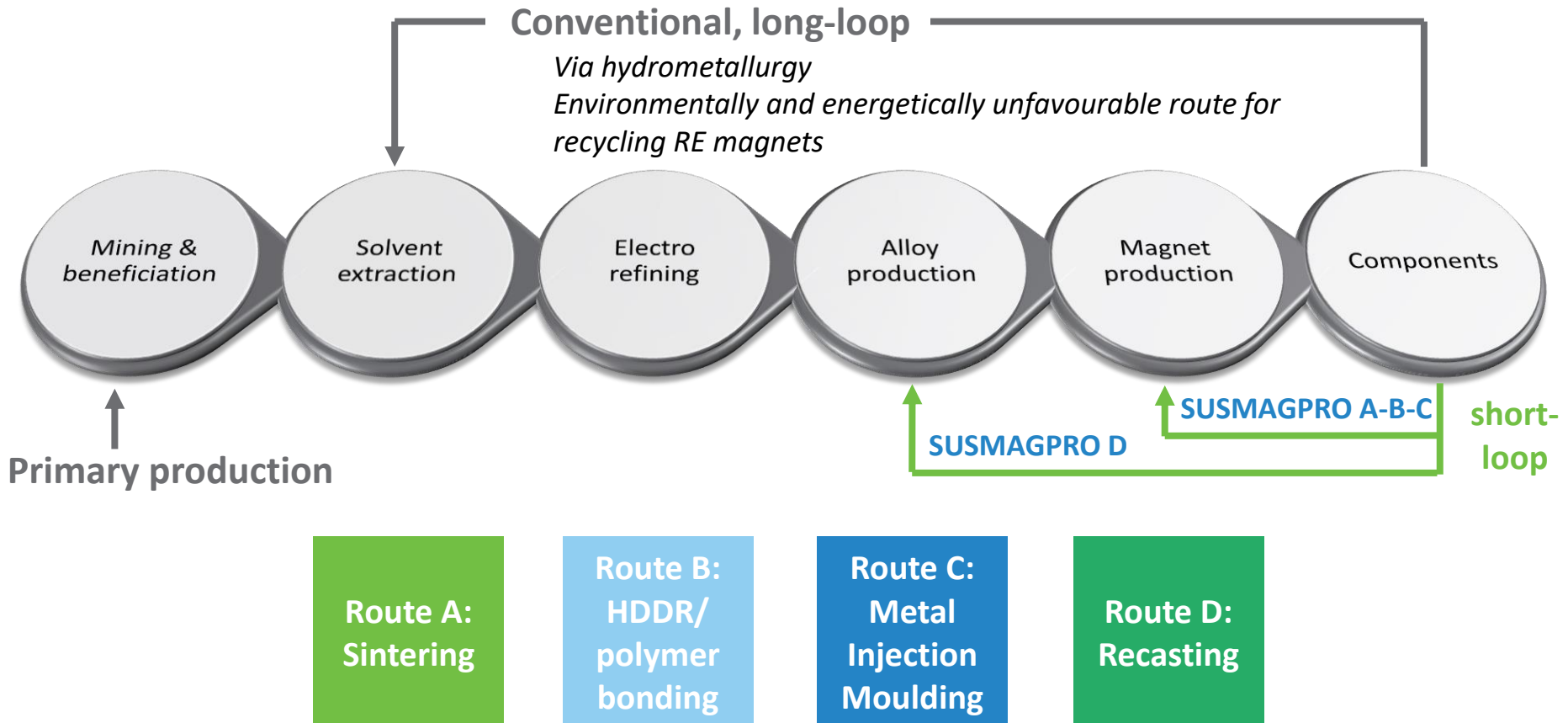
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A Shorter and Environmentally-friendlier Loop



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Hydrogen Processing of Magnetic Scrap (HPMS)

This new technology employed in SUSMAGPRO enables the break down of old magnets into powder.

Once separated from other elements and purified, the resulting RE powders are ready to be reprocessed into new magnetic components.



Click on the image to watch a video of the process



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Supporting the UN SDGs

**SUSTAINABLE
DEVELOPMENT GOALS**



SUSMAGPRO supports the SDGs 7, 8, 9, 12, 14 and 15 as defined by the United Nations. Learn more about SDGs on the [official UN website](https://sdgs.un.org/).



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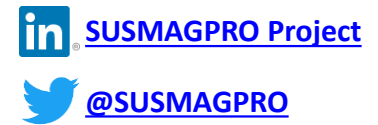
 <p>7 AFFORDABLE AND CLEAN ENERGY</p>	Ensure access to affordable, reliable, sustainable and modern energy for all	SUSMAGPRO delivers an independent and affordable supply of RE magnets for renewable energy and mobility
 <p>8 DECENT WORK AND ECONOMIC GROWTH</p>	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	SUSMAGPRO creates jobs in Europe and applies European standards for health, security and environment in waste recycling and magnet manufacturing.
 <p>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</p>	Build a resilient infrastructure, promote inclusive & sustainable industrialisation and foster innovation	SUSMAGPRO paves the way to a more resilient European supply chain of RE magnets and strengthens European industry and science by introducing innovative technologies
 <p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p>	Ensure sustainable consumption and production patterns	SUSMAGPRO enables a circular economy for RE and RE products by supplying novel solutions for more sustainable recycling of permanent magnets
 <p>14 LIFE BELOW WATER</p>	Conserve and sustainably use the oceans, seas & marine resources for sustainable development	SUSMAGPRO reduces water pollution coming from mining, treatment and waste discharge through its circular economy approach
 <p>15 LIFE ON LAND</p>	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss	SUSMAGPRO reduces pollution and environmental damages linked to mining and landfills by supporting urban mining and design for recycling, as well as reusing waste in a more sustainable recycling process



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Get Involved and Help Us Spread the Word!



European citizens: Get live impressions at one of our roadshow stages in various European cities, contact us for further information

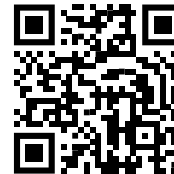
City councils, local associations: Host a roadshow stage in your city



Teachers, associations, local authorities: Contact us for further information for your students, members or citizens



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Test your Knowledge!



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Test your knowledge on Rare Earth Elements and RE magnets!

TAKE QUIZ



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Useful Links and Further Information

- Learn more about Waste Electrical and Electronic Equipment (WEEE) and discover unused precious resources in your home!
 - <https://weee4future.eitrawmaterials.eu/>

Unlock precious resources in your home
#WEEE4Future

Waste Electrical and Electronic Equipment (WEEE) is one of the fastest-growing waste streams and a major threat to the environment and to human health. But there's something you can do about it!

→ **LEARN MORE**



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Useful Links and Further Information

- General information on Rare Earth Elements:
 - <https://geology.com/articles/rare-earth-elements/>
 - <https://www.britannica.com/science/rare-earth-element/>
- Issues related to mining:
 - <https://www.theguardian.com/sustainable-business/rare-earth-mining-china-social-environmental-costs>
- Urban Mining:
 - <https://www.dw.com/en/urban-mining-hidden-riches-in-our-cities/a-42913985>
- Circular Economy:
 - <https://www.ellenmacarthurfoundation.org/circular-economy/concept>
 - https://ec.europa.eu/environment/circular-economy/index_en.htm
- United Nations' Sustainable Development Goals (SDGs):
 - <https://sdgs.un.org/goals>
- Design for Recycling
 - <https://www.sciencedirect.com/topics/materials-science/design-for-recycling>



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SUSMAGPRO Consortium

Coordinator:

HS PF



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