HYPROMAG

Making Magnets Green.

Our Expertise: Magnet recycling.

2015-2017

- Development of Metal Injection Moulding for Magnets
- Proof of concept: waste-free magnets recycling

2013-2015

- HPMS process
- End-of-Life (EOL) magnet prototype recycling
- Proof of concept: high-quality recycled sintered magnets

2021

- Foundation of the European Raw Material Alliance
- Carlo heads the task force "Awareness Raising"
- Carlo is co-author of the ERMA action plan "Rare Earth Magnets and Motors. A European call for Action"

2018-2020

- Foundation of sister start-up HyProMag Ltd.
- Brexit

2021-2024 INSPIRES

- Development of tailored recycling route & pilot plant to recycle EOL-magnets in white goods products with automatic sorting

2021

Foundation of HyProMag GmbH

2019-2023

- Pilot lines for End-of-Life Magnets
- Recycling with an initial capacity of 110 t/a
- Guidelines for Eco-Design of magnet containing products

2018-2021

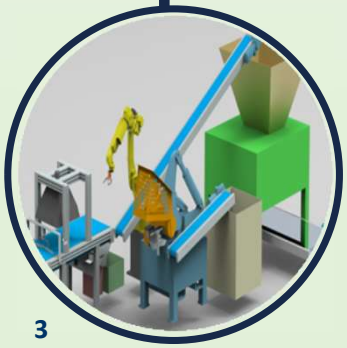
- Machine-readable grading & labelling system for EOL-Magnets
- Systematic recycling factor for scrap magnets

2022-2026

- Full manufacturing line for sintered magnets (investment 6+ M€)
- Resilient and sustainable supply chain for NdFeB magnets

Our Offerings: Circular Magnets. All inclusive.

1 Application development



2 Recycling of NdFeB magnets

Patent on HPMS process

3 Processing of NdFeB recycling powders

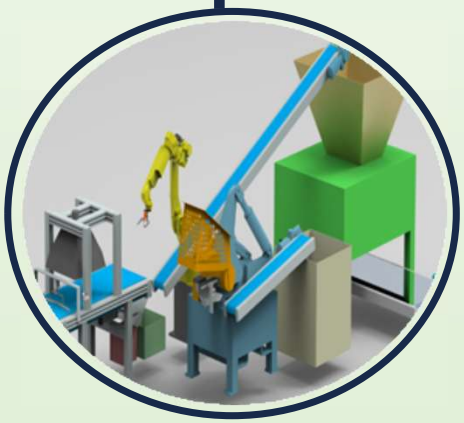
4 Magnet Production

5 Consulting

HYPROMAG Magnet Recycling

Our Offerings: Application development

1 Application development



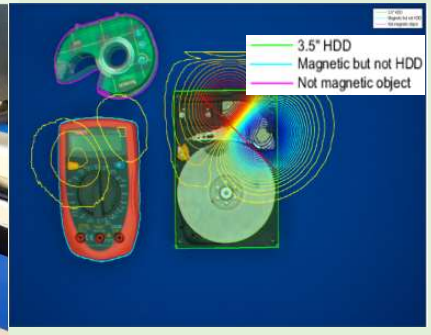
Our experience and strengths :

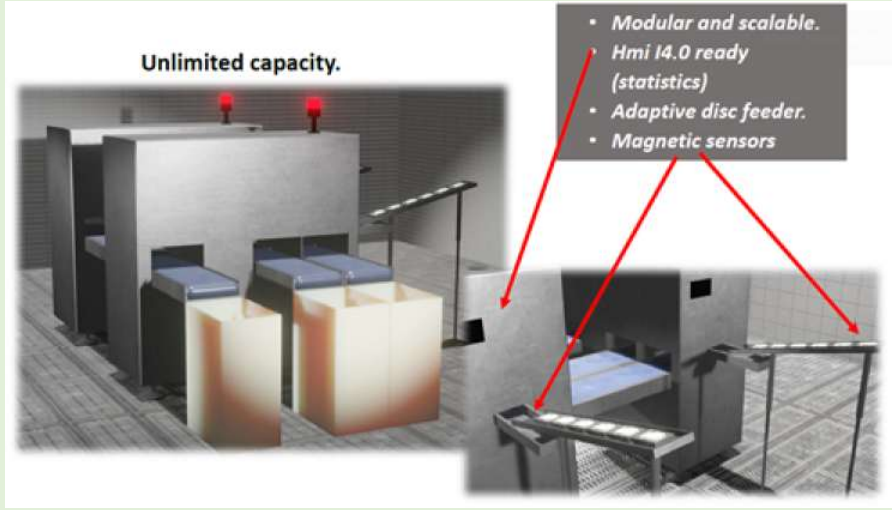
- A large number of different components containing magnets have been tested for their dismantlability.
- We have strong partners in the design and development of automated disassembly units.
- Strong primary treatment plant operator for collection of magnetic scrap and disassembly on a large industrial scale

HYPROMAG Magnet Recycling

Our Offerings: Application development

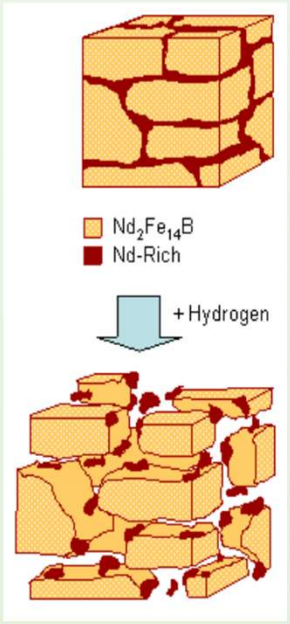
1 Application development

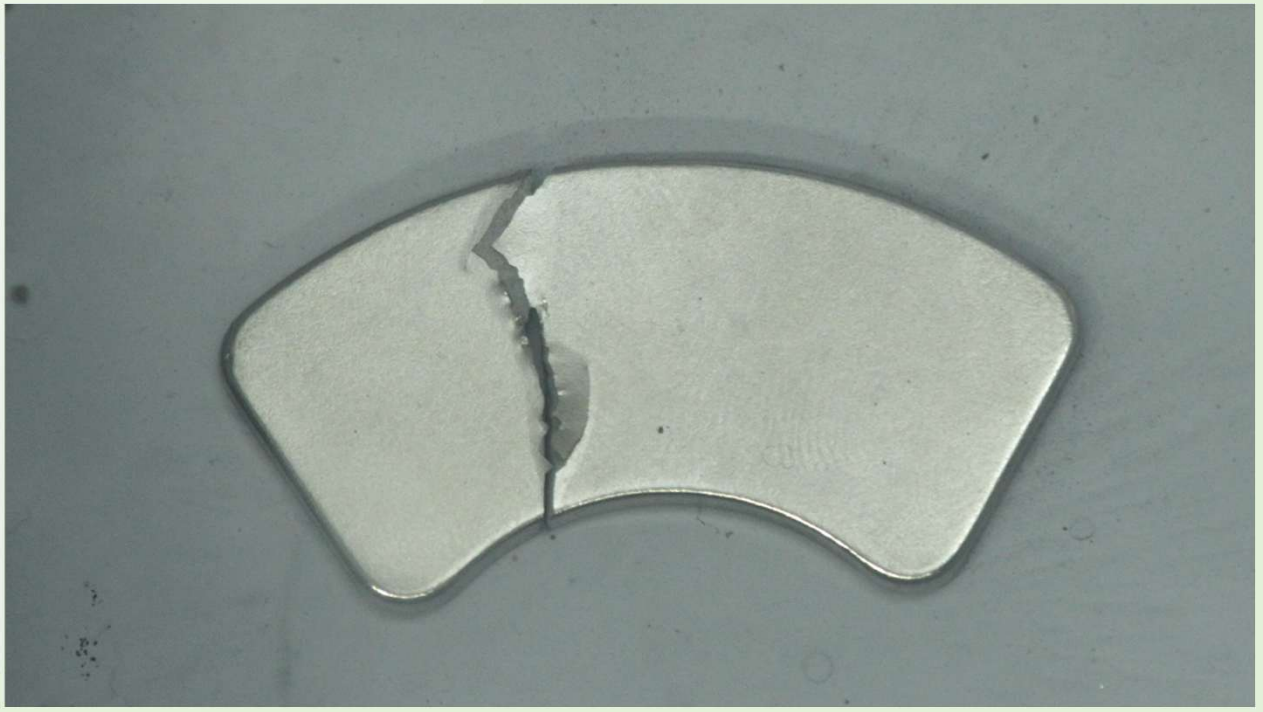




HYPROMAG Magnet Recycling

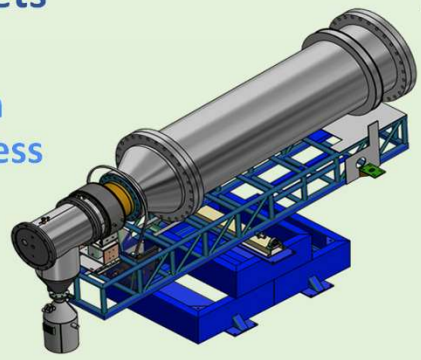
Our Process: HPMS (Hydrogen Processing of Magnetic Scrap)





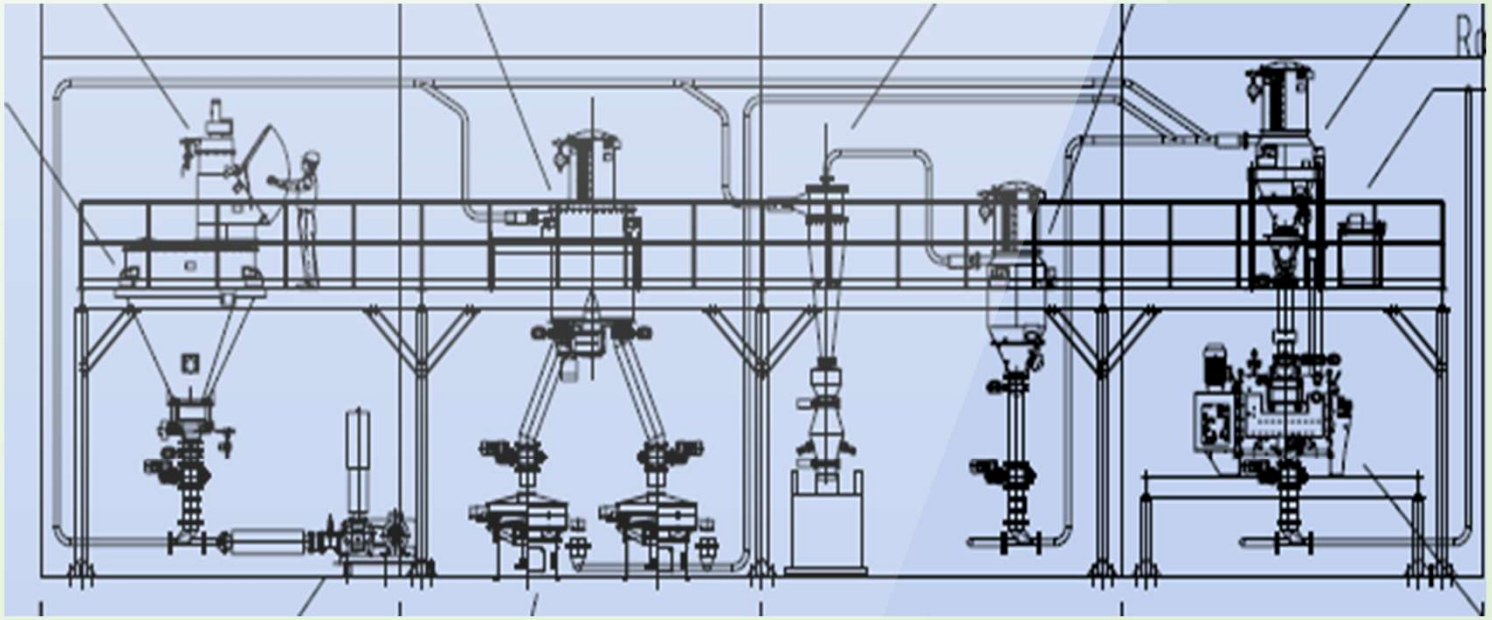
2 **Recycling of NdFeB magnets**

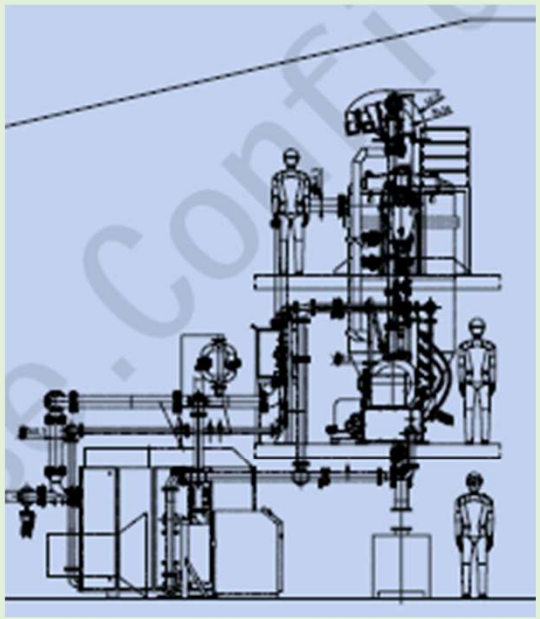
Patent on HPMS process



HYPROMAG Magnet Recycling

Our Process: NdFeB powder processing





3 Processing of NdFeB recycling powders

4 Steps from HPMS powder to magnet-production-ready powder

- Sieving
- Blending
- Milling
- Degassing

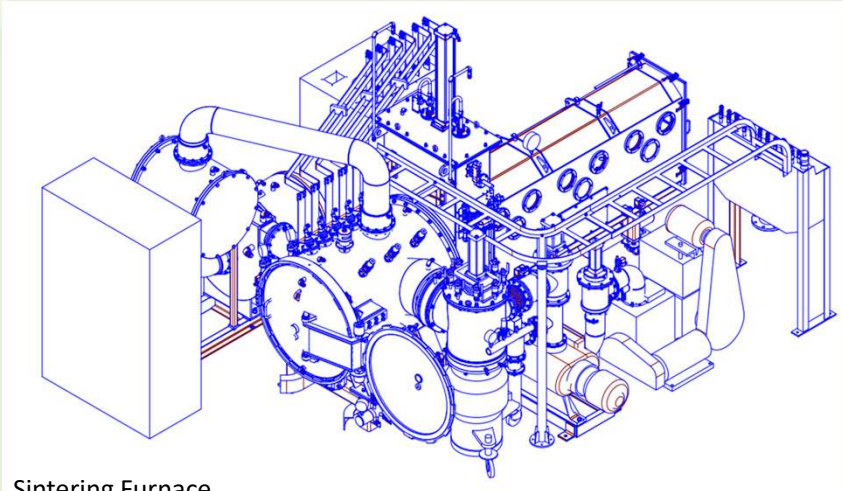
→ Ready for magnet production

Our Process: Magnet Production

Pilot plant capacity:
~100 t p.a. in 2026

4 Magnet Production

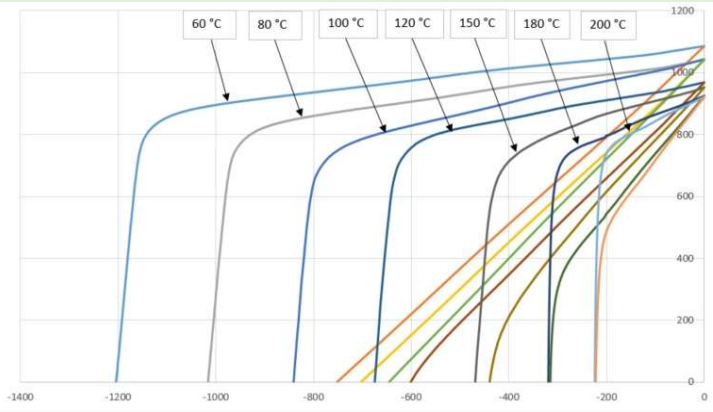
Alignment Press



Sintering Furnace

Eroding

Grinding



Analysis

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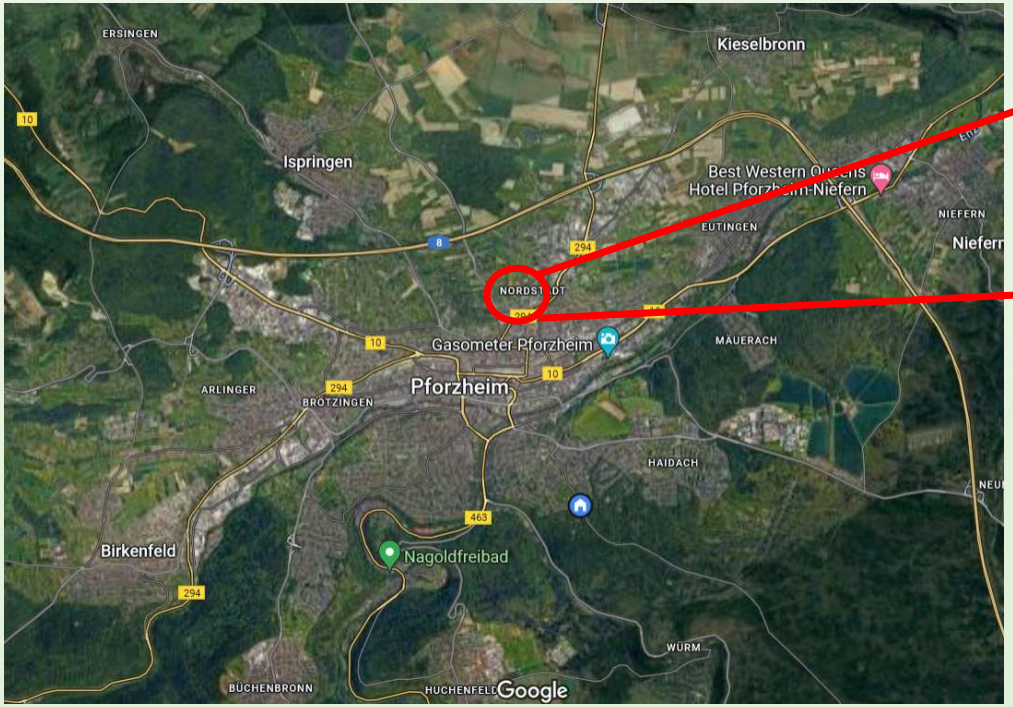
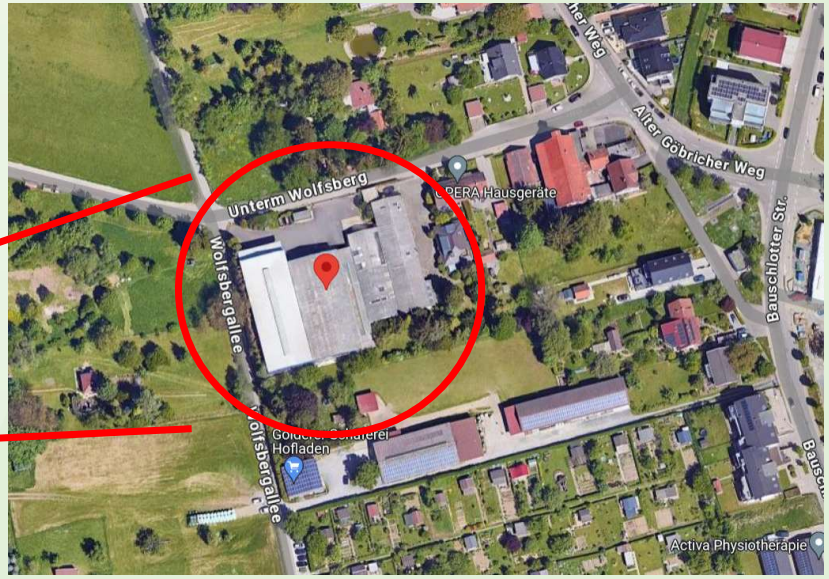
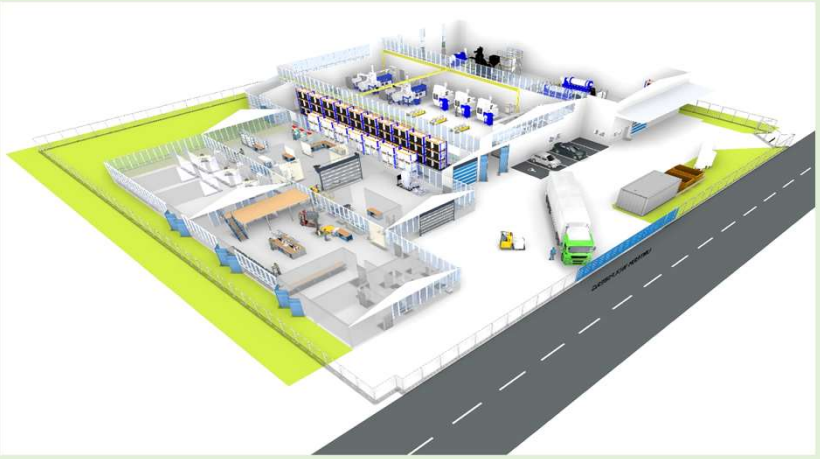
Our Site: Powder and Magnet Production







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Our Offering: Consulting

5 Consulting

Design for Recycling:

- We help companies develop products that are designed from the ground up for optimal recycling. This reduces the need for newly mined rare earth materials and minimizes the environmental impact over the entire life cycle of the product.

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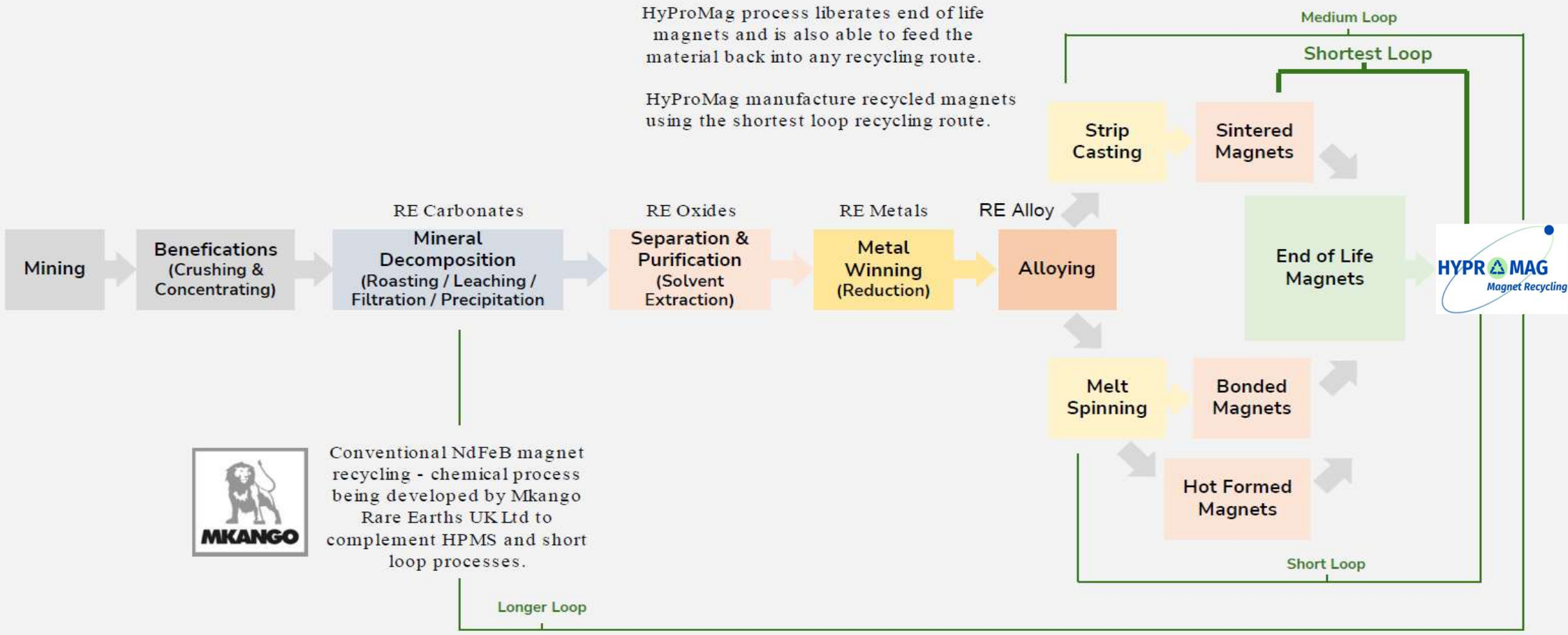
Short Loop Recycling



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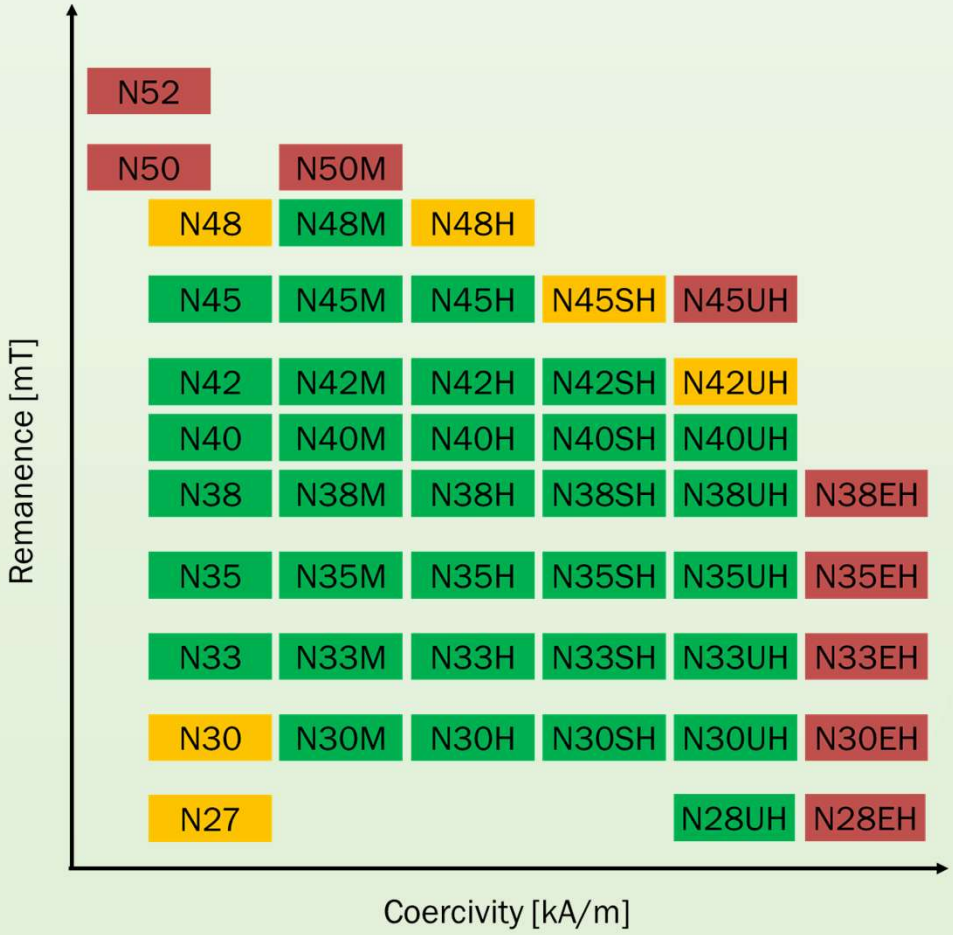
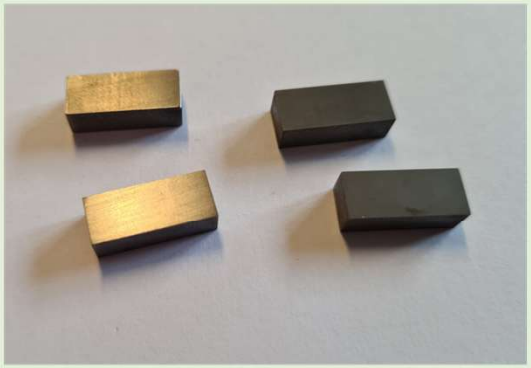
What we are able to do.



Current manufacturing capability

Expected manufacturing capability soon

Further research being undertaken



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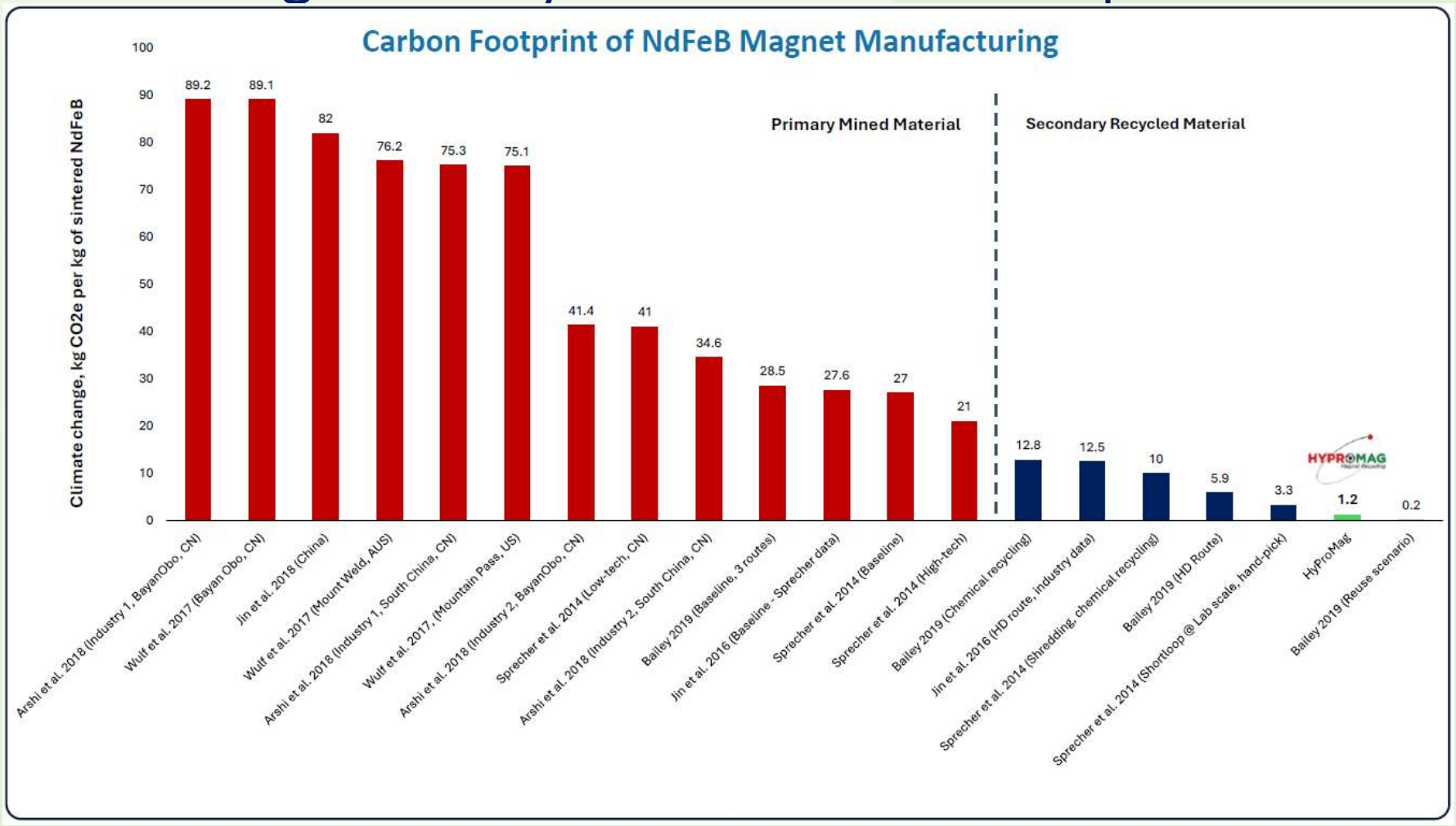
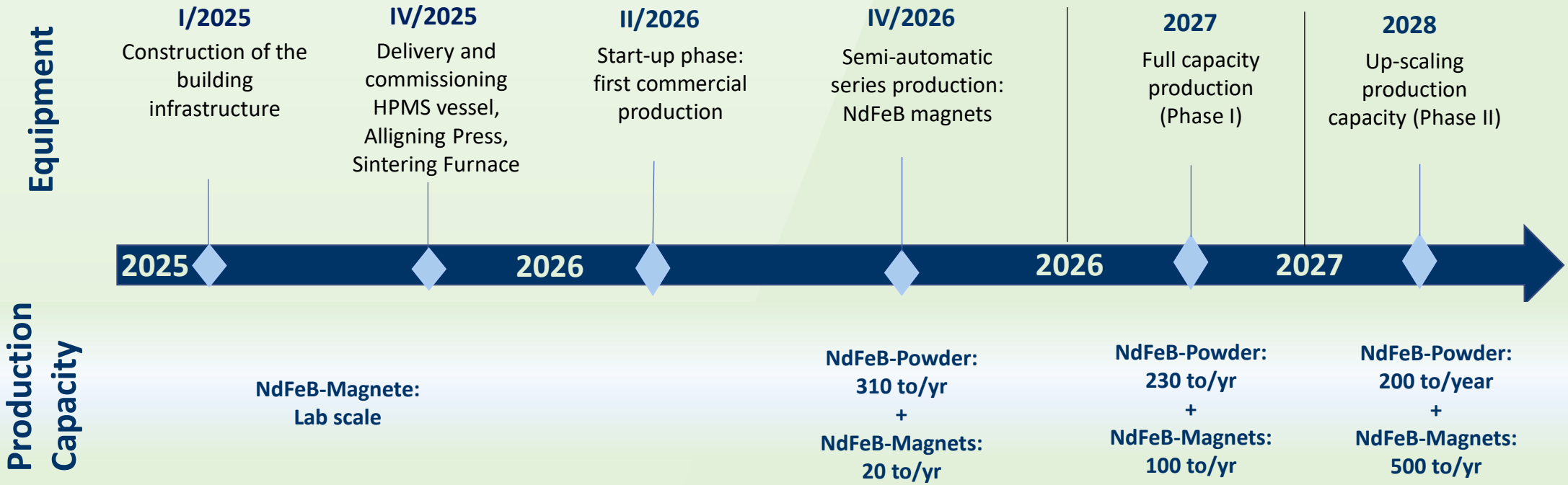
Significantly Reduced CO2 Footprint



Roadmap: implementation & milestones.



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THANK YOU