HYPROMAG
Magnet Recycling

Recycled magnet manufacturing

High performance
Sustainably sourced
Low carbon footprint

ETHICAL | INNOVATIVE | GREEN

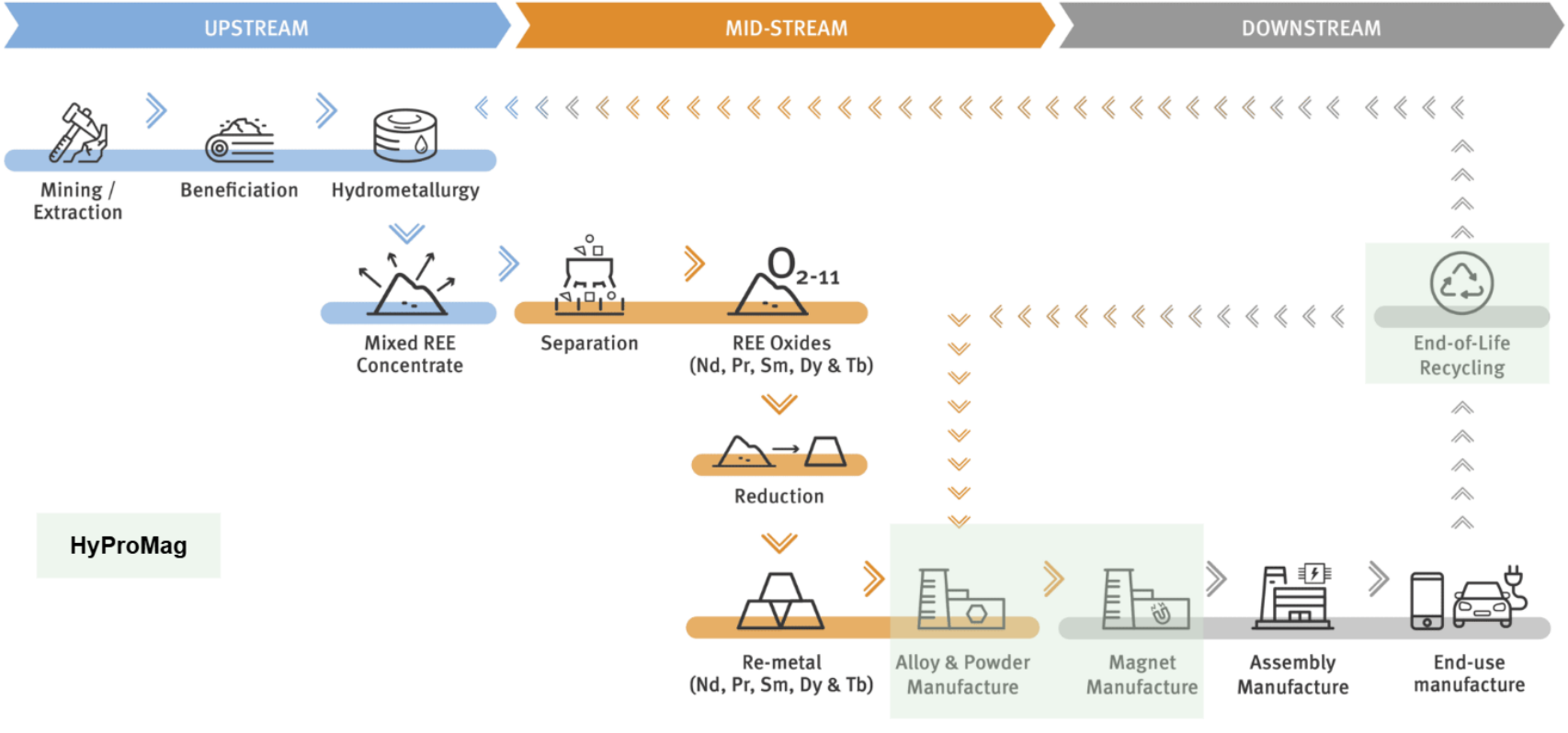
HYPROMAG Magnet Recycling

MKANGO

Maginito

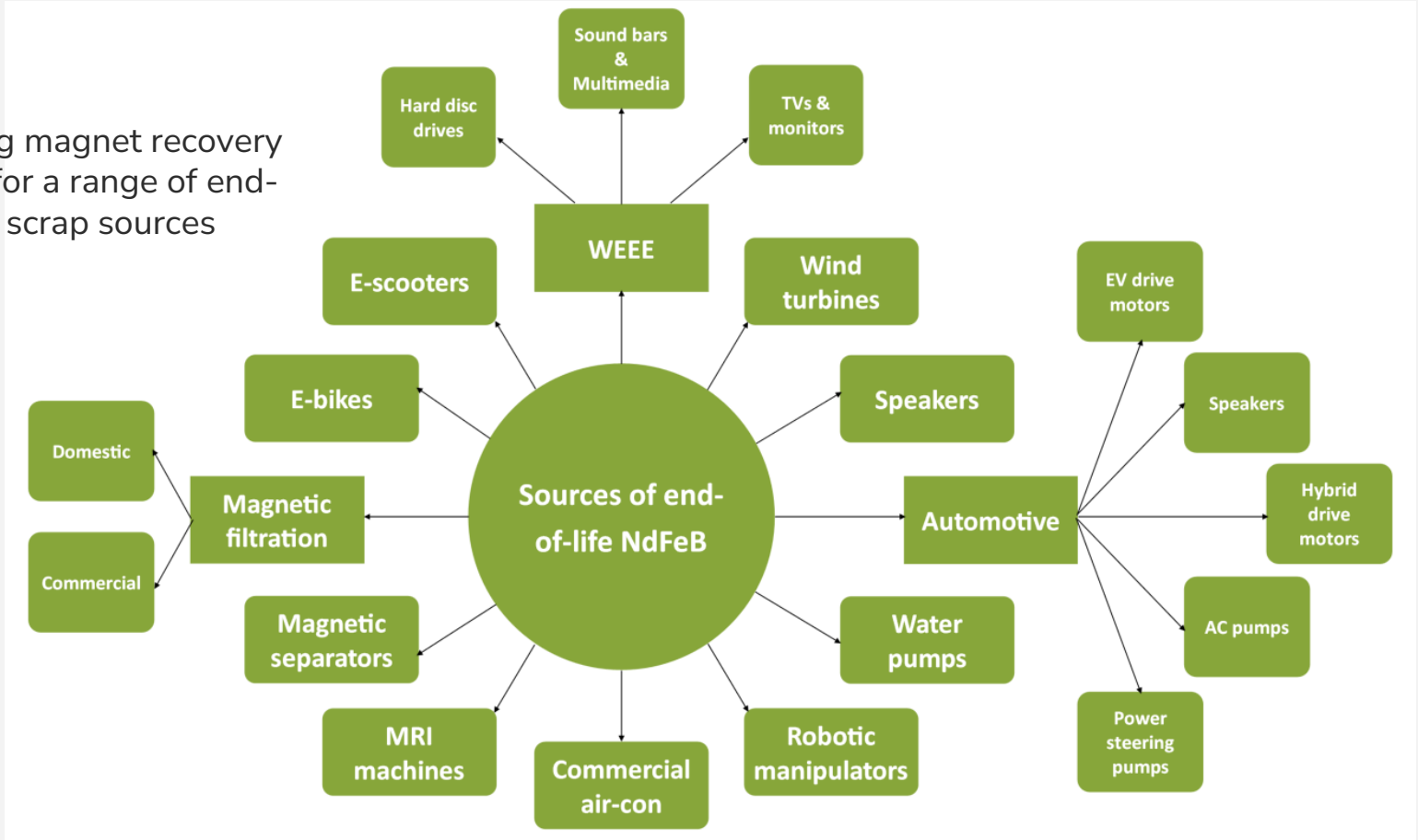
COTEC HOLDINGS GROUP

HYPROMAG'S FOCUS



INPUTS

Developing magnet recovery solutions for a range of end-of-life scrap sources



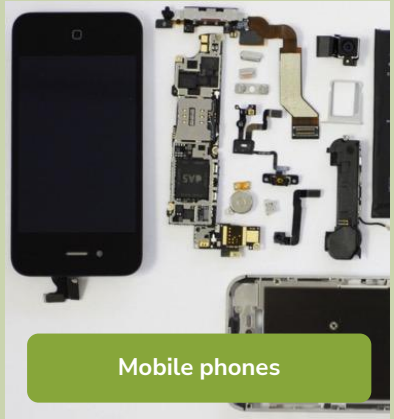
HPMS **OVERCOMES** RECYCLING CHALLENGES

→ Products are **not designed** with recycling in mind

→ Current recycling processes **are not suitable** for NdFeB magnets

→ **HPMS solves the issue by extracting and demagnetising** embedded NdFeB magnets

Rotor from an automotive drive motor



Mobile phones

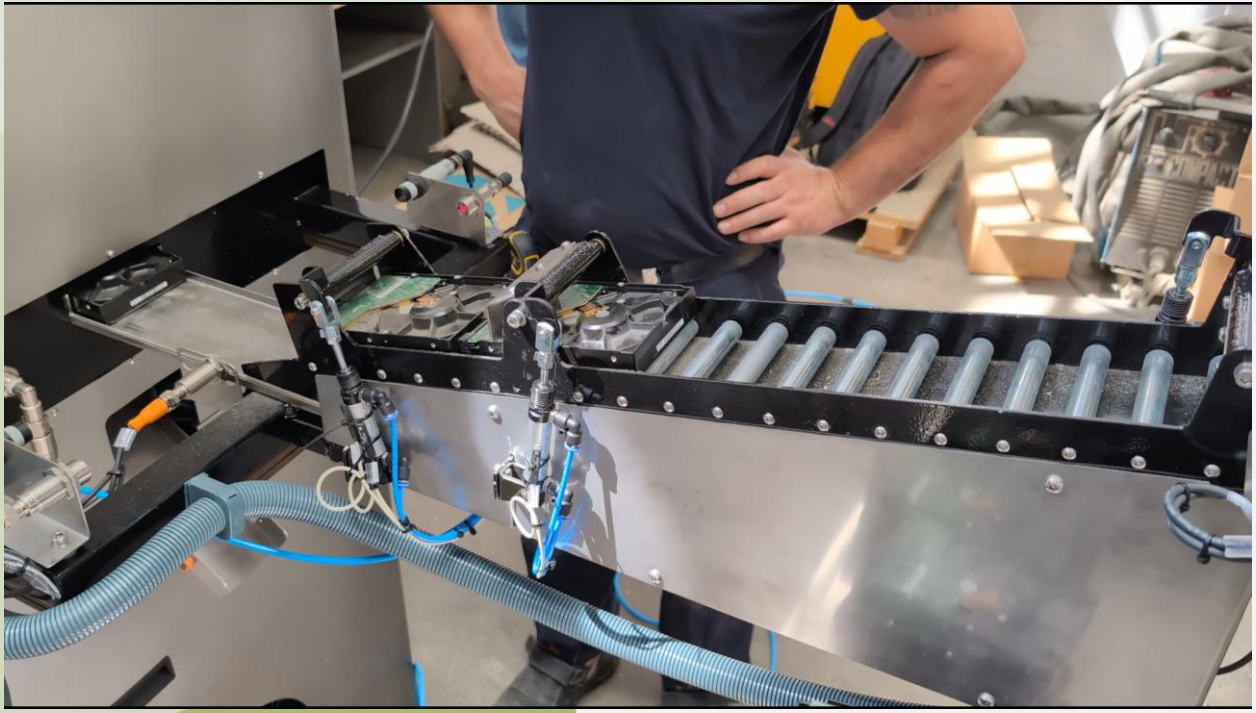
Hard disk drives

Shredded automotive motor – courtesy of Axion

Shredded HDDs

HDD MAGNET SEPARATION **IN ACTION**

Automated HDD preprocessing to create HPMS ready feed

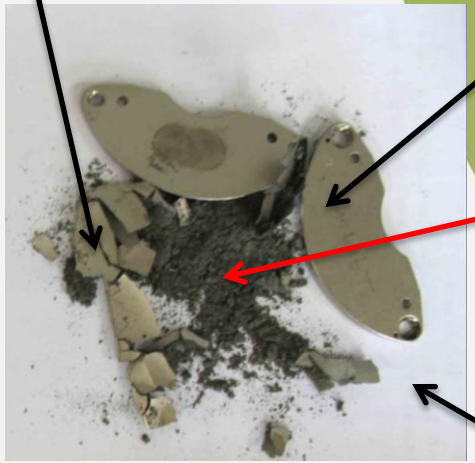


HPMS **ENABLES** NdFeB EXTRACTION

Ni electroplate

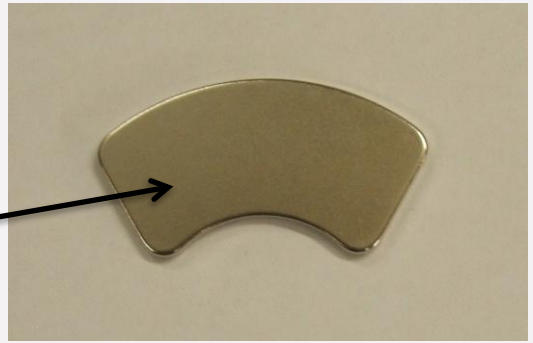
Soft magnetic Fe casing

Voice coil assembly extracted from hard drive



Hydrided NdFeB powder

Voice coil assembly after HD process

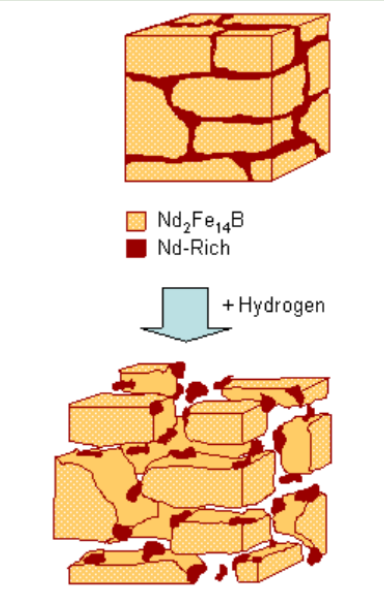


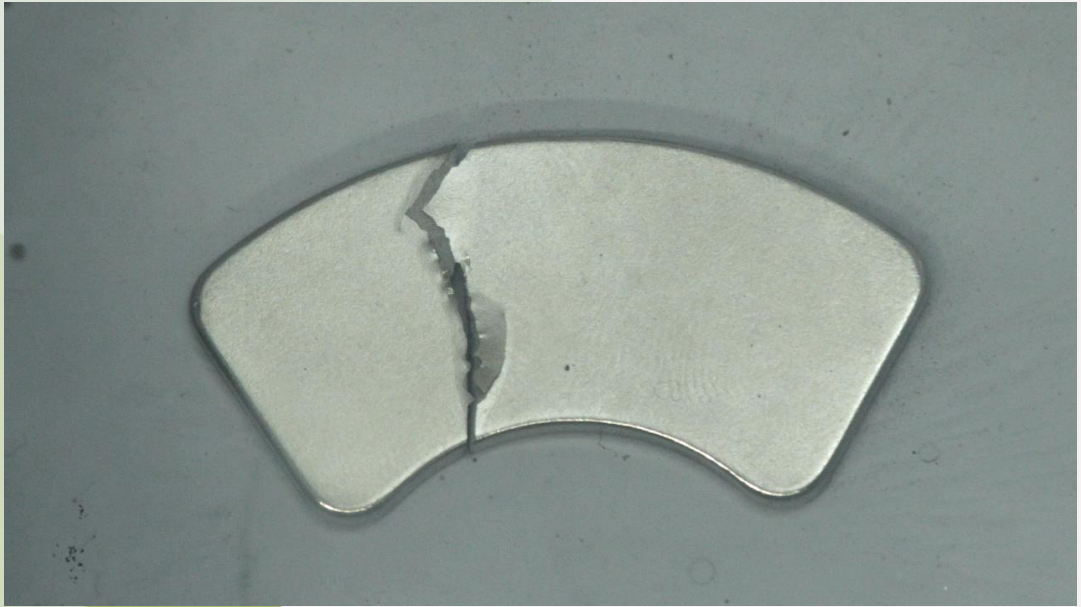
Ni electroless plated voice coil magnet

US patent – No.13/169839

HYDROGEN DECREPITATION **IN ACTION**

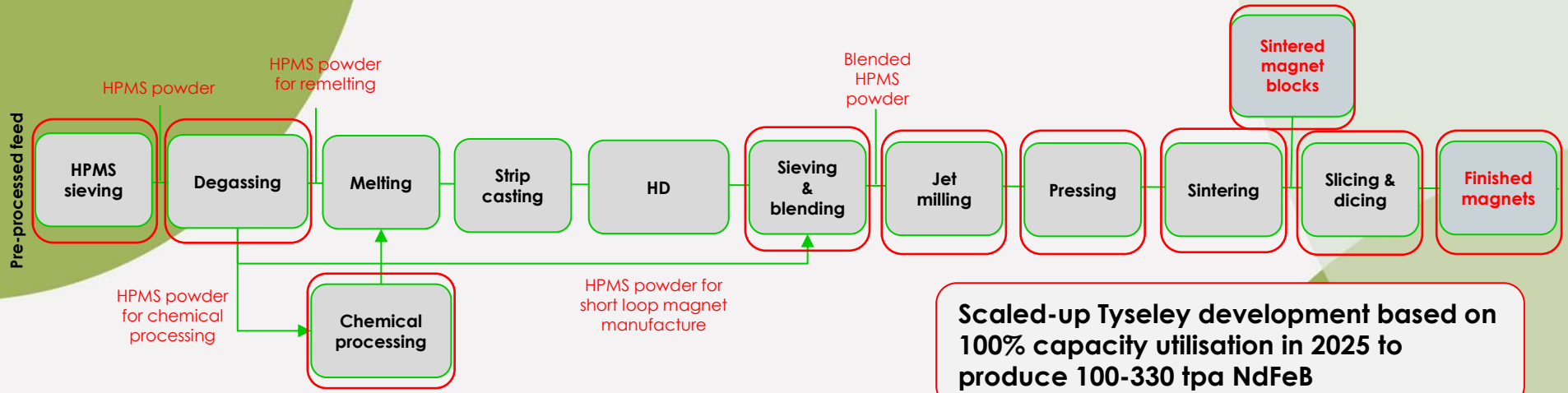
HPMS – HDD Voice Coil Magnet Assembly



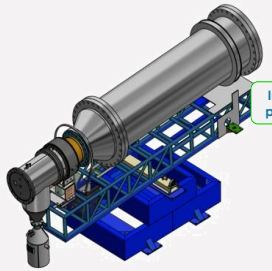


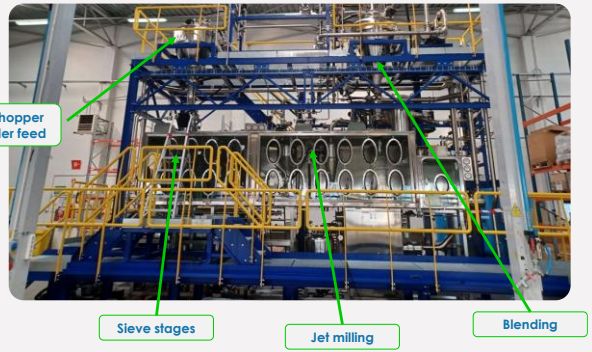
Source: Dr Vicky Mann, University of Birmingham

SCALE UP – UK – TYSELEY ENERGY PARK (2025)

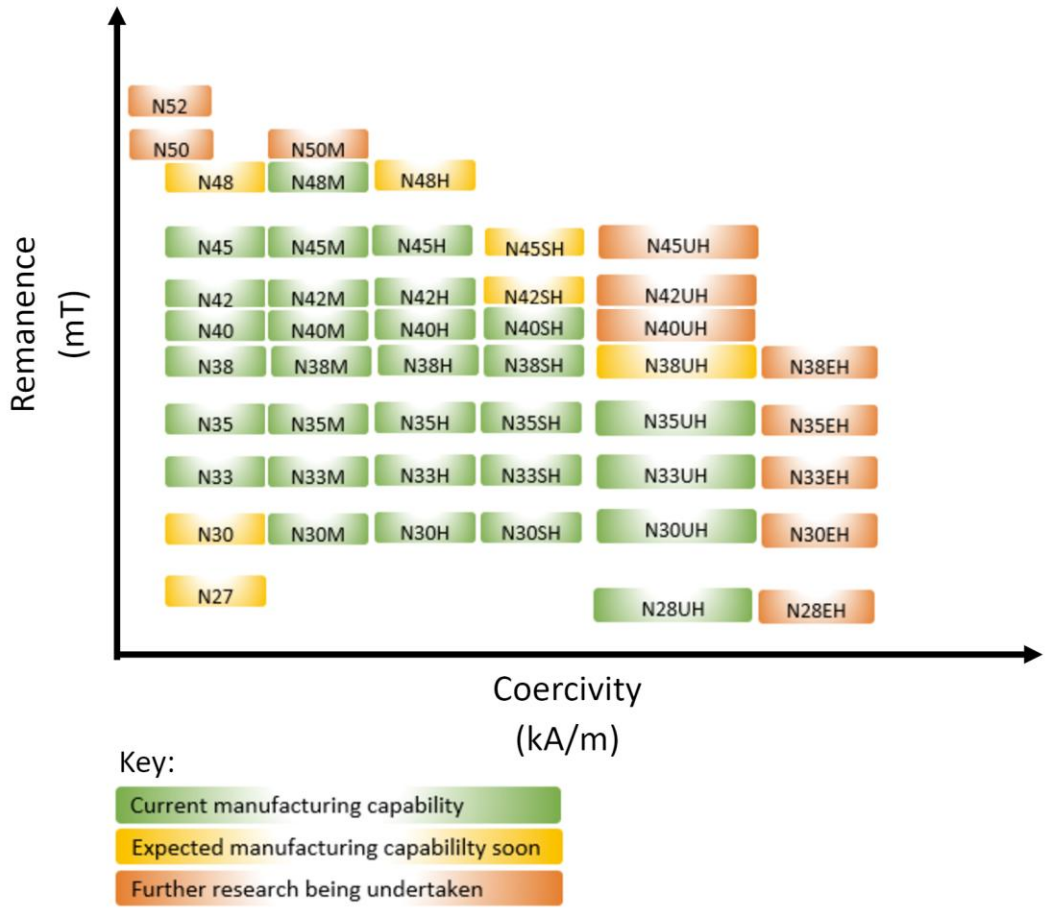


Scaled-up Tyseley development based on 100% capacity utilisation in 2025 to produce 100-330 tpa NdFeB



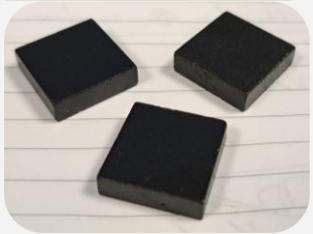


OUTPUTS



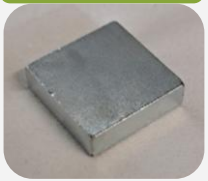
Sintered NdFeB magnet and alloy products with low carbon footprint

Epoxy coated magnets



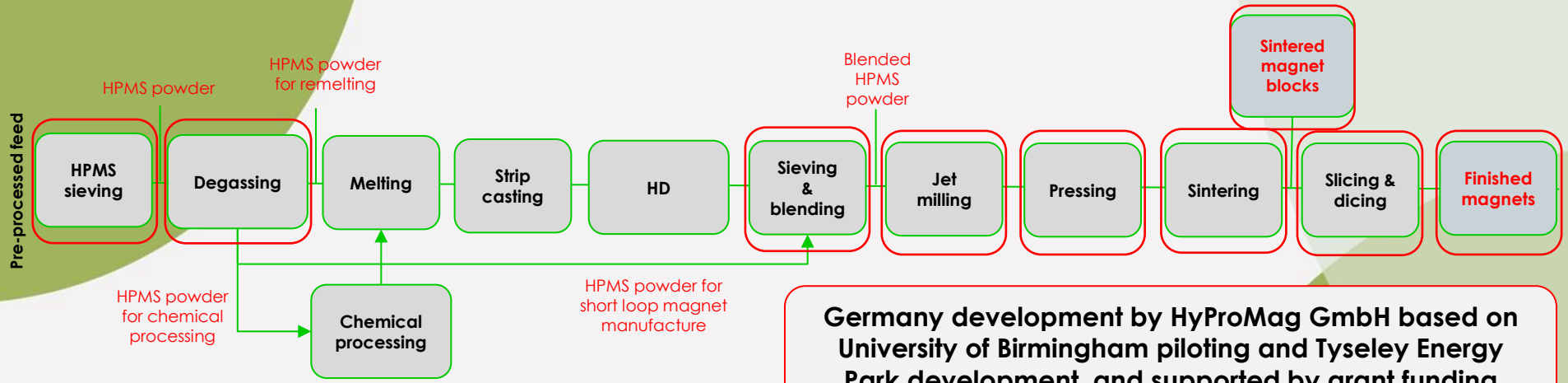
Epoxy coated motor magnets

Zinc coated magnet



Coated loudspeaker magnet

SCALE UP – Germany – PFORZHEIM (2025)



Germany development by HyProMag GmbH based on University of Birmingham piloting and Tyseley Energy Park development, and supported by grant funding

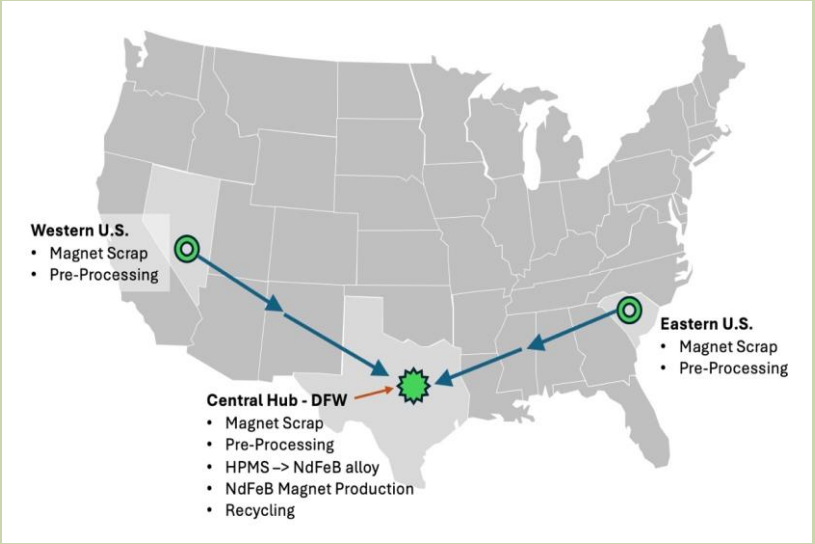
Scaled-up Germany development based on 100% capacity utilisation in 2025 to produce 100-330 tpa NdFeB

SCALE UP – USA – (2027)

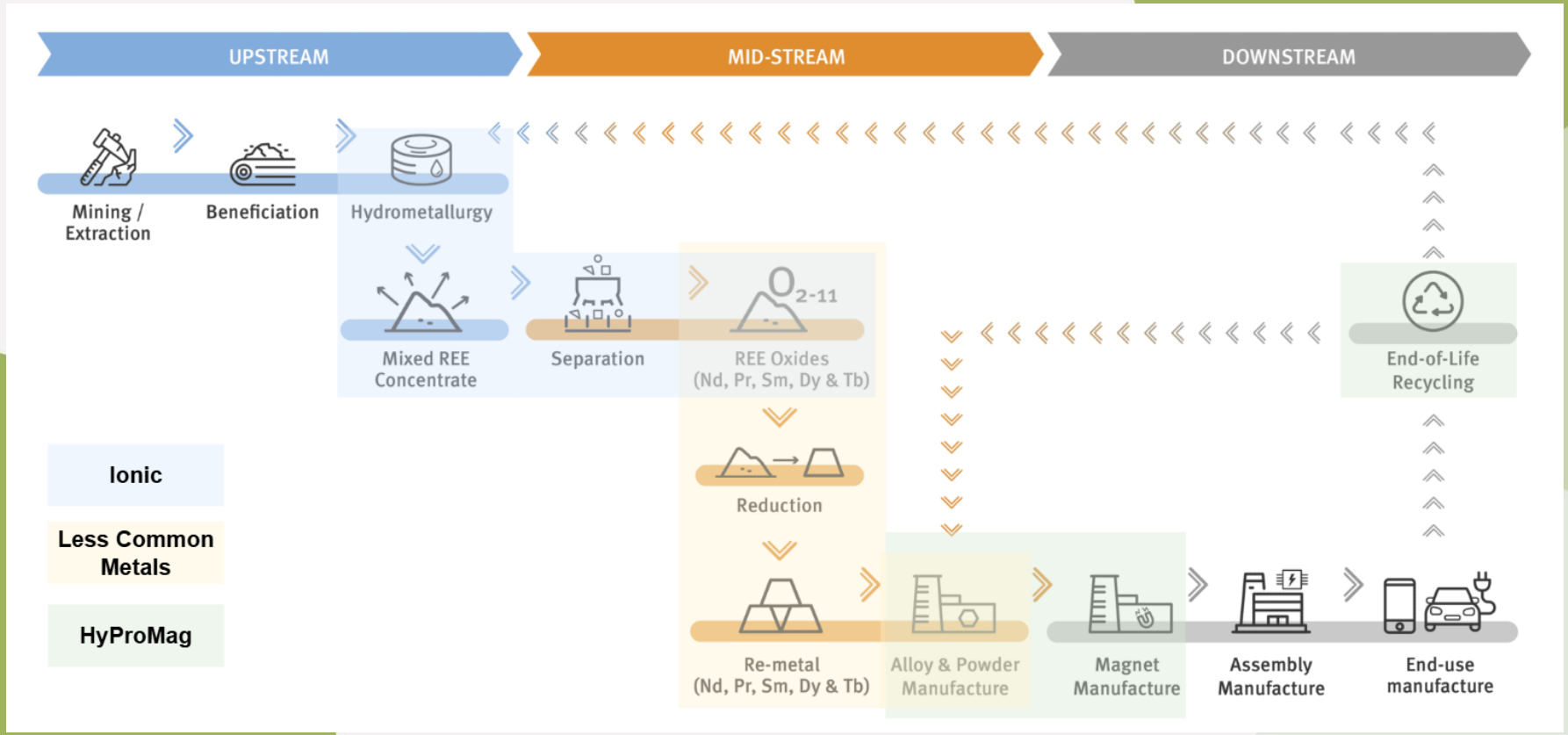
USA Feasibility Study completed for 1,000tpa NdFeB/magnet production

- State-of-the art rare earth magnet recycling and manufacturing operation with a central Dallas Fort Worth, Texas hub supported by two pre-processing spoke sites in the eastern and western regions of the United States:
  - US$262m NPV and 23% IRR based on current market prices
  - US$503m NPV and 31% IRR based on forecast market Prices
  - Expansion potential with the inclusion of a third HPMS vessel
- Production of 750tpa of recycled sintered NdFeB magnets and 291tpa of associated NdFeB co-products over a 40 year operating life
- First Revenue targeted in Q2 2027 with a Notice to Proceed expected in 2025 following completion of Detailed Engineering Design and Value Engineering phase, which will commence shortly.
- Up-front capital cost of US$125 million with significant opportunities to reduce
- CoTec is responsible for funding the Detailed Engineering Design, Value Engineering and the project development costs

Proposed operating configuration: 'hub and spoke' model



COMBINING RECYCLING LOOPS TO MAXIMISE OPPORTUNITIES



THANK YOU

To discuss magnet scrap solutions and purchasing, magnet and other product sales please contact **magnets@hypromag.com**

To discuss collaboration and consultation please contact **technical@hypromag.com**

HYPROMAG Magnet Recycling

Maginito

MKANGO

UNIVERSITY OF BIRMINGHAM

HYPROMAG Magnet Recycling