



MKANGO RESOURCES LTD.  
550 Burrard Street  
Suite 2900  
Vancouver  
BC V6C 0A3  
Canada

## **FIRST PRODUCTION OF RECYCLED MAGNETS AT TYSELEY ENERGY PARK IN BIRMINGHAM, UK MAJOR MILESTONE FOR HYPROMAG**

**London / Vancouver: December 12, 2023** – Mkango Resources Ltd. (AIM/TSX-V: MKA) (the “Company” or “Mkango”) is pleased to announce the first production of recycled rare earth magnets in the United Kingdom on commercial scale magnet manufacturing equipment in over 20 years, a major milestone in securing critical raw materials for the energy transition.

### **HIGHLIGHTS:**

- **First production runs of short-loop recycled rare earth magnets completed at the Tyseley Energy Park (“Tyseley”) rare earths hub in Birmingham, UK - commercial production targeted for mid-2024**
- **First UK production of sintered rare earth magnets on commercial scale equipment in over 20 years – new domestic source to catalyse electric vehicle, wind turbine and other clean technology industries**
- **Tyseley scale-up underpinned by successful piloting at University of Birmingham with over 3,000 finished rare earth magnets produced from piloting to date**
- **Strong interest for recycled magnets from potential customers and for recycling solutions from original equipment manufacturers (“OEMs”), and automotive and recycling companies**
- **Hydrogen Processing of Magnet Scrap (“HPMS”) technology being commercialised by HyProMag is far cleaner and more energy efficient than traditional magnet recycling processes**
- **HyProMag was selected by the Minerals Security Partnership (“MSP”) for support as one of its key projects given its strong potential to contribute towards the development of responsible critical mineral supply chains**

Production of recycled rare earth magnets at Tyseley is being developed by the University of Birmingham and HyProMag, which is owned by Mkango’s 79.4% held subsidiary, Maginito Limited (“Maginito”). Further production runs are planned in the coming weeks to provide customer and project partner samples.

Commercial production at Tyseley is targeted for mid-2024, with initial throughput targeted at 20 tonnes per annum (“tpa”) rare earth magnets and alloys, scaling up to a minimum of 100tpa in subsequent months. Larger scale up scenarios of up to 1,000tpa are currently being evaluated.

HyProMag is the main industrial partner for the Tyseley development and the exclusive licensee for underlying HPMS technology, developed at the University of Birmingham and now being commercialised by HyProMag. HPMS is a revolutionary new recycling technology that preserves the quality of the original magnets for reprocessing; a far cleaner and more energy efficient process than the traditional dismantling, thermal demagnetisation and cleaning processes and lends itself to automated and efficient processing. The resulting recycled magnets are being made to recognised industrial grades.

The Tyseley development forms the basis for the 2024 development of magnet recycling and manufacture in Germany by HyProMag GmbH and for the 2025/2026 development of a multi-spoke and hub operation in the United States through the joint venture with CoTec Holdings Ltd (“CoTec”).

Commissioning of the remaining equipment and infrastructure at Tyseley is expected in the coming weeks, underpinning the subsequent transition to commercial production. For these initial production runs, the recycled raw material feed was derived from wind turbine magnets, voice coil assemblies from hard disk drives and production scrap which was processed through the existing recycling pilot plant commissioned in 2022 at the University of Birmingham, and then transported for short loop magnet manufacture at Tyseley.

**Will Dawes, Chief Executive of Mkango said:** *“This is a major milestone for the Company, HyProMag and for the UK, creating a strong platform to advance to commercial production and for the scale-up and roll-out of HPMS technology into Germany, United States and other jurisdictions. HyProMag’s recycling technology has major competitive advantages versus other recycling technologies, and is a key enabler for the cost effective and energy efficient separation and recycling of rare earth magnets, avoiding the need for dismantling, and enabling the production of magnets with a significantly reduced carbon footprint.”*

**Nick Mann, Operations General Manager of HyProMag said:** *“Beginning production on commercial scale equipment is very exciting for all of us at HyProMag. We are receiving strong market interest to begin delivering recycled magnets to customers at scale – being able to start that over the coming months will be extremely positive. We also look forward to implementing the lessons learned as we see equipment arriving in Germany next year and in the USA soon afterwards.”*

**Professor Allan Walton, Head of the Magnetic Materials Group, University of Birmingham, and founding Director of HyProMag said:** *“A huge amount of work has been carried out over the last year on the existing pilot plant at the University of Birmingham to produce a spectrum of NdFeB magnets with a range of magnetic grades. This has allowed us to test recycled magnets in a range of products for the first time with extremely encouraging results. The installation of the new equipment at Tyseley Energy Park has allowed us to prove that these properties can be achieved on a commercial scale for the first time on automated equipment. This is a massive step forward and re-introduces commercial sintered magnet manufacturing back into the UK for the first time in over 20 years”.*

HyProMag is receiving strong interest for recycled magnets from potential customers, underpinning the transition to commercial operations, and for recycling solutions from original equipment manufacturers (“OEMs”), and automotive and recycling companies looking for a low cost and energy efficient circular solution for magnet recycling that does not require dismantling – HyProMag’s patented HPMS technology provides the solution.

The magnets produced at Tyseley were of commercial grade, featuring a square loop with good coercivity (resistance to demagnetisation) and remanence (magnetic strength), which are key measures of magnetic performance.

Apart from providing feed during the commissioning phase of the Tyseley development, the pilot plant at the University of Birmingham has enabled the testing of a broad variety of scrap streams and the production of a wide range of products since its commissioning in 2022, generating operating information to support the scale-up and commercialisation of operations. Furthermore, over 3,000 finished rare earth magnets have been produced to date by HyProMag and the University of Birmingham from recycled HPMS powder produced for project partners and potential customers from the pilot scale equipment. These magnets are being tested in a wide range of applications including multiple automotive, aerospace, electronics applications, and others planned, providing valuable marketing and technical information to further support the scale-up and commercialisation of operations.

Apart from the production of finished magnets, the University of Birmingham pilot plant has also produced alloys for remelt testing and chemical processing, maximising the flexibility of the product suite and the ability to process

different scrap streams. Mkango is also developing a further pilot plant at Tyseley for long loop recycling via a chemical process, which complements the HyProMag short loop recycling process and will also be commissioned in the coming weeks. Material for chemical processing, including swarf (the powder produced from grinding and finishing magnets), will either be processed in-house by Mkango, or in partnership with third parties.

### **About HyProMag**

HyProMag ([www.hypromag.com](http://www.hypromag.com)) is 100 per cent owned by Maginito Limited, which is owned on a 79.4/20.6 basis by Mkango and CoTec. HyProMag is commercialising rare earth magnet recycling using Hydrogen Processing of Magnet Scrap (“HPMS”) technology in the UK, Germany and United States, with first production in the UK this year, Germany in 2024 and the United States in 2025/2026.

HPMS technology was developed at the University of Birmingham, underpinned by approximately US\$100 million of research and development funding, and has major competitive advantages versus other rare earth magnet recycling technologies, which are largely focused on chemical processes but do not solve the challenges of liberating magnets from end-of-life scrap streams – HPMS provides the solution. HyProMag’s company presentation can be viewed via the following link: [HyProMag Corporate Presentation](#)

HyProMag’s HPMS recycling technology was selected by the Minerals Security Partnership (“MSP”) for support as one of its key projects. The technology was selected by the MSP because the MSP determined its strong potential to contribute towards the development of responsible critical mineral supply chains.

The MSP was formed in 2022 by 14 governments and aims to ensure adequate supplies of minerals such as rare earths to meet net zero-carbon goals. It aims to support public and private sector investments building diverse, secure, and responsible global critical minerals supply chains.

Having commissioned the UK’s first rare earth magnet recycling pilot plant at the University of Birmingham in 2022, as featured on BBC Midlands News: <https://youtu.be/9P-dsNCffWw?si=pQQeLDv0zV8kdnbM>, alongside the UK’s only facility to make sintered rare earth magnets, HyProMag, together with the University of Birmingham, are developing a large-scale recycling and magnet manufacturing plant at Tyseley Energy Park, Birmingham. This £4.3 million (C\$7.3 million) project is being funded by Driving the Electric Revolution, an Industrial Strategy Challenge Fund challenge delivered by UK Research and Innovation (“UKRI”).

### **About Mkango Resources Ltd.**

Mkango's corporate strategy is to develop new sustainable primary and secondary sources of neodymium, praseodymium, dysprosium and terbium to supply accelerating demand from electric vehicles, wind turbines and other clean technologies. This integrated Mine, Refine, Recycle strategy differentiates Mkango from its peers, uniquely positioning the Company in the rare earths sector. Mkango is listed on the AIM and the TSX-V.

Mkango is developing its flagship Songwe Hill rare earths project (“Songwe”) in Malawi with a Definitive Feasibility Study completed in July 2022 and an Environmental, Social and Health Impact Assessment approved by the Government of Malawi in January 2023. Discussions regarding the Mine Development Agreement (“MDA”) for Songwe Hill are ongoing with the Government of Malawi.

In parallel, Mkango and Grupa Azoty PULAWY, Poland's leading chemical manufacturer have agreed to work together towards development of a rare earth separation plant at Pulawy in Poland (the “Pulawy Separation Plant”) to process the purified mixed rare earth carbonate produced at Songwe Hill.

Through its ownership of Maginito ([www.maginito.com](http://www.maginito.com)), Mkango is also developing green technology opportunities in the rare earths supply chain, encompassing neodymium (NdFeB) magnet recycling as well as innovative rare earth alloy, magnet, and separation technologies. Maginito is owned 79.4 per cent by Mkango and 20.6 per cent by CoTec. It is focused on developing green technology opportunities in the rare earths supply chain,

encompassing neodymium (NdFeB) magnet recycling as well as innovative rare earth alloy, magnet, and separation technologies.

Maginito holds a 100 per cent interest in HyProMag and a 90 per cent direct and indirect interest (assuming conversion of Maginito's convertible loan) in HyProMag GmbH, focused on short loop rare earth magnet recycling in the UK and Germany, and a 100 per cent interest in Mkango Rare Earths UK Ltd ("Mkango UK"), a company focused on long loop rare earth magnet recycling in the UK via a chemical route. CoTec and Maginito have also agreed to form a 50:50 joint venture in relation to the roll-out of rare earth magnet recycling into the United States, with feasibility study and development costs funded by CoTec.

Mkango also has an extensive exploration portfolio in Malawi, including the Mchinji rutile exploration project, the Thambani uranium-tantalum-niobium-zircon project and Chimimbe nickel-cobalt project.

For more information, please visit [www.mkango.ca](http://www.mkango.ca)

### **Market Abuse Regulation (MAR) Disclosure**

The information contained within this announcement is deemed by the Company to constitute inside information as stipulated under the Market Abuse Regulations (EU) No. 596/2014 ('MAR') which has been incorporated into UK law by the European Union (Withdrawal) Act 2018. Upon the publication of this announcement via Regulatory Information Service, this inside information is now considered to be in the public domain.

### **Cautionary Note Regarding Forward-Looking Statements**

This news release contains forward-looking statements (within the meaning of that term under applicable securities laws) with respect to Mkango. Generally, forward looking statements can be identified by the use of words such as "targeted", "plans", "expects" or "is expected to", "scheduled", "estimates" "intends", "anticipates", "believes", or variations of such words and phrases, or statements that certain actions, events or results "can", "may", "could", "would", "should", "might" or "will", occur or be achieved, or the negative connotations thereof. Readers are cautioned not to place undue reliance on forward-looking statements, as there can be no assurance that the plans, intentions or expectations upon which they are based will occur. By their nature, forward-looking statements involve numerous assumptions, known and unknown risks and uncertainties, both general and specific, that contribute to the possibility that the predictions, forecasts, projections and other forward-looking statements will not occur, which may cause actual performance and results in future periods to differ materially from any estimates or projections of future performance or results expressed or implied by such forward-looking statements. Such factors and risks include, without limiting the foregoing, the availability of (or delays in obtaining) financing to develop Songwe Hill, and the various recycling plants in the UK, Germany and the US as well as the separation plant in Poland, governmental action and other market effects on global demand and pricing for the metals and associated downstream products for which Mkango is exploring, researching and developing, geological, technical and regulatory matters relating to the development of Songwe Hill, the ability to scale the HPMS and chemical recycling technologies to commercial scale, competitors having greater financial capability and effective competing technologies in the recycling and separation business of Maginito and Mkango, availability of scrap supplies for recycling activities, government regulation (including the impact of environmental and other regulations) on and the economics in relation to recycling and the development of the various recycling and separation plants of Mkango and Maginito and future investments in the United States pursuant to the cooperation agreement between Maginito and CoTec, the outcome and timing of the completion of the feasibility studies, cost overruns, complexities in building and operating the plants, and the positive results of feasibility studies on the various proposed aspects of Mkango's, Maginito's and CoTec's activities. The forward-looking statements contained in this news release are made as of the date of this news release. Except as required by law, the Company disclaims any intention and assume no obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by applicable law. Additionally, the Company undertakes no obligation to comment on the expectations of, or statements made by, third parties in respect of the matters discussed above.

**For further information on Mkango, please contact:**

**Mkango Resources Limited**

William Dawes  
Chief Executive Officer  
[will@mkango.ca](mailto:will@mkango.ca)  
Canada: +1 403 444 5979  
[www.mkango.ca](http://www.mkango.ca)  
@MkangoResources

Alexander Lemon  
President  
[alex@mkango.ca](mailto:alex@mkango.ca)

**SP Angel Corporate Finance LLP**

Nominated Adviser and Joint Broker  
Jeff Keating, Kasia Brzozowska  
UK: +44 20 3470 0470

**Alternative Resource Capital**

Joint Broker  
Alex Wood, Keith Dowsing  
UK: +44 20 7186 9004/5

**Tavistock Communications**

PR/IR Adviser  
Jos Simson, Cath Drummond  
UK: +44 (0) 20 7920 3150  
[mkango@tavistock.co.uk](mailto:mkango@tavistock.co.uk)

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