



# Recycling & Clean Processing Technologies

Rare Earth Elements and Critical & Strategic Metals from

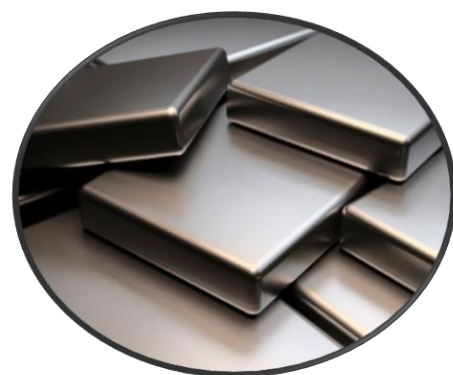
- Magnets
- Bauxite Residues
- Mining and Industrial sources

# Forward Looking Statement

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# Clean Technologies for Sustainable Metals

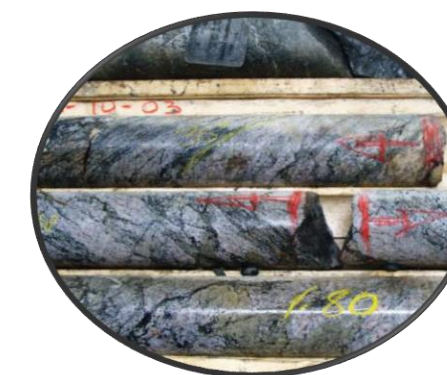


## REE Recycling

- Fully funded to develop the 1<sup>st</sup> rare earth magnet recycling facility outside of Asia
- Ongoing detailed engineering in preparation to procurement and construction
- Sustainable solution to the magnets that drive transport electrification and the global renewable energy movement

## Montviel REE Deposit

- Largest rare earth Bastnaesite 43-101 resource estimate in North America
- Patented metallurgical process
- Road and power infrastructure

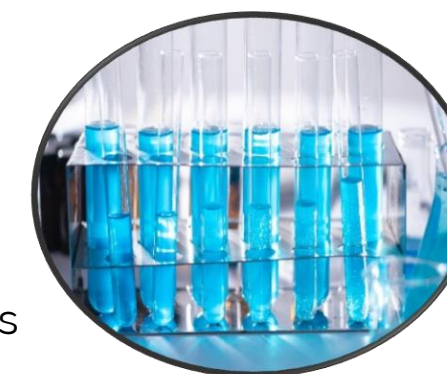


## Bauxite Residues Sustainable Processing

- Working with a major industrial partner to advance technology to pilot stage
- Production of bulk metals (Fe, Al) while reducing waste volume >80%
- Recovery of valuable critical metals (REE, Sc, Ti, V) and recycling of main reagents

## Critical Metals R&D

- Strong technical team led by CTO Dr. Pouya Hajiani
- Leveraging REE expertise to evaluate other sources (mining, industrial & e-waste)
- Targeting various critical metals and sources such as Co, Li, V, Ni, Nb, Ti, Ta, Cr and others
- Healthy pipeline of projects







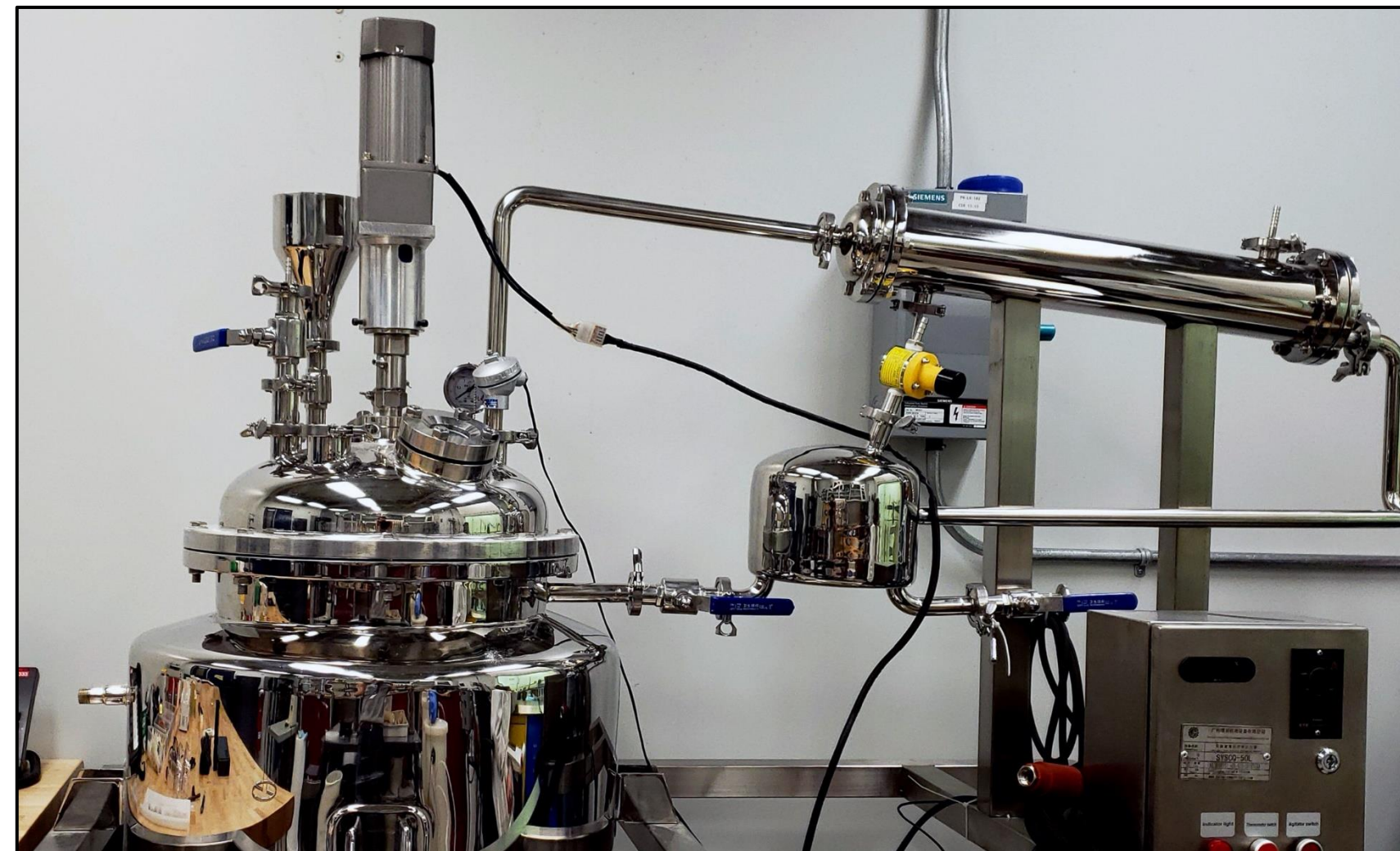
- **2011** Montviel carbonatite discovered in Quebec, Canada
- **2015** Largest 43-101 bastnaesite resource estimate in North America published
- **2015** Developed an innovative low acid & low power process for Montviel
- **2017** Successfully extracts and purifies Nd, Dy oxides and Co from NdFeB scrap (lab scale)
- **2019** Technology demonstrated in a 20L pilot & initial supply agreements signed
- **2020** Engineering starts with Hatch and a 50L pilot
- **2020** Expands R&D to other critical metals to leverage its processing technologies
- **2021** Technology developed for Bauxite Residues processing



- Proprietary technology
- Environmentally safe
- Small footprint
- Low CAPEX



**Magnet Feed**



**Pilot Unit**



**REO Product**

- Recovery of main reagents > 90%
- No liquid effluent produced
- High purity, >99.5% REO Product
- Iron oxide as by-product
- Lower GHG emissions than conventional mining



**Iron By-Product**



# REE Recycling Demo Plant

- Facility in Saint-Bruno secured and construction complete
- Majority of equipment selected
- Detailed engineering ongoing
- Fully funded:
  - \$3M debt facility from Investissement Québec
  - Over \$3.5M raised in equity
- Upcoming milestones:
  - Equipment ordering
  - Plant construction & assembly



St Bruno facility

# REE Recycling Demo Plant

Demo Plant Economics	
Demo plant feed throughput	1.5 tpd / 8hr day
Average grade of feed stock	30% TREO (Nd, Pr, Dy, Tb)
Capital costs (inc. W/C)	\$4.8 M
Direct operating costs	\$3 / kg of TREO
Targeted Sales*	\$10 M
Target Profit Margin	20%
<b>Conversion to Commercial Plant</b>	<b>Up to 4.5 tpd / 24hr operation</b> Additional costs \$1M-\$2M Targeted Sales \$30 M
*Based on REO bottom prices pre 2020 increase	



# Permanent Magnet Sector

- NdFeB market is over 180,000 tonnes per year and valued at around \$12B
- Demand expected to surpass 300,000 tonnes by 2030
- China produces over 85% of the world's magREO (Nd, Pr, Tb, Dy) and over 90% of the NdFeB magnets
- Demand driven by electrification of transport and sustainable power generation
- Magnet demand from the EV & Wind sectors expected to grow from 14,500 tpy to over 66,000 tpy in 2030

<sup>1</sup>Source: Adamas Intelligence, Walter T. Benecki LLC & Dr. John Ormerod (2018), Roskill



# What is recycled?

- Swarf: > 50,000 tpy globally
- Pre & Post Consumer assemblies:
  - Several established programs for collecting end of life magnets from motors and wind turbines
  - Manufacturers get back material back from clients
  - >15,000 tpy available worldwide with volumes increasing in some application and decreasing in others

Pre & Post Consumer assemblies



Swarf



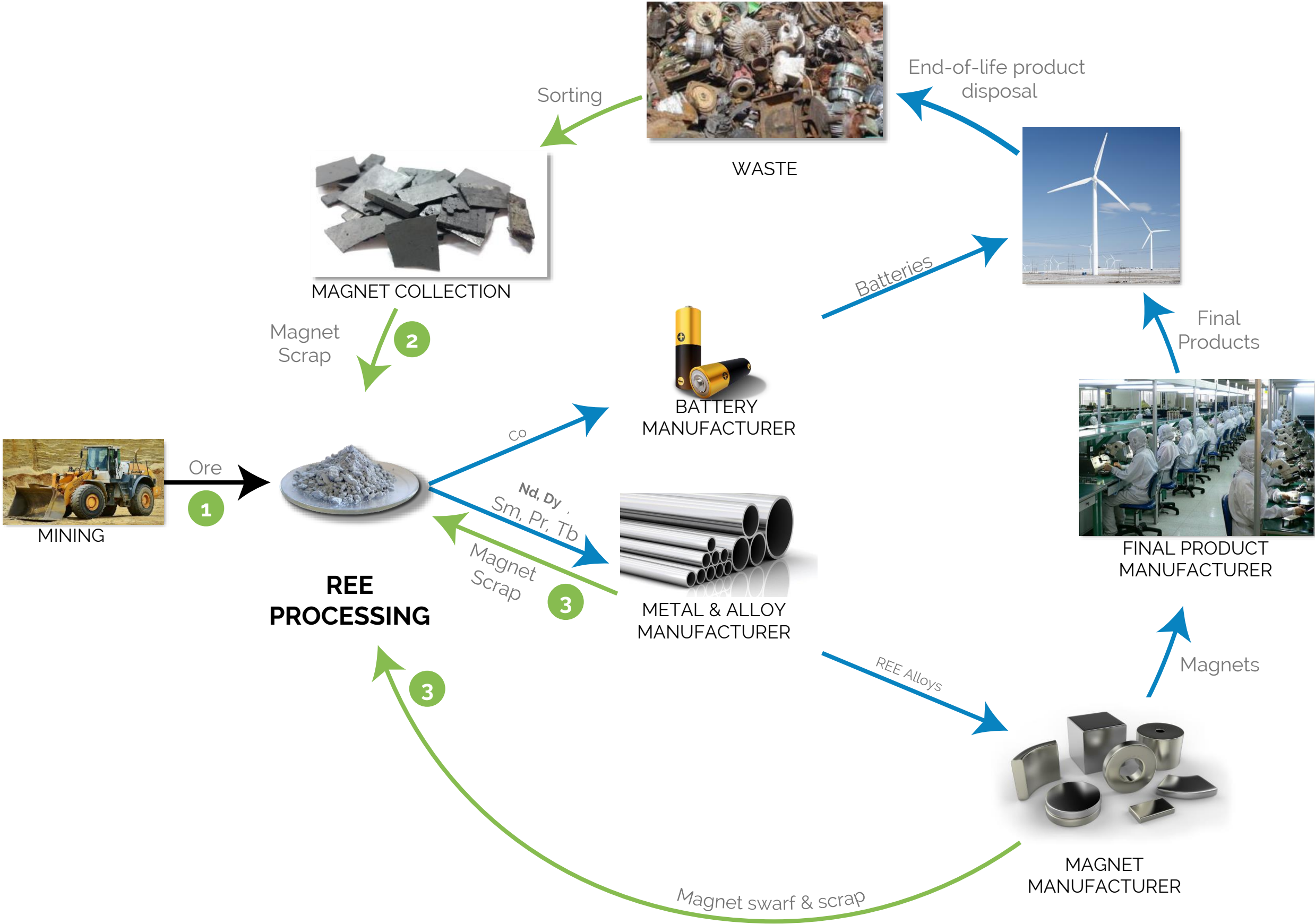
Scrap



Source: Rocklink GMBH



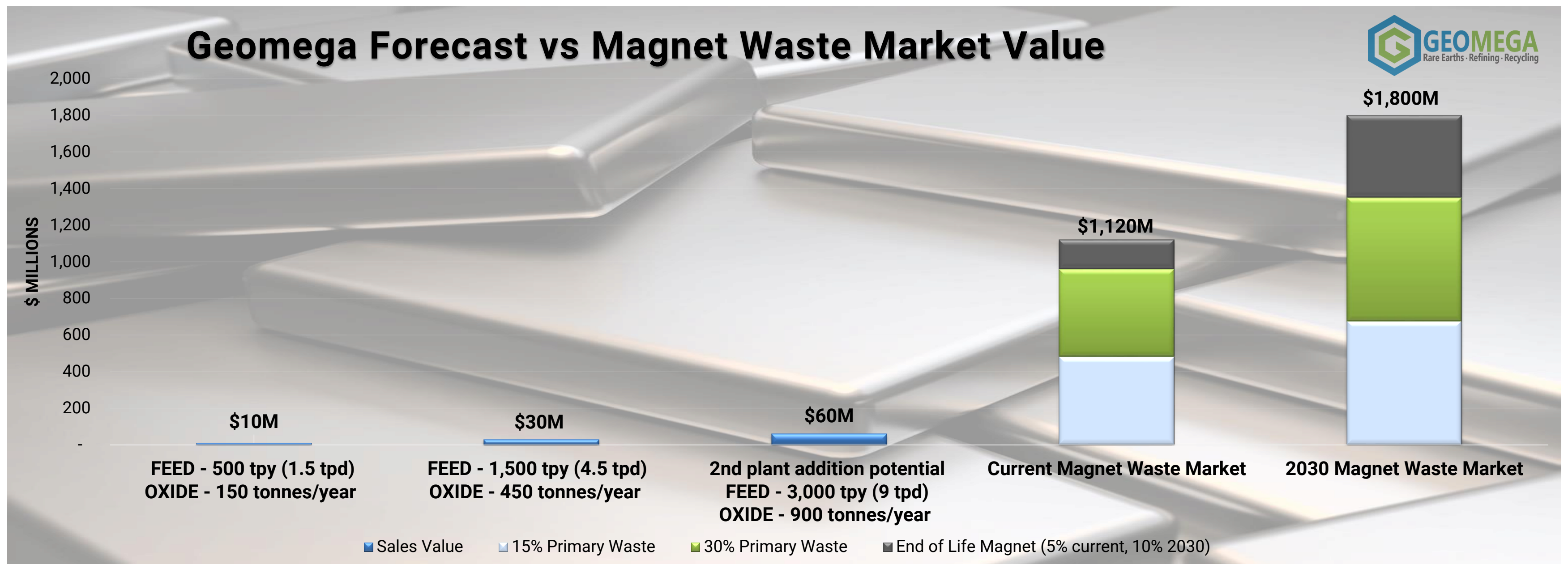
# REE Circular Economy





# REE Recycling Growth Potential

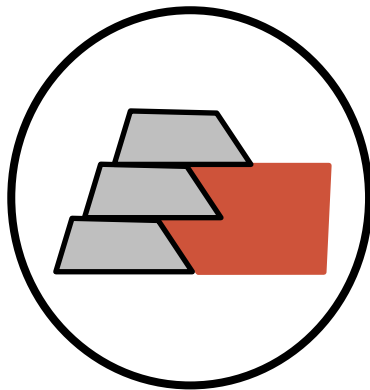
- Starting from a robust demo model & then upgrading to commercial plant
- Significant growth opportunity in magnet recycling from a growing global production
- Continuous growth from end of life sources



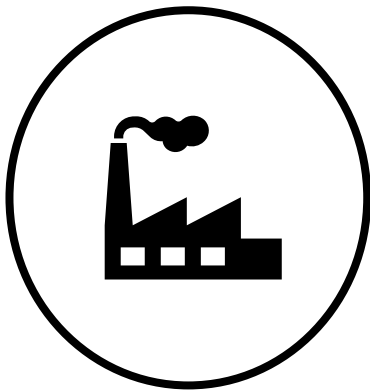
# Bauxite Residues Basics



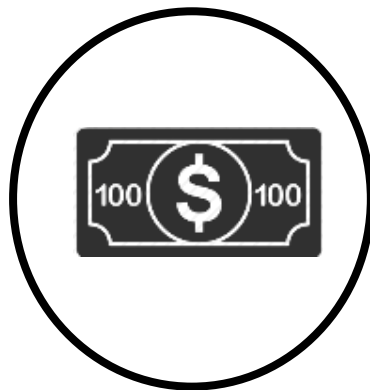
More than 80 plants worldwide produce bauxite residues



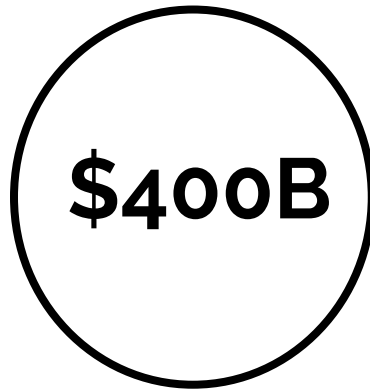
Over 4 B Tonnes of Bauxite Residues are stored in tailings globally



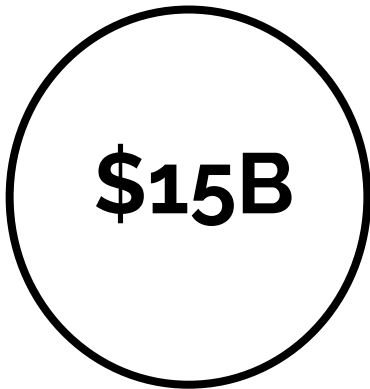
Over 150MT of Bauxite Residues are produced annually worldwide



\$80 – \$120 in lost metal value per tonne of bauxite residues



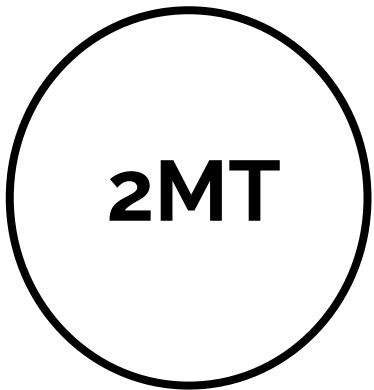
in metal value in storage



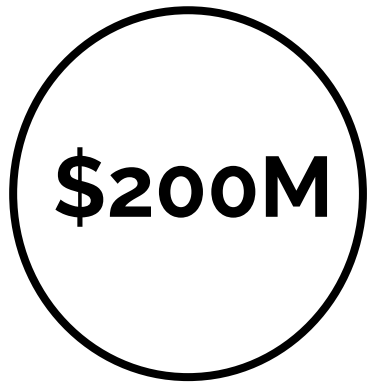
in metal value in annual bauxite residues production



# Bauxite Residues Value Proposition



Average plant production  
of bauxite residues per year

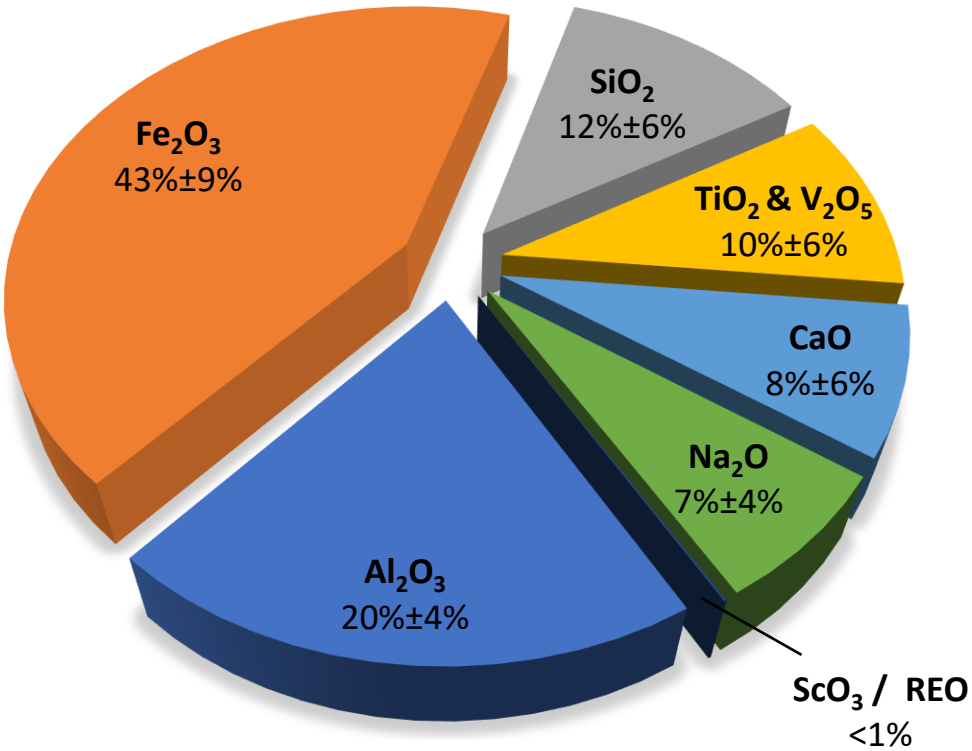


in metal value per year  
mostly in Iron, Aluminum  
and Scandium

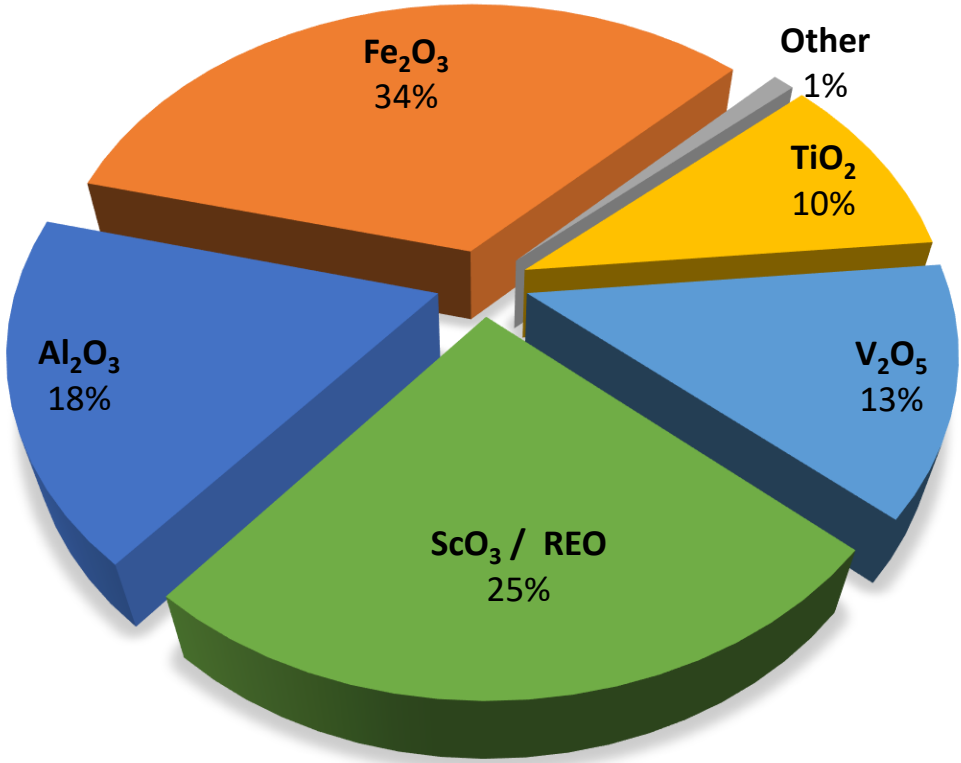


Technology to be deployed  
globally through licensing  
and royalty agreements

Average composition



Value distribution\*



\*Estimated at \$100/T and 80% recovery

# Bauxite Residues Technology



- Recovery of **bulk metals (Fe, Al)** to maximize **volume reduction (>80%)**
- Recycling of main reagents to **reduce costs and effluents**



- Production of **valuable** minor metals concentrates (Ti, V, Sc/REE)
- To develop **sustainable** Scandium supply for the automotive, aerospace and other industries



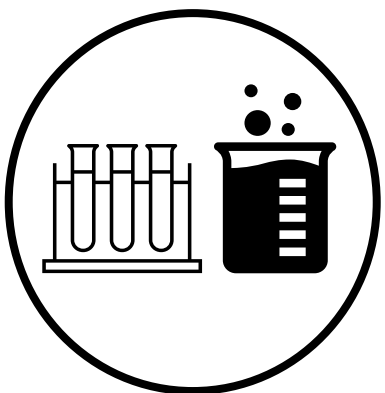
- To conserve and contribute to **cleaner water**
- To remove potential **soil** contamination from seepage



# Bauxite Residues Technology



- Working with a major industrial international partner
- Advancing the technology to pilot stage



- Bench scale successfully demonstrated
- Positive internal economic evaluation
  - **Synergis** between various processing steps
  - **Non-corrosive** reagents eliminates the need for high-cost specialized equipment
  - No sophisticated purification steps **reduces CAPEX** and **de-risks scale-up**

- Leveraging expertise and technology strengths to evaluate other sources (mining, industrial & e-waste)
- Applying technology to other feeds with similar characteristics
  - High iron (Fe) content
  - Loss of REE and other CSM in the tailings
  - Need for reagents recycling and tailings volume reduction
- Potential for royalties & licenses with major partners looking to
  - Reduce environmental footprint (GHG & land/water usage)
  - Advance circular economy within their production
- Healthy pipeline of projects



# Montviel REE Project

- 100% owned by Geomega
- Located in Quebec with power and road infrastructure available
- Largest rare earth Bastnaesite 43-101 resource estimate in North America
- 82.4 Mt @ 1.5% TREO & 0.17% Nb<sub>2</sub>O<sub>5</sub> Indicated and over 184Mt Inferred
- Patented metallurgical process (US15/578,498)
- Strong support from the Quebec government, local communities and the CREE First Nation
- The most accessible REE project in Canada

- Geomega's technology developed with Montviel in mind
- Technology to demonstrate Montviel as a robust project even at low REO prices
  - Recyclability of main reagents
  - Reduction of environmental footprint
  - Simplified process
  - Iron as a by-product
- Technology more mature than it was in 2015
- Market demand stronger than it was in the last 10 years and only growing



# Management Team

**Kiril Mugerman**

Director, President & CEO

**Dr. Pouya Hajiani**

Chief Technology Officer

**Mathieu Bourdeau**

Chief Financial Officer

**Alain Cayer**

VP Exploration

## Board of Directors

**Gilles Gingras**

Ex-partner at Deloitte

**Kosta Kostic**

Partner at Fasken

**Mario Spino**

Financial Modeling at  
National Bank Financial

**Nicholas Nickoletopoulos**

President & Managing Director of Metalunic  
Prev. President & CEO of Urecon

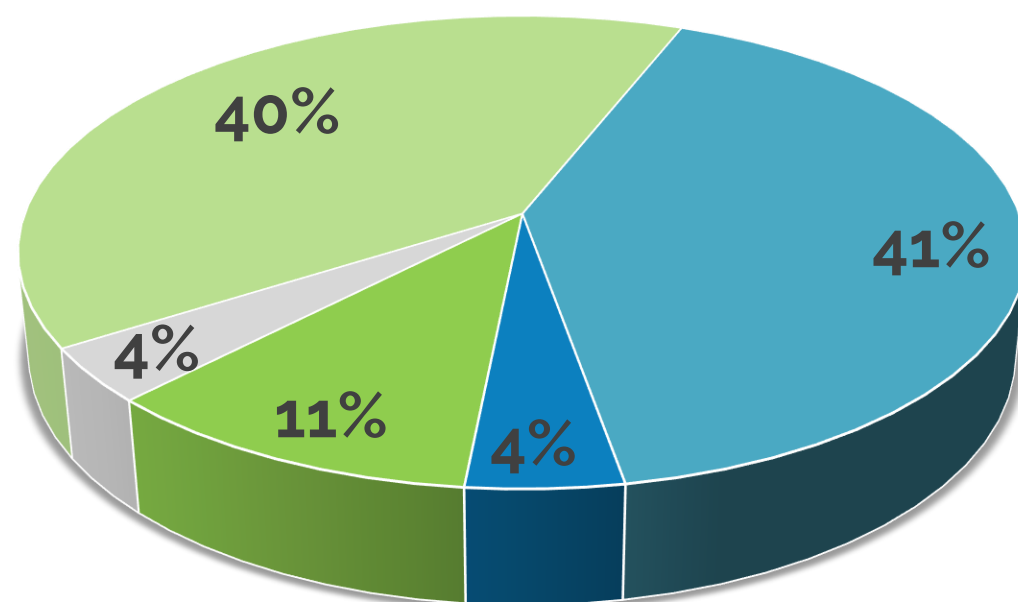
**Matt Silvestro**

President & Owner of  
Jobmaster Magnets

- 
- **Clean processing technologies for Critical & Strategic Metals**
  - **Low CAPEX & Low OPEX REE recycling**
  - **Bauxite residues technology**
  - **Major REE Montviel project in the pipeline**
  - **Several R&D projects ongoing to apply technology to other feeds**
  - **Royalties & licenses opportunities on major global waste streams of CSM**



# Share Structure



- Management & Insiders
- Quebec Inst. Funds
- Strategic Investors
- Private Large Positions
- Retail

\*Debt financing from IQ for \$3M has not yet been withdrawn

**Issued & Outstanding (28/02/2021) 126,747,786**

Stock Options

9,801,250

Warrants

18,853,562

Fully-Diluted

155,337,598

Equity assets

16.8M shares of KTR.V

Cash

\$3.5M & \$3M IQ\*



# Rare Earths Recycling & Clean Processing Technologies



Kiril Mugerman – President & CEO

[kmugerman@geomega.ca](mailto:kmugerman@geomega.ca)

(450) 641-5119 ext 5653

[www.geomega.ca](http://www.geomega.ca)