Developing a Rare Earths Hub in Quebec

Corporate Presentation October 2020







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Neodymium Oxide

Neodymium Metal

NdFeB Magnets





Electric Motors







REE Recycling

- Developing the 1st rare earth magnet recycling facility outside of Asia
- Clean proprietary technology ٠
- Ongoing piloting & engineering
- Facility secured and built
- Next: Procurement & plant assembly
- Debt financing secured from QC qovernment (\$3M)
- Production expected in 2021 ٠



٠

Critical Metals R&D

- Strong technical team led by CTO Dr. Pouya Hajiani
- Leveraging REE experience to evaluate other ٠ sources (mining, industrial & e-waste)

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Developing a Rare Earths Hub in Quebec

Geomega's Main Activities

- Owns 100% of the Montviel carbonatite deposit in Quebec
- Largest rare earth Bastnaesite 43-101 resource estimate in North America
- 82.4 Mt @ 1.5% TREO & 0.17% Nb2O5 Indicated and over 184Mt Inferred
- Patented metallurgical process
- Road and power infrastructure



Montviel REE Deposit

- Developing innovative technologies for the critical metals essential for a sustainable future
- Targeting various metals and sources such as Co, Li, V, Ni, Nb, Ti, Ta, Cr and others

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- 2011 Montviel carbonatite discovered in Quebec, Canada
- 2015 Largest 43-101 bastnaesite resource estimate in North America published
- 2015 Developed an innovative hydrometallurgical process for Montviel. Low acid (HCl) and low power consumption
- 2017 ISR technology 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 with Hatch and a 50L pilot
- **2020** Expands R&D to other critical metals to leverage its processing technologies

History Highlights

Intord



Geomega's ISR Technology

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



Pilot Unit

Lower GHG emissions than conventional mining



Magnet Feed



REO Product

- Recovery of main reagents > 95%
- No liquid effluent produced
- High purity, >99.5% REO Product
- Iron oxide as by-product
- Lower GHG emissions than conventional mining



Iron By-Product

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REE Recycling Demo Plant

- **HATCH** completed and delivered: •
 - Process flow diagrams
 - Equipment list & sizing •
 - Utilities, stream tables and heat & mass balance •
- Ongoing pilot testing to validate process adjustments and modifications ۲
- Facility in Saint-Bruno secured and construction complete ۲
- Next steps include: ●
 - Equipment datasheets •
 - Process control diagrams •
 - Piping & instrumentation diagrams \bullet
 - Layout
 - Ordering equipment \bullet
- Securing construction company Developing a Rare Earths Hub in Quebec



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REE Recycling Demo Plant

Demo Plant Economics - production of 1.5 tons per day

Conversion to Commercial Plant	Up to 4.5 tp Additional o
Target Profit Margin	20%
Targeted Sales	\$10 M
Direct operating costs	\$3 / kg of 7
Capital costs (inc. WC)	\$4.8 M
Average grade of feed stock	30% TREO (
Demo plant feed throughput	1.5 tpd / 8h

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nr day

(Nd, Pr, Dy, Tb)

REO

Up to 4.5 tpd / 24hr operation Additional costs \$1M-\$2M Targeted Sales \$30 M

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Completed

- 1st Pilot plant (April 2019)
- Feed study (October 2019)
- Plant location secured (January 2020)
- Engineering with Hatch (August 2020)
- \$3.05M debt funding (no interest, 5 years) secured with Quebec Government (September 2020)
- Various sources of feed material secured

Upcoming

- 2nd Pilot plant (finishing up)
- Sourcing of additional feed material (ongoing)
- Discussions with rare earths buyers (ongoing)
- Evaluating other non-dilutive funding through Federal and Provincial governments (ongoing)
- Engineering (ongoing)
- Procurement to begin (Q4 2020)
- Construction (Q1 2021)
- Plant commissioning (H2 2021)
- Production (2021)

Milestones



- 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



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Feed Overview

mercial plant owing global production





- Magnet-REO (Nd, Pr, Tb & Dy) represent only 30% of the annual global demand for all REE (over 170k tpy) but over 80% of total REE market value (US\$2 B)
- Seismic shifts in the global REE supply/demand outlook indicating significant shortages
- Geopolitical changes in the China/North America & EU supply chain dynamics Change in global investor sentiment and attitude bias away from non-sustainable
- legacy resource extraction methodologies.

Provides Geomega with a substantial and favorable entry point into the domestic and international REE supply framework



Why recycle REE?





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

Pre & Post Consumer assemblies



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What is recycled?

Swarf



Scrap



Source: Rocklink GMBH Page 11 | Geomega (GMA.V)



REE Circular Economy

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REE Recycling in China





- China is the global leader in REE recycling
- China controls over 90% of REE Separation capacity with over 31% of that used for Recycling – BAIINFO, June 2019
- Efficient collection programs & Solvent Extraction (SX) facilities dedicated to recycling are already in place
- HCl based process with iron rich waste & organic solvent-based • pollutants in aqueous discharges - Disposal is low cost in traditional tailings
- Over \$1.2B of REO are recycled annually
- Magnet scrap import to China is prohibited

Global magnet collection is still limited with no clear processing route

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REE Recycling – Geomega Solution

What is needed to increase REE recycling

- Requires low cost & environmental process that operates in batches
- Low CAPEX plant to justify economics based on the feed that is easily available outside of China today
- An operational plant will create an active market with recycling companies
- Recycling Infrastructure is already there to make homogeneous and segregated collection
- Government regulations to promote, educate & support REE recycling

Geomega's ISR proprietary green technology



More Suppliers Joining

- **Global supply growing** ullet
 - LOIs signed with several groups for over 800 tpy \bullet
 - Pilot programs for magnet recovery from electric vehicles ongoing
 - Partnership with Jobmaster Magnets to recycle from existing clients
 - LOI with USA Rare Earths to process waste from the U.S. Magnet plant ullet
 - More suppliers to join the magnet collection network



Rare Earth

Source: Rocklink GMBH

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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 ullet
- 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 ٠ generation
- Magnet demand from the EV & Wind sectors expected to grow from • 14,500 tpy to over 66,000 tpy in 2030

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

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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% Nb2O5 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
- Project has been on stand-by since 2015 to allow scale up of Geomega's processing technologies

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- Strong technical team led by CTO Dr. Pouya Hajiani •
- Leveraging REE expertise to evaluate other sources (mining, industrial & e-waste) •
- Developing innovative technologies for the critical metals essential for a sustainable future
- Potential for royalties & licenses •
- Targeting: •
 - REE
 - Co, Ni, V and Li (critical battery materials) •
 - Nb, Ti, Ta and Cr
 - Other metals suffering from traditional non-sustainable processes •

Critical Metals R&D

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Management Team

Kiril Mugerman

Director, President & CEO

Dr. Pouya Hajiani

Chief Technology Officer

Chief Financial Officer

Board of Directors

Gilles Gingras

Kosta Kostic

Mario Spino

Chairman of Mason Graphite, ex-partner at Deloitte

Partner at McMillan LLP

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

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Mathieu Bourdeau

Alain Cayer

VP Exploration



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- Established supply of magnet waste material •
- Deal in place with a trading house to sell final product •
- Low CAPEX •
- Low OPEX
- **Small Footprint** •
- **Clean Process** •
- **Ongoing pilot and engineering** •
- Major milestones ahead: completion of pilot, detailed engineering, \bullet procurement, construction & production



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



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Share Structure

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Kiril Mugerman – President & CEO <u>kmugerman@geomega.ca</u> (450) 641-5119 ext 5653

www.geomega.ca

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