Rare Earth Element (REE) Recycling for the Permanent Magnet Industry

Corporate Presentation
November 2019
Forward Looking Statement

Our presentation contains “forward-looking statements” not based on historical facts. Forward-looking statements express, as of the date of this presentation, our estimates, forecasts, projections, expectations and opinions as to future events or results. The forward looking statements that are contained in this presentation are based on various assumptions and estimates by the Corporation and involve a number of risks and uncertainties. As a consequence, actual results may differ materially from results forecast or suggested in these forward-looking statements and readers should not place undue reliance on forward-looking statements. We caution you that such forward-looking statements involve known and unknown risks and uncertainties, as discussed in the Corporation’s filings with Canadian Securities Administrators. Various factors may prevent or delay our plans, including but not limited to, contractor availability and performance, weather, access, mineral prices, success and failure of the exploration and development carried out at various stages of the program, and including as regards the commercialization of any of the technology, general business, economic, competitive, political and social conditions. The Corporation expressly disclaims any obligation to update any forward-looking statements, except as required by applicable securities laws.

Neodymium Oxide  Neodymium Metal  NdFeB Magnets  Electric Motors
The History

- 2009 Geomega founded – focus on mineral exploration
- 2011 Montviel carbonatite discovered in Quebec, Canada
- 2012 Maiden resource estimate
- 2013 Initial work on innovative REE separation begins
- 2015 Largest 43-101 bastnaesite resource estimate in Canada published
- 2015 Innord, private subsidiary created with the support of the Quebec Government. Focus on innovation in rare earths extraction and refining
- 2015 Developed successfully an innovative hydrometallurgical process for Montviel. Low acid (HCl) and low power consumption
The History

- 2016 Focus switches to secondary sources in order to demonstrate technology - lower CAPEX risk than traditional mining
- 2017 ISR technology successfully extracts and purifies Nd, Dy oxides and Co from NdFeB scrap (lab scale)
- 2018 ISR technology 1st successful scale up (lab, 2L reactor)
- 2019 ISR technology demonstrated in a 20L pilot
- Engineering begins for a demonstration plant with 1.5 tpd throughput capacity
- 2020 Targeting initial production from the demonstration plant
Geomega’s ISR Technology

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

- Recovery of main reagents > 95%
- No liquid effluent produced
- Iron oxide as product
Geomega’s ISR Technology

Other advantages:

▪ Works with both metallic and calcined phase of magnets
▪ Applicable to NdFeB and SmCo magnets
▪ Can process sintered and bonded magnets
▪ Batch process, ideal for the recycling industry
▪ No need to remove plating
▪ Can accept both magnetized and demagnetized material
▪ Can process rusty and broken scrap
▪ Currently adjusting to handle assemblies as well
## ISR Technology Demo Plant

### FEED study Updated Economics - production of 1.5 tons per day

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demo plant feed throughput</td>
<td>1.5 tpd / 8hr day</td>
</tr>
<tr>
<td>Average grade of feed stock</td>
<td>30% TREO (Nd, Pr, Dy, Tb)</td>
</tr>
<tr>
<td>Capital costs</td>
<td>$2.6 MM</td>
</tr>
<tr>
<td>Direct operating costs</td>
<td>$3 / kg of TREO</td>
</tr>
<tr>
<td>Targeted Sales</td>
<td>$10 MM</td>
</tr>
<tr>
<td>Target Profit Margin</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Expansion potential</strong></td>
<td><strong>Up to 4.5 tpd / 24hr operation</strong></td>
</tr>
</tbody>
</table>
Upcoming Milestones

2019

- Optimization of Pilot Plant: Q2-Q3
- Equity Financing Complete: Q3
- Results of FEED Study: Q3
- Selection of Demonstration Plant Location: Q4
- Debt / Government Funding: Q4

2020

- Equity Financing Complete: Q3
- Results of FEED Study: Q4
- Selection of Demonstration Plant Location: Q4
- Start EPCM: Q4
- Offtake Agreements: Q4-Q1
- Plant Commissioning: 2020

Feed Sourcing Contracts & Stockpiling Material – always ongoing
Feed Material

Primary - Magnet & Alloy manufacturers residues

End of Life (EOL) Bulk magnets

Focusing on Magnet-based Feed Grade – up to 40% REO (Nd, Pr, Tb, Dy)
Feed Material

LOI with Rock Link – 100 to 200 tpy
  German based specialist in production waste and EOL recycling.

LOI with U.S. based magnet manufacturer – 12 to 24 tpy

Collaboration with Comet Traitement & U. Liege in a Recycling Pilot study by major EV manufacturer

Working on securing additional sources of both feed types
2018 Neodymium (NdFeB) magnet production – 160,000 tons ($11B US)
- 15-30% waste in production = 24,000 to 48,000 tpy

Electric Vehicles – Avg. 3 kg NdFeB per EV
- 2018 sales – 2M EV = 6,000 tonnes NdFeB
- Avg. lifespan 8-10 years

Wind Power – 3MW = up to 2 tons NdFeB
- Annual growth – avg. 50,000 MW = 15,000 tpy NdFeB
- In 2017 decommissioned 650 MW and growing
- Decommissioning growth approx. 25% per year

MORE GROWTH = MORE MAGNET WASTE IN THE FUTURE
Educating the upstream recycler

- 100s to 1000s recycling & scrap companies in every country
- Most don’t recognize the value of the magnet
- Magnet is considered waste and discarded with the steel
- Recycling industry always evolves towards new materials

Government Support

- Labeling as Critical Materials
- Regulations to mandate recovery

OEM / Major Corporations Support

- Everyone looking for a solution that is clean and cost efficient

NO BUYER / NO GOVERNMENT SUBSIDIES = NO RECYCLING
Feed Overview

- Starting model is robust
- Growth opportunity in magnet recycling is significant
- Additional growth expected from other secondary sources
Ginger International Trade & Investment Pte Ltd ("GITI")

- Appointed official sales representative for Europe & Asia
- Singapore based, specializes in rare earths and minor metals
- Extensive network with REE manufacturers, traders and end users

Working on securing offtakes in Europe & North America
3 different feeds
Why Invest in the REE Sector?

15 Lanthanide elements critical to our clean tech & high tech industries

- Key demand is the permanent magnet – the driver of the renewable energy revolution & transportation electrification.
- Expected supply shortfall and increase in Magnet REE prices.
REE Industry Bottleneck – China’s Chokehold

- Global REE refining capacity > 90%
- Solvent Extraction (SX)
- Solvents used in process not environmentally friendly
- High CAPEX & difficult to permit outside of China

Result:
REE consumer is >85% in China & Japan
• Production distribution approximates the global demand for key uses (e.g., magnets)
• REE market evaluated at $8B US in 2018, expected to reach $14B in 2025 (CAGR 8.6%)
• Nd, Pr, Dy, Tb combine for approx. 30% of demand but 80% of the REE market value
Permanent Magnet Sector

Global Permanent Magnet Market

9.4% avg annual growth from 2015 to 2024

<table>
<thead>
<tr>
<th>Material</th>
<th>Weight (000s Kg)</th>
<th>Value ($ Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NdFeB</td>
<td>160,000</td>
<td>11,200 (99%)</td>
</tr>
<tr>
<td>Ferrite</td>
<td>830,000</td>
<td>5,800</td>
</tr>
<tr>
<td>Bonded NdFeB</td>
<td>11,000</td>
<td>1000</td>
</tr>
<tr>
<td>SmCo</td>
<td>4,200</td>
<td>400</td>
</tr>
<tr>
<td>Alnico</td>
<td>6,300</td>
<td>350</td>
</tr>
<tr>
<td>Other</td>
<td>2000</td>
<td>150</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,013,500</td>
<td>$18.9 Billion</td>
</tr>
</tbody>
</table>

Source: Walter T. Benecki LLC & Dr. John Ormerod

Rare Earths Recycling for the Permanent Magnet Industry

Source: Roskill
**Global Production & Prices**

Chinese monopoly results in:
- Major geopolitical risk
- Price volatility & supply uncertainty
- Demand destruction
- Difficult to establish new mines

Source: Hobart M. King

**BUT, today’s reality is:**
- Low but stable prices
- Drives demand growth
- Positive for innovation
- Positive for recycling

Source: Bloomberg
Nd, Pr, Dy, Tb Prices

Source: Kitco
Quebec – a future REE hub

- Strong support for innovation from Canada and Quebec
- Quebec becoming an electrification hub with developing supply of Lithium & Graphite
- ISR Technology to be used to establish Quebec as the clean and cost-efficient recycler of choice outside of China for NdFeB
- Expand to recycling other secondary feeds of rare earths / specialty metals
- Use ISR to refine REE mining concentrates
- Use ISR on alternative REE bearing feeds such as coal, tailings and other mining feeds
Summary

- Magnet recycling is not the future, it’s the reality of today
- China is the leader in REE recycling (established infrastructure & supply)
- ROW is playing catch-up, AGAIN!
- Blaming low rates of recycling on low REO prices is WRONG
- Need cleaner and more cost-effective technologies, not higher prices

- What is the missing link in the outside of China REE supply chain? RECYCLING
- What is the missing piece of the puzzle in establishing NdFeB magnet production outside of China? RECYCLING

- Low CAPEX, Low OPEX, Small Footprint, Clean Process
  The Achilles heel of China’s dominance in the REE sector
Management

**Kiril Mugerman - President & CEO**
- Over 8 years in the REE sector
- Previously mining analyst with IA Securities in industrial minerals and exploration geologist with Gold Fields Ltd.
- President & CEO of Kintavar Exploration
- Holds a B.Sc. With Honors from McGill University in Earth & Planetary Science

**Dr. Pouya Hajiani, Ph.D. - Chief Technology Officer**
- Over 5 years of research in lanthanides extraction and purification
- Inventor of the FFE and ISR separation of REE and hydrometallurgical extraction method for REE and Nb for Montviel ore
- Previously project manager and process engineer for petrochemical companies under RSI

**Mathieu Bourdeau, CPA, CA - Chief Financial Officer**
- 6 years at Deloitte as Director of Audit and Consulting Services
- Previously financial controller for Explorance Inc.

**Alain Cayer, P. Geo., M.Sc. - VP Exploration**
- Responsible for delineating the large carbonatite deposit at Montviel
- VP Exploration of Kintavar Exploration
- Discovered the Eleonore gold deposit and the Mitchi Copper project
### Board of Directors

**Gilles Gingras, CPA, CA**
- Retired and former Partner in Audit and Advisory Services at Deloitte LLP (1987 to 2013)
- Member of Deloitte LLP Canadian Board of Directors and of its finance, risk management and governance committees (2002 to 2010)

**Jean Demers, P. Geo**
- President of Geodem Inc. consulting in corporate financing and evaluation
- Assistant syndic and trainer for the Ordre des Geologues du Quebec and previously a director
- Involved in corporate governance for 20+ years & recipient of the Quebec Interprofessional Council’s Merit Award

**Kosta Kostic**
- Partner and member of McMillan LLP National Capital Markets and M&A group
- Practice focused on corporate finance, securities and M&A in the mining, renewable energy and information technology

**Mario Spino**
- Model validations for National Bank of Canada
- Previously principal advisor with KPMG and financial market risk management and derivatives evaluation
- Holds a M.Sc. in financial engineering from HEC
### Share Structure

<table>
<thead>
<tr>
<th>Shareholding Group</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management &amp; Insiders</td>
<td>37.8%</td>
</tr>
<tr>
<td>Quebec Inst. Funds</td>
<td>11.1%</td>
</tr>
<tr>
<td>Private large positions</td>
<td>3.6%</td>
</tr>
<tr>
<td>Retail</td>
<td>3.6%</td>
</tr>
</tbody>
</table>

#### Issued & Outstanding

- **100,749,514** shares in total
- **6,252,500** Stock Options
- **10,153,886** Warrants
- **117,155,900** Fully-Diluted shares
- **16.8M** shares of KTR.V

![Stock Price Chart](chart.png)
Rare Earths Recycling for the Permanent Magnet Industry

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www.geomega.ca
About Us

Geomega owns 96.1% Innord, the innovation arm focused on scaling up "ISR", a local, environmentally friendly REE recycling and refining technology.

100% owned REE asset located in Quebec with a 43-101 resource, permanent access and excellent infrastructure.
Geomega’s ISR Technology

- Proprietary & unique.
- Significant advantages: low CAPEX & environmentally safe.
- Organic solvent free process vs. legacy solvent extraction methods (SX).
- Recycles waste from permanent magnet manufacturers and extracts four HHREE.
- Recovery of main reagents – 95%
- Over 5 years of R&D.
GeoMegA’s Market Opportunity

• Focus on high price & high demand REE (Prices as of June 13, 2019)*
  Neodymium Nd ($52/Kg)
  Praseodymium Pr ($60/Kg)
  Dysprosium Dy ($290/Kg)
  Terbium Tb ($583/Kg)

Target European & North American markets

  ~ 5,000 tpy of HHREE

• Focus on small volume & high grade feedstock to reach commercial production
  up to 2,000 tpy @ 30-40% HHREE

• Governments are seeking a clean technology to replace the SX Technology – Toxic & not Environmentally Friendly.

• Need high margin operation = Neodymium Magnet Recycling