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

Corporate Presentation - AGM
October 2019
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About Us

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

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

<table>
<thead>
<tr>
<th>Description</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>Sales</td>
<td>$10 MM</td>
</tr>
<tr>
<td>Profit Margin</td>
<td>20%</td>
</tr>
<tr>
<td>Expansion potential</td>
<td>Up to 4.5 tpd / 24hr operation</td>
</tr>
</tbody>
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Upcoming Milestones

2019

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

2020

- **Q4-Q1**: Offtake Agreements
- **Q4**: Start EPCM
- **2020**: Plant Commissioning

Feed Sourcing Contracts & stockpiling material – always ongoing

Rare Earths Recycling for the Permanent Magnet Industry
Feed Material

Primary - Magnet & Alloy manufacturers residues

End of Life (EOL) Bulk magnets

Focusing on Magnet-based Feed Grades 30 to 40% REO (Nd, Pr, Tb, Dy)
3 different feeds
Feed Material Source

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
Sales Agreements

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
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 = up to 33,000 tpy NdFeB
• In 2017 decommissioned 650 MW = up to 400 t NdFeB
• Decommissioning growth approx. 25% per year

MORE GROWTH = MORE MAGNET WASTE IN THE FUTURE
Summary

- Starting model is robust and growth opportunity in magnet recycling is significant
- Additional growth expected from other secondary sources
- Ultimate goal remains to process mining concentrates (Montviel and others)

### Geomega Forecast vs Magnet Waste Market Value

- **Sales Value**
- **15% Primary Waste**
- **30% Primary Waste**
- **End of Life Magnet (5% current, 10% 2030)**

<table>
<thead>
<tr>
<th>Current Magnet Waste Market</th>
<th>2030 Magnet Waste Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,120M</td>
<td>$1,800M</td>
</tr>
</tbody>
</table>

#### Feeds and Oxides
- **FEED - 500 tpy (1.5 tpd)**
  - FEED - 1,500 tpy (4.5 tpd)
  - 2nd plant addition potential
- **OXIDE - 150 tonnes/year**
  - OXIDE - 450 tonnes/year
  - OXIDE - 900 tonnes/year

Rare Earths Recycling for the Permanent Magnet Industry
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 (000's 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>
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Source: Walter T. Benecki LLC & Dr. John Ormerod

Source: Roskill

Rare Earths Recycling for the Permanent Magnet Industry
Global Production & Prices

- Major geopolitical risk
- Pricing bubbles
- Demand destruction
- Difficult for new mines to get established
- But this is the prices reality
- Drives demand growth
- Positive for innovation

Source: Hobart M. King

Source: Bloomberg
Nd, Pr, Dy, Tb Prices

Source: Kitco
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
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)

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

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+ year & recipient of the Quebec Interprofessional Council’s Merit Award

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**

Issued & Outstanding: 100,749,514

- Stock Options: 6,252,500
- Warrants: 10,153,886
- Fully-Diluted: 117,155,900

Equity assets: 16.8M shares of KTR.V
Rare Earths Recycling for the Permanent Magnet Industry

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