WHAT A GEOLOGIST NEEDS TO KNOW ABOUT MARKETING INDUSTRIAL MINERALS

Spring 2014
<table>
<thead>
<tr>
<th>FACTOR</th>
<th>METAL</th>
<th>IM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market type</td>
<td>Undifferentiated</td>
<td>Differentiated</td>
</tr>
<tr>
<td>Total value</td>
<td>Lower ~33%</td>
<td>Higher ~67%</td>
</tr>
<tr>
<td>Specifications</td>
<td>Few</td>
<td>Many</td>
</tr>
<tr>
<td>Buyer loyalty</td>
<td>Low (price)</td>
<td>High (perform)</td>
</tr>
<tr>
<td>Branding</td>
<td>Uncommon</td>
<td>Common</td>
</tr>
<tr>
<td>Marketing</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>
MARKETING  versus  SALES

Strategic  versus  Tactical
Long Range  versus  Focused
Customer (Long Term)  Customer (Daily)

← Overlap →
Marketing is the exploration phase for industrial minerals and rocks.
<table>
<thead>
<tr>
<th>IM SEGMEN</th>
<th>PERCEIVED IMPORTANCE</th>
<th>PRACTICAL IMPORTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Transport</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Processing</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Mining</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Exploration</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>
Geology dictates deposit existence

Markets dictate deposit development

Transportation
IM MARKET TYPES

Commodity = Product driven
Specialty = Market driven
<table>
<thead>
<tr>
<th></th>
<th>COMMODITY</th>
<th>SPECIALTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARKETING NEEDED</td>
<td>↓</td>
<td>↑</td>
</tr>
<tr>
<td>TECHNICAL SUPPORT</td>
<td>↓</td>
<td>↑</td>
</tr>
<tr>
<td>RESEARCH &amp; DEVELOPMENT</td>
<td>↓</td>
<td>↑</td>
</tr>
<tr>
<td></td>
<td>Value</td>
<td>Risk</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Specialty Alone</td>
<td>high value</td>
<td>high risk</td>
</tr>
<tr>
<td>Commodity Alone</td>
<td>low value</td>
<td>mod. risk</td>
</tr>
<tr>
<td>Commodity + Specialty</td>
<td>moderate value</td>
<td>least risk</td>
</tr>
<tr>
<td><strong>Market Characteristics</strong></td>
<td><strong>Commodity Minerals</strong></td>
<td><strong>Specialty Minerals</strong></td>
</tr>
<tr>
<td>----------------------------</td>
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<td>-----------------------</td>
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<tr>
<td>Place Value</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>(transport sensitive)</td>
<td>(transport insensitive)</td>
</tr>
<tr>
<td>Volume</td>
<td>Large</td>
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<tr>
<td>Specifications</td>
<td>Standard</td>
<td>Customized</td>
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<tr>
<td>Sample evaluation</td>
<td>Short</td>
<td>Long</td>
</tr>
<tr>
<td>Properties, uniformity</td>
<td>General</td>
<td>Controlled</td>
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<tr>
<td>Testing</td>
<td>Standard</td>
<td>Customized</td>
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<tr>
<td>Market &amp; Management style</td>
<td>Business</td>
<td>Technical</td>
</tr>
<tr>
<td>Main sales basis</td>
<td>Price (undifferentiated)</td>
<td>Performance (differentiated)</td>
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<tr>
<td>Time to first sale</td>
<td>Short</td>
<td>Medium to Long</td>
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<tr>
<td>Market change</td>
<td>Slow to moderate</td>
<td>Rapid to moderate</td>
</tr>
<tr>
<td>Lab &amp; R&amp;D need</td>
<td>Low</td>
<td>High</td>
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</table>
MARKETING

Market Study = What?

Market Development = Where? How?
MARKET STUDY

Commodity Survey — basic data, easy, past & present

Market Evaluation— forecasting, hard, future
MARKETING STUDY

Asking the right questions of the right people!
MARKET STUDY

- Exploration: green field, grass roots
- External: inactive; active (generally well known)
- Internal: inactive; active (new or existing product)
Mineral to end use market

Mineral

Intermediate product

Intermediate market

End use market

ilmenite

titanium dioxide white pigment

white paint manufacturer

automobiles/DoItYourself
Mineral to end use market

bentonite clay

cat litter manufacturer  drilling mud manufacturer  foundry sand binder
pet owners  oil producer  auto engine producer

talc

cosmetics manufacturer  plastics compounnder  papermaker
babies/beautiful people  garden furniture/auto dash  magazine publisher
Mineral to end use market

**silica sand**
- glassmaker
- beer bottles
- abrasive manufacturer
- sand blasting buildings
- ceramic manufacturer
- tiles/sinks/toilets

**zeolites**
- foot odour control
- retail

**emery**
- abrasive manufacturer
- emery boards/sandpaper

**diatomite**
- filter manufacturer
- wineries/breweries
Commodity Survey

• Existing Data
  – Financial
  – Production
  – Geological
  – Legal
  – Environmental

• Very minor forecasting
MARKET EVALUATION

- Forecasting (volume, price)
- Economic/Financial Analysis
- Specific Products
- Timing
- Location
APPROACH

Industrial (Short time)
Consumer (Long time)
<table>
<thead>
<tr>
<th>MARKETING ORGANIZATION TYPES</th>
<th>In-house Distributors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agents</td>
</tr>
<tr>
<td></td>
<td>Merchants</td>
</tr>
<tr>
<td></td>
<td>Traders</td>
</tr>
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MARKET POSITIONING STRATEGIES

- Low cost
- Differentiation
- Focus
- Segmentation
Mine to market supply chain

**SUPPLY**
- exploration
- mineral finance
- plant engineering
- mining
- processing

**LOGISTICS**
- trading
- port handling
- mineral inspection
- freight
- warehousing/distribution

**MARKET**
- direct market mineral consumer
- intermediate market mineral consumer
- end market mineral consumer

**DEMAND**
Major Markets

- Agriculture
- Ceramics
- Chemical
- Glass
- Paints
- Paper
- Plastics
- Refractories
- New markets
baddaleyite  
ball clay  
borates  
celestite  
feldspar  
fluorspar  
halloysite  
kaolin  
limestone  
lithium minerals  
nepheline syenite  
petalite  
plastic clay  
quartz  
rare earths  
silica sand  
soda ash  
spodumene  
talc  
wollastonite  
zircon
Chemicals

- borates
- celestite
- chromite
- fluor spar
- iodine
- limestone
- lithium
- magnesia
- manganese
- nitrates
- phosphates
- pyrites
- rare earths
- salt
- soda ash
- sodium sulphate
- sulphur
- zirconia
Glass

- borates
- dolomite
- dolime
- feldspar
- fluorspar
- kaolin
- lime
- limestone
- lithium carbonate
- zircon
- lithium minerals
- nepheline syenite
- petalite
- quartz
- rare earths
- silica sand
- soda ash
- sodium sulphate
- spodumene
Paint, Paper, Plastics

- alumina trihydrate
- barytes
- bentonite
- brucite
- celestite
- chromite
- diatomite
- feldspar
- ground calcium carbonate
- gypsum
- huntite-
  hydromagnesite
- ilmenite
- iron oxide
- kaolin
- manganese
- mica
- ppt calcium carbonate
- quartz
- rutile
- silica sand
- talc
- wollastonite
Refractories

- andalusite
- bauxite
- fused alumina
- alumina
- chromite
- dolomite
- graphite
- kyanite
- fused magnesia
- dead burned magnesia
- sintered mullite
- fused mullite
- olivine
- pyrophyllite
- refractory clays
- silica sand
- fused silica
- silicon carbide
- sillimanite
- sintered spinel
- fused spinel
- zircon
- fused zirconia
New Markets

• Fuel cells, wind turbines, solar panels

• Nanomaterials
  – Particle size 1 to 100 nanometers (10^{-9} meters)
  – Clays, talc, titanium oxide, calcium carbonate
  – Chemical, mechanical, physical properties superior to larger particles—fine crystal size and large surface area
  – wood preservation, marine antifouling, thermoplastics, permanent coatings, environmental catalysts, deodorants, oral care, glass polishing, semiconductor polishing
SUMMARY

Metals and IM’s require markedly different approaches

Marketing dominates industrial minerals

IM marketing style = industrial, not consumer

Marketing (strategic) and sales (tactical) differ

IM marketing evaluation = Ask the right questions

IM markets = commodity (product) or specialty (market)
## IM Marketing Summary Table

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• Mineral consuming market existence & its performance directly affects demand for mineral raw materials, i.e. industrial minerals

• No market demand = no mineral supply = no mineral development