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Growth in Electronics

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Forward Looking Statements

The forward-looking statements in this presentation concerning revenue, earnings, return on capital, volume, growth, economic growth rates, stock price performance, and the value of future product and service offerings involve risks and uncertainties, and are subject to change based on various important factors. These include the impact of changes in worldwide and national economies, availability and cost of power and other energy materials and the ability to recover these costs, pricing fluctuations in foreign currencies, changes in interest rates, the continued timely development and acceptance of new products and processes, the impact of technologies, competitive products and pricing, and the impact of tax and other legislation and regulation in the jurisdictions in which the company operates.

The technology discussed is included in U.S. and foreign patents and patent applications.
Praxair Snapshot

- 2003 sales: $5.6 billion
- Commercial terms capture above average ROC
  - Long term contracts
    - on-site
    - merchant
    - packaged
  - Take or pay
- Broad customer base
- Providing key solutions at small fraction of cost stack

2003 End Markets

- Aerospace 4%
- Manufacturing 22%
- Metals 15%
- Chemicals 11%
- Energy 10%
- Food and Beverage 8%
- Other 13%
- Electronics 7%
- Healthcare 10%
- Manufacturing 22%
- Metals 15%
- Chemicals 11%
- Energy 10%
- Food and Beverage 8%
- Other 13%
- Electronics 7%
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Operating Model

♦ Focus on 10 core geographies

♦ Volume demand grows faster than industrial production

♦ Optimize 5 growing opportunities
  • US Gulf Coast hydrogen
  • Electronics
    • Healthcare
    • China
    • Application technologies

♦ Relentless focus on execution
  • Productivity savings > $100MM/yr
    - Procurement
    - Global operational excellence
    - Six Sigma
  • Flawless project execution

Source: Bloomberg and company reports
What we are NOT doing

- Dilutive acquisitions
- Projects at or near our cost of capital
- Spending CAPEX ahead of demand
- Project financing
- “One-off” plant sales

A highly disciplined approach that mitigates risk and creates a “smart” portfolio
Global Electronics Sales - $420MM in 2003

By Geography

- 2000: 89% (North America/Europe), 11% (Asia)
- 2002: 80% (North America/Europe), 20% (Asia)
- 2004E: 74% (North America/Europe), 26% (Asia)

By Product

- 2000: 36% (Industrial Gases), 64% (Materials Science & Services)
- 2002: 42% (Industrial Gases), 58% (Materials Science & Services)
- 2004E: 49% (Industrial Gases), 51% (Materials Science & Services)

Mix is shifting
Key Growth Areas

Asia

CAGR: 29%

Materials Science and Services

CAGR: 11%

From 2000 to 2004 the CAGR of global MSI was 2%
Key Growth Initiatives - Semiconductors

- **Materials Science for 300mm**
  - Thin film metal deposition: PVD, CVD, & ALD
  - CMP consumables: belts, pads, slurries
  - Advanced components

- **Supply Chain Services**
  - Generic components
  - Parts management
  - Applied Materials alliance

- **Electronic Gases**
  - On-site high purity gases
  - Select specialty gases
  - Expansion in Asia

*Investment focus on high growth, high return segments*
Positioned to meet growing 300mm demand: Cu, Ta, Co, and Ni

Strong intellectual property position
- Competitive advantage in Tantalum - AdvanTage™
- Long life targets increase tool productivity by 30%
- Ultrafine grain materials - better film uniformity and device yield
- Product development with key OEM’s
- State of the art 300mm application lab

Supplying 80% of the 300mm fabs operating globally

A leading position in $400MM PVD market
CVD/ALD Precursors

- Developing next generation liquid CVD precursors for depositing metal and metal oxide films - Hf, Ru, Ta, & others
- Materials present in vapor react on chip surface to form thin film
- Enables advanced devices @ 65nm and below: high k dielectrics, DRAM, gate stack, interconnection barrier films
- Complementary to deposition materials and electronic gas business platforms

High growth market after 2008
Materials Science - CMP Consumables

♦ Belts and Pads
  • In production for copper technology
  • Multiple geometries/chemistries
  • Beta testing with multiple customers
  • Production facility to start-up in Q3 2004

♦ Slurries
  • Leading supplier of alumina based polishing slurries
  • HC Starck JDA for silica
  • State of the art testing lab in Indianapolis
  • Development with Applied Materials for Reflexion tool™
Advanced Components

♦ Technically differentiated components for chamber applications
  • Electrostatic chucks – performance materials and design for 300mm requirements
  • Chamber components - liners, gas dispersion plates, electrodes, rings, screen/baffles, chamber, exhaust systems
  • Specialty ceramic materials and coatings technology

♦ Increasing customer productivity
  • Reducing particle generation increases product yield
  • Increasing corrosion resistance provides longer service life

♦ Enabling smaller feature sizes
  Developing performance materials and processes to increase wafer processing accuracy

Creating value from increased component performance
Supply Chain Services

- Supply chain management and one-stop shopping for a wide range of consumables
- Reduces the need for fabs to deal with multiple vendors for thousands of parts
- Applied Materials alliance combines Praxair’s existing operational expertise with AMAT’s position in leading fabs
- Providing a service for the generic consumable market

AMAT alliance enables market share growth
Electronic Gases - Bulk and On-site

♦ Low cost reliable supply

♦ Winning in Asia
  - China - N2 supply and other products to new 300mm fabs
  - Korea - N2 supply at Samsung’s 300mm in Geihung
  - Korea - N2, H2 & He supply at Samsung’s new flat panel display complex

♦ Leading technology supplier
  
  **Supercritical CO$_2$**
  - Leading candidate for enabling dry cleaning solution
  - Praxair/TEL provides a unique/proprietary solution
  - Demonstrated Integrated system and tool
  - First to market
Electronic Gases - Process Gases

♦ Integrated source for key process gases, services, and delivery systems

♦ Focus on select process gas products for semiconductor, LCD and LED markets
  Arsine, Phosphine, Silane, Ammonia, NF3

♦ Growth in Europe and Asia on all select process gas products

♦ UpTime™ gas delivery system
  Increased productivity & lower cost of ownership

♦ Recent ultrahigh purity ammonia supply wins for Asian LED:
  • Epistar (Taiwan)
  • EpiPlus (Korea)
  • Luxxon (Taiwan)
  • South Epitaxy (Taiwan)
# Market Outlook - Key Products

<table>
<thead>
<tr>
<th>Product</th>
<th>Global 2003 Market ($MM)</th>
<th>2004-6 annual growth rate*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Targets</td>
<td>$400</td>
<td>10-15%</td>
</tr>
<tr>
<td>Tantalum</td>
<td>$55</td>
<td>40%</td>
</tr>
<tr>
<td>CMP Pads</td>
<td>$150</td>
<td>15-20%</td>
</tr>
<tr>
<td>CMP Slurries</td>
<td>$250</td>
<td>15-20%</td>
</tr>
<tr>
<td>Ceramic Chamber Components</td>
<td>$30</td>
<td>40%</td>
</tr>
<tr>
<td>Supply Chain Services</td>
<td>$500</td>
<td>15%</td>
</tr>
</tbody>
</table>

*Praxair Estimate

*In Q1 2004 Materials Science and Services grew 37% and overall gas sales grew 6% (YÖY)*
Principles of Sustainability

Governance and Integrity

Foster a culture of integrity and accountability throughout the company through rigorous compliance with all laws, and by establishing and following effective corporate governance practices.

Customer Commitment

Continuously develop new products and applications that help our customers improve their productivity, energy efficiency and environmental performance. Provide the highest levels of service, reliability and quality to our customers.

Environmental Responsibility

Continue to improve the efficiency of energy consumption. Reduce the intensity\(^1\) of air emissions, including greenhouse gases.

Employee Safety and Development

Maintain a safe work environment with a goal of zero accidents. Provide training and career opportunities that allow employees to develop to their fullest potential. Increase the diversity of our workforce so that it is more representative of the communities in which we operate.

Community Support

Help to improve the welfare and future of the communities in which we operate by sharing our knowledge, expertise and resources related to environmental protection, and community health, safety and security.

Financial Performance

Continuously improve our financial performance and provide attractive returns to our shareholders. Generate operating cash flow to reinvest in business growth and pay dividends.

\(^1\)Intensity is per-unit-of-production measure