What’s Ahead For Nitrogen Fertilizer In The USA?

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PotashCorp
# Nitrogen Fertilizer Sources

- **Anhydrous Ammonia** $\text{NH}_3$ 82-0-0
- **Urea** $\text{CO} (\text{NH}_2)_2$ 46-0-
- **Ammonium Nitrate** $\text{NH}_4 \text{NO}_3$ 33-0-0
- **UAN** 28/32-0-0
- **Ammonium Sulfate** $\text{NH}_4 \text{SO}_4$ 21-0-0-24S
- **MAP** $\text{NH}_4 \text{H}_2 \text{PO}_4$ 11-50-0
- **DAP** $(\text{NH}_4)\text{HPO}_4$ 18-46-0
- **APP** $(\text{NH}_4)_3 \text{HP}_2 \text{O}_7$ 10-34-0
- **Potassium Nitrate** $\text{KNO}_3$ 13-40-0
- **Slow Release-Controlled Release N** 43/44-0-0
## North American Ammonia Capacity

**FY 2003**

<table>
<thead>
<tr>
<th>U.S./Canada</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Million Tons</td>
<td></td>
</tr>
<tr>
<td>Agrium</td>
<td>4,165</td>
</tr>
<tr>
<td>Terra</td>
<td>3,270</td>
</tr>
<tr>
<td>Koch</td>
<td>3,195</td>
</tr>
<tr>
<td>CF</td>
<td>3,072</td>
</tr>
<tr>
<td>PCS</td>
<td>2,290</td>
</tr>
<tr>
<td>Miss Chem</td>
<td>1,770</td>
</tr>
<tr>
<td>All Others</td>
<td>5,209</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22,971</strong></td>
</tr>
</tbody>
</table>
## North American Urea Capacity
### FY 2003

<table>
<thead>
<tr>
<th></th>
<th>U.S./Canada</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Million Tons</td>
<td></td>
</tr>
<tr>
<td>CF</td>
<td>1,930</td>
<td>33.1</td>
</tr>
<tr>
<td>Agrium</td>
<td>1,260</td>
<td>21.6</td>
</tr>
<tr>
<td>PCS</td>
<td>1,090</td>
<td>18.7</td>
</tr>
<tr>
<td>Koch</td>
<td>620</td>
<td>10.6</td>
</tr>
<tr>
<td>All Others</td>
<td>930</td>
<td>16.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5,830</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
## North American UAN Capacity FY 2003

<table>
<thead>
<tr>
<th>U.S./Canada</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Million Tons</strong></td>
<td><strong>Total</strong></td>
</tr>
<tr>
<td>Terra</td>
<td>3,607</td>
</tr>
<tr>
<td>CF</td>
<td>2,190</td>
</tr>
<tr>
<td>PCS</td>
<td>1,899</td>
</tr>
<tr>
<td>Koch</td>
<td>1,627</td>
</tr>
<tr>
<td>All Others</td>
<td>2,631</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11,953</strong></td>
</tr>
</tbody>
</table>
What Drives N Fertilizer Markets in the USA/World?

- Manufacturing Technology/Capacity
- Cost
- World Markets
- Transportation
- Storage
- Convenience
Driving Factors

- Record increase in world nitrogen capacity
- China’s ban on urea imports
- Collapse of the Russian ruble
- High U.S. natural gas prices
New Ammonia Capacity vs Demand

Cumulative Growth

Million Tonnes Product

- China
- L. America
- FSU
- Unspecified
- Other Asia
- M. East
- W. Europe
- N. America
- Africa
- E. Europe
- Demand


Several Projects uncertain

Source: Fertecon
**Nitrogen - A Simplified Flow Diagram**

1. **Natural Gas**: 33.5 MMBtu/ton
2. **Anhydrous Ammonia ($\text{NH}_3$)**
3. **Nitric Acid ($\text{NA}$)**
4. **Liquid Ammonium Nitrate ($\text{AN}$)**
5. **UAN Solution (28-32% N)**
6. **Liquid Urea ($\text{UR}$)**
7. **Solid Urea

<table>
<thead>
<tr>
<th>Ammonia</th>
<th>Nitric Acid</th>
<th>Ammonium Nitrate</th>
<th>UAN Solution</th>
<th>Solid Urea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertilizers &amp; Industrial Sales</td>
<td>Industrial Sales</td>
<td>Fertilizers &amp; Explosives</td>
<td>Fertilizers</td>
<td>Fertilizers, Feeds &amp; Industrial Sales</td>
</tr>
</tbody>
</table>

Source: PotashCorp
NYMEX Natural Gas Prices

Source: NYMEX Monthly Closing gas prices

$US/MMBtu

$9.13

$4.43
US Ammonia and Urea Prices
Monthly Averages

Source: Fertecon
NYMEX US Natural Gas Futures Prices
October 16, 2003

Source: NYMEX
Urea Imports

By Month

Thousand Tonnes N

Source: BJA
US Nitrogen Consumption

Million st Product

- UAN (31% increase)
- Direct Application Ammonia (16% decrease)
- Urea (57% increase)
- Ammonium Nitrate (17% decrease)
- Ammonium Sulfate (29% increase)

Source: Commercial Fertilizers
US Nitrogen Consumption as % of total

Percent of Total N Tons Consumed

Source: Commercial Fertilizers
Comparative N Prices in Corn Belt

$ per lb N

- Ammonium Sulfate
- UAN
- Urea
- Ammonia

# Nitrogen Prices

<table>
<thead>
<tr>
<th>N Fertilizer</th>
<th>Wholesale Mid Cornbelt Price *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$ per ton</td>
</tr>
<tr>
<td>Ammonia (82%)</td>
<td>300-315</td>
</tr>
<tr>
<td>Urea (46%)</td>
<td>215-225</td>
</tr>
<tr>
<td>UAN (28%)</td>
<td>136-142</td>
</tr>
<tr>
<td>AM. Nitrate (33%)</td>
<td>185-195</td>
</tr>
<tr>
<td>AM. Sulfate (21%)</td>
<td>135-140</td>
</tr>
</tbody>
</table>

*Green Markets, Dec 15, 2003*
Longer Term Outlook

U.S. natural gas prices are expected to moderate but will remain significantly above historical averages. This will likely result in:

• Increased reliance on imported N
• Further consolidation of the U.S. industry
  --Industrial ammonia suppliers along Gulf Coast likely to close and rely on imports.
  --Some urea capacity likely to close due to increased offshore competition

Tightening world balance and access to large domestic market, however, will allow bulk of the industry to remain competitive.
# US Ammonia Capacity Potential Closures Due to High Natural Gas Prices

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Percent of Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity in 1999</td>
<td>20.2</td>
</tr>
<tr>
<td>Closures to date</td>
<td>3.6</td>
</tr>
<tr>
<td>Current Capacity</td>
<td>16.6</td>
</tr>
<tr>
<td>Capacity at risk</td>
<td>4.2</td>
</tr>
<tr>
<td>Potential capacity</td>
<td>12.4</td>
</tr>
</tbody>
</table>

Source: Industry Publications
Thank You