World Sulphur Outlook

The Sulphur Institute
Washington, DC, USA

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Vice President, Agricultural Programs
TSI’s Mission

Global advocate for sulphur

Represents all stakeholders producing, buying, selling, handling, transporting, or adding value to sulphur

Unified voice for sulphur producers, consumers, and service providers
  • Promotes safe handling, transportation
  • Protects the environment
All forms Sulphur Production, by Type
Million tons sulphur equivalent

Most growth in non-voluntary sources: elemental and smelter acid
## Gas-Recovered Sulphur Production (1000 tons)

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>4,412</td>
<td>4,150</td>
<td>3,600</td>
</tr>
<tr>
<td>U.S.A</td>
<td>1,190</td>
<td>1,250</td>
<td>1,100</td>
</tr>
<tr>
<td>EECA</td>
<td>7,655</td>
<td>8,455</td>
<td>11,600</td>
</tr>
<tr>
<td>West Asia</td>
<td>6,894</td>
<td>8,230</td>
<td>13,290</td>
</tr>
<tr>
<td>Europe</td>
<td>1,365</td>
<td>1,290</td>
<td>865</td>
</tr>
<tr>
<td>China</td>
<td>80</td>
<td>1,070</td>
<td>4,000</td>
</tr>
<tr>
<td>Others</td>
<td>928</td>
<td>915</td>
<td>915</td>
</tr>
<tr>
<td>Total</td>
<td>22,524</td>
<td>24,860</td>
<td>35,370</td>
</tr>
</tbody>
</table>

Source: Fertecon, 2010
OIL REFINERY RECOVERED SULPHUR
(million tonnes)

Source: Fertecon, 2010
## Oil-Recovered Sulphur Production (1000 tons)

<table>
<thead>
<tr>
<th>Region</th>
<th>2009</th>
<th>2010</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.A</td>
<td>7,630</td>
<td>7,875</td>
<td>9,400</td>
</tr>
<tr>
<td>Europe</td>
<td>3,359</td>
<td>3,230</td>
<td>4,230</td>
</tr>
<tr>
<td>West Asia</td>
<td>1,955</td>
<td>1,975</td>
<td>2,905</td>
</tr>
<tr>
<td>Asia</td>
<td>7,903</td>
<td>7,600</td>
<td>9,020</td>
</tr>
<tr>
<td>-China</td>
<td>1,300</td>
<td>1,540</td>
<td>2,300</td>
</tr>
<tr>
<td>-India</td>
<td>1,450</td>
<td>1,600</td>
<td>2,000</td>
</tr>
<tr>
<td>Others</td>
<td>2,837</td>
<td>3,110</td>
<td>4,070</td>
</tr>
<tr>
<td>Total</td>
<td>22,874</td>
<td>23,790</td>
<td>29,625</td>
</tr>
</tbody>
</table>

Source: Fertecon, 2010
Middle East production grows by 12.6 million tons, 2009-2019

Source: IFA, 2011; BSC, April, 2010
West Asia States’ sulphur export availability more than doubles, 2009-2019

Source: BSC, 2010
North America: +1.6 million tons

- Canadian production from gas declines. All growth from oil sands, which increases from 1.6 Mt/y (2009) to 3.0 Mt/y by 2015.

- Sulphur recovery capacity at US oil refineries increases by ~ 2.5 Mt/y by 2013.

Source: BSC, 2010
US Gulf forming plant capacity now totals >12,000 t/d.

<table>
<thead>
<tr>
<th>Company</th>
<th>Location</th>
<th>Capacity (t/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gulf Sulphur Service</td>
<td>Donaldsonville LA</td>
<td>4,000</td>
</tr>
<tr>
<td>Gulf Sulphur Service</td>
<td>Galveston TX</td>
<td>2,000</td>
</tr>
<tr>
<td>Martin Midstream</td>
<td>Beaumont TX</td>
<td>4,000</td>
</tr>
<tr>
<td>Koch Sulfur Products</td>
<td>Beaumont TX</td>
<td>345</td>
</tr>
<tr>
<td>Koch Sulfur Products</td>
<td>Corpus Christi TX</td>
<td>2,000</td>
</tr>
</tbody>
</table>

And more plants are under study, some at inland locations

Source: ICIS, 2011
FSU: +6.4 million tons
Gas-Recovered Sulphur Production (1000 tons)

Source: IFA, 2011; BSC, April, 2010
FSU Offshore Exports

Source: Oxbow, 2011
Elemental Sulphur Production
Million tons sulphur

- Strongest growth is in Middle East, FSU and Asia.
- All growth is from involuntary production.

Source 2008 and 2009: The Sulphur Institute
Source 2010-2014: British Sulphur Consultants April 2010
PYRITE SULPHURIC ACID PRODUCTION (million tonnes)

Source: Fertecon, 2010
SMELTER SULPHURIC ACID PRODUCTION (million tonnes)

Source: Fertecon, 2010
93% of sulphur consumption is as sulphuric acid
7% is consumed as elemental sulphur
Total world acid production in 2010: 200 million tons, up 9% from 2009
• From elemental: 122 million tons
• From smelters: 64 million tons
• From pyrites: 14 million tons
Nickel Projects Will Create New Demand

<table>
<thead>
<tr>
<th>Location</th>
<th>Sulphur Requirement (tonnes/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goro, New Caledonia</td>
<td>460,000</td>
</tr>
<tr>
<td>Ravensthorpe, Australia</td>
<td>500,000</td>
</tr>
<tr>
<td>Ramu River, Papua New Guinea</td>
<td>360,000</td>
</tr>
<tr>
<td>Ambatovy, Madagascar</td>
<td>600,000</td>
</tr>
<tr>
<td>Moa, Cuba</td>
<td>200,000</td>
</tr>
</tbody>
</table>

Source: ICIS, 2011
Sulphur Consumption
Million tons sulphur equivalent

After two years of decline, fertilizer demand recovers in 2010
Industrial demand impacted by declining global economy; slight recovery in 2010
Over 50% of world sulphur demand

Demand in 2010 increased

Maaden adding 1.5 Mt/y S demand

Fertilizer demand growth to come mostly from E. Asia, L. America and S. Asia
The Sulphur Market Balance, 1995-2015

2015 is when the problems begin...
...for someone...
Internationally Traded Sulphur - 2009

Exports
- Canada: 20%
- Saudi: 11%
- Kaz+FSU: 11%
- Russia: 10%
- Mexico: 2%
- U.S.: 8%
- W. Europe: 7%
- Iran: 4%
- Japan: 5%
- Others: 11%

Imports
- China: 43%
- Morocco: 11%
- Europe: 8%
- Latin Am.: 2%
- ME: 5%
- Tunisia: 5%
- India: 5%
- U.S.: 8%
- Africa: 4%
- Others: 7%
- Oceania: 2%

28.3 million tons

Source: FRC
Declining trend from N. America (22% of the total in 2010) more than offset by increases from Mideast (42% of the total); Asia and FSU account for 20% and 16%, respectively.

Source: China Sulphuric Acid Industry Association
Sulphur: An Advantaged Element

• Essential for protein in humans, animals and plants
• Valuable raw material for making wide variety of products in everyday life
• Natural element in air, water and land
• **Valuable: plant nutrient**
• **Valuable soil amendment**
• **Valuable component of select construction materials**
Sulphur - fourth major plant nutrient

Required in similar amounts as P, about 20.6 million tons S in 2005.

About 10 million tons S applied as a fertilizer worldwide

Total S fertilizer market potential for 10.6 million tons S today

12.5 million tons by 2015, primarily in Asia and the Americas.
Asia has the largest regional deficit around the world with India and China in the lead.
Traditional S fertilizer production will not meet the increasing demand for sulphur in agriculture.

Sulphur fertilizers and their use provides potential market of 9.6 million tons of sulphur consumption annually, benefiting the industry.

Fertilizer producers need to address this market potential...
Mark your calendars now!

The Premier Sulphur Industry Event will be in Antwerp, Belgium – April 23-25, 2012 for:

- Two days of networking with top industry players
- Insightful speakers on key topics
- A Sulphur Education Session for those new to the industry

Visit [www.sulphurinstitute.org](http://www.sulphurinstitute.org) for updates!
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Interacid Trading S.A.
Inter-Chem
Jupiter Sulphur L.L.C.
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Marsulex, Inc.
Martin Operating Partnership, L.P.
Mitsubishi Corporation
Mitsui & Co. (U.S.A.), Inc.
Mosaic Fertilizer LLC
Oxbow Carbon
PotashCorp
Primary Resources Inc.
PRISM Sulphur Corporation
SaeKwang Chemical Ind. Co. Ltd.
Sandvik Process Systems
Savage Services Corporation
Schiber Truck Company
Shell Sulphur Solutions
Sino-Chem Fertilizer Company Ltd.
solvadis GmbH
Sultran Ltd.
Tasweeq – Qatar International Petroleum Marketing Company Ltd.
Tessenderlo Kerley, Inc.
Transammonia, Inc.
Union Tank Car Company
Uralchem
Valero Marketing and Supply Company
Zwaans van der Heuvel Tankvaart BV