Soda Ash & Derivatives
Resilient cash generator for Solvay

Capital Markets Day
June 10-11 2015

Christophe Clémenté
President, Soda Ash & Derivatives
Soda Ash & Derivatives
Resilient cash generator for Solvay

Soda ash in many applications

- Flat glass
- Container glass
- Detergents
- Pharma

North America
2 production sites

Europe
7 production sites
3 R&I centers

Asia & RoW
1 production site
(in construction)

- 45%
- 24%
- 12%
- 19%

€ 1.4 bn
Net sales 2014

~ 3,500
employees

10 production sites
3 R&I centers

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Leading player with very competitive supply

**Raw materials**

- **Synthetic process**
  - Limestone
  - Salt brine

- **Natural process**
  - Trona mineral
  - CO₂ Carbon dioxide

Vertically integrated with own mines

**Products**

- Na₂CO₃ Soda ash
- NaHCO₃ Bicarbonate

Largest soda ash & bicarbonate producer worldwide

**Applications**

- Additives in chemical and metallurgical applications
- Flux in glass (flat, container)
- Water softener in detergents
- Supplement in food & pharma
- Flue gas agent

**End-markets**

- Industrial applications ~20%
- Building & Construction ~20%
- Consumer goods & Healthcare ~20%
- Agro, Feed & Food ~30%
- Energy & Environment ~10%

Solvay products approximate main end-market exposures

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Diversified soda ash market

Markets driven by GDP growth

Solvay addresses over 50% of global market

Total market volumes 2014

- Europe: 20%
- NAFTA: 12%
- North-East Asia: 44%
- Seaborne: 24%

Total market volumes 2014 (excluding North-East Asia)

- Metallurgy: 4%
- Chemicals: 12%
- Detergents: 15%
- Container glass: 26%
- Others: 20%

Addressable market: 56%

2014-18 CAGR 2.3%

- 23% Flat glass
  - ~80% linked to construction
  - Increasing glass surface in modern construction
  - Double glazing
  - Rest mainly linked to automotive

Markets driven by increasing population

- North-East Asia: 44%
- Seaborne: 24%

Markets driven by GDP growth

- Europe: 20%
- NAFTA: 12%
Soda ash market is global with regional supply/demand dynamics

**NAFTA** (in mt/yr)

- Capacity: 12.2
- Demand: 6.7

**EUROPE** (in mt/yr) (Including Turkey and Western Russia)

- Capacity: 1.0, 9.7, 10.6
- Demand: 1.0, 9.1, 10.6

**CHINA** (in mt/yr)

- Capacity: 13.8, 17.2, 23.6
- Demand: 13.8, 17.2, 23.6

**Export to SEA-BORNE market** (in mt/yr)

- from NAFTA: 4.5
- from Europe: 1.4
- from China: 1.8

**MAIN PRODUCING REGIONS** (2014 figures)

- Synthetic process
- Natural process
- Synthetic process ("Hou" method)
Addressing a resilient market

**Soda ash demand**

in mt/yr (excluding China & internal Bicarbonate consumption)

- **Europe**
- **NAFTA**
- **Seaborne**

<table>
<thead>
<tr>
<th>Year</th>
<th>Europe</th>
<th>NAFTA</th>
<th>Seaborne</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>10.8</td>
<td>6.7</td>
<td>6.7</td>
<td>29.8</td>
</tr>
<tr>
<td>2011</td>
<td>11.1</td>
<td>6.7</td>
<td>6.7</td>
<td>30.8</td>
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<tr>
<td>2012</td>
<td>11.0</td>
<td>6.7</td>
<td>6.7</td>
<td>30.7</td>
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<tr>
<td>2013</td>
<td>10.7</td>
<td>6.7</td>
<td>6.7</td>
<td>30.4</td>
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<tr>
<td>2014</td>
<td>10.6</td>
<td>6.7</td>
<td>6.8</td>
<td>30.7</td>
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<tr>
<td>2015e</td>
<td>10.8</td>
<td>6.8</td>
<td>6.8</td>
<td>31.4</td>
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<tr>
<td>2018e</td>
<td></td>
<td></td>
<td>7.1</td>
<td>15.3</td>
</tr>
</tbody>
</table>

**Source:** Demand projection update (27/04/2015)

2.3% CAGR

Solvay’s market

Not active in China
European soda ash supply/demand improved

<table>
<thead>
<tr>
<th>Year range</th>
<th>Event</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2008 - 2013 | New production capacity (2008-2009) | • Beyparazi mine (Turkey)  
• Natural process  

+1 Mt/yr ⇒ ~8% capacity increase in European market |

| 2014 - 2016 | Closure of less competitive assets | Capacity reduction by 1.6 mt/yr |
| In Europe | ⇒ 0.7 mt/yr | In Rest of World (export) | ⇒ 0.9 mt/yr |
| • Solvay Povoa | • Tata Winnington | • Penrice Osborne  
• Tata Magadi Pure Ash Factory  
• Central Glass Ube |

| 2017 - 2019 | Capacity increase risk | Growth of demand to continue |
| Potential expansion plans in Turkey | Further restructuring | among least competitive assets possible |

Demand decline in 2009

Overcapacity

Growth in European and seaborne demand

Tighter market conditions

Higher capacity utilization rates  
Supportive pricing environment
Market leader with “world-class” assets

Solvay assets

66% “World-class” assets addressing regional and export markets

Green River (Wyoming, US)
- Green River (US, Wyoming)
- Natural soda ash production
- 2.5 mt/yr capacity
- 12% capacity increase 2014-2016

Devnya & Torrelavega (Europe)
- At delivered cash cost comparable to natural process
- 2.0 mt/yr capacity

34% “Local” assets addressing local markets

Solvay has 36% of European capacity

Solvay has 20% of North American capacity

Solvay site
Cost competitiveness, key success factor in the soda ash industry

Average FOB cash cost

- **Natural process (NP)**
- **Synthetic process**

Source: Solvay estimates based on public information

**Soda ash plants**

- **Solvay “World-class” assets**
  - Turkey (NP)
  - US “Green River” (NP)

- **Solvay “Local” assets**
  - China (NP)
  - EU 1st tier
  - Africa (NP)

- **Production Costs**
  - EU 2nd tier
  - India
  - CIS Baltics
  - North East Asia (“Solvay” and “Hou” processes)

- **Freight & logistics costs**

**Source:** Solvay estimates based on public information

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Solvay breakthrough actions enhancing competitiveness

Key actions in Europe

Variable costs

Energy costs
- 18% reduction of total steam consumption
- 44% decrease in CO₂ emission right deficit

Raw materials and logistics

Fixed costs

- Closure of Povoa plant in January 2014
- Reduction of 580 positions
- Maintenance savings across plants reducing cost base by 20%

Cost savings split

- Variable costs: €100m by YE 2015
- Fixed costs: 20%
- Maintenance: 20%

Strong delivery

- 2013: 25%
- 2014: 74%
- 2016e: 100%
Solvay, market maker in Bicarbonate, a diversified growth story

Global Bicarbonate demand

Total market volumes (2014)

- Others 14%
- Healthcare 13%
- Chemicals 5%
- Detergents 5%
- Flue gas 13%
- Animal nutrition 30%
- Food 20%

Global market growth slightly above GDP

Driven by:
- Food needs
- Environmental regulations
- Aging population

Solvay positioning

- Unparalleled security of supply
  - 8 facilities in Europe and North America
- New 100 kt/yr plant in Thailand (07/2015)
  - To serve Asian premium markets
- SOLVAir Natural Solutions
  - 50/50 JV with Natural Soda
  - To accelerate development of SOLVAir for emissions treatment in North America
- Solvay market leader
  - Actively developing bicarbonate usage through innovative high-value applications

Ambition to grow at 2x bicarbonate market growth

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### Solvay Setting new standards in bicarbonate

<table>
<thead>
<tr>
<th>Application</th>
<th>Mega trends</th>
<th>Growth drivers</th>
<th>The Solvay difference</th>
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</thead>
<tbody>
<tr>
<td><strong>Flue gas treatment</strong></td>
<td>Resource constraints &amp; increased sustainability demand</td>
<td>• Tightening regulation on SO₂, HCl and NOₓ emissions (currently tightening in NAFTA and Asia)</td>
<td>• 450 industrial sites using SOLVAir solutions worldwide</td>
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<tr>
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<td>→ Growth up to 10%</td>
<td>• Recycling offering in Europe</td>
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<td></td>
<td></td>
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<td>• SB/03 launched in 2015</td>
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<td></td>
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<td></td>
<td>• SOLVAir Natural Solutions (NAFTA)</td>
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<tr>
<td><strong>Animal feed</strong></td>
<td>Evolving demography &amp; consumers behaviors</td>
<td>• Increased demand for dairy and meat/poultry</td>
<td>• Global industrial footprint</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• End of EU milk quota (April 15) boosts dairy production</td>
<td>• Branding and technical support in animal nutrition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>→ GDP growth</td>
<td></td>
</tr>
<tr>
<td><strong>Healthcare</strong></td>
<td>Evolving demography &amp; consumers behaviors</td>
<td>• Growing access to hemodialysis</td>
<td>• Large Pharma BICAR capacity to be started in Asia</td>
</tr>
<tr>
<td></td>
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<td>• Increasing living standards in Asia</td>
<td>• Highest quality standard in the industry (4 sites GMP-certified, of which 2 API-certified)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>→ Growth up to 8%</td>
<td></td>
</tr>
<tr>
<td><strong>Food</strong></td>
<td>Evolving demography &amp; consumers behaviors</td>
<td>• Global demand for bakery</td>
<td>• Highest quality standards made available in Asia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Quality/safety/traceability</td>
<td>• Solvay branded baking soda packages</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Retail markets for baking soda</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>→ GDP growth</td>
<td></td>
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</tbody>
</table>
Key take-aways

Resilient profitability

→ REBITDA growing at mid-single digit CAGR over 2013-2016
→ Underpinned by very competitive assets

Ensuring competitive soda ash assets

→ Breakthrough operational excellence actions across European soda ash plants to further reinforce competiveness
→ Ramping up capacity of natural soda ash production in the U.S.

Market maker for bicarbonate

→ Growing at 2x market growth
Christophe Clémente

began his career in Rhone-Poulenc in 1990. He took up various executive positions both in Europe and in the US: VP & Finance Director of Novecare from 2000 to 2002, VP General Manager of North America for Novecare from 2003 to 2006, VP General Manager of Novecare Europe from 2007 to 2012.

He joined the Integration Management Office in 2012, took up the head of Strategy for Essential Chemicals in January 2013 and has been appointed President of the GBU Soda Ash & Derivatives effective January 1, 2014.

Christophe Clémente, a French national, is a graduate of the Institut Supérieur de Gestion.
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