Butyl Rubber – The Enabler of Mobility

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Head of Business Unit Butyl Rubber

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Agenda

- Butyl Rubber – Business overview
- Growth drivers
- Investments
- Outlook

Business Unit Butyl Rubber – A premium supplier of high-quality butyl and halobutyl rubbers

Performance Polymers

- Butyl Rubber
- Performance Butadiene Rubbers
- Technical Rubber Products
- Semi-Crystalline Products

Applications Butyl Rubber
Butyl Rubber – Business overview

**Facts**
- Production capacity: ~400,000 t/a (all announced investments)
- Sales: >€500 m
- Employees: ~900
- Customers: >200

**Products & brands**
- Product groups: Regular butyl, Halobutyl
- Main brands: [Butyl, Bromobutyl, Chlorobutyl]

**Markets & competition**
- Share: LANXESS No. 2 in oligopolistic market
- Market size: ~€2.2 bn in 2010e
- Competitors: ExxonMobil Chemicals, Sinopec, Nizhnekamskneftekhim, Sibur Holding

Butyl Rubber – A market leader in synthetic rubber

**Butyl rubber end uses** 2008-2010e
- 2008: 84% (Tire), 5% (Others), 4% (Gum), 7% (Pharma)
- 2010e: 76% (Tire), 11% (Others), 4% (Gum), 4% (Pharma)

**Global demand**
- Americas: 21%
- APAC: 57%
- EMEA: 22%

* Based on BU sales; ** LANXESS estimates
LANXESS is the only true global player in butyl rubber

LANXESS sites
- Sarnia, Canada
- Zwijndrecht, Belgium
- Singapore (2013)

Exxon
- Americas, Exxon
- Europe, Exxon
- Russia, Nizhnekamsk,
  Exxon & JSR
- Japan, JV Exxon & JSR
- China, Sinopec
- Singapore, LANXESS

Sibur
- Russia, Sibur
- China, Sinopec

Sinopec
- China, Sinopec
- Singapore, LANXESS

Source: LANXESS market intelligence based CMAI, SRI; not to scale

Butyl Rubber is a core business within LANXESS

Technology and process focus
- Secured raw material supply
- Cost efficiency due to world-scale plants
- Integrated approach for product and application development

Customer focus
- THE reliable long-term supplier
- Close cooperation with customers to meet specific needs
- Only supplier of regulatory-approved food grade butyl rubber
- Technical experts worldwide

Future focus
- R&D pipeline for tire & non-tire
- Steadily investing in the future (Singapore, Antwerp expansion)
- Long-term strategic orientation and market intelligence
- Investing in biological raw material sources (Gevo)

Securing and leveraging LANXESS leading market position
Step towards securing alternative raw material supply

- Development of a fermentation process to produce isobutanol organically (sugars in biomass)
- Intention to use technical know-how to produce isobutene by dehydrating isobutanol
- Cooperation to broaden future supply options against the background of volatile raw material prices
- Investment underpins LANXESS commitment to ‘Green Chemistry’

* Mechanic, chemical und enzymatic; ** DDGS – Distillers’ Dried Grains with Solubles

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Butyl Rubber: growing markets with good demand, especially in emerging countries

- Overall long-term (2011-2015) CAGR:
  - APAC: ~5%
  - EMEA: ~2%
  - Americas: ~2.5%

Market development

Great untapped potential from growing middle class in Asia

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<th>Growth driving megatrends</th>
<th>Growing middle-class in emerging countries</th>
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<td>Mobility:</td>
<td>People entering middle class*</td>
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<tr>
<td>- Growing middle-class in emerging countries</td>
<td>Brazil</td>
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<td>- Increasing global trend for radial truck and bus tires</td>
<td>India</td>
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<td>- Urbanization:</td>
<td>China</td>
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<td>- Growing requirements for high-quality medical packaging</td>
<td>BRIC</td>
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</table>

Source: Goldman Sachs Global Economics Group, “Is this the BRICs decade?”, 2010; Michelin estimates
* Population with income >$6,000 and <$30,000/capita in BRIC countries
BRIC countries with tremendous growth potential

Radialization rate for truck and bus tires 2009 [%]

- Radialization as an indicator for rising use of tubeless tires made of halobutyl
- China's radialization rate expected to grow by ~16%* (CAGR 1995-2013)
- India with highest growth potential due to only 10%-12% radialization rate for truck tires

Increasing radialization rate fuels demand for butyl rubber

Source: Michelin Factbook 2009, LANXESS market intelligence; * www.bekaert.com, LANXESS market intelligence

Significant growth potential from Asian truck and bus tire market

- Global truck tire markets:
  - 17% OEM, 83% replacement
  - Asia represents 62% of world truck tire production*
- Strong increase in demand for halobutyl rubber in truck tires due to:
  - substitution (radialization trend in Asia)
  - globally increasing road transportation combined with high replacement proportion

Note: Non-halobutyl part of innerliner contains: Processing aids, catalysts and additives; * LMC 2010
Tire producers are reacting swiftly

High-quality non-tire applications with long-term growth rates

**Medical devices**
- Butyl as first choice material due to high impermeability to gases and liquids
- Growth drivers:
  - Increasing requirements for modern, high-quality medical packaging in emerging countries
  - Use of butyl mandatory in China
  - Growing and aging population with improved access to modern medical treatment

**Adhesives and technical sealants**
- Butyl is the product of choice due to excellent sealing properties, permanent elasticity
- Growth drivers:
  - Energy-efficient insulations (e.g. window sealing)
  - High-end sealants in modern automobile industry (e.g. batteries, fuel cells)
  - Improved access to industrial food packaging

**Butyl demand for medical devices**
- Source: LANXESS market intelligence

**Butyl demand for adhesives and technical sealants**
- Source: LANXESS market intelligence
Debottlenecking in Antwerp necessary to bridge the gap until Singapore-capacity becomes available

- Butyl rubber as product of choice in several high-end applications leads to a tight supply
- Nameplate capacities include:
  - LXS plus 14 kt (Antwerp)
  - LXS plus 100 kt (Singapore)
- LXS business plan considers multiple world scale capacities which come on stream stepwise 2013-2020

Global nameplate capacity
Demand
Production @ 95% capacity utilization

Capacities are needed to serve growing demand

Tight market 2010 – 2013

Source: LANXESS market intelligence based CMAI, SRI

Butyl rubber in treads – Enhancing the dynamic properties

- Improved wet and dry traction performance
- Similar rolling resistance and tread durability

Traction properties significantly improved
Center of excellence for material research

- Located in the research park Ontario, Canada
- Direct access to innovation capabilities in research park and at University of Western Ontario
- Cross-functional team of scientists and engineers for butyl polymer research

Source: LANXESS market intelligence
LANXESS – The only company continuously investing since 2006 in the profitably growing global butyl business

- LANXESS with already three strategic debottlenecking processes since 2006
- All capacity increases essential to meet strong customers’ demand
- All new capacities have been absorbed by the market
- LANXESS has been sold out of butyl rubber in the last years
- Even in the crisis, demand for butyl rubber rebounded again as of Q3 2009
LANXESS €400 m investment in the first new BTR production facility in Asia underpins leading position

Timeline new plant in Singapore

- Engineering
- Groundbreaking
- Construction
- Soil preparation
- Infrastructure
- Steel construction
- Beginning of pipeline installation
- Pipeline installation
- Technology installation
- Testing
- Start up of production

Debottlenecking Antwerp by 14kt will be completed

Start up of new world scale production in Singapore

New plant with best-in-class technology

- Favorable technology due to implementation of streamlined processes
- Lowering the plant’s overall energy consumption utilizing optimized equipment and state-of-the-art exhaust gas treatment systems
- Developing the next generation of butyl technology
- Breakthrough resulting in an entirely new production process with highly efficient resource utilization

Protect and improve leadership position

Develop breakthrough

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<th>Raw materials</th>
<th>Process</th>
<th>Product</th>
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<td>Co-Monomers: Isobutene Isoprene</td>
<td>Polymerization</td>
<td>Regular Butyl Rubber</td>
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BU BTR: value creating investments in a premium business

- Markets grow – LANXESS prepared to serve
- Technical leadership will be strengthened
- Largest global butyl investment since 1984
- Investments strengthen segment and total LANXESS profitability
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