



LANXESS Capital Markets Day 2012 Performance Butadiene Rubbers – The key enabler of “Green Tires”

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Energizing Chemistry

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Agenda

- **PBR overview**
 - “Green Mobility” drives demand for high-performance rubbers
 - Update on market landscape
 - PBR – Excellent partner for the tire industry

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“Green Mobility” energized by LANXESS



Chemistry is the key to
“Green Mobility”

Performance Polymers: ~60% of group sales; ~60% of segment earnings

Butyl Rubber

**Performance
Butadiene Rubbers**

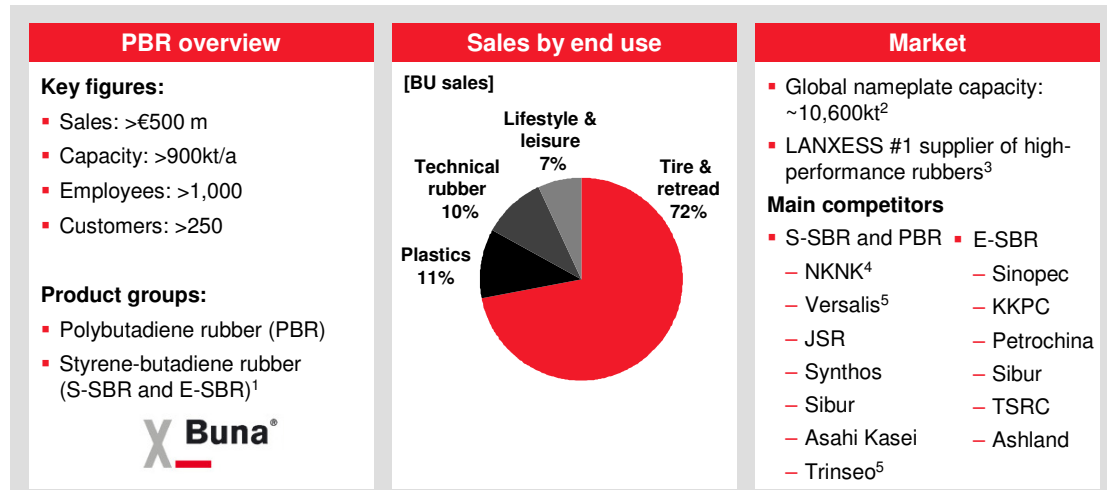
Technical
Rubber Products

High Performance
Materials

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PBR overview – Top solutions meeting future mobility needs

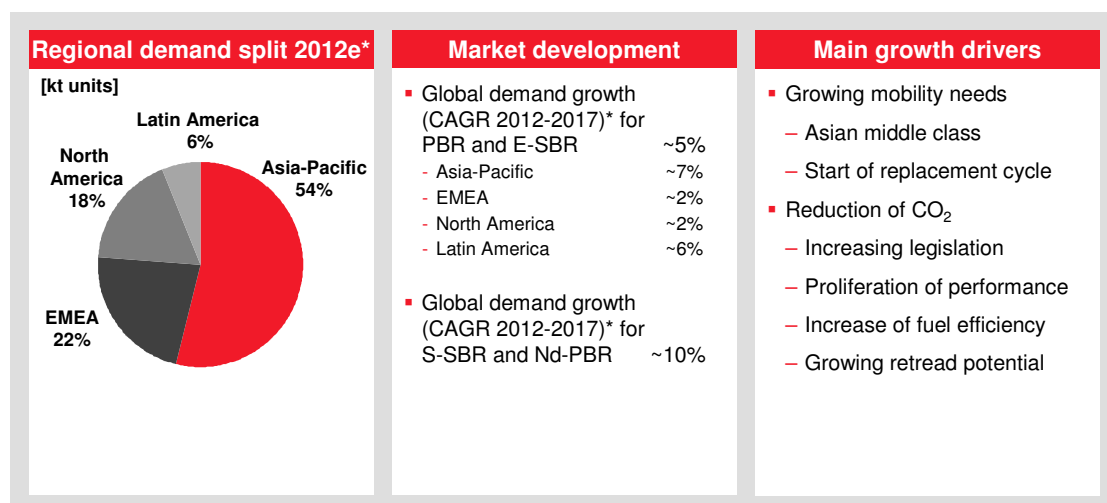


¹ S-SBR: Solution styrene-butadiene rubber / E-SBR: Emulsion styrene-butadiene rubber; ² Source: IHS Chemicals 2012; ³ High-performance rubbers include rubbers such as S-SBR and Nd-PBR; ⁴ Nizhnekamskneftekhim; ⁵ Versalis formerly Polimeri; Trinseo formerly Styron

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Demand grows based on sustainable drivers





* LANXESS estimates based on IHS Chemicals 2012

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PBR offers different types of synthetic rubber for better tire performance

Products	Characteristics	Tire industry applications	
<p>Nd-PBR</p> <p>X Buna[®] CB</p>	<ul style="list-style-type: none"> ▪ Outstanding abrasion resistance ▪ Reduced rolling resistance ▪ Excellent strength ▪ High crack resistance 	<ul style="list-style-type: none"> ▪ Tread ▪ Undertread ▪ Sidewall ▪ Carcass ▪ Beadregion 	
<p>S-SBR</p> <p>X Buna[®] VSL</p>	<ul style="list-style-type: none"> ▪ Excellent wet grip ▪ Reduced rolling resistance ▪ Good abrasion characteristics ▪ Superb mechanical properties 	<ul style="list-style-type: none"> ▪ Tread 	

- PBR production technologies lead to:
 - Nd-PBR with high molecular weights and low polydispersities
 - Rubber with superior performance / processing balance, e.g. via patented “Mooney Jump Reactions”
 - Tailormade S-SBR via fine tuning of macro- and microstructures and functionalities

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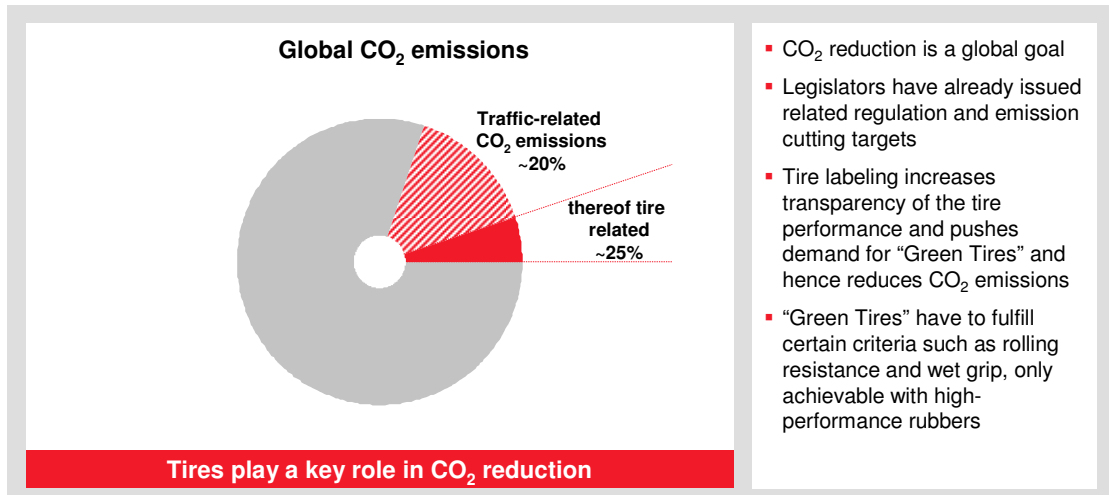
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High-performance rubbers help to achieve the global CO₂ emission reduction goals

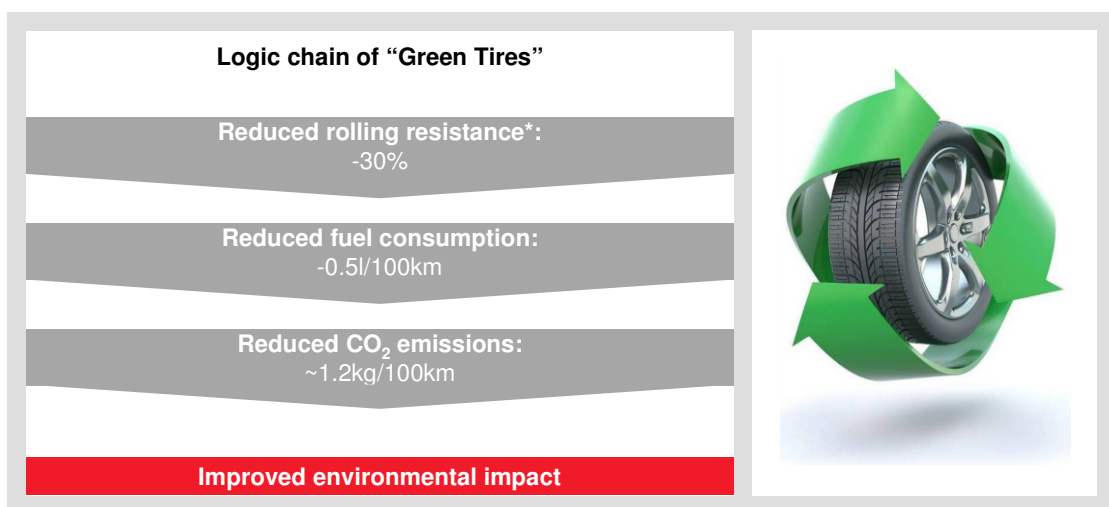


Source: BMW: "Der Reifen im Spannungsfeld zwischen hohen technischen Anforderungen und immer schärfer werdenden gesetzlichen Auflagen", 2008; Michelin: "CO₂ Reduzierung – Ein Beitrag der Reifenindustrie", 2008

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"Green Tires" have a large impact on CO₂ reduction




Source: www.auto-motor-und-sport.de/eco/verbrauchsreduzierung-rollwiderstandsoptimierte-reifen-alles-ueber-den-reifen-rollwiderstand-1899808.html
(Calculation based on a car with a gasoline engine and an average fuel consumption of 10l/100km); * Reduced rolling resistance versus standard tires

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PBR targets the reduction of the environmental footprint of “Green Tires” in two main dimensions

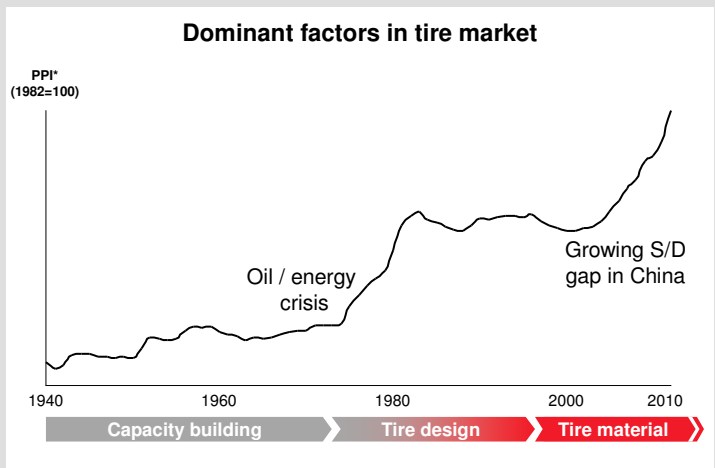
<p>PBR develops sustainable and efficient production processes</p>	<ul style="list-style-type: none"> ▪ State-of-the-art production processes ▪ Optimized energy consumption ▪ Sustainable usage of raw materials, e.g. investigate renewable resources and solely use of low PAH* containing processing oils 	
<p>High-performance rubbers provide solutions to the tire industry</p>	<ul style="list-style-type: none"> ▪ Improve balance between rolling resistance and wet grip behavior ▪ Increase durability to extend the tire life span ▪ Extend tire lifecycle by retreading ▪ Optimize processability of rubber 	

* PAH: Polycyclic aromatic hydrocarbons

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Increased fuel efficiency was propelled by tire design first and now benefits from tire materials

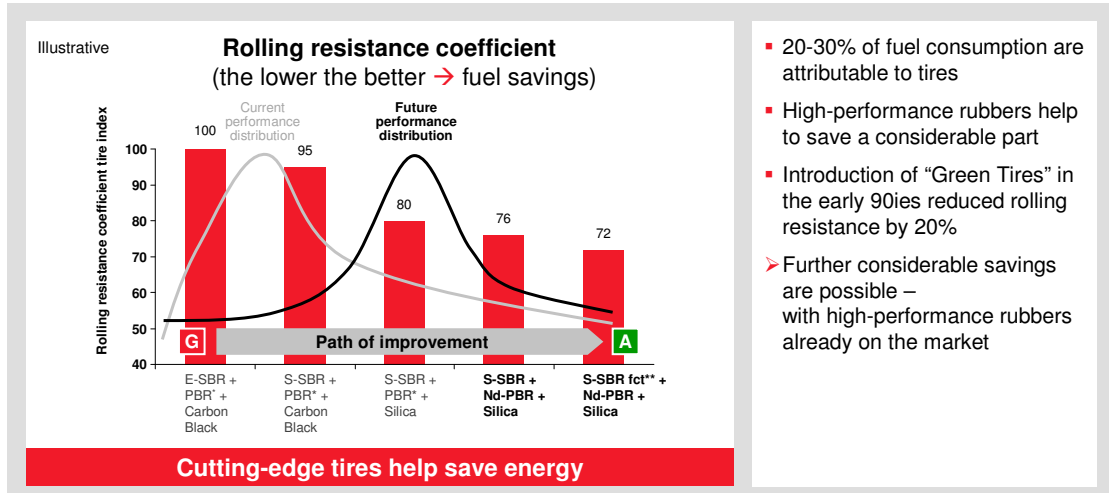
<p>High-performance rubbers define new era</p> <ul style="list-style-type: none"> ▪ In the post war era huge capacities for rubber and tires were built ▪ After the oil crisis, the radialization succeeded in the western world, providing a new standard of safety and performance built on design ▪ The new era will clearly be defined by the performance leap based on high-performance rubbers 	<p>Dominant factors in tire market</p> 
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Source: US Department of Labor; * Producer Price Index – Tires, 1939-2011

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Tire labeling increases pressure to reduce CO₂ emissions and will create transparency for the customer

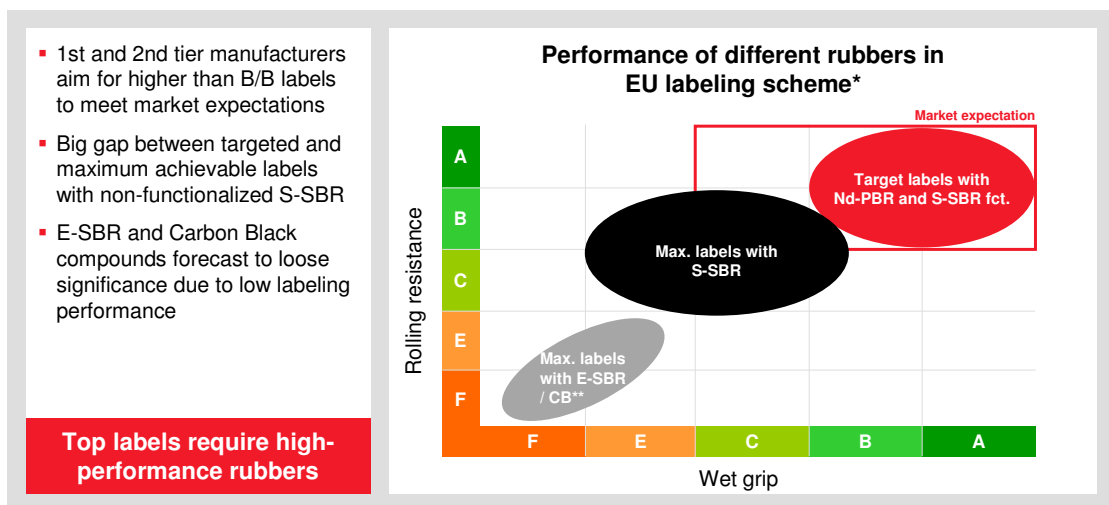


* PBR: General Purpose Butadiene Rubber; ** fct.: Functionalized S-SBR for better integration of the filler into the polymer matrix

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Market aspirations of tire manufacturers can only be met with high-performance rubbers

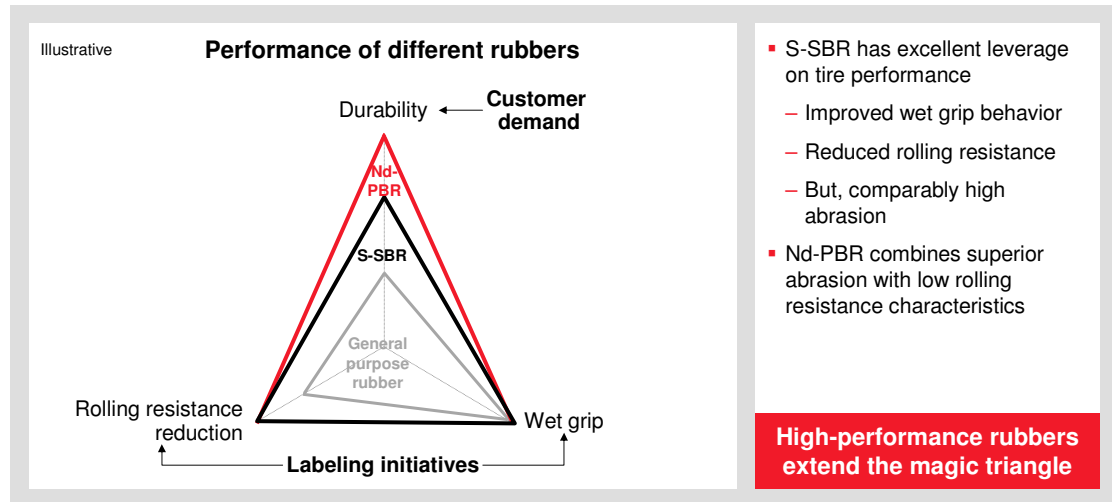


Source: LANXESS market study "S-SBR Global Market Study"; * Statements are applicable to passenger car tires only; ** Carbon Black

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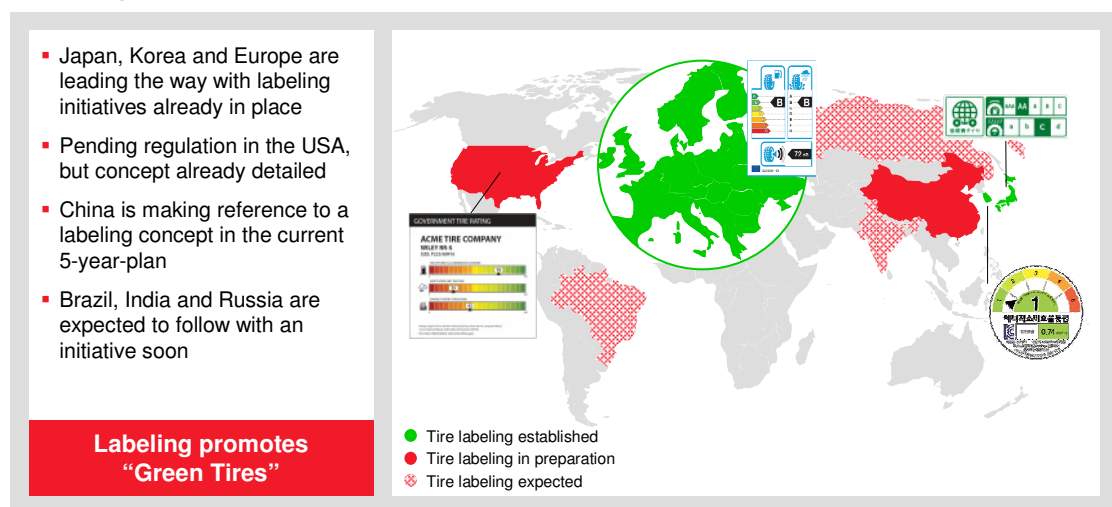
Acceptance of “Green Tires” benefits from Nd-PBR increasing durability and fuel efficiency without compromising on safety



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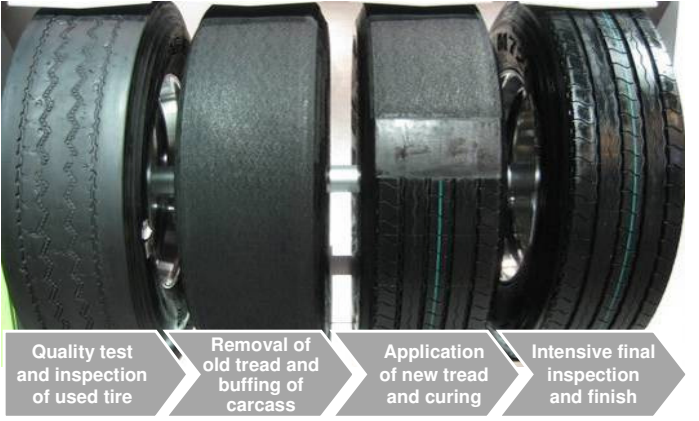
Proliferation of labeling initiatives supports a global homogenization of tires



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Retreading increases demand for high-performance rubbers in the future



Good cause for retreading

- Radialization is a pre-requisite and proliferating
- Retreading consumes less resources and is more economical (~25% of costs of a new tire, but 100% PBR)
- Growing car fleets will trigger higher demand for retreading
- Tire manufacturers build new retreading business models
- Retreads account for 31% globally*

Retreading consumes far less resources

Quality test and inspection of used tire → Removal of old tread and buffing of carcass → Application of new tread and curing → Intensive final inspection and finish

Source: Michelin.com (2011), Bridgestoneretread.co.uk (2011), www.retread.org; * Michelin (Factbook 2003 and 2005)

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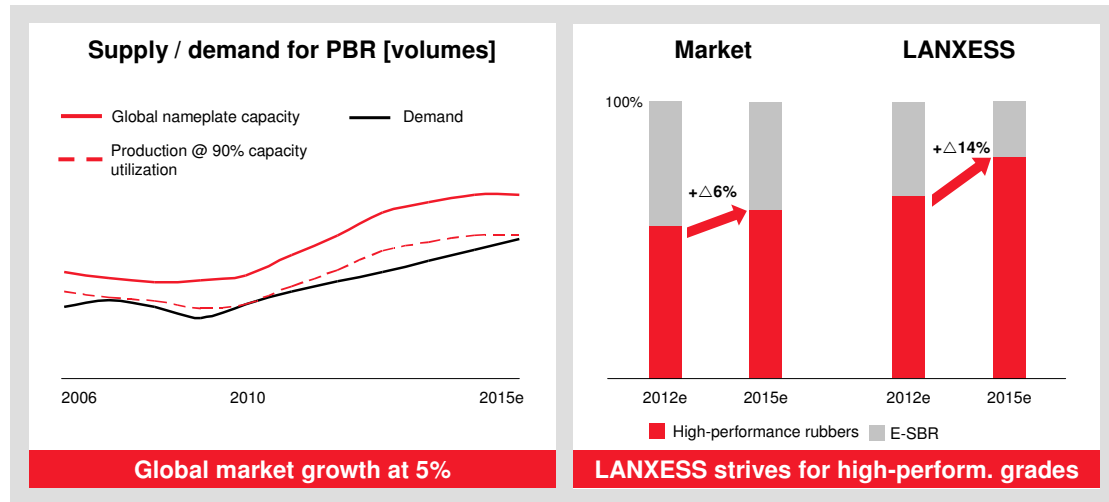
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Supply / demand forecast to tighten mid-term; trend to high performance continues

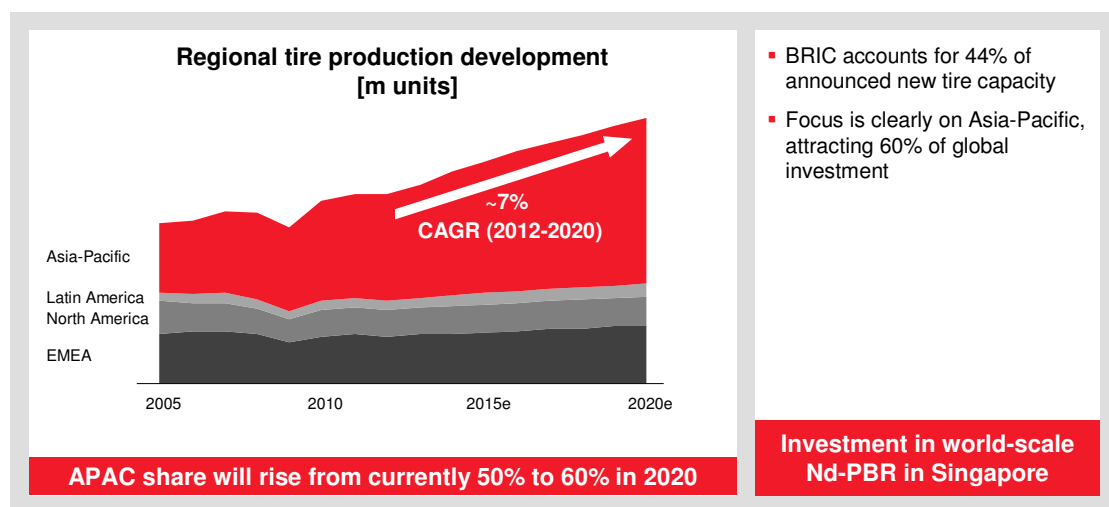


Source: LANXESS estimates based on IHS Chemicals 2012

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LANXESS expands into future growth regions

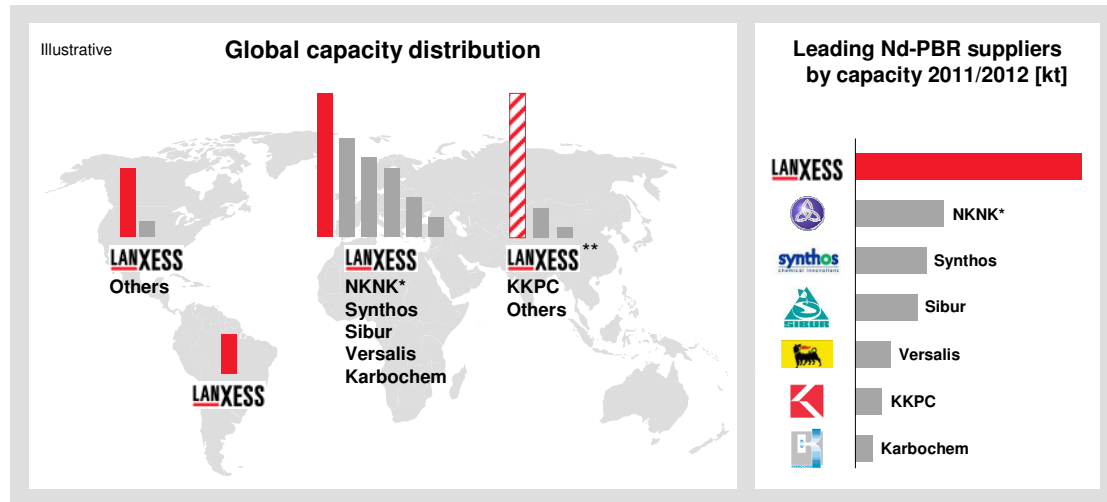


Source: IHS Chemicals 2012

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LANXESS – Global #1 for Nd-PBR with unique production network



Source: LANXESS estimates based on IHS Chemicals 2012; * Nizhnekamskneftekhim; ** Plant start-up expected: H1 2015

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LANXESS is a very competent global partner for the tire manufacturing industry due to its unique set of offering

Unique set of offering


Products


- Broad portfolio
- High-performance rubbers
- High-quality grades
- Globally available products




Know-how

- R&D
- Technical service
- Understanding of the 360° of rubber





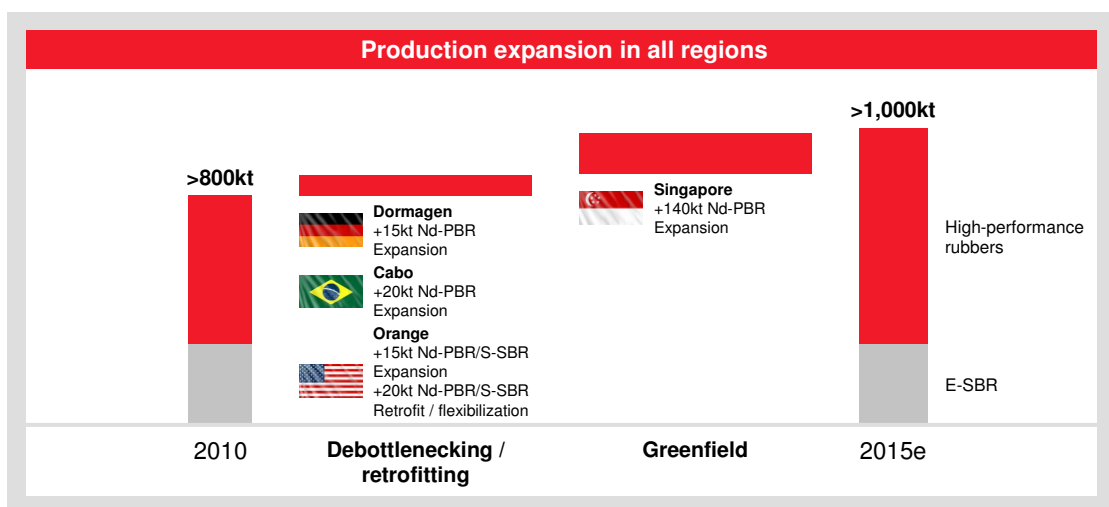
LANXESS – Enabler of “Green Mobility”



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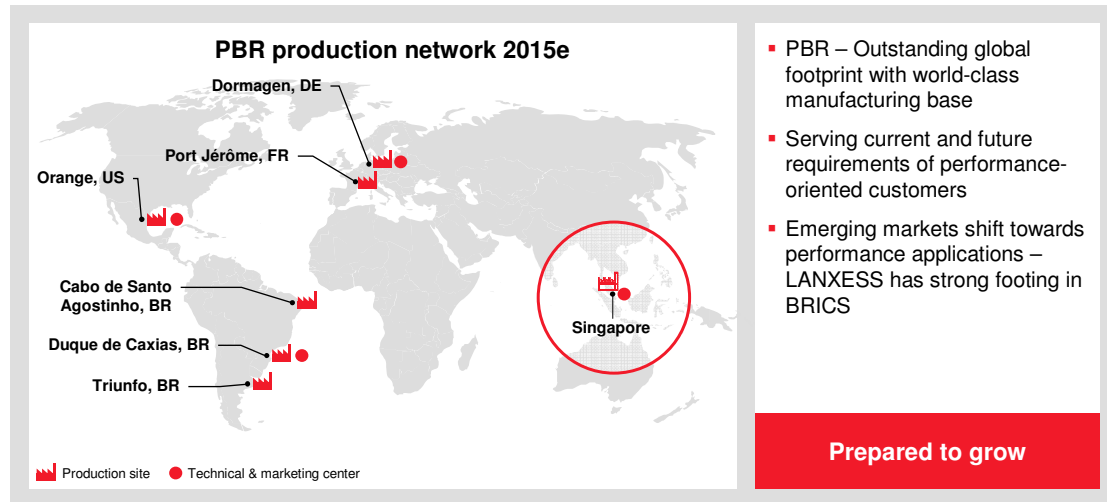
PBR will continue to serve customers' growth



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New Nd-PBR facility strengthens PBR's global production network



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PBR has long-standing supplier relations and secures access to butadiene

<p>LANXESS has excellent sourcing position</p>	<ul style="list-style-type: none"> ▪ Global supply footprint ▪ Partly captive sourcing ▪ Primarily pipeline supply ▪ Excellent structural access ▪ World's largest merchant butadiene buyer
<p>On purpose butadiene technology could ease S/D balance</p>	<ul style="list-style-type: none"> ▪ Technology is available ▪ USA used to be supplied by on purpose plants historically ▪ Economics for on purpose butadiene depend on butadiene selling price and energy cost
<p>High-performance rubbers create value that ensures access to butadiene</p>	<ul style="list-style-type: none"> ▪ Re-dedication of butadiene towards higher-performance products

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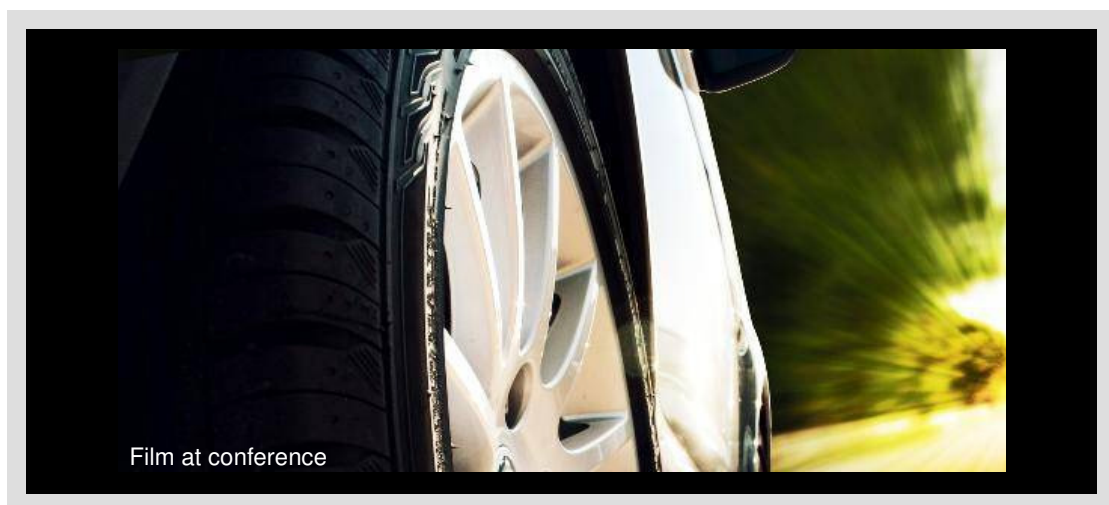
Performance Butadiene Rubbers – Enabling “Green Mobility”

Quality growth	<ul style="list-style-type: none">▪ Megatrends generate underlying growth▪ Materials to determine top tire performance	
Global footprint	<ul style="list-style-type: none">▪ PBR enables quality growth in all regions▪ Raw materials are a regional matter, but centrally managed	
Outstanding offering	<ul style="list-style-type: none">▪ PBR provides superior added value to customers▪ Outstanding rubber expertise	

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LANXESS premieres AA-rated concept tire



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