End-of-Life tires in China

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Agenda – 20 minutes (!)

**China tire industry**
- Cars and trucks
- OE and replacement

**Wider environmental issues**
- Emissions
- Blue Sky legislation
- Self-sufficiency

**End-of-life tires**
- Only recently become an issue
- How many?
- Projections for future
- State-guidance

**Retreading**
- Domestic companies
- International companies

**Recycling**
- How much - where it goes
- Specific projects

**Pyrolysis**
- How much - where it goes
- Specific projects

**Q&A**
- Feel free to interrupt
- Happy to respond to questions
- Make this informal & informative
Tire Industry in China

China Bridgestone
Hangzhou Zhongce Rubber $3395m
GITI Tire $3131m
Triangle Group $1144m (was $2437m)
Shandong Linglong Rubber $1346m
Double Coin Holdings $1065m
Xingyuan Tyre $1285m
Aeolus Tyre $969m
Qingdao Doublestar Industrial $741m
Prinx Chengshan $656.4m
Shandong Yongtai Group. $751m
Shandong Hengfeng Tyre Co. $1344m
Sailun Jinyu Tyre Co. Ltd. $1258m.
Guizhou Tyre Co. Ltd. $739.5m
Shandong Shengtai Tyre Co. $824m
Jiangsu Tongyong Tire Ltd. $651.3m
Weifang Yuelong Rubber Group $643.3m
Sichuan Haida Tyre Group Co. $470.3m
Wanli Tyre & Rubber $526.7m
Shandong Zhongyi Rubber Co. Ltd. $450.6m
Shandong Yinbao Tire Group $381.9m
Shandong Rongsheng Tyre Co. Ltd. $370.3m
Qingdao Sentury Tire Co. Ltd. $295m
Shandong Sangong Tyre Co. Ltd. $292.7m
Xuzhou Xugong Tyre Co. Ltd. $258.9m
Shandong Bayi Tyre Manufacture Co. Ltd. $270m
Shandong Wanda Tyre Co. Ltd. $243.3m
Shandong Huitong Tyre Co. Ltd. $164.8m
Shandong Taishan Tyre Co. Ltd. $197.8m
Beijing Shouchuang Tire Co. $201m
Tianjin United Tire & Rubber Co. (TUTRIC) $112m
Haoyou Tire co $120m
Shandong Bayi $201m

ELT tires in China by David Shaw

Slide no 3 of 21

未来轮胎在中国
Car tire demand in China 2008 – 2016

OE and replacement

OE

Replacement

Source: CRIA & Tire Industry Research

EL T tires in China by David Shaw

OE

TBR

PCR/LT

Car tire demand in China 2008 – 2016

OE

Replacement

Source: CRIA & Tire Industry Research

EL T tires in China by David Shaw

OE
Government environment activity

Blue Skies policies started in early 2017
First targets were heavy fuel oil boilers; steel factories etc
Factories closed if they could not upgrade
Low-end tire pyrolysis plants were high on the list
Capacity for 7.3mn ELT tires/year eliminated in 2017 (official data)

7 policies for next three years
1. Defence of the blue sky
2. Diesel truck pollution control
3. Urban black water treatment
4. Comprehensive management of the Bohai Sea
5. Yangtze River conservation and repair
6. Water source protection
7. Agricultural and rural pollution control
Scrap tires have been off-radar

Current ELT situation
2017: around 370mn units = 13.5mn tonnes, growing at 8%-10% annually
2020: up by 50% to 500mn units / 20mn tonnes
See next slide

Disposal routes (until 2017)
Small, family-run collection & recycling - Heavy pollution
Very limited retreading - tends to be unprofessional
Western brands seeking to build retread business with fleets
crumbed rubber goes into GRG products - up to 5mn tonnes/year
Reclaim/recovery quite popular

Since 2017
Environmental policies closed small businesses
Government seeking to promote retreading
Government policies driving investment & research into ELT management
## ELT tire data

<table>
<thead>
<tr>
<th>Category</th>
<th>PCR &amp; LT</th>
<th>TBB/ TBR</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car PARC 2017</td>
<td>170mn</td>
<td>47mn</td>
<td>217</td>
</tr>
<tr>
<td>Avg Tires per Vehicle</td>
<td>4</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Tires in use (mn)</td>
<td>680</td>
<td>564</td>
<td>1,244</td>
</tr>
<tr>
<td>Percentage replaced each year (%)</td>
<td>20%</td>
<td>45%</td>
<td></td>
</tr>
<tr>
<td>Percentage retreaded (%)</td>
<td>Zero</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Annual Waste Tire Amount (mn units)</td>
<td>136</td>
<td>244</td>
<td>380</td>
</tr>
<tr>
<td>Waste Tire Output (Tire/Ton)</td>
<td>130</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Annual Waste Tire Output (mn t)</td>
<td>1.046</td>
<td>13.54</td>
<td>14.59</td>
</tr>
</tbody>
</table>

Source: Ministry of Public Security, as of the end of 2017
Government policies since 2017

- Tire retreading;
- Product quality monitoring and management
- Research into waste tire rubber powder
- New rubber recycling technologies
- Thermal cracking production technology.

August 2017” China issued documents on the Waste Tires Recycling Industries, and on solving the environmental problems of the waste tire recycling industry.

Government also released “Retreading Industry Access Conditions”, and “Access Conditions for the Comprehensive Utilisation of the Waste Tire Industry”, requires capacity of no less than 30,000 units.
Retreading

Official support from government
Tire company chairman say they support it (They don't really)

Real view of tire makers
Each retread is seen as a lost sale of a new tire
Retread technology, training and skills are minimal
Truckers do not care for casings; life can be as little as 20k - 30k km

International tire makers gaining some success in bus fleets
Beijing (and other cities) bus fleet has many thousands of vehicles
Heavily targetted by Michelin, Bridgestone and others
eg Deppon Logistics trials since 2008, more usage from 2012-2017
Deppon has said that in 2018 it will begin the gradual introduction of retreaded tires across its fleets in 25 cities, raising retreads in use to 30%
Dynamic situation

March 2018
NPC Member & President of the LinDa Group, Li Xiaolin, proposes “Government Subsidies for Waste Tire Pyrolysis (Thermal Cracking) Power Generation”

March 2018 - CRIA urges caution

Traditional processes:
- Retreading
- Prototype utilisation
- Vulcanised rubber powder
- Recycled rubber
- Pyrolysis
- Burning for energy recovery is used less in China than elsewhere
Pyrolysis gets a bad name

High investment but low utilisation - many enterprises fail

In September 2017, Vanlead (Wanli) cooperated with Enviro to invest CNY400mn in a 30kt/year waste tire pyrolysis project in Guangzhou (cancelled).

In November 2017, Techcent invested CNY700mn in a 200kt/year waste tire pyrolysis project in Sichuan.

In December 2017, Double Star invested CNY600mn in a 200kt/year waste rubber pyrolysis project.

In December 2017, the Sound Group and Jinan Hengyu jointly invested CNY500mn in a 100kt/year pyrolysis project.

In January 2018, Beautiful China built a new 100kt/year waste rubber pyrolysis project.

CRIA analysis: “Pyrolysis produces carbon black (35%), pyrolysis oil (40%), bead wire (15%), and pyrolysis gas (10%). Apart from low value products, the process also includes environmental and safety risks.”
Specific projects

CRIA says can process rubber by reclaim many times

General view that “reclaimed rubber can only be recycled three times.” The CRIA has dismissed this view.

Tensile strength of reclaimed rubber must be at least 8.0MPa, and tire makers **must use at least 1% reclaimed rubber** to meet the production requirements.

CRIA: replacing 1 ton raw rubber with 3 tons of reclaimed rubber could effectively alleviate China's NR scarcity.

**Top tire makers studying tire recycling with ELT departments**

Zhongce, Aeolus
Wanli, Mesnac
Double Star, Shaanxi
Double Coin, Beautiful China
Chongqing
Wanli/Vanlead & Enviro

Announced on 20 December 2017
30kt/year pyrolysis with Scandinavian Enviro Systems

Environmental legislation (updated in November 2017)
Limits use of land to tire production and prohibits chemical processes with a flash point below 60°C

Future:
May go forward, if new land can be assigned
Double Star’s pyrolysis unit

Joint venture with Beautiful China
On April 3, Beautiful China Holdings Co. Ltd, a Hong Kong listed company, and Eco-Star signed a “non-legally binding” cooperation framework agreement for Beautiful China to invest in two wholly-owned subsidiaries of Eco-Star:

Eco-Star is a wholly-owned subsidiary of Double Star and develops recycling technology and equipment.

Capacity
Four pyrolysis lines, due on stream in H1 2018. Investment of CNY46.66mn
Can process 60,000 tons / year of tires

Annual production
26,000 tons of fuel oil
22,000 tons of carbon black
7000 tons of steel cord.
Chongqing waste tire project

Chongqing Zhongxian

- Bringing forward its 200kt/year renewable resource distribution platform,
- Includes 15kt/year waste tire rgranulation line
- Includes 20kt/year reprocessing of waste plastics
- The main work on the project is already completed.
- Due on-stream before the end of June 2018.
Deheng Environmental Technology

Ground-breaking on March 8 for a new “100 ton / year waste tire recycling unit”
Location: Liquan County, Xianyang City, Shaanxi Province.
Two phases each with a single tire pyrolysis line of 50kt/year
The total investment of the project is CNY307mn.
Pyrolysis lines will be fed with ambient granulate

Planned annual output is
34,000 tons of carbon black,
12,000 tons of steel cord,
16,000 tons of light oil,
24,500 tons of diesel oil, and
3,220 tons of heavy oil.
Conclusions

**ELT issues becoming more high profile**
- Main tire makers investing in ELT management technologies
- Huge thirst for information on recycling technologies
- Opportunities for tires-to-fuel projects
- Pyrolysis getting a bad name

**Government involvement**
- Blue Skies policies
- 'Access Conditions' on retreaders
- Encouraging 'green' technologies

**Retreading**
- Current infrastructure is extremely limited
- Roughly 2% market penetration
- International majors making limited progress
Tire Industry Research

News
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Opinion, Commentary, Analysis
https://www.linkedin.com/today/author/7706927

Market Research & information
China Tire Newsletter (Weekly)
Global Tire Industry newsletter (Monthly)
Global tire analysis 2017
More coming in 2018

Conference planning
Tire technology -Hanover 2018-19
VDI conference
China Tire Intelligence report

Week ending 18 May 2018

Contents

Section 1: Outlook 2
US holds hearing for 25%+ Chinese duties 2
MIT develops roadmap for low-emission trucks 2
Tire companies hold shareholders’ meetings 2

Section 2: Domestic tire makers 3
Guizhou Vietnam Plant to be on stream in 2019 3
Luxan releases Five-Year Brand Plan 3
Aerolus answers SEE questions 3
Xingyuan publishes 2017 data 3
China anti Egypt form JV tire company 3
Prinx Chengshan man named as top craftsman 4
Salun Jinyu buys Canadian tire dealer 4
Double Star seeks court relief in Toyo case 4
Tire company assets to be auctioned 4
Wanli helps CRRC develop new traffic tires 4
SLJY holds drift competition ceremony 4
Rumour: Shengtai and Xingyuan to break up? 4
Triangle receives more land compensations 5
Triangle uses funds to buy financial products 5
Triangle organises Indonesia trip for dealers 5
Tire Company real estate to be auctioned 5
Huadong Rubber to acquire Longyue Rubber? 5
Huasheng Rubber leases Goform capacity? 5
SLJY 2017 result: capacity data 5
Wanda Boto passes environmental audit 5

Section 3: International tire makers 6
Kumho to hold meeting in July 6
Kenda increases investment in Tianjin plant 6
CST publishes Q2 results 6
Cooper wishes to develop Chinese market 6
Trelleborg promotes Agri tires in Mongolia 6
Kenda publishes Q2 results 6
Kumho Tire to dispose of defence business 6

Section 4: Statistics and data 7
Shandong tire exports rise in Q1 7
Chinese TBR exports rise sharply 7
CAAM: China commercial vehicle data for April 7
CAAM: Motorcycle production declined in April 7
CAAM: China passenger car data for April 7
Vietnam’s inner tube exports to China surge 7

Section 5: Upstream and suppliers 8
Double Star starts up Intelligent Manufacturing 8
Qingdao CB company to be auctioned 8
MOFCOM to hear views on NBR from Japan, Korea 8
Zhongtou invests in green rubber production 8
CRIIA holds Reinforcement Material Workshop 8
CRIIA discusses prospects for rubber additives 8
Six deaths at petrochemical company 8
Hainan to create rubber exchange 8
Hainan NR clone improves yield by 36% 9
Silica company increased capital 9

Section 6: Retail and online activities 9
Double Star works with gas stations to sell tires 9
CST builds Tmall bicycle tire flagship store 9

Section 7: Environment & recycling 10
Qingdao company hit by 2 environment fines 10

Section 8: Other activities 10
Guangrao Tire Expo opens 10
AGSIS releases second list of 35 tire companies 10
Jinan issues penalties on mismatched treads 10
Six tire firms enter Shandong’s Top-100 list 10
Shandong government awards tire companies 10
Tire dealers fined after borrowing CNY60mn 11
GRTAE exhibition summary 11

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Page 1 of 11 — Week ending 18 May 2018 © 2018 Shaw Information Services Ltd
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Opinion & commentaries:

All-Season tires still fall short  P3

What’s the future for All-season tires in Europe? AA Grades to be required under new EU rules

Global regulations on tires

CRIA conference ‘18  P6

CRIA: Tire managers discuss industry issues
CRIA data shows sharp fall in 2017 tire profits
Hu Wenyong: Key talks for the CRIA in 2018
CRIA releases 2018 Top 100 rubber companies

Carbon black going short  P10

WBCSD to promote sustainable NR

Import-Export data  P12

US imports of tires from China
EU imports of tires from China

Double Star to take control Kumho Tire  P13

‘Worst tire in the world’  P15
Goodyear’s G159

China Tire report  April  P18

May 2018 edition: Dateline: 30 April 2018

News & analysis

Section 1: Investments and closures  19
Section 2: People  20
Section 3: Legislation and government  21
Section 4: New business models  23
Section 5: Statistics  24
Section 6: Perspective  27
Section 7: Raw Materials  29
Section 8: Company information  30
Section 9: Company results  34
Section 10: What’s Green  35

About this publication

This document has been prepared in response to demands from the global tire community for insight into all aspects of the global tire industry value chain.

During conversations with many Chinese people, we identified a strong need in China for a source of information on the global tire industry that lies outside of the official Chinese government channels.

Furthermore, in conversations with industry analysts, we identified a need for a regular publication that explains and analyses key developments in the global tire industry.

About the author

This report is compiled by David Shaw. Mr. Shaw publishes widely on LinkedIn about the tire industry. He has a 30-year track record reporting on the global tire industry at the highest levels. He publishes market research reports; offers a weekly news service and manages conferences globally.

For more information see http://TireIndustryResearch.com

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Future Tire - Cologne - May 2018

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Thank you for your attention

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