

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

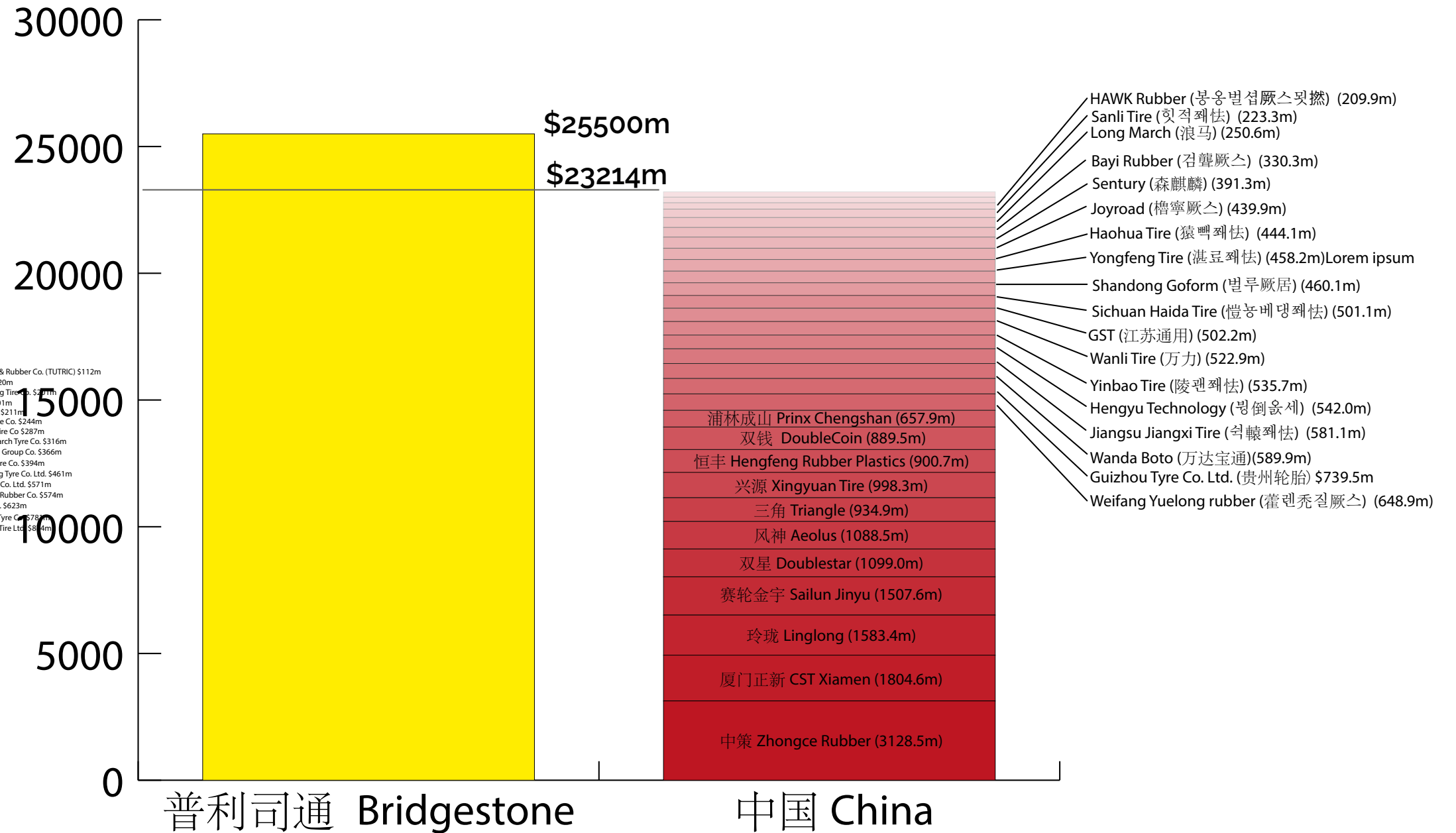
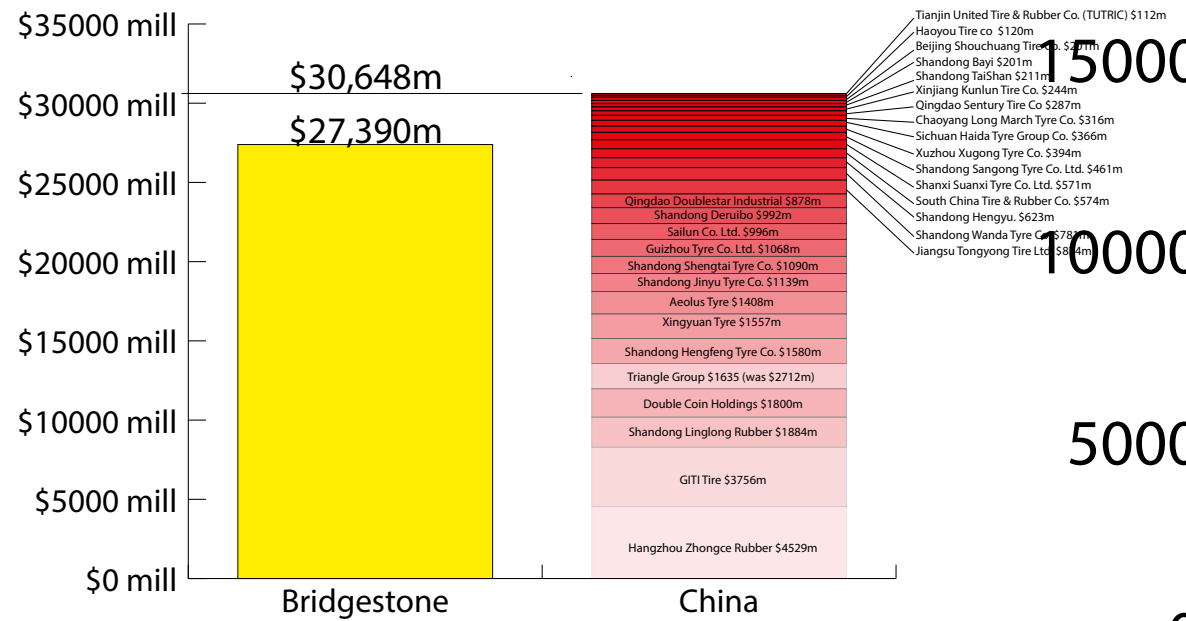
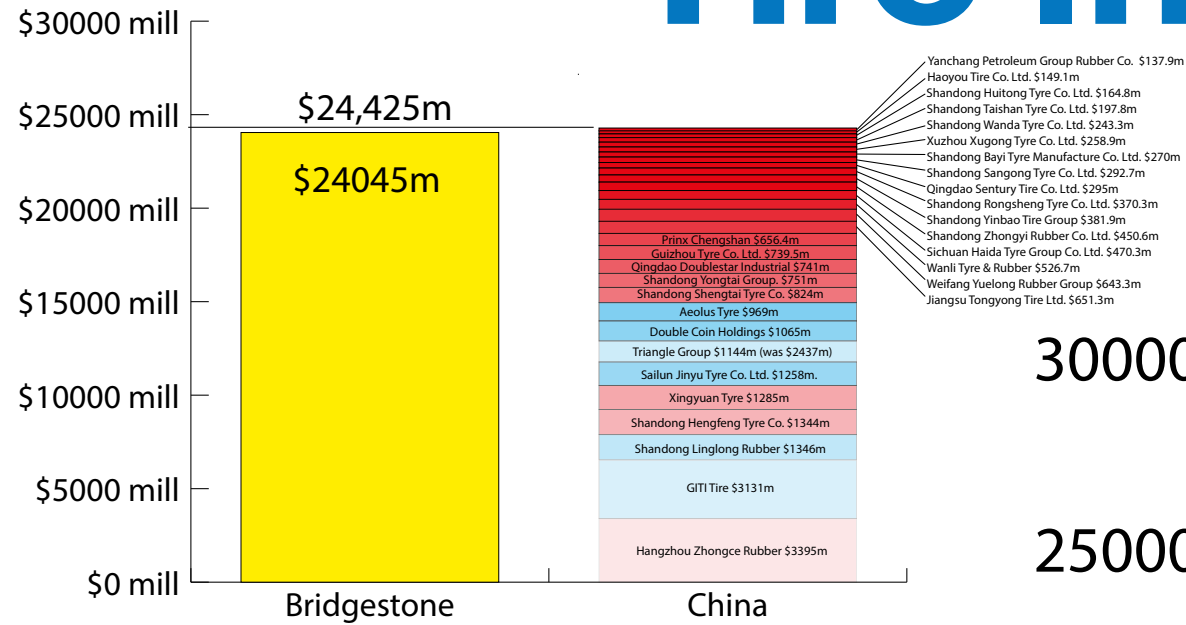
- How much - where it goes
- Specific projects

Q&A

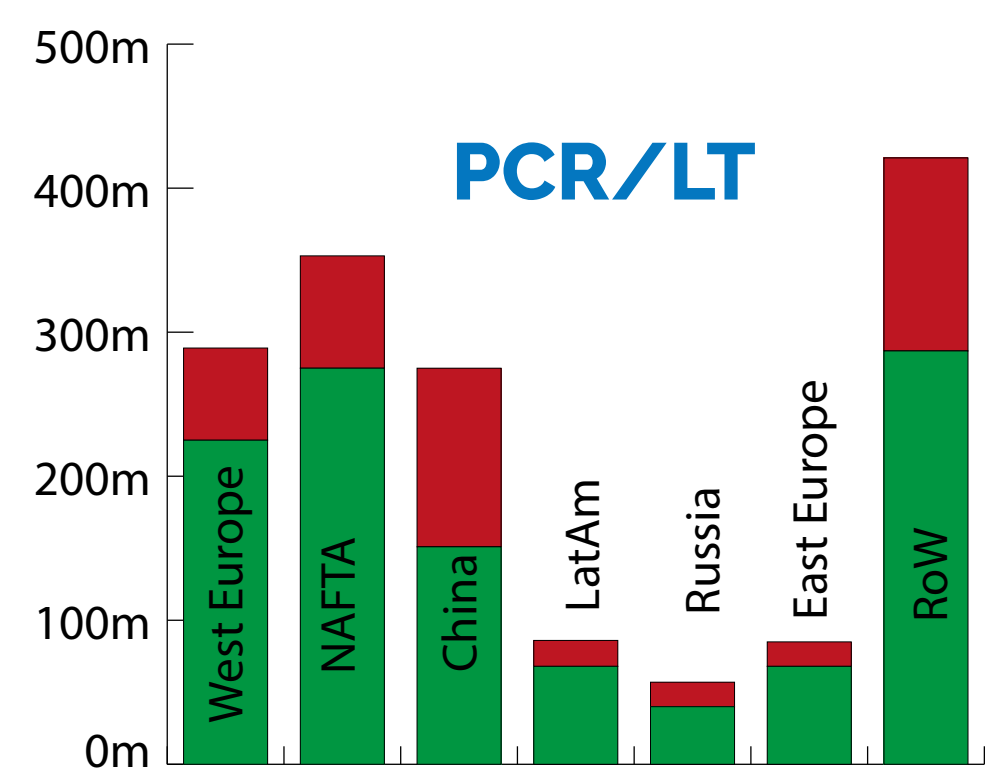
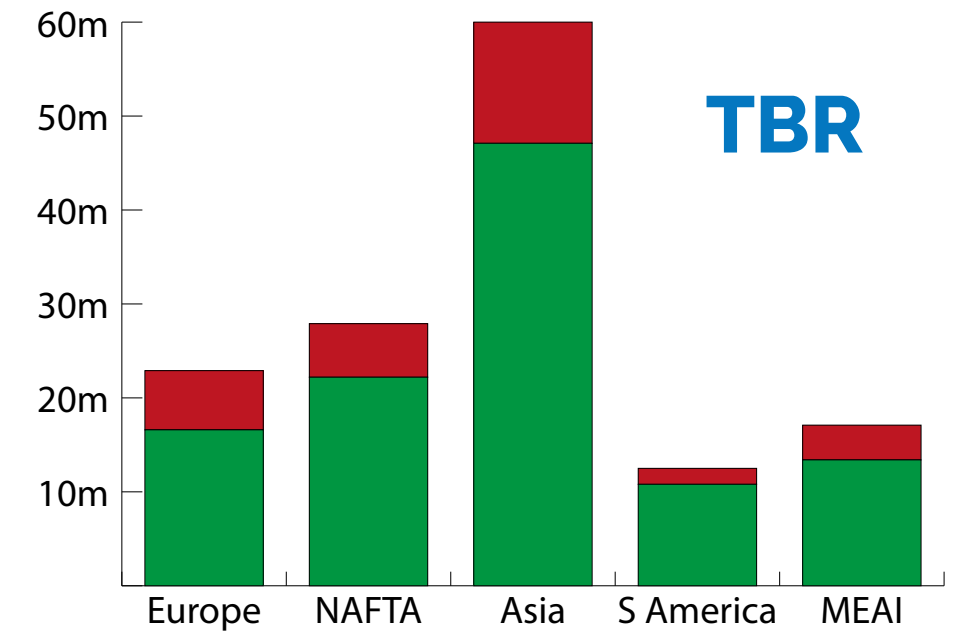
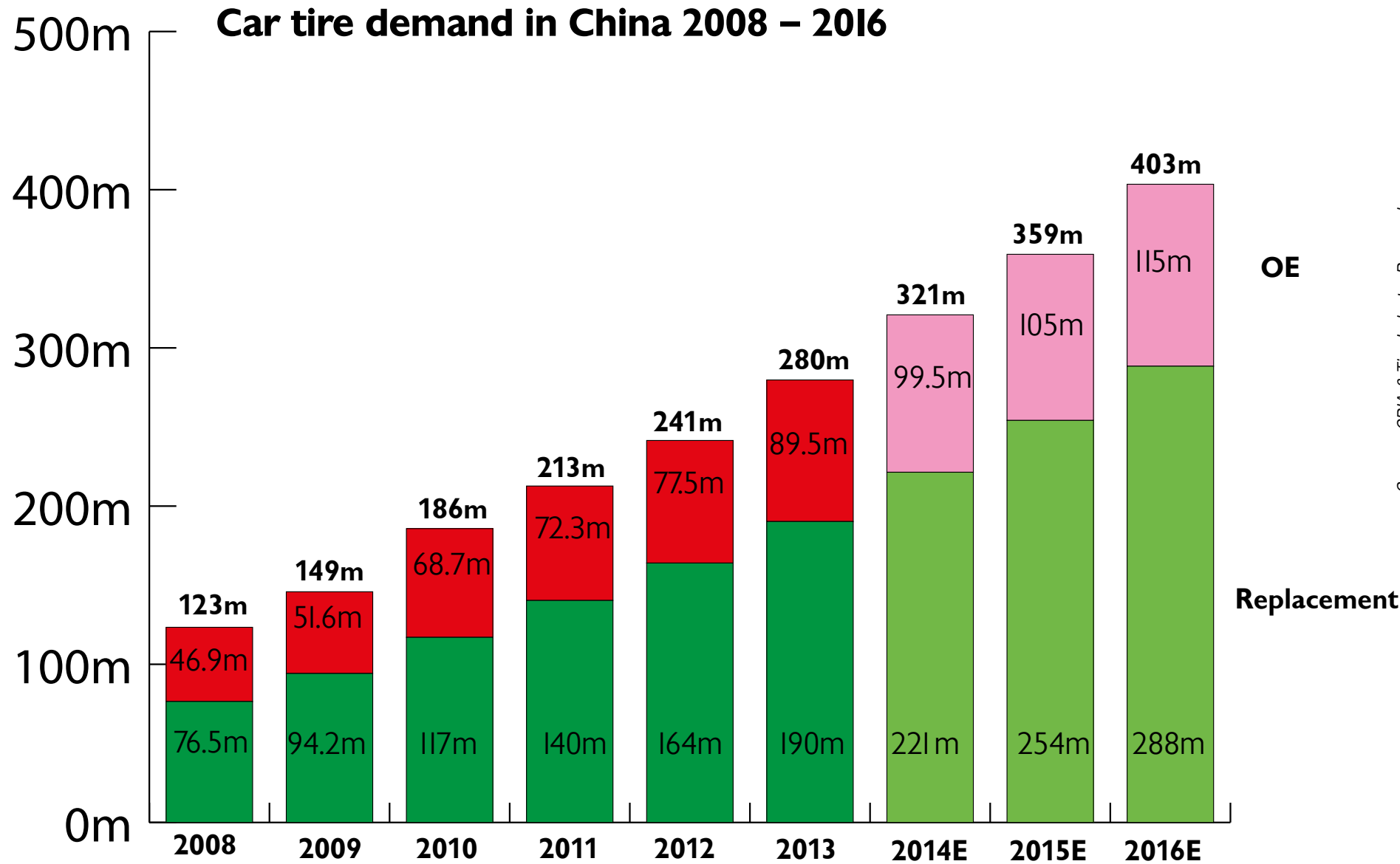
- Feel free to interrupt
- Happy to respond to questions
- Make this informal & informative



Tire Industry in China



OE and replacement



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

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

Source: Ministry of Public Security, as of the end of 2017

Government policies since 2017

January 2017: “**Guidance for Accelerating the Development of the Renewable Resources Industry**”,

- 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,

Wanli,

Double Star,

Double Coin

Chongqing

Aeolus

Mesnac

Shaanxi

Beautiful China

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.



Shaanxi tire recycling unit

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

Twitter @TireIndustry

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 Weekly Newsletter

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TIRE INDUSTRY
RESEARCH

China Tire Intelligence report

Week ending 18 May 2018

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3 Aeolus answers SEE questions
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4 Prinx Chengshan man named as top craftsman
4 Sailun Jinyu buys Canadian tire dealer
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4 SLJY holds drift competition ceremony
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11 Tire dealers fined after borrowing CNY60mn
11 GRTAE exhibition summary

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Global Monthly Newsletter



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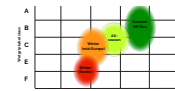
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Global Tire Intelligence report

Opinion & commentaries:

May 2018 edition: Dateline: 30 April 2018

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

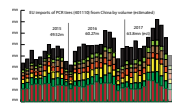


CRIA: Tire managers discuss industry issues
CRIA Shi Yifeng: Problems in tire companies
CRIA data shows sharp fall in 2017 tire profits
Xu Wenyong: Key tasks for the CRIA in 2018
CRIA releases 2018 Top 100 rubber companies

Carbon black going short P10



WBCSD to promote sustainable NR P11



Import-Export data P12

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



Double Star to take control Kumho Tire P13



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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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