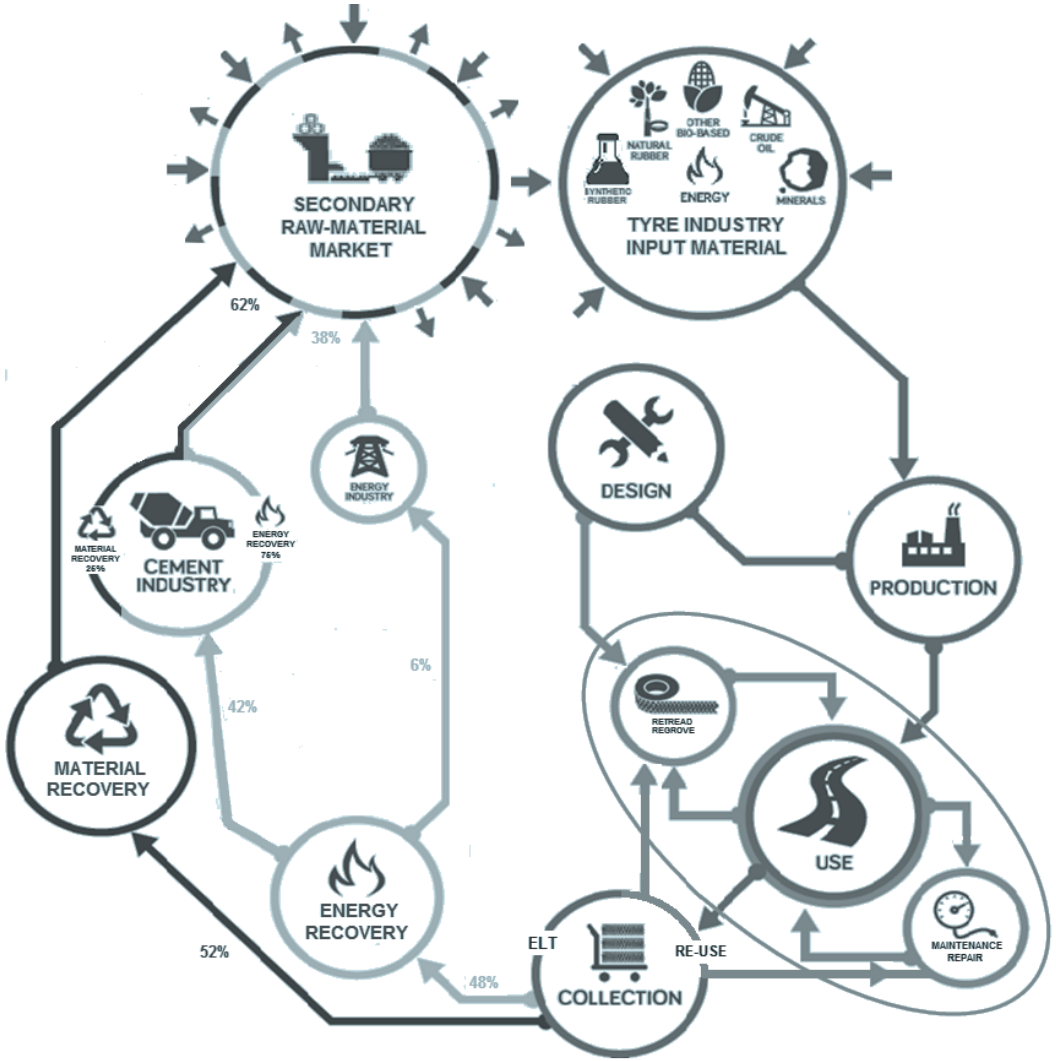
INTERNATIONAL BIPAVER

THE FUTURE OF PCR RETREADING IN EUROPE

Challenges and Chances

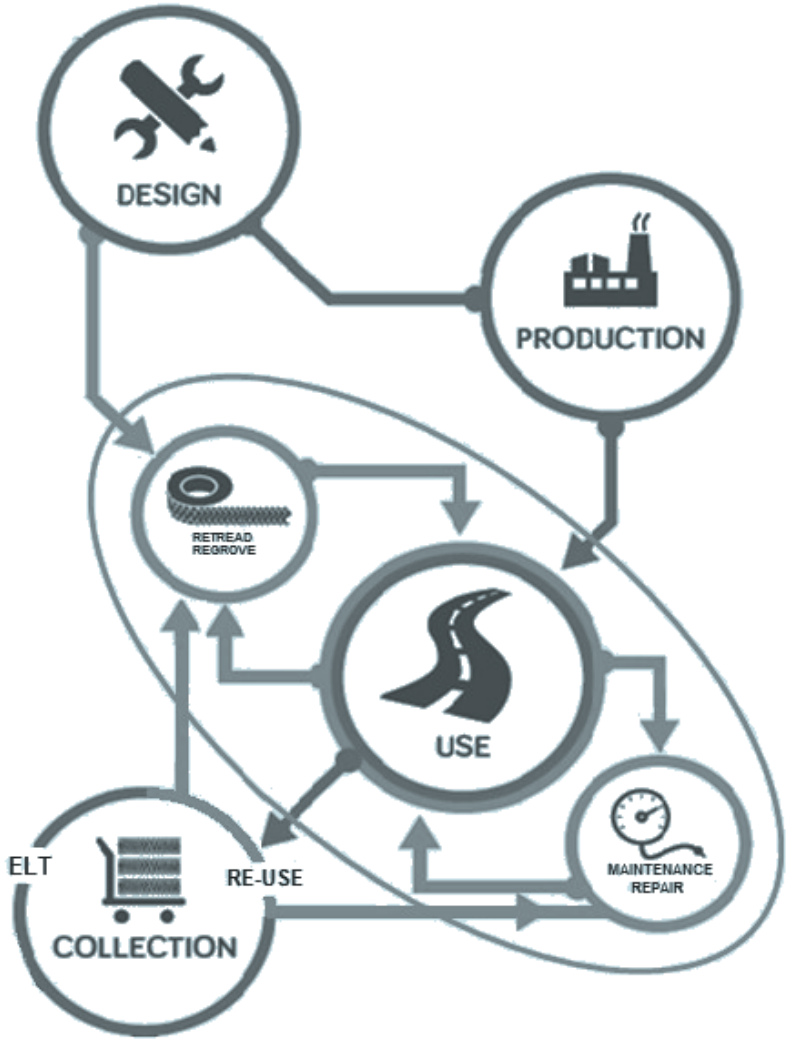
Alessandro Villa

CIRCULAR ECONOMY



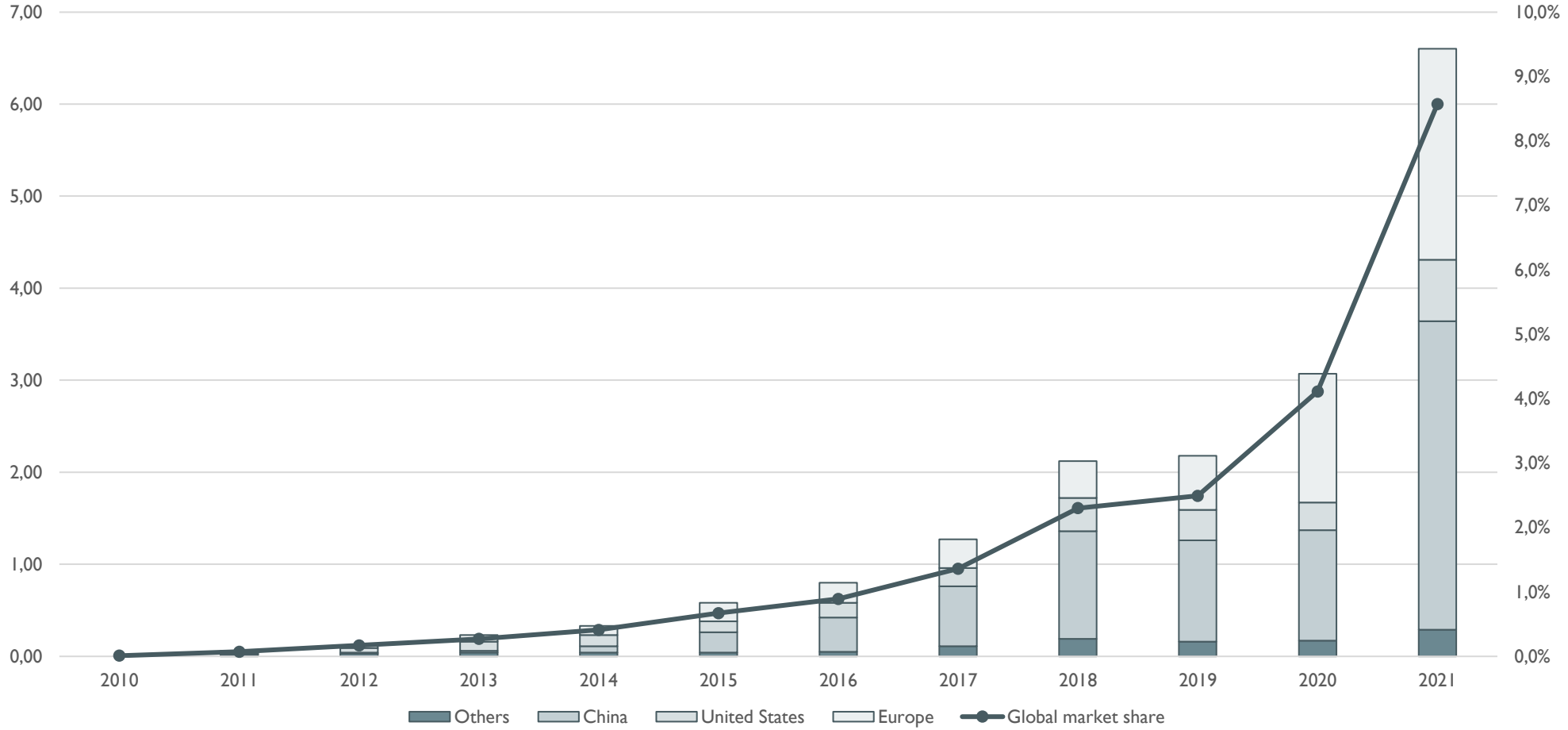
Source: ETRMA – Circular Economy

CIRCULAR ECONOMY



Source: ETRMA – Circular Economy

ELECTRICAL VEHICLES MARKET - Global sales and sales market share of electric cars, 2010-2021



IEA, Global sales and sales market share of electric cars, 2010-2021, IEA, Paris
https://www.iea.org/data-and-statistics/charts/global-sales-and-sales-market-share-of-electric-cars-2010-2021

EUROPEAN EV CAR MARKET SHARE

WE 5+5	2022 Q1	Comparison to 2021 Q1
BEV	287,000	+55%
PHEV	195,000	-8%
Hybrid	529,000	+7%
Total	**1,012,000**	**+13%**

Source: Electric Vehicle Sales Review Q1 2022 – Strategy& PwC

acea

DRIVING MOBILITY FOR EUROPE

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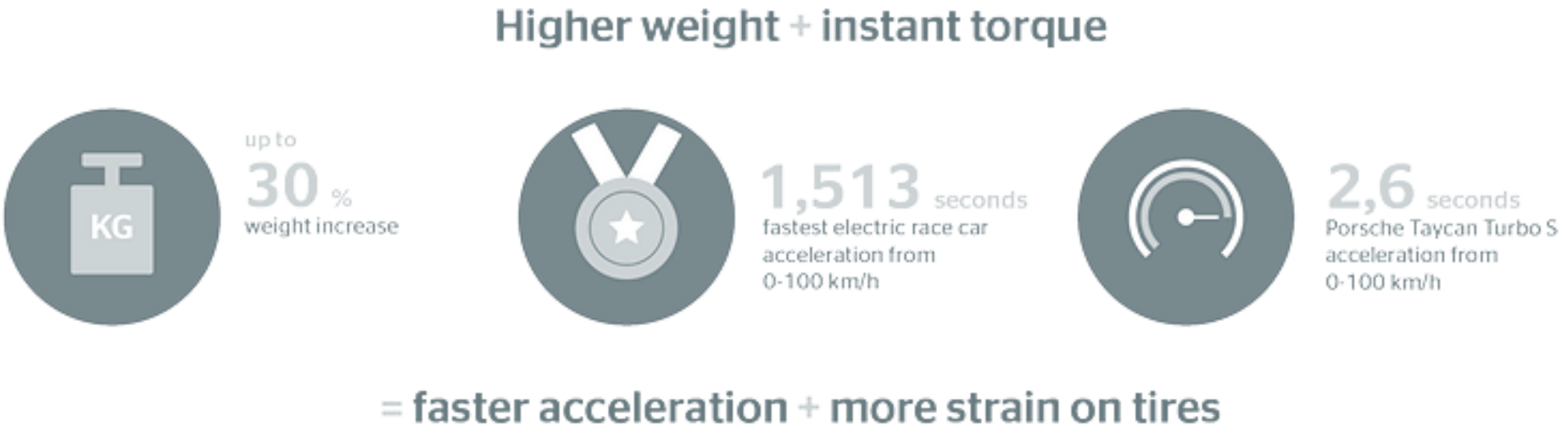
Fuel types of new cars: battery electric 10.0%, hybrid 25.1% and petrol 36.0% market share in Q1 2022

5 May 2022

Brussels, 5 May 2022 – In the first quarter of 2022, the market share of hybrid electric vehicles expanded, accounting for 25.1% of total passenger car sales in the European Union (up from 20.9% in Q1 2021).

Source: ACEA - European Automobile Manufacturers' Association

TIRES TECHNOLOGY REQUIREMENTS



Increased Weight means Longer Braking Distance

High Instant Torque means High Tire Wear

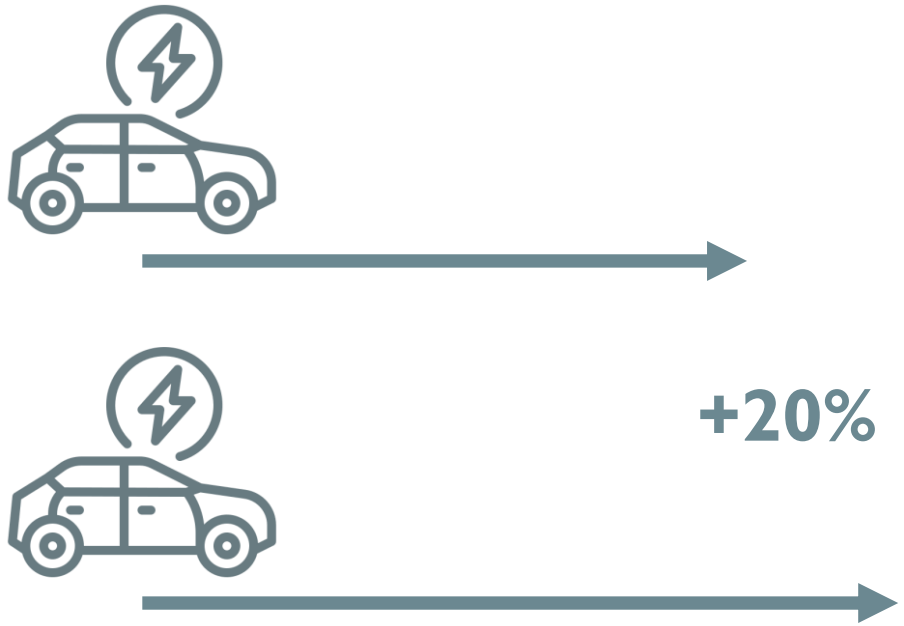
Source: Continental Tire - Electric vehicle tires – Everything you need to know

ROLLING RESISTANCE

Today RR has a very small effect on the efficiency of an ICV, although tires account for up to 30% of fuel consumption, we measure it as a couple of tanks less during the year.

In EVs, low RR is measured in **battery range**, and each kilometer more make the difference in the EV business.

The RR is achieved trough materials but also with a **low tread pattern**.



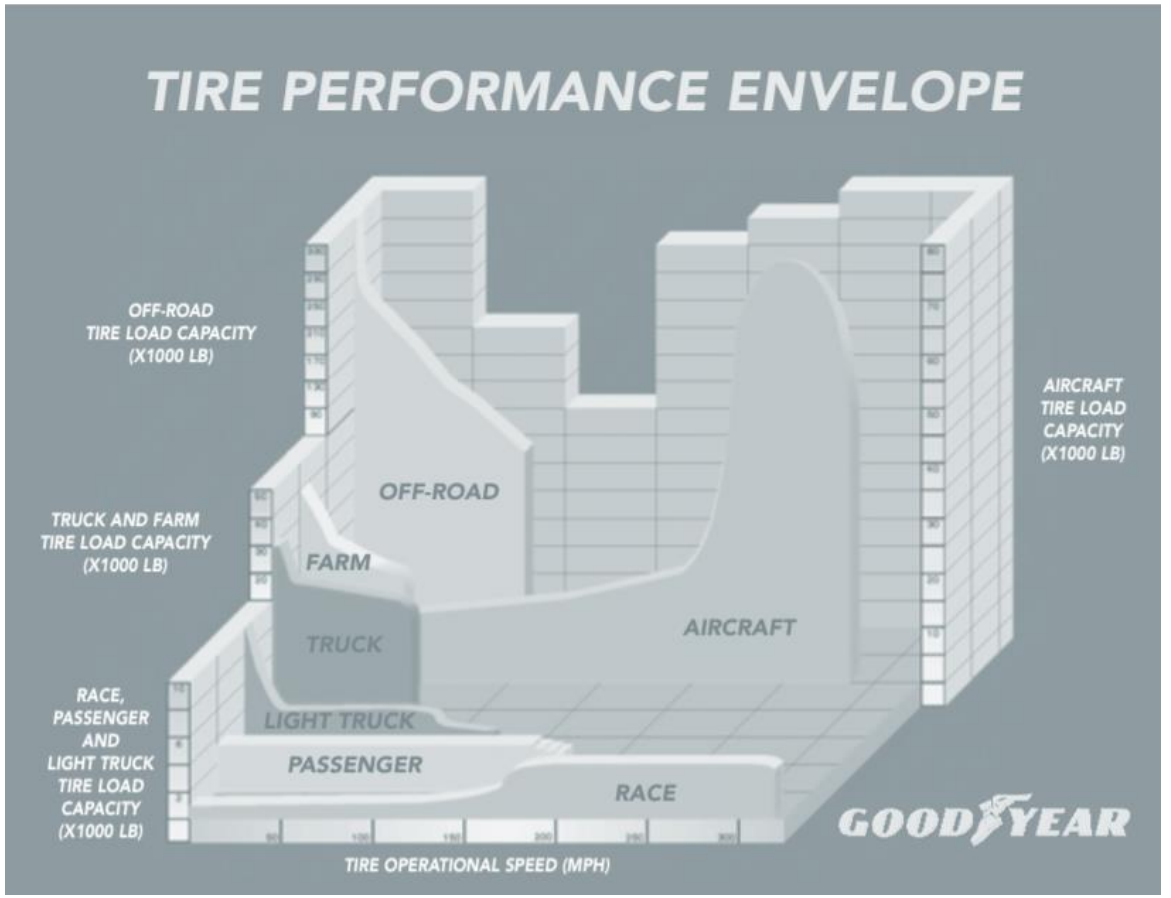
A BIG OPPORTUNITY FOR RETREADING INDUSTRY:

With the current growing market share of EVs and legislation to ban ICVs, in a few years we would have to manage a huge volume of ELTs, which from a technical point of view are perfect to be "retreaded"

- Rapid tread wear due to torque (20% faster than ICV's)
- Low Rolling Resistance = Low Tread Patter = Quick Wear
- Reinforced Tire Carcass due to EV's weight (up to +30%)

RETREADABILITY TODAY

- 9 x
- 3x
- 1x
- 1x



Source: Aircraft Tire Databook 10/02 - Goodyear

RETREADING: A "BAD WORD" IN TIRE BUSINESS

TIRE MANUFACTURES APPROACH

Michelin UPTIS

*"No pneumatic tire «**recheargeable**» for EV: the tread can be «recharged» trough a 3D printing technology"*

Continental Conti GreenConcept

*"High sustainability tires with special tread strip capable of multiple **renewals**"*

POINT OF ATTENTION OF PCR RETREADING

Comparing with other tire segments, PCR retreading is suffering a lot for casing availability,

main reasons are:

- PCR tires are used until the end of their technical life, there is not a concepts of "tire management" like for other segments
- Close of 30% of casing coming in a retreaders are scraped due to quality reason.
- Several casings are directly sent to the ELT consortium for waste destination without a proper selection and destination to the retreading

PCR RETREADING IN EUROPE

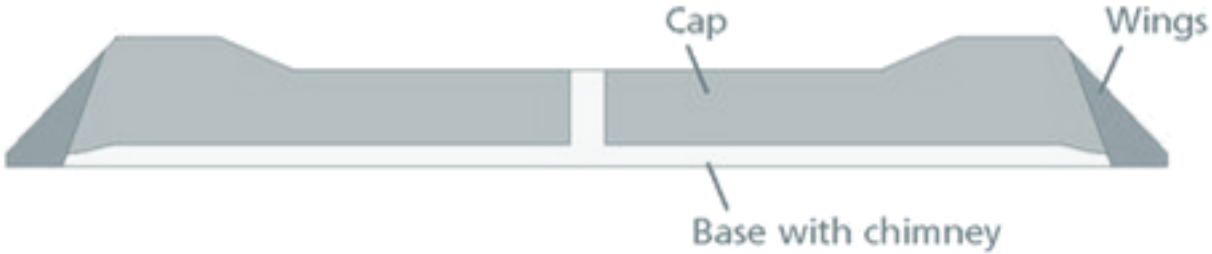
PCR retreading has been a very active business until the early 2000, with the incoming of the far eastern cheap tires, the business has been by huge problem of profitability that led to the closing of several players.

Nowadays the business is concentrated in some niche segments with few players :

- Car – with focus on Winter
- Light Truck
- 4x4 – pure of the road
- Racing: rally - race – off the road

PROCESS REQUIREMENT TO FULFILL THE EV TECHNOLOGY

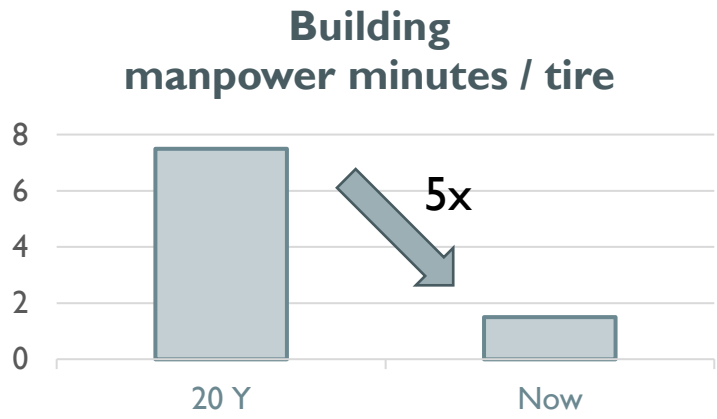
- Retreading process is still based on machines developed years ago without any significant improvement in term of quality and efficiency.
- Outgoing quality is strongly dependent on the skills and knowledge of the operator.
- High process cost due to low level of automation with many low added value activities
- Tread compound: Silica based Tread – multicompound + chimney



- Curing process not aligned to the uniformity requirements.

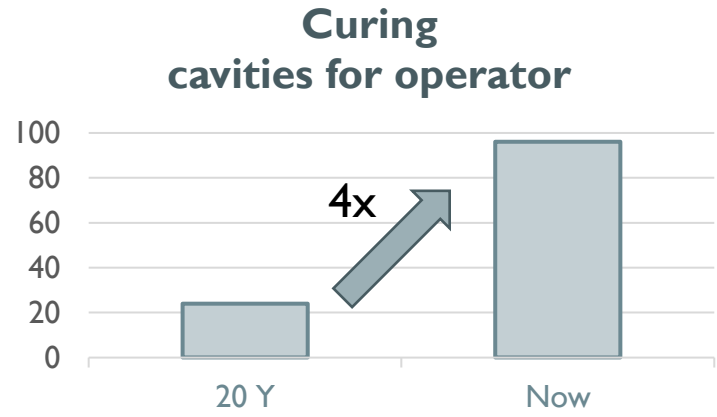
TIRE INDUSTRY

in the last years we have seen a progressive improvement in the tire manufacturing process. Along side a high level of automation there is an elevate level of process and quality control.

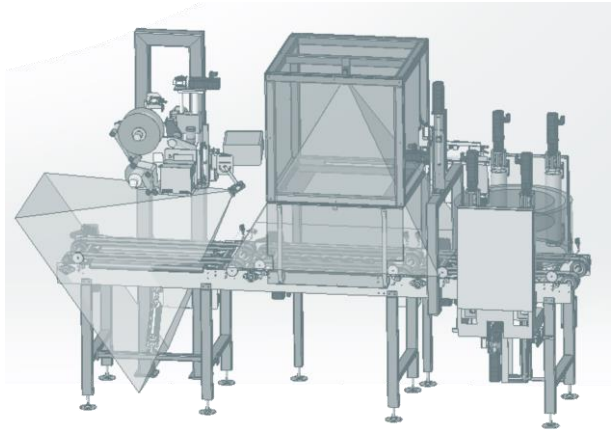


Result

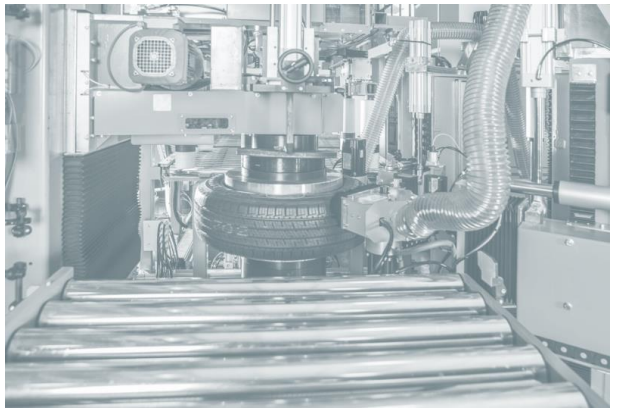
less than 10 manpower / minute to manufacture a tire from compound to finishing with very high uniformity. and a a full process traceability



MOSAIC
Motion System And Information Control

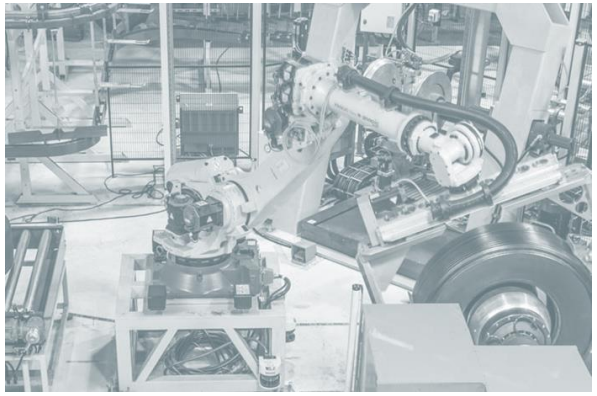


matteuzzi
MATTEUZZI ITALIA SRL GROUP



GOenergy

trm
Tyre Retreading Machinery



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End User communication

ELT's consortiums

Legislation

Tire Management (Mileage Business Model)

Design for reuse

Efficiency (Process Automation)

Traceability (Product and Process)

Quality

Thank You

For Your Attention

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