



AÇÃO AMBIENTAL  
2016

Painel "Economia Circular: Modelos de Negócios"  
**Rodrigo Santiago – Michelin**  
Rio de Janeiro – Sistema FIRJAN

← **SEMINÁRIO FIRJAN DE AÇÃO AMBIENTAL**

**REPENSAR PRODUÇÃO,  
DESCARTE  
E CONSUMO.** →



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← SEMINÁRIO FIRJAN DE AÇÃO AMBIENTAL

REPENSAR PRODUÇÃO,  
DESCARTE  
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## 1º de Junho 14h às 18h

### Seminário "Economia Circular"

#### Keynote Speaker

- Douwe Jan Joustra – Implement Circular Economy (ICE-Amsterdam)

#### Painel "Economia Circular: Modelos de Negócios"

- Beatriz Luz – Exchange For Change Brasil
- Mayra Sallie – MIG Jeans
- Rodrigo Santiago – Michelin
- Leonardo Freitas – EcoLab

#### Painel "Economia Circular: Caminhos Possíveis"

- Marc Diaz de Las Heras – Sebrae/RJ – Programas Estratégicos
- Pedro Junqueira – Resiliência e Operações do Município do Rio de Janeiro
- Tomás de Lara – Sistema B Brasil

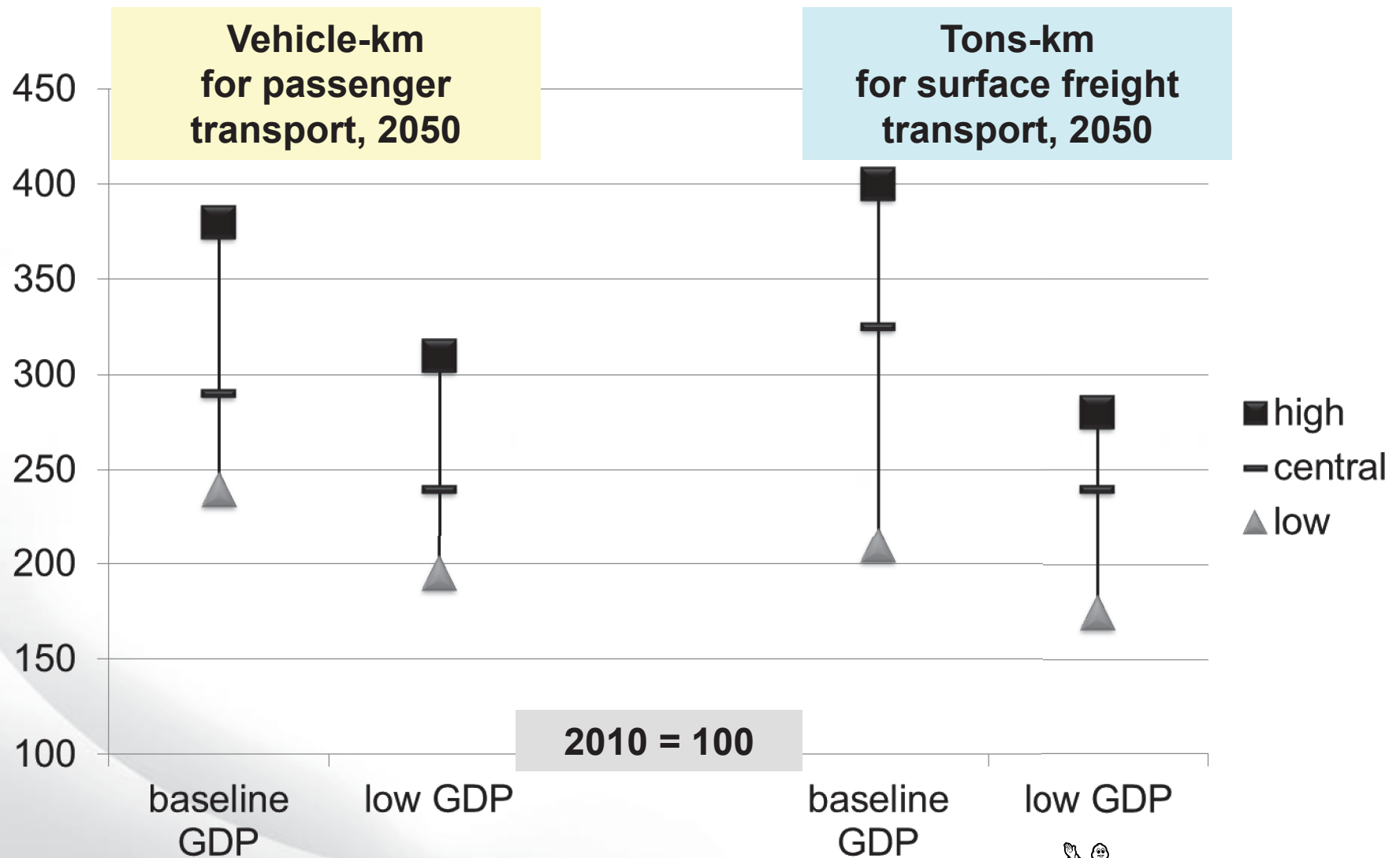
# MICHELIN circular economy strategy



# MICHELIN = Market transformer for more than 125 years



# Demand for mobility will continue to grow



Source ITF Transport Outlook 2013 ( p60 & p62 )

# Road mobility challenges



1950 : 50 million vehicles  
2000 : 800 million  
2050 : 2 billion ?

Too many accidents  
18% of CO<sub>2</sub> emissions  
Fossil energy dependency  
Raw material availability  
Congestion in cities  
Local pollution  
Traffic noise

**Mobility  
needs to be:**

***Safer***

***Cleaner***

***More efficient***

***More enjoyable***

# Impact of all our activities on the environment



Depletion  
of natural resources



Impact  
on human health  
and biodiversity



Climate change

# Passenger car tire life cycle assessment

Raw material  
& tire manufacturing

**11%**



tire distribution

**< 1 %**



Usage impact  
(CO<sub>2</sub> + particulates)

**93 %**

Energy recovery  
Material recovery  
Landfill  
end of life impact

**-3%**

Scrap tire  
collection

**< 1 %**



**MICHELIN**

A better way forward





## Raw material needed for tires

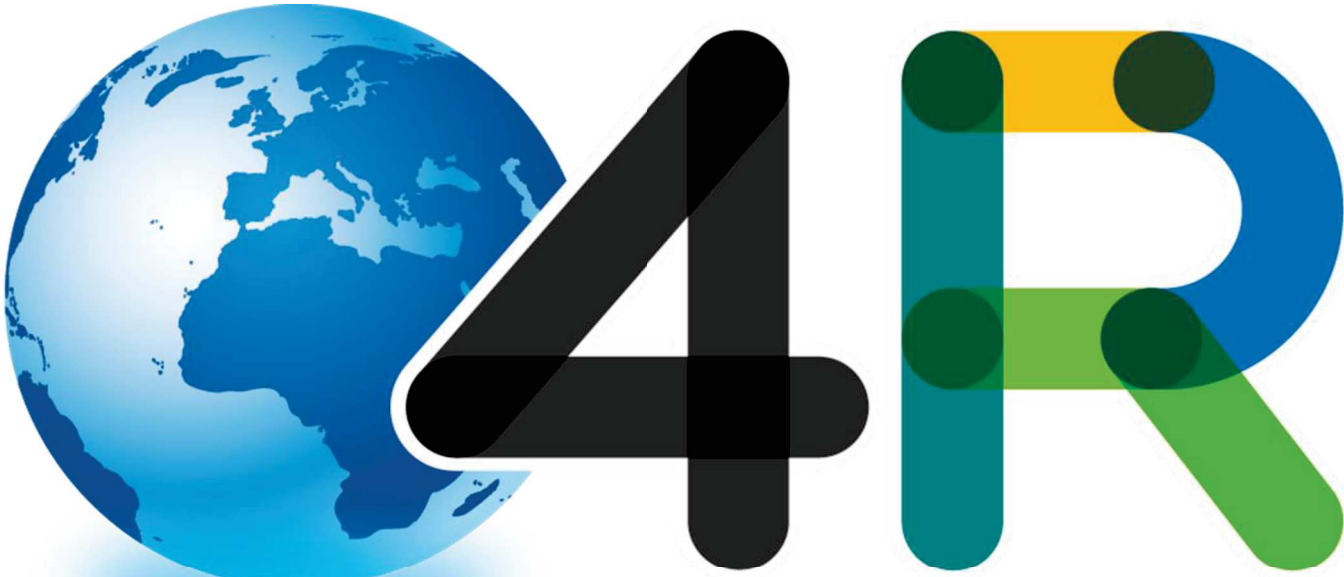


### Rubber compound 83%

■ natural rubber	25 %
■ synthetic rubber	20 %
■ reinforcing fillers	26 %
■ chemical additives	12 %
■ steel cables	14 %
■ textile cords	3 %



# MICHELIN 4R Strategy



**REDUCE**



**REUSE**



**RECYCLE**



**RENEWABLE**



**MICHELIN**

*A better way forward*

**Michelin tires are lighter**



**Michelin tires last longer**



**Michelin tires save fuel**



**Michelin Functional Economy**





*repairing*



*regrooving*



*recapping*

## Material recovery



*whole tire*

*shreds*



*crumb*



*powder*



*alcohol*



## Energy recovery



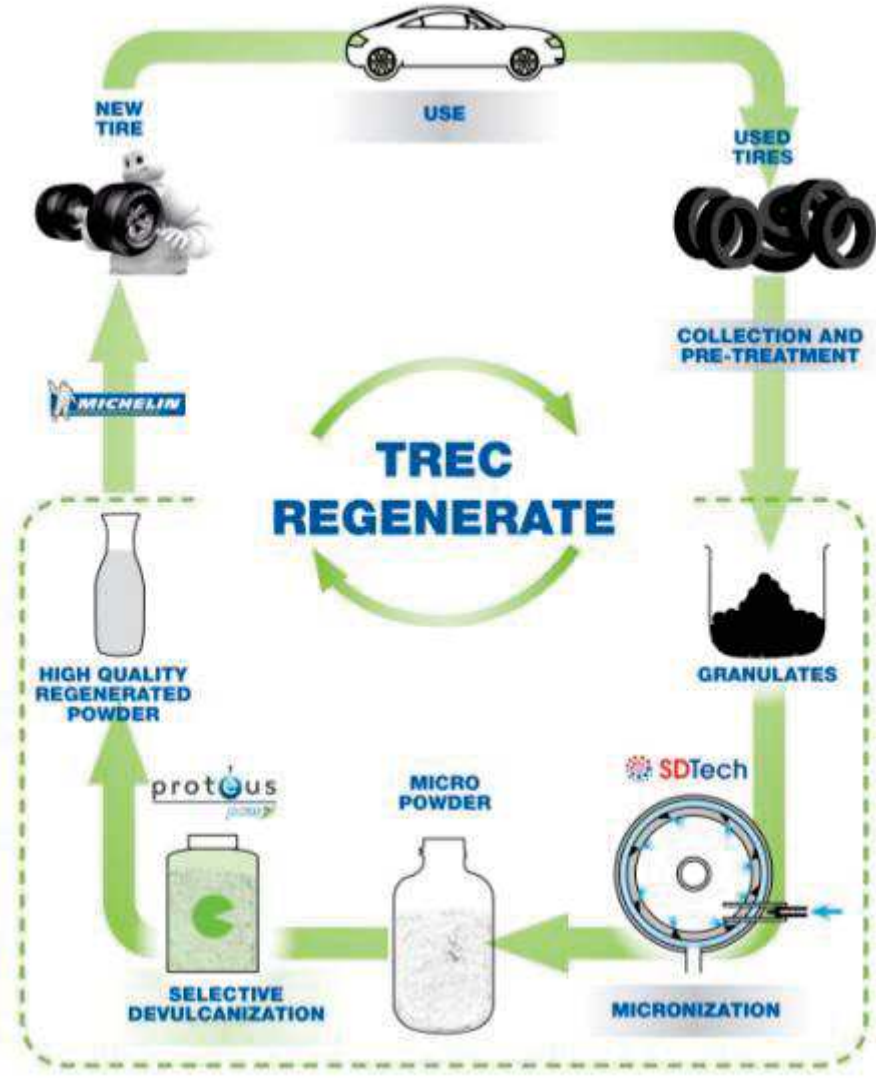
*steel industry*



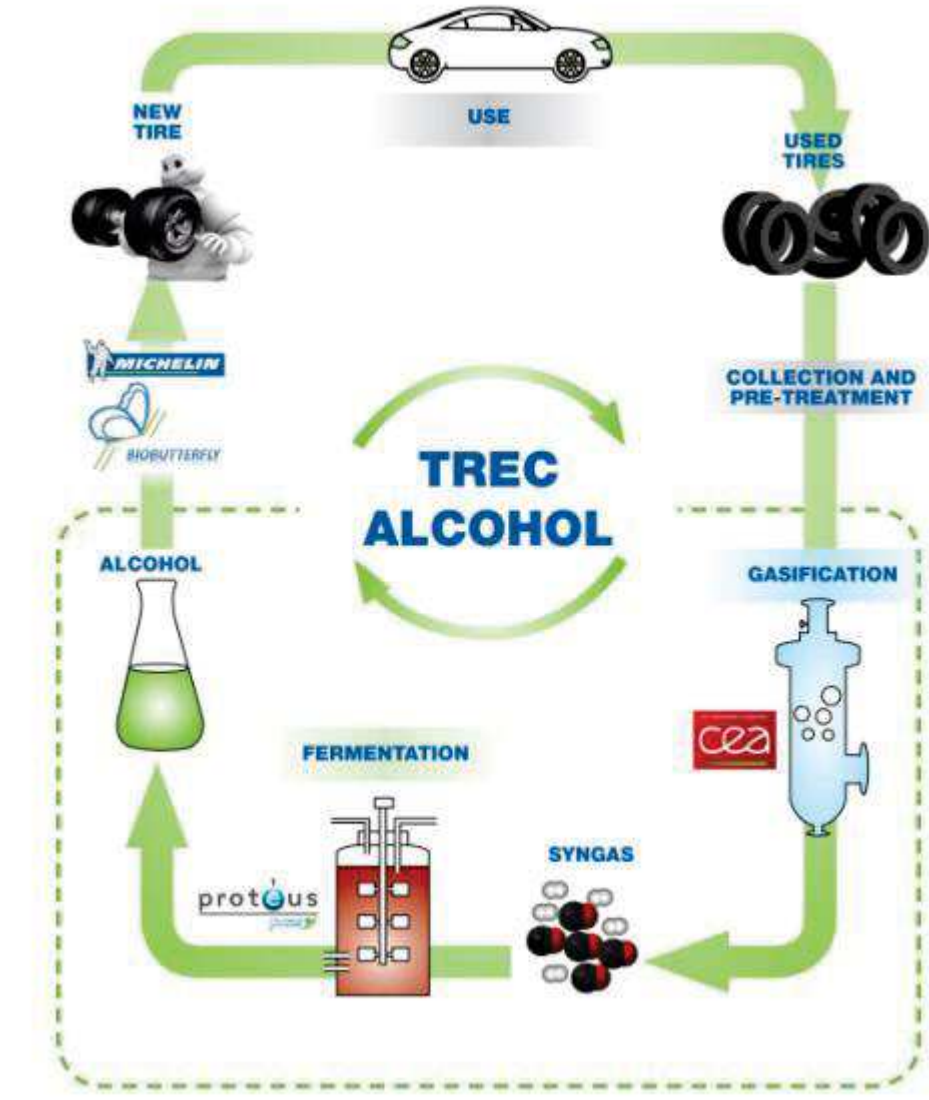
*cement  
factories*



*thermal power  
generation*



1 metric ton  
of used tires  
will provide  
830 kg  
of high quality  
regenerated powder



1 metric ton  
of used tires  
will provide  
200 kg  
of synthetic rubber



**RENEWABLE**

**Natural rubber**



**bio-sourced isoprene**



**bio-sourced butadiene**



**Use of natural oil and natural resins in tire compound**







## bio-sourced isoprene

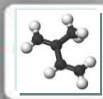


biomass



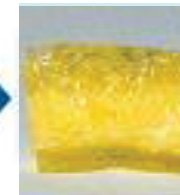
*Bio-tech*

Isoprene



*Polymerization*

Poly isoprene



## bio-sourced butadiene "BioButterfly" Project



1<sup>st</sup>, 2<sup>nd</sup> et 3<sup>rd</sup>  
generation  
Biomass



Biotechnology  
Fermentation

Alcohols



Catalytic  
reactions  
Separation

Butadiene



Polymerization

Synthetic  
rubber





# MICHELIN TK Solution

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GCAS – TK Business Model - Confidentiality D3





59/80 R 63 XDR

DER GRÖSSTE REIFEN  
DER WELT  
THE BIGGEST TYRE  
IN THE WORLD



KANITOU

CAT

WHITE

# Today, do you ...

Do you consider your business model with supplier is best in class?

Do you get the maximum of potential life out of your tires ?

Do you track downtime of trucks due to tire related issues?

Do you track and monitor ton-kilometer delivered by each tire?

Do you link your service provider revenue to your activity?

Do you know the cost of carrying running inventory and spare tires at your site?

Do you think the time spent for forecasting, ordering, tracking tires for your fleet is the best use of your resource?

Do you benefit the most out of the expertise of your Tyre supplier ?

# An Integral offer

- 

1 Tire Supply
- 

2 Tire Service
- 

3 Tire Repair
- 

4 Tire Recycling
- 

5 TMS  
OperTrak
- 

6 TPMS  
MEMS2  
EVOLUTION 2
- 

7 Tire & Site  
Expertise
- 

8 One Single Invoice per Work Realized = Ton.Kilometer
- 

9 Economically Link all Actors toward Mine Production

# How it works ?

**A Tire specialist full time on site, manage continuous progress**

→ *Tire Expertise at your convenience*

**+ No invoices per tire, instead Ton moved on Kilometers/miles**

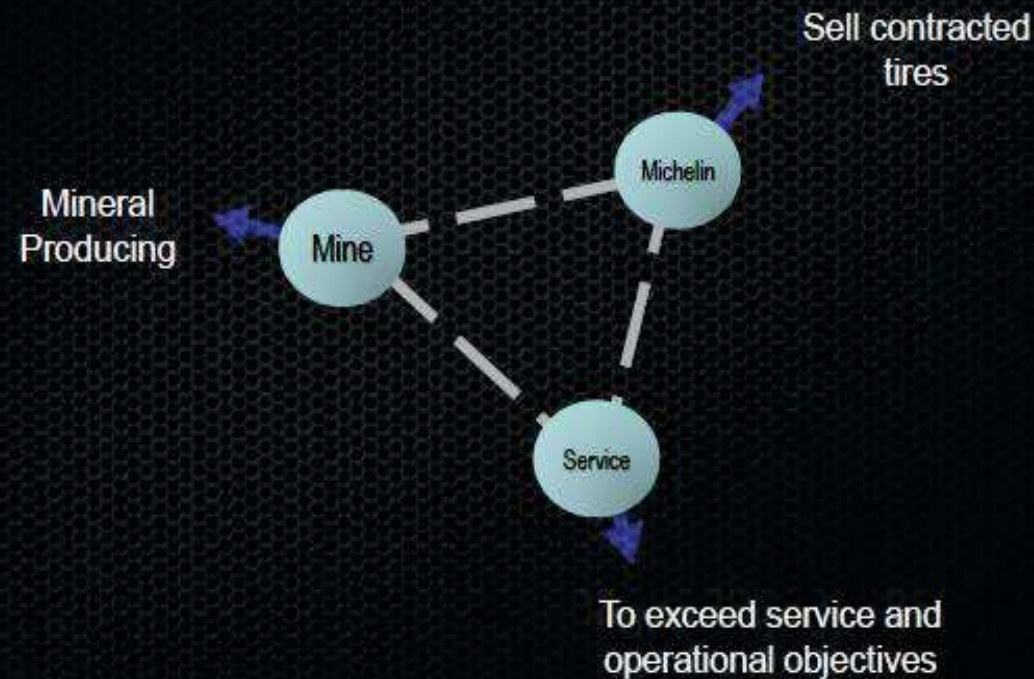
→ *TK Base*

**+ Incentive for each stakeholder when tire performance exceed the target**

→ *Performance Gain Sharing*

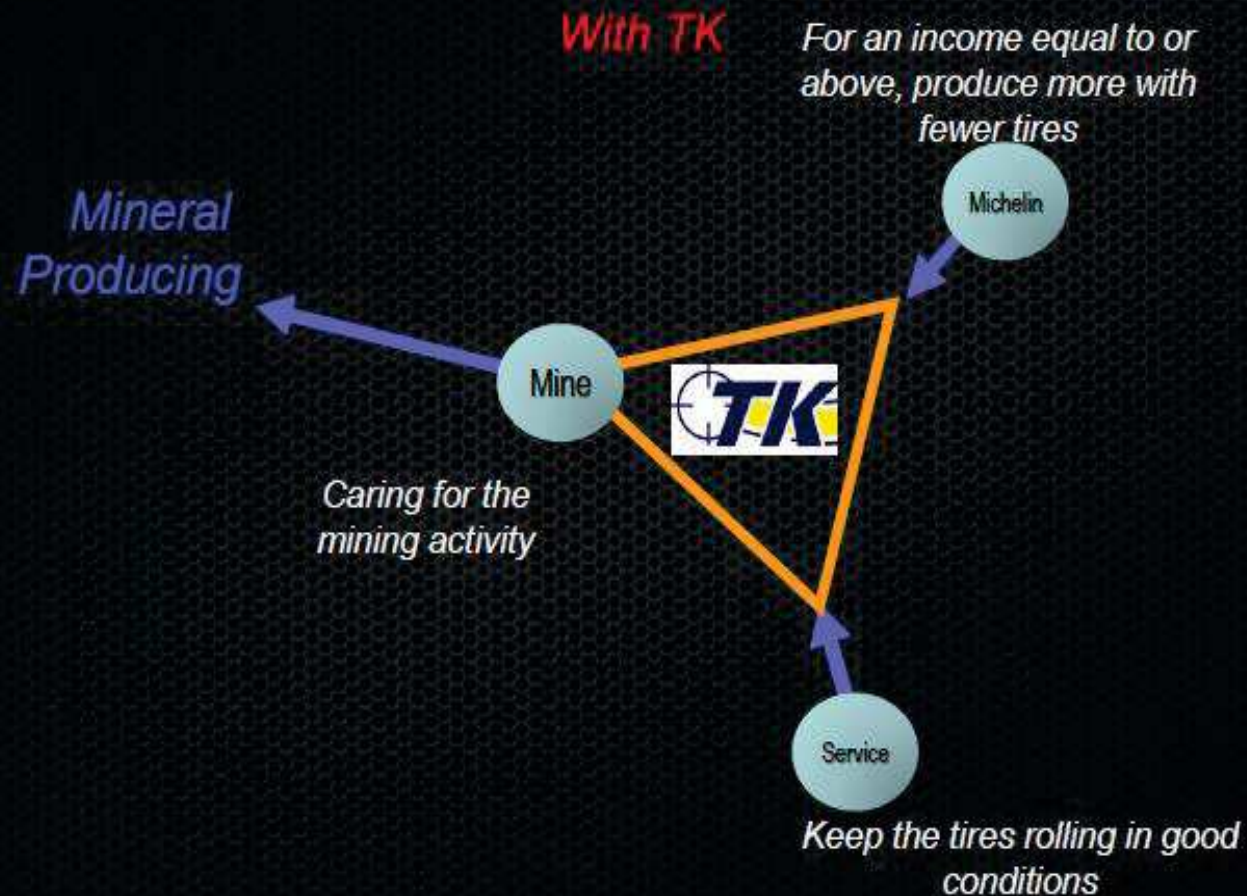
# TK breaks the paradigm

*Before TK*





# TK breaks the paradigm



# Benefits

- Reduce working capital
- Productivity : reduce cost of tonnage moved : TK
- Variable cost : Invoicing by production metric : TK
- Reduce downtime of trucks
- Reduce number of tire scraped for a given tonnage moved
- Focus management staff on core mining issue, Michelin takes care of tire from cradle to grave
- Tire management cost is predictable
- All actors are committed on production KPI : TK
- One single interlocutor for Tires activities
- Benefit daily from Michelin expertise
- Give a continuous progress impetus

# Example 2, Copper Mine, Chile

Operation  
has started  
in 2006

TK contract  
started end of  
2010 for 5  
years



186,000  
Tones  
Coopper/ yr

25 CAT 793



MEMS  
users

300 million of TK per year

## Example 2, Copper Mine, Chile

« With the new contract, my boss decided to move  
Tire management from Maintenance to Operation  
Department »

Head of Operation Department

# Benefits

- Cost of tonnage moved

**“We estimate that since the beginning of the contract, we have cut off our cost per truck per year by 85 k\$”**

Mine Contract Manager

# MICHELIN 4R a win-win-win strategy

for our customers  
for the planet  
for MICHELIN





**Thank you**

