



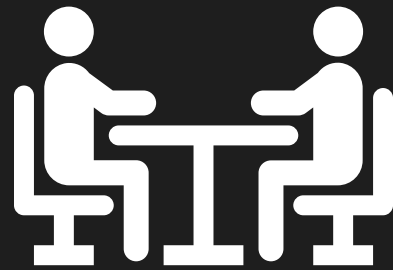
BLACK CYCLE

Move to the green revolution



A vertical strip on the left side of the image showing a stack of many old, worn, light-brown tires. The tires are stacked in a way that their circular centers are visible, creating a pattern of concentric circles.

Thank you to join us



Namaste مرحبا Willkommen Bem Vindo Selamat Datang
Bienvenidos Namaste Bienvenue Croeso Welcome Bienvenidos أهلا وسهلا
Benvenuti Welkom Bienvenue Bem Vindo
Selamat Datang Willkommen
Benvenuti
دوبре дошъл Benvenuti
Καλώς ήλθατε

A MAJOR EUROPEAN PROJECT FOR RECYCLING END-OF-LIFE TYRES INTO NEW TYRES



**BLACK
CYCLE**

Move to the green revolution

2nd WORKSHOP Welcome to Zaragoza!

Ramón Murillo - CSIC



Ramon Murillo (ICB-CSIC)

Welcome to Zaragoza!

- Zaragoza is a historic city located in the northeast of Spain and capital of the historical territory of Aragón
- It was founded by the Iberians in the third century BC but then it was re-founded by the Romans with the name Caesaraugusta
- After a Visigothic period, it was conquered by the Arabs in 714 until 1118, when it was reconquered by an Occitan, Frankish and Aragonese army



Welcome to Zaragoza!

- A growing commercial city during the middle and modern ages
- The city was devastated during the Napoleonic wars with three successive sieges



Welcome to Zaragoza!

-and now, Zaragoza is a modern city with a population of ca. 700000 people



Welcome to Zaragoza!

- With a powerful industrial sector, excellent communications, strong compromise with the renewable energies and very close to almost anywhere!



Visits during this workshop

- You will have the chance to visit CSIC facilities and Sisener/Greenval Technologies site
-and also, if you wish enjoying tapas in “El tubo”!





**THANK YOU
and
ENJOY YOUR VISIT!**



Horizon2020
European Union Funding
for Research & Innovation

This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 869625.



Jean-Michel DOUARRE – Consortium Director (MICHELIN)

The European BlackCycle project is a POWERFUL Tool to create a MASSIVE tire circular economy!!!



Martin von Wolfersdorff is an expert on recovered carbon black and tyre pyrolysis.

He founded Wolfersdorff Consulting Berlin to advise clients in the recycling and tire industries on the commercialisation of recovered carbon black.

He is a top voice for recovered carbon black at various sustainability events.

Martin von Wolfersdorff

[recovered carbon black and tyre
pyrolysis Expert]

Moderator
for the
2nd BLACKCYCLE
WORKSHOP
in Zaragoza





Good practices

FOR THE BLACKCYCLE ONLINE WORKSHOP



Connect at least **10 minutes before the beginning of the workshop** for more tranquility (first exchanges and last settings)



Be sure **to turn off your microphones and cameras** before the workshop to avoid interference and free up bandwidth



There will be time for discussion at the end of the workshop, so don't hesitate **to ask your questions and/or use the chat**

Plenary session

9.00 am



Blackcycle project: Welcoming note

9.30 am



Blackcycle project: Technical session part 1

10.30 am



Coffee Break

11.00 am



Blackcycle project: Technical session part 2

11.40 am



Tyre recycling: towards the Circular Economy

12.20 pm



Networking Session :

Discovering Who is who ?

1.00 pm



Networking lunch

Working Groups

2:30 pm



- Technical dissemination
- Regulation and Policy
- Social acceptance

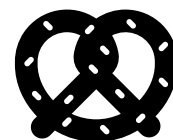
5:00 pm

Closing Session :



Share results of the working groups

7.00 pm



To end this day and continue to interact together: Join us en el tubo



Day 1

Plenary session

9.00 am  **Welcome**
Ramon Murillo (ICB-CSIC)
Jean-Michel DOUARRE (MICHELIN)

9.20 am  **Official Blackcycle video**

9.30 am *European BLACKCYCLE consortium: The power to move forward-* **Margarita DORATO (MICHELIN)**

9.40am *A major project milestone achieved: High quantity of optimized pyrolytic oil from ELTs* –**Andreas KAPF (PYRUM)**

10.00am *A key step in 2022: Distillation scale-up at TRL7-* **Juan Daniel Martínez (ICB-CSIC) & Ignacio de Pascual (SISENER)**

10.15 am *2022 Validation of the scale-up: from kg to tons of sustainable Carbon Black* - **Helmut GROMES (ORION)**



Coffee Break



10.30 am
11.00 am *What about a tyre with Sustainable Carbon Black?–* **Magali HEURTEFEU (MICHELIN)**

11.15 am *Upgrading Heavy Pyrolytic Oil from ELTs to High-Quality Carbon Black Feedstock: aromatization and desulphurization–* **Eleni PACHATOURIDOU (CERTH)**

11.30 am *BLACKCYCLE Conclusion* **Margarita DORATO & Jean-Michel DOUARRE (MICHELIN)**

*Facing the unexpected: how to stay on track?
“Feelings and Lessons learned from partners’ participation to EU BLACKCYCLE project”*

TYRE RECYCLING: TOWARDS THE CIRCULAR ECONOMY

11.40 am *Pyrolysis market & its deployment in Europe* - **Martin VON WOLFERSDORFF (Wolfersdorff Consulting)**

Identification of tires in support of the circular economy
Arthur WAGNER (REGOM / Transport CASSIER) & Jérôme BARRAND (MICHELIN)



OFFICIAL BLACKCYCLE VIDEO



A MAJOR EUROPEAN PROJECT FOR RECYCLING END-OF-LIFE TYRES INTO NEW TYRES



BLACK CYCLE

Move to the green revolution

TOPICS : CE-SC5-07-2018-2019-2020 - Raw materials innovation for the circular economy: sustainable processing, reuse, recycling and recovery schemes

CALL: H2020-SC5-2019-2



Horizon2020
European Union Funding
for Research & Innovation

This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 869625.

**Annually, 1.6 Billion tires
become waste worldwide**



31 Million Tons



3.5 Million Tons



90% Collected



Energy valorization



Material valorization

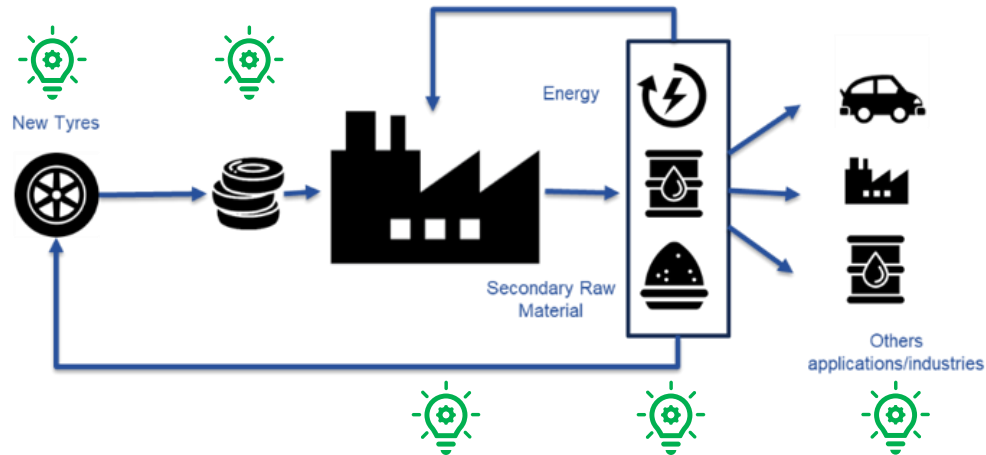
Only a limited amount of secondary raw material that **can be reused in the tyre** industry.

In Europe, **more than half of these are exported** to other countries.

Offering a **great potential for material recovery**, which is only partially exploited.

BLACKCYCLE project aims to enable a massive circular economy of tyres

BlackCycle aims at addressing these technological hurdles to transform ELTs into high quality Secondary Raw Materials (SRMs) that could be used not only by the tyre industry, but also in other technical applications, closing the loop and supporting the development of a circular economy.



More than **10** innovations along the value chain

The BlackCycle project aims at creating, developing, and optimising a full value chain :

To valorize **100%** ELTs selected

To increase up to **10 times** SRMs rate into a new tyre

To decrease **CO2** emission at least **50%**

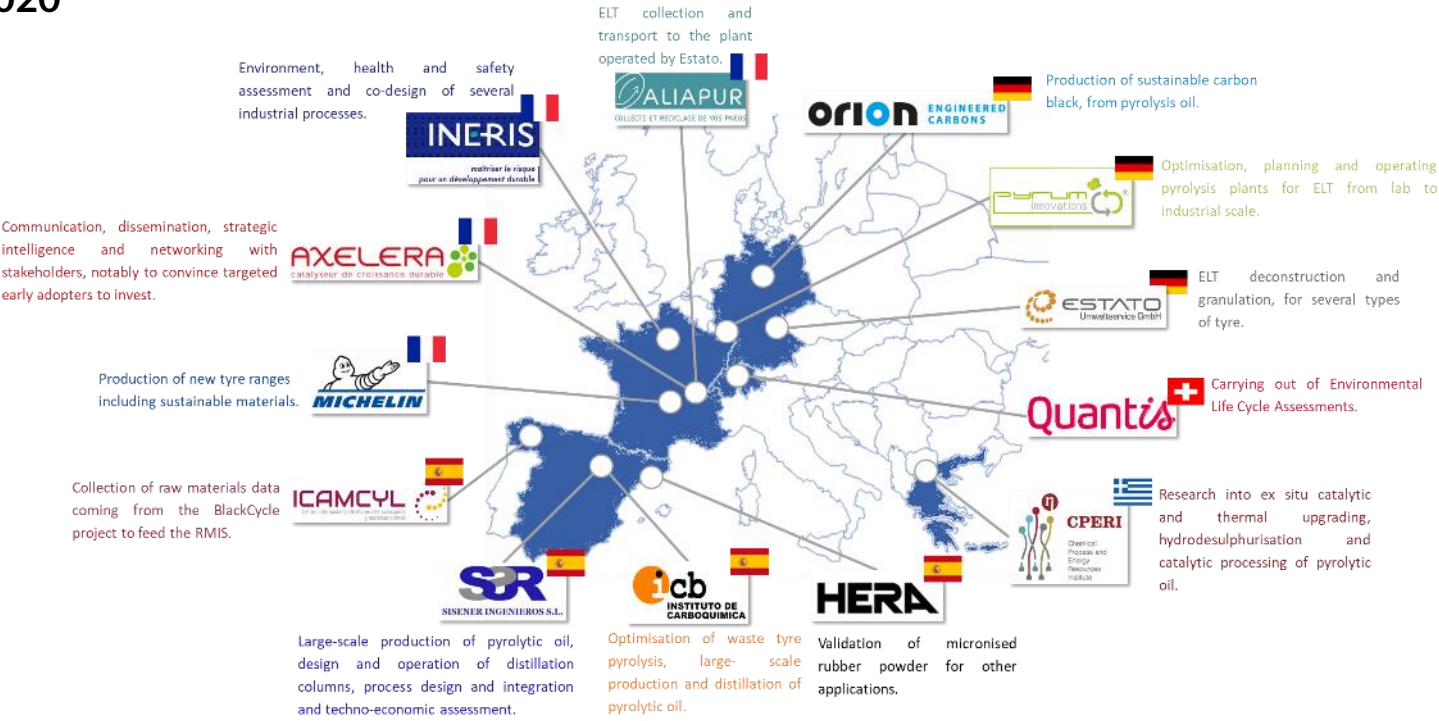
By Offering An **Economically** And **Environmentally** Viable Alternative

7 Industrial & Start up Partners, 5 Research Centers and an Innovation cluster gathered in a EU Consortium in 5 Countries



May 2020

Aug 2023



TECHNOLOGICAL BARRIERS

NON-TECHNOLOGICAL BARRIERS

BLACKCYCLE aims at creating, developing and optimising a full Value Chain



TRL : 4 to 7

To develop 2 pyrolysis technologies to produce pyrolytic oil and r-CB

Depending on the quality of the of ELTs granulates and the operating conditions of pyrolysis

Auger Reactor



TRL5

Hundreds kg samples



TRL7 - dozens tons samples

Moving Bed Reactor



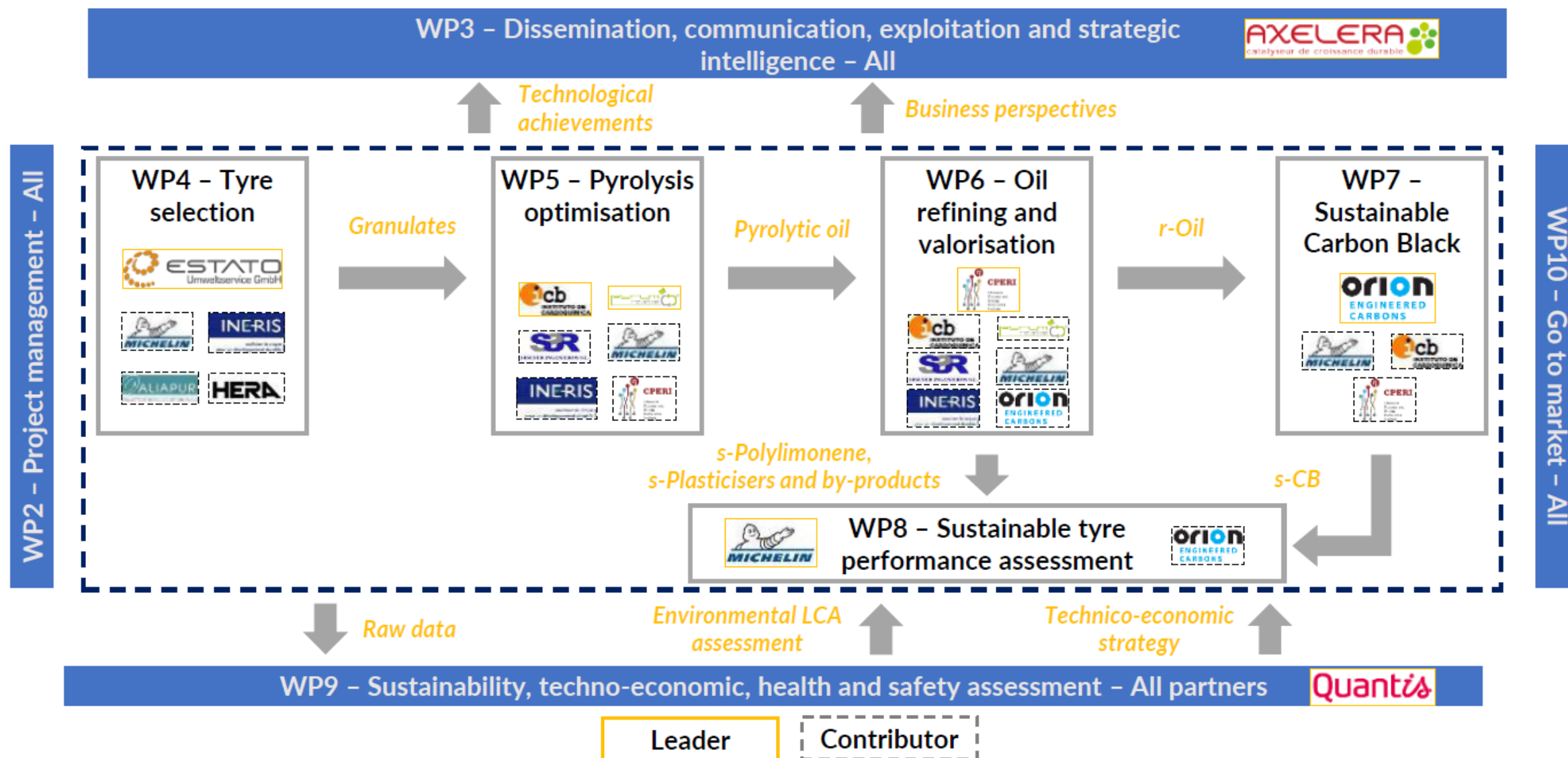
TRL4

kg samples



TRL7 - dozens tons samples

BLACKCYCLE aims at creating, developing and optimising a full Value Chain - implemented on 10 Work Packages



BLACKCYCLE project is a POWERFUL tool to create a massive tire CIRCULAR ECONOMY

Focus on 4 steps of the value chain



Tyre validation



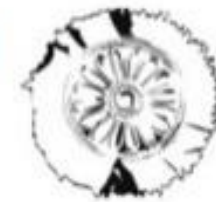
High quantity of optimized pyrolytic oil from ELTs



Distillation from TRL5 up to scale-up at TRL7

BLACKCYCLE project is a POWERFUL tool to create a massive tire CIRCULAR ECONOMY

Other levers to improve the pyrolytic oils



**High-Quality CB Feedstock:
Aromatization & Desulphurization**



Pyrum Innovations AG

A major project milestone achieved:

**High quantity of optimized pyrolytic oil
from ELTs**

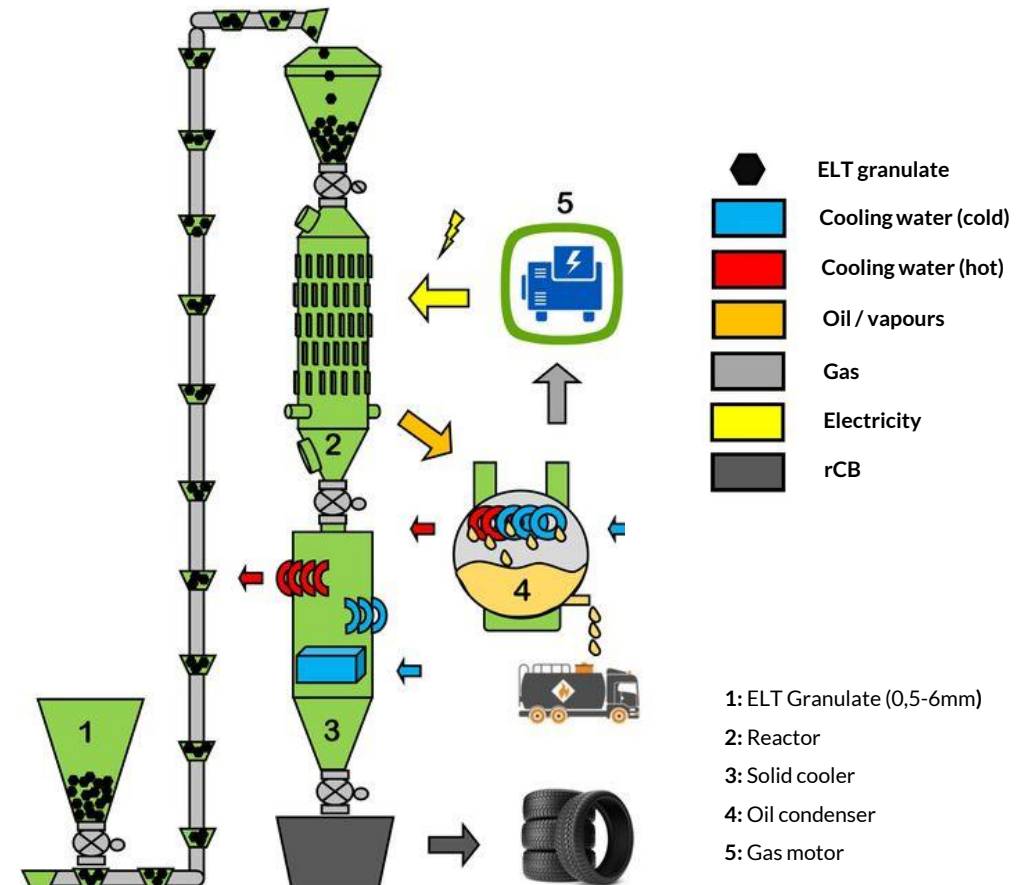
Speaker: Dr. Andreas Kapf (Head of R&D)

Pyrum's pyrolysis technology: The Moving Bed Reactor

Industrial plant with a capacity of 5.000t per year

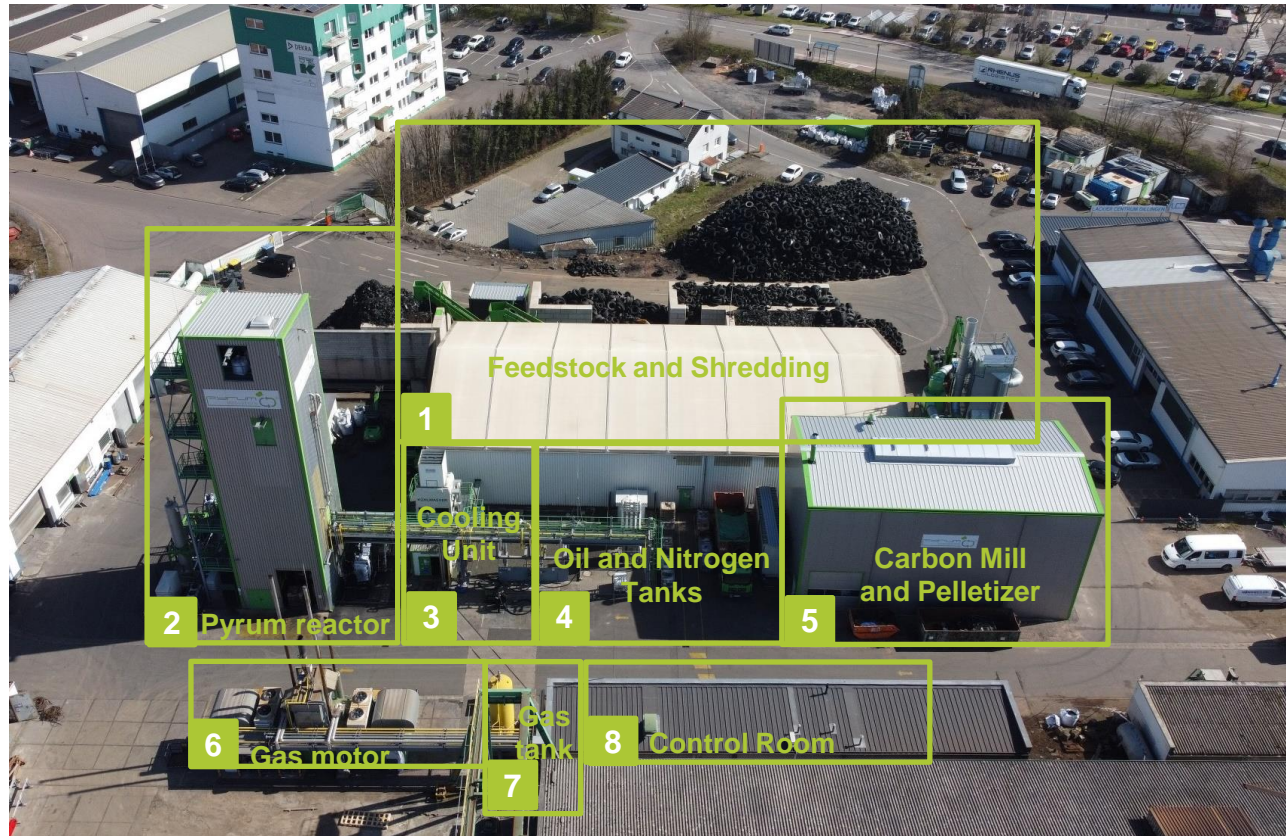
Key information:

- 1 ▶ **Proven concept:**
 - In test operation since **2015**
 - In 24/7 industrial production with commercial sales since **2020**
- 2 ▶ **Total control:**
152 electrical heating units distributed over 5 levels can be **individually** controlled to optimize the temperature input and product quality.
- 3 ▶ **Robust and safe design:**
The material is passing through the reactor just with **gravity**. The absence of moving parts and their sealings within the reactor results in low-maintenance and safe operation
- 4 ▶ **Energy self sufficient**
The electrification of the pyrolysis gas in the results in **more electrical energy** than the whole pyrolysis plant consumes



Overview of Pyrum's plant site

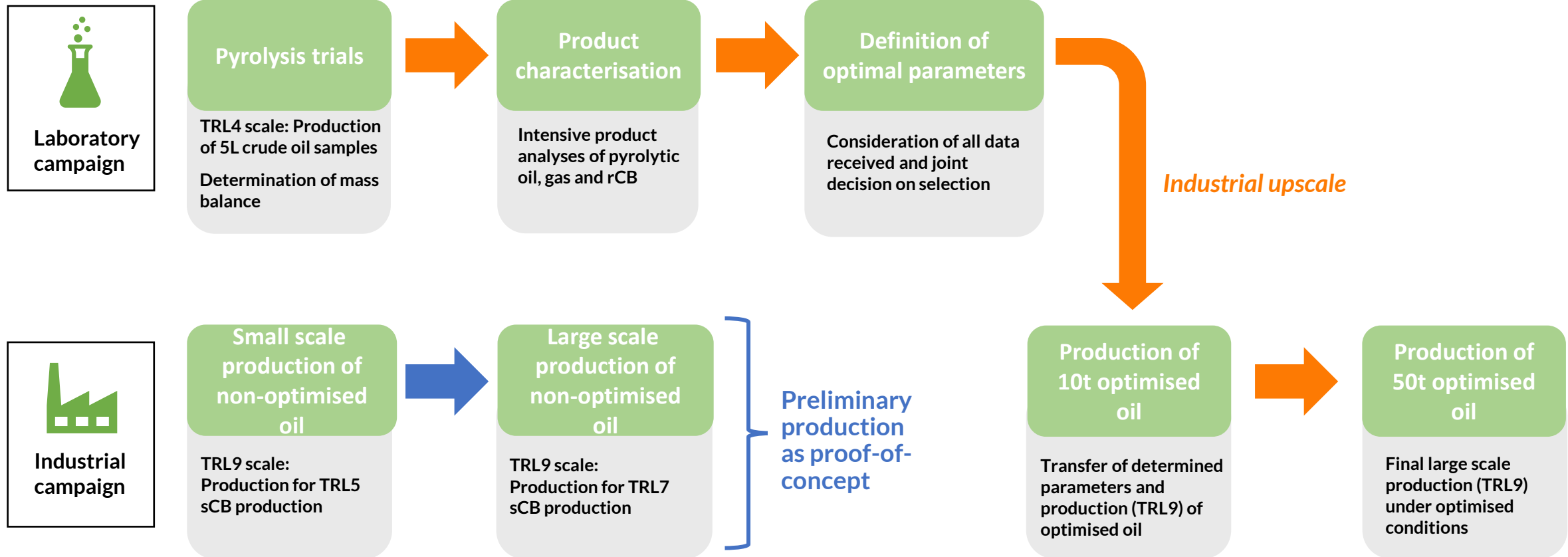
Located in Dillingen/Saar, Germany



- 1 ▶ **Feedstock (End-of-Life-Tires) and shredding unit:** granulating whole tires and separating rubber from steel and textile fibers
- 2 ▶ **Pyrum reactor:** patented main part of the Pyrum process. 25-meter-high tower transforming rubber granulates into pyrolysis oil, carbon and gas
- 3 ▶ **Standardized cooling unit:** to cool the whole process and all end products
- 4 ▶ **Oil tanks (40,000 liters underground) and pumping station:** to fill trucks with Pyrum oil + nitrogen
- 5 ▶ **Carbon mill and pelletizer:** to transform raw carbon to commercial recovered Carbon Black (rCB)
- 6 ▶ **Gas generator:** creation the power for the Pyrum Plant thanks to the produced gas from the process
- 7 ▶ **Storage and cleaning of pyrolysis gas:** before it enters the gas generator
- 8 ▶ **Control room:** controlling the entire plant with 2-3 persons only

Pyrum's pathway of the optimisation process and high quantity Production of ELT pyrolysis oil

Optimisation at laboratory level and upscale into industrial production

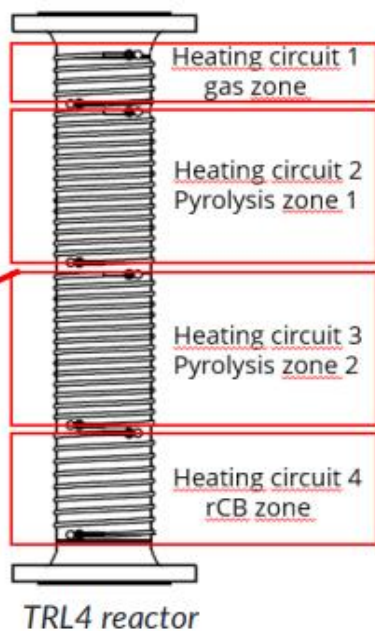


From laboratory to industrial scale: Overview laboratory plants

Pyrolysis



TRL4 laboratory pyrolysis plant



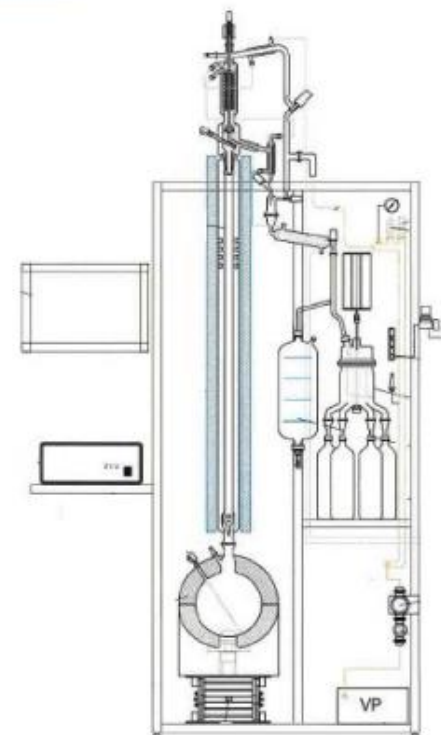
- Moving bed reactor
- Throughput: 0,5 – 1 kg/h
- 4 individually controllable heating zones

The optimization of the pyrolysis not only based on crude pyrolytic oil, also in consideration of the final distilled product.

Distillation



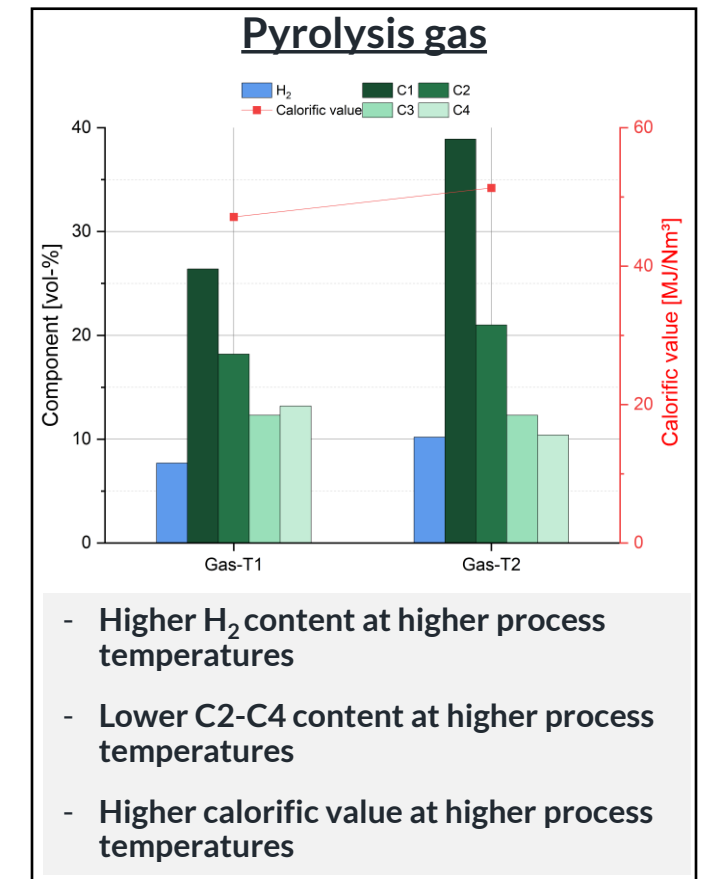
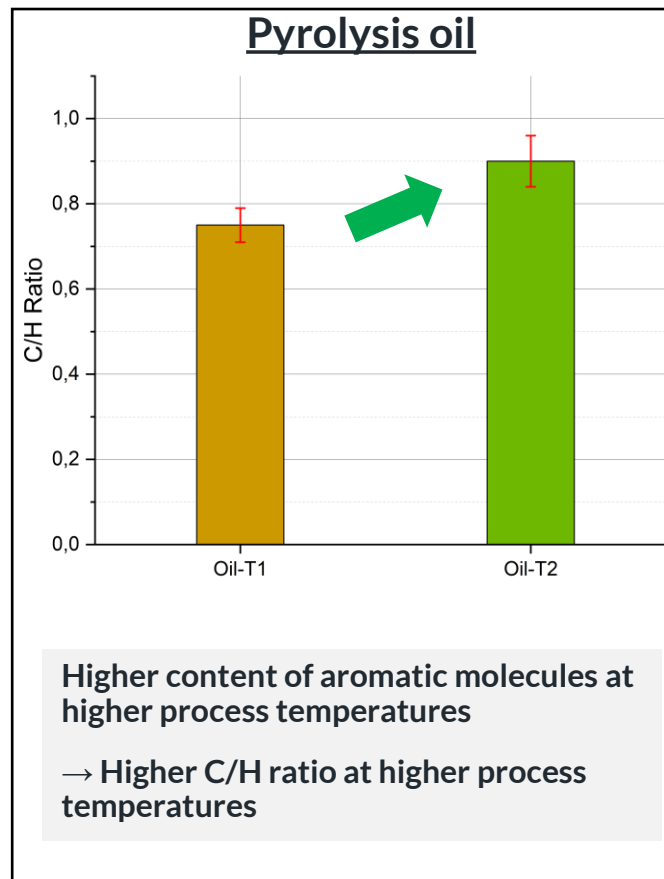
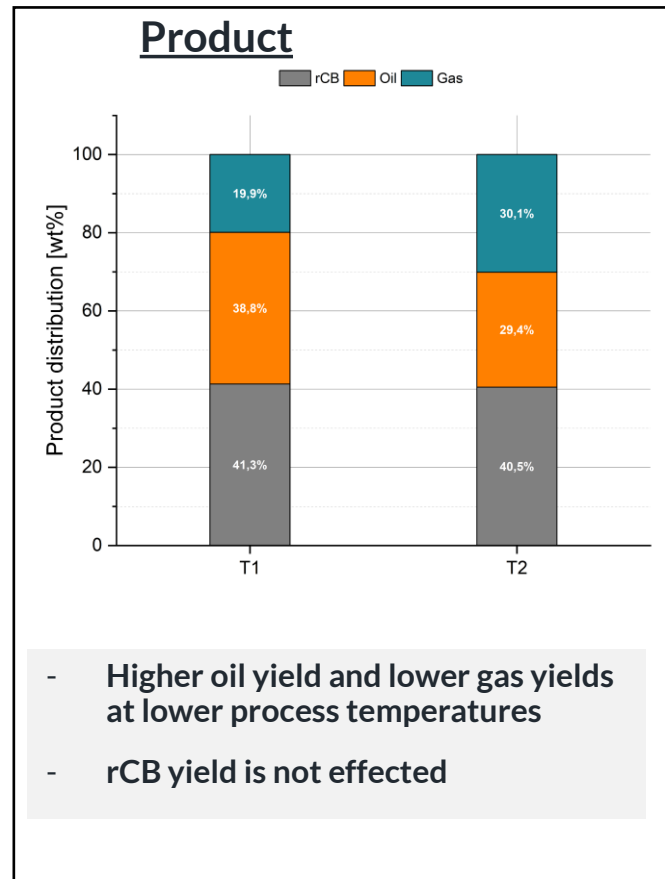
TRL4 laboratory distillation plant



- Distillation plant designed for complex oils
- 15 theoretical plates
- Flask volume of 10L
- Fully automatic
- Atmospheric pressure & vacuum distillation

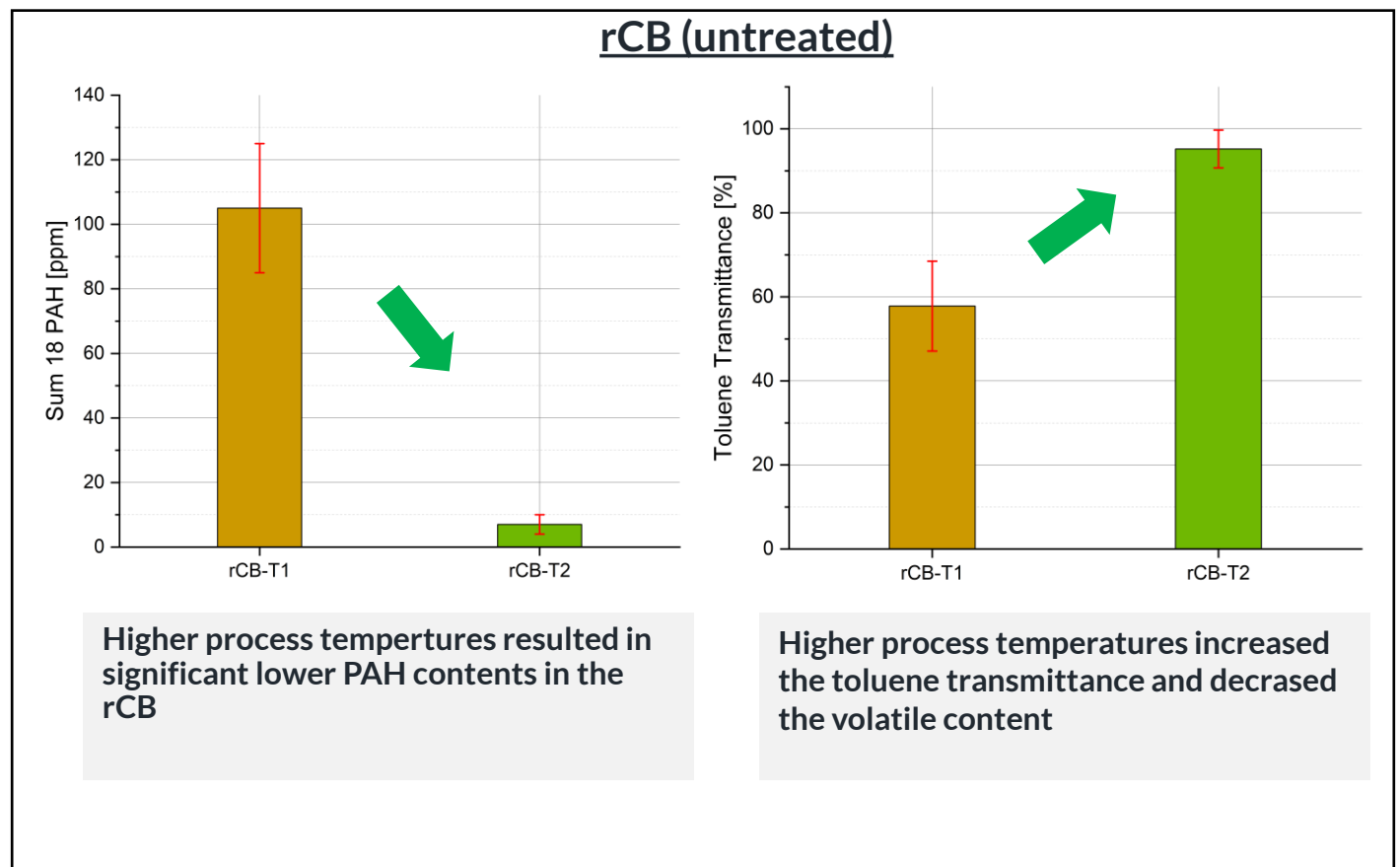
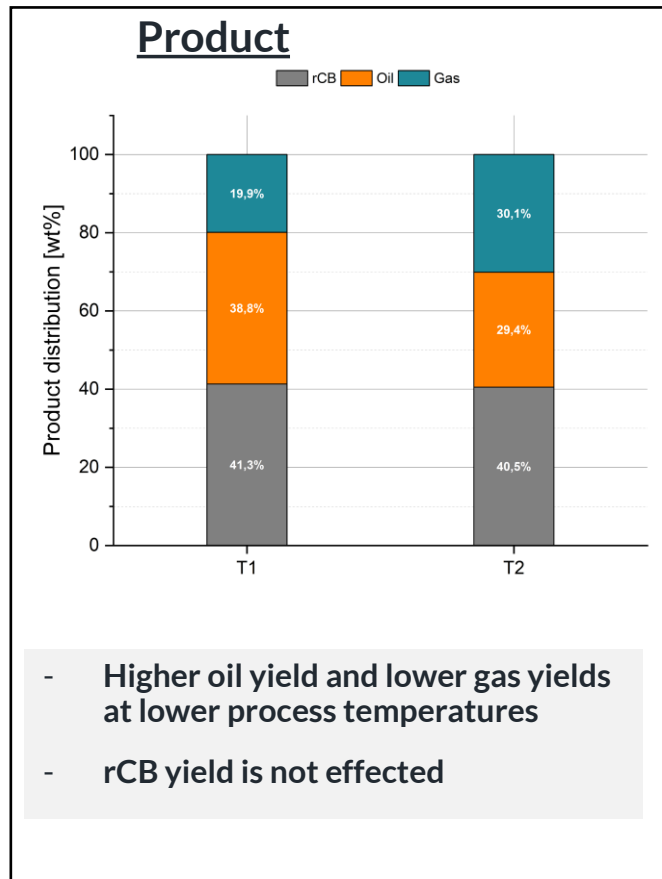
Influence of temperature onto the yield and chemical composition of the pyrolysis products

Pyrolysis trials performed at the TRL4 laboratory plant at two temperature profiles: T1 < T2



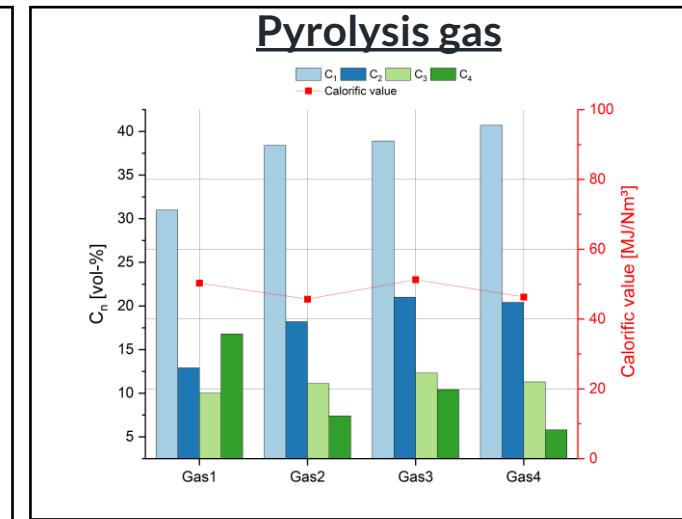
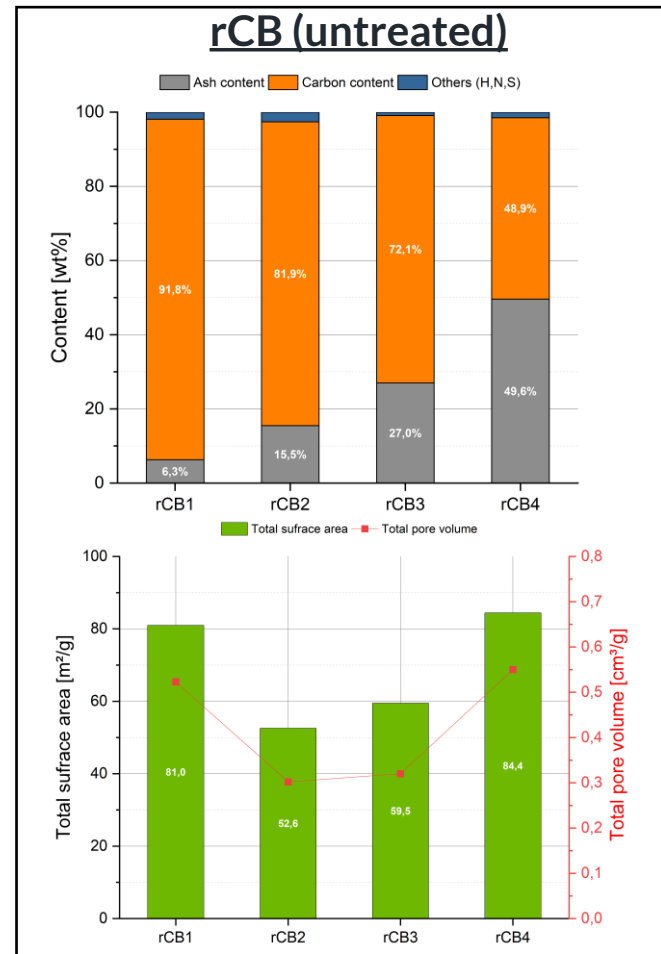
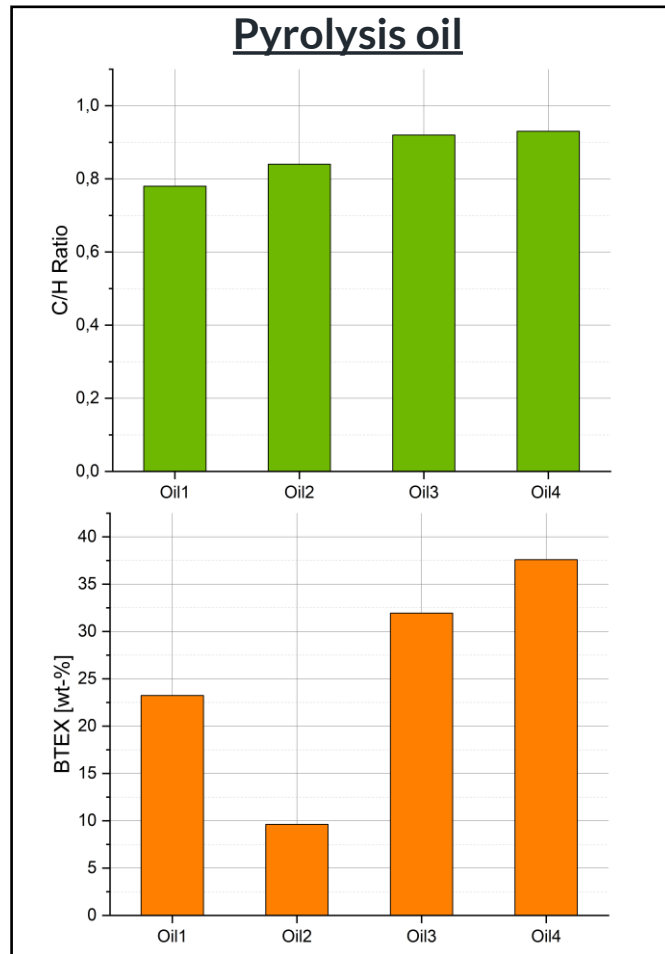
Influence of temperature onto the yield and chemical composition of the pyrolysis products

Pyrolysis trials performed at the TRL4 laboratory plant at two temperature profiles: T1 < T2



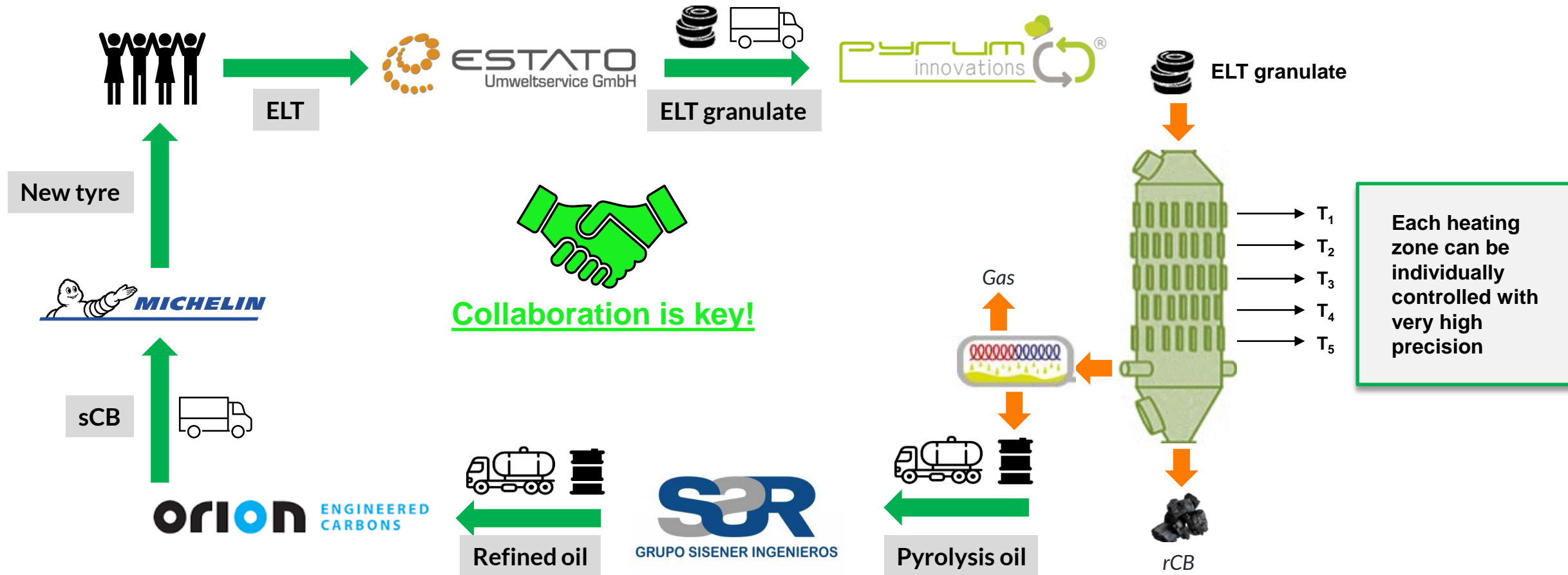
Influence of ELT type onto the yield and chemical composition of the pyrolysis products

Pyrolysis trials at TRL4 performed with four different and pure ELT feedstocks with similar granulate properties



Consideration of all obtained data of the influences of temperature and feedstock and selection of the settings for the industrial upscale

Overview of the circular pathway: From pyrolysis oil to new tyres



Total volumes and energy of the industrial production campaigns of optimised pyrolysis oil for sCB production



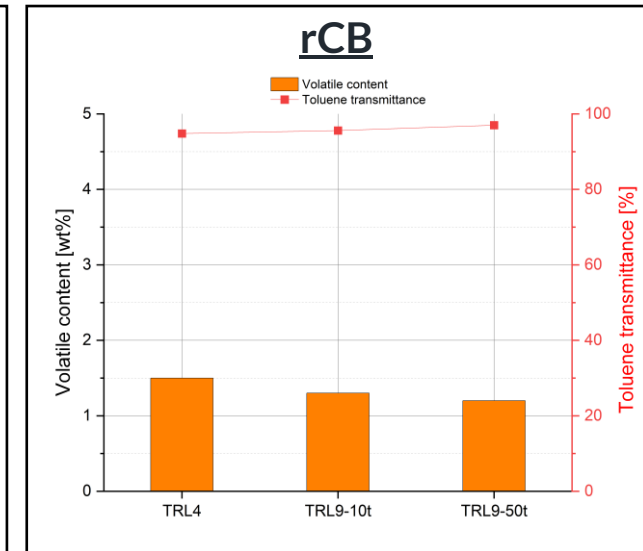
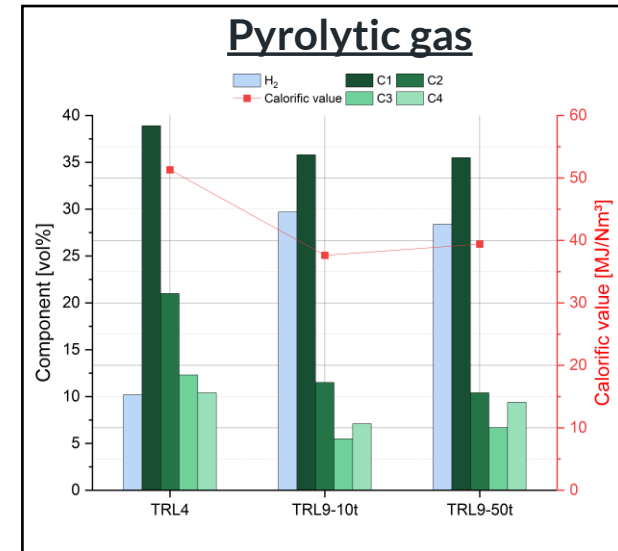
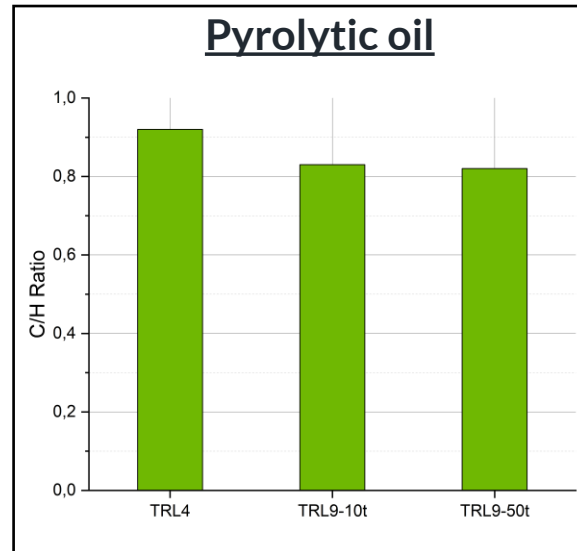
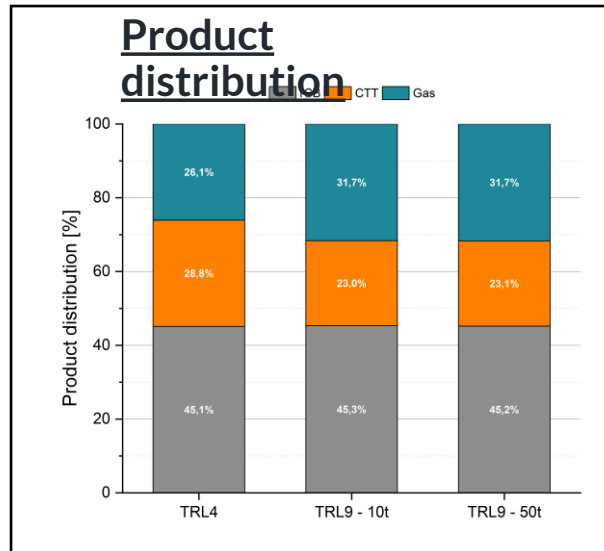
Overview production data

	Name	Trial 1	Trial 2	Total
Input	ELT granulate	43,6 t	219,4 t	263,0 t
	Electricity	18,3 MW	91,5 MW	109,8 MW
Output	Pyrolytic oil	10,1 t	50,7 t	60,8 t
	Pyrolytic gas	9,8 t	69,6 t	79,4 t
	rCB	19,7 t	99,2 t	118,9 t
	Electricity	27,6 MW	138,0 MW	165,6 MW



In both trials a surplus of electrical energy was produced which can be directly used or feed into net grid.

Comparison of product distribution and composition between laboratory (TRL4) and industrial (TRL9) production



- Higher oil yield at TRL4
- Higher gas yield at TRL9
- Similar rCB yields

- Lower C/H ratio at TRL9

- Higher H₂ content at TRL9
- Lower content of C2-C4 at TRL9

- No significant deviations

Summary

- 1) Successful optimization of the industrial process and high quantity oil production
- 2) TRL4 trials give a detailed prediction of the product distribution and product quality of an industrial upscale → Highest similarity for rCB
- 3) Both TRL9 trials show close to identical product composition → Excellent process stability and repeatability



THANK YOU !



This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 869625.

A major project milestone achieved: **Distillation scale-up at TRL7**

Speakers: Juan Daniel Martínez (ICB-CSIC)
Ignacio de Pascual (SISENER)



Background: Crude Tyre Tar (CTT)



Tremendously complex hydrocarbon

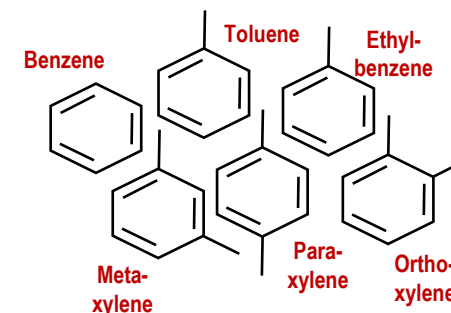
- Light and aromatic compounds
- Flash point < 35°C
- Legislative complexity
- Contamination problems
- Traces of solids
- Contains water
- Etc...

Why distillation?

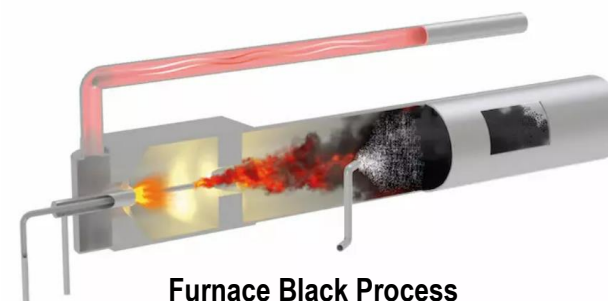


Distillation

Light Tyre Tar (LTT)



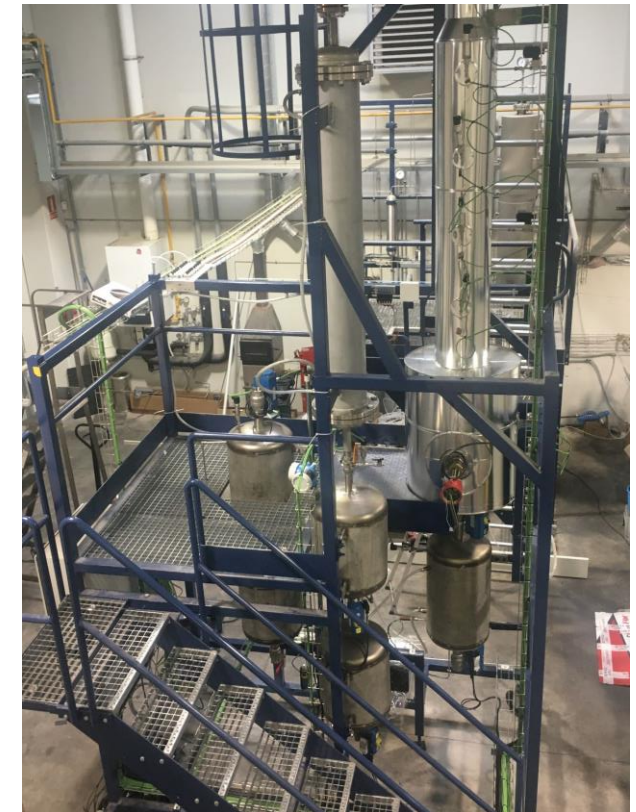
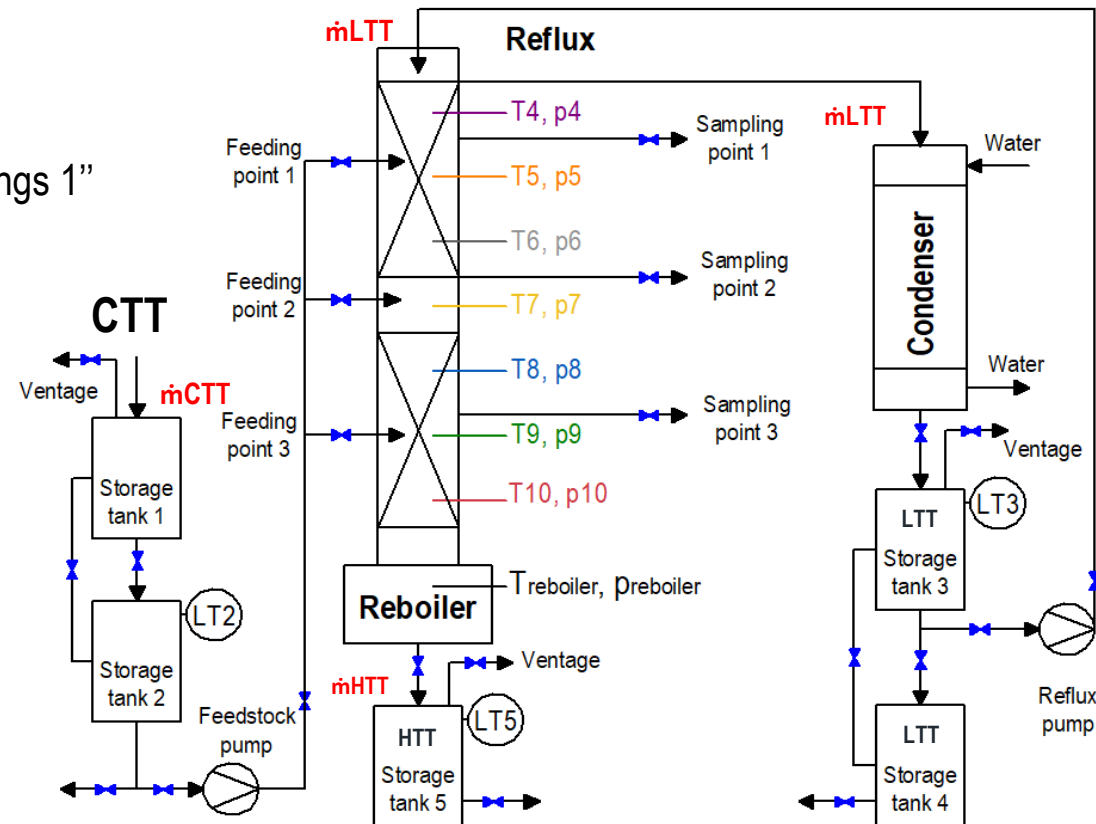
Heavy Tyre Tar (HTT) – FP > 65°C



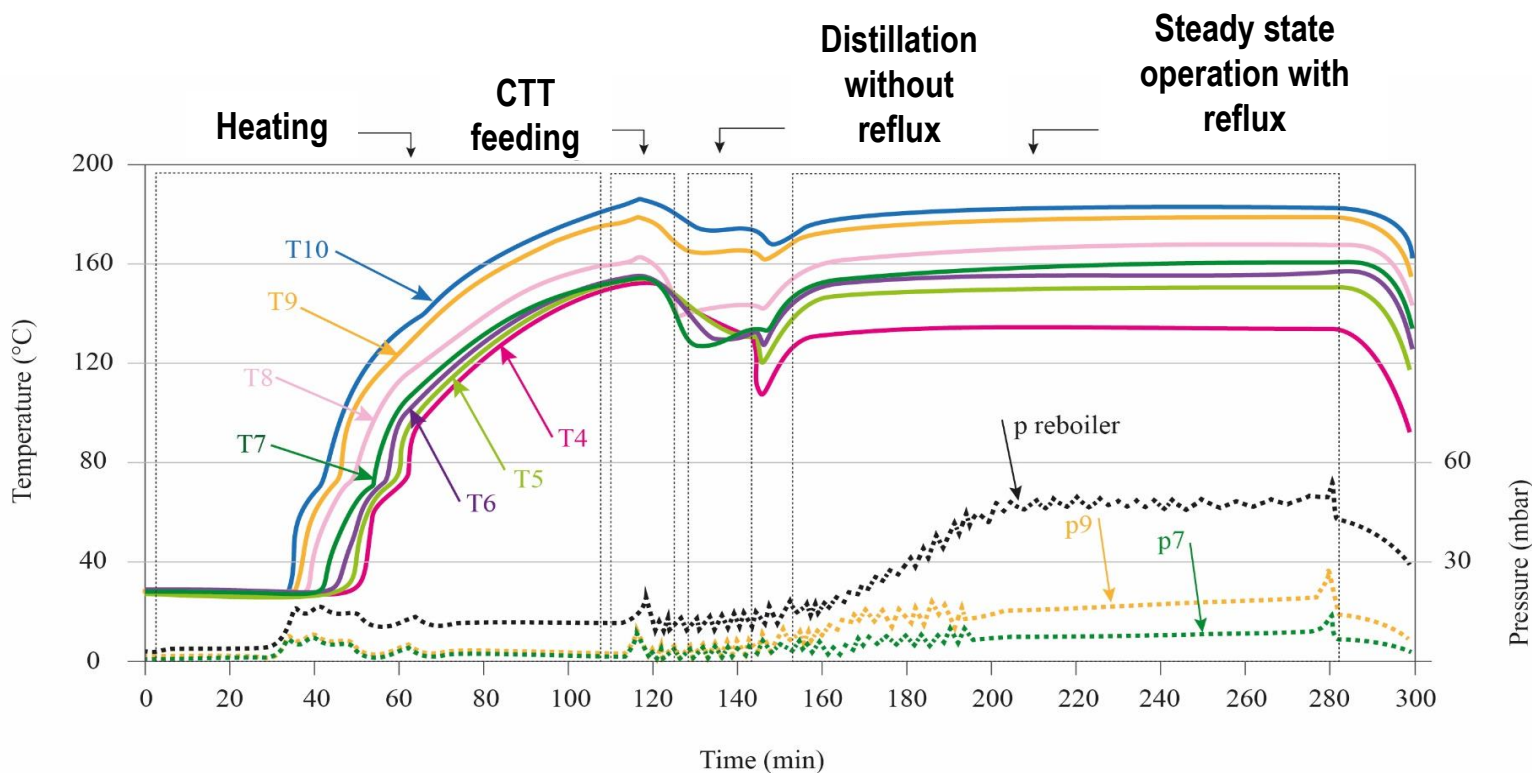
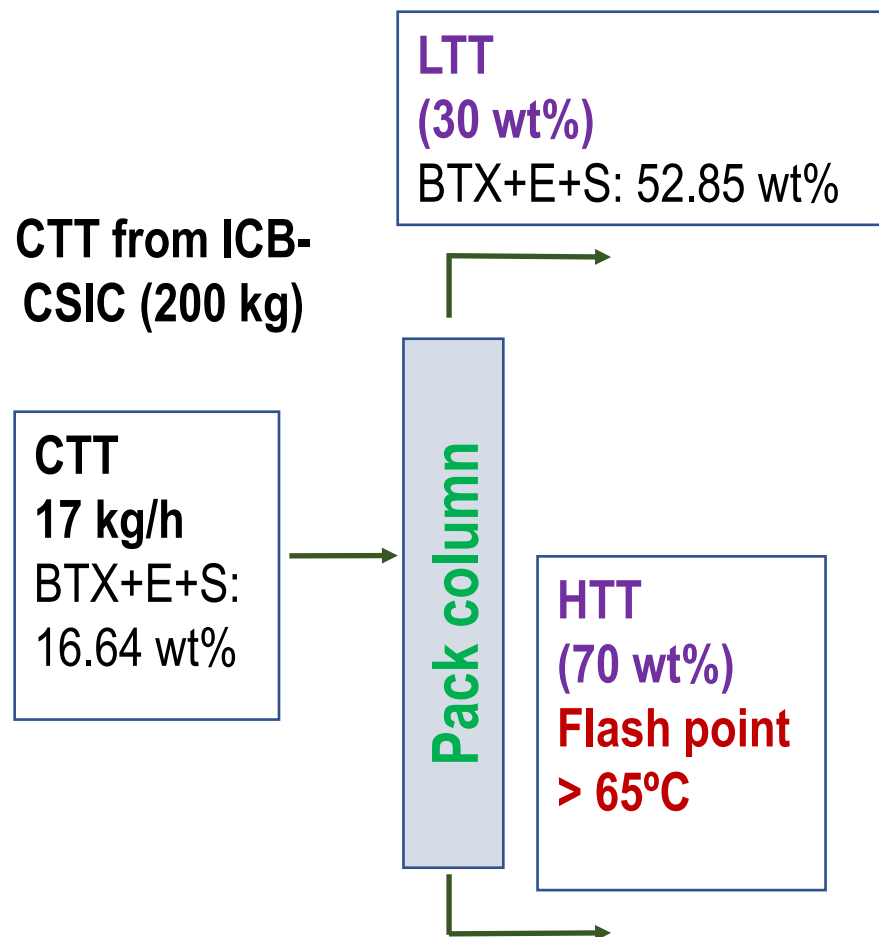
Sustainable carbon black (sCB)

Optimisation of distillation process: TRL5 plant

- **Nominal capacity:** 20 kg/h
- **Packing:** 1 pack of pall rings 1"
- **Height:** 4 m
- **Internal diameter:** 110 mm
- **Packing height:** 4m
- **Equilibrium stages:** 8
- **Reflux ratio:** 0-3
- **Reboiler temp.** : up to 300°C



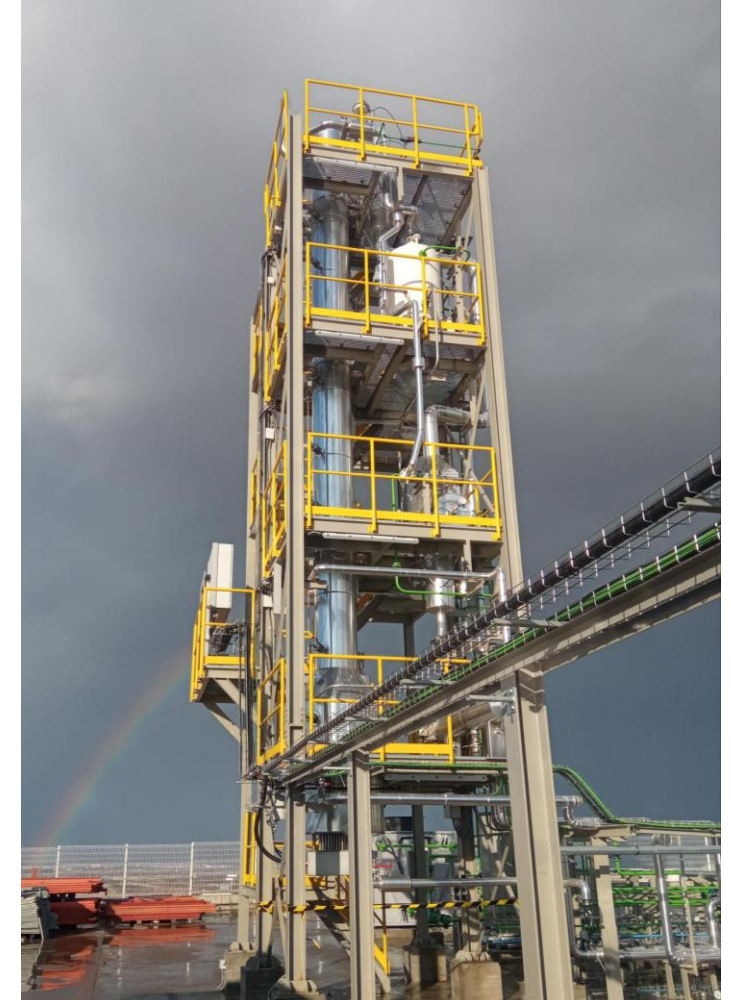
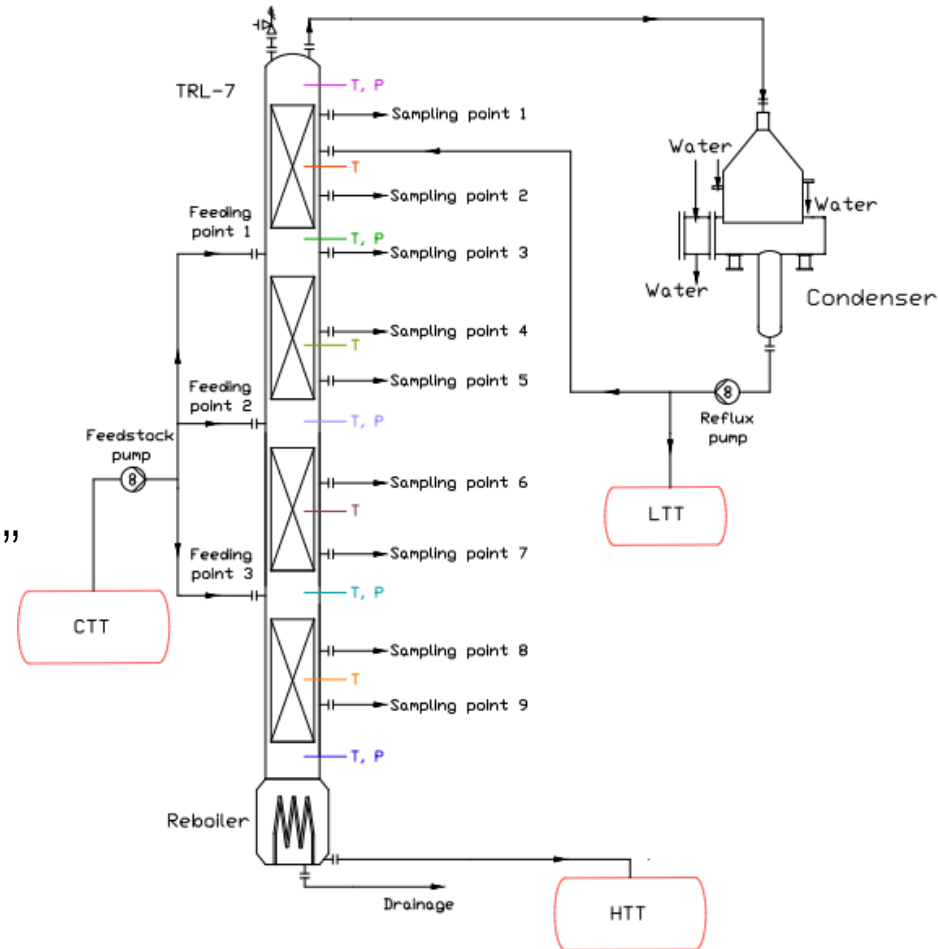
Distillation feasibility using the TRL5 plant



Conditions → 290 °C and 1.9 of reflux ratio

Validation of distillation at scale-up TRL7

- **Nominal capacity: 500 kg/h**
- Reflux ratio: 0-3
- Max. Pressure: 0,5 barg
- Reboiler temp.: Up to 300 °C
- h: 12 m
- Øi: 343 mm
- Packing: 4 packs of pall rings 1''
- Packing height: 6m
- Equilibrium stages: 12



Distillation column ancillaries in the TRL7



Instrumentation



Control valves



Vessels

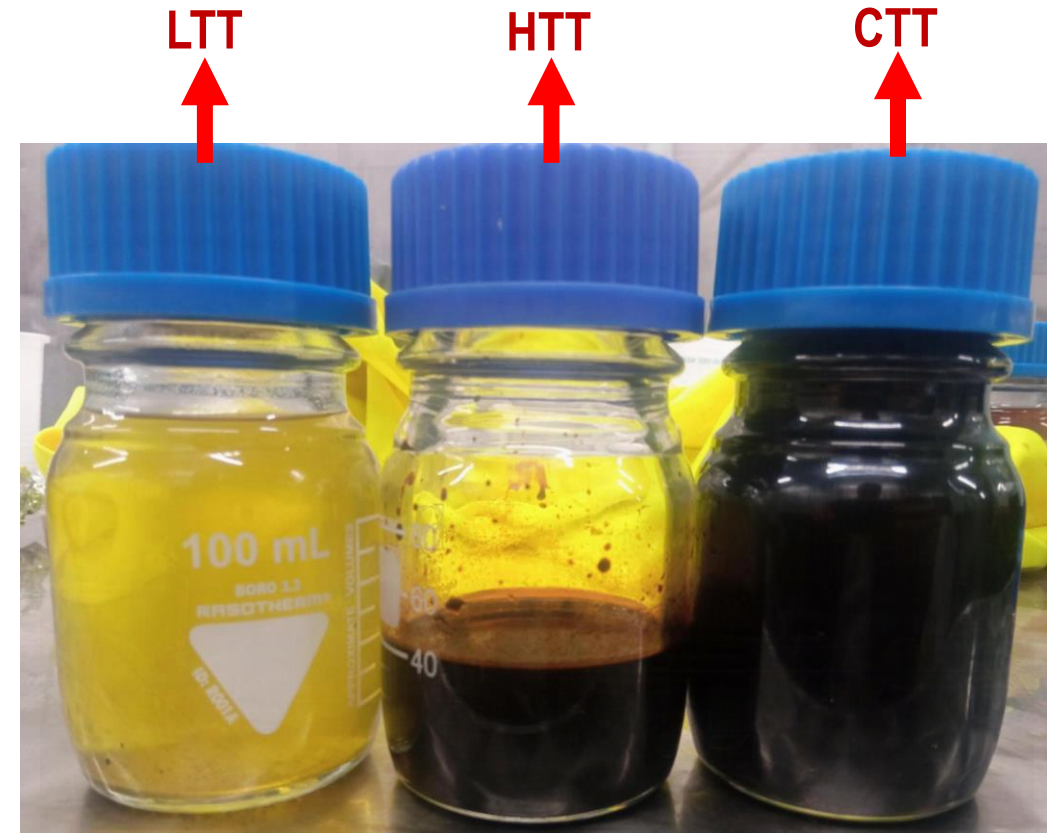


Schedule carried out for the distillation column at TRL7

Schedule TRL7	Sep-Dec		Jan	Feb	Mar	Apr	May	Jun	Jul	Ago	Sep	Oct	Nov
	2020-2021		2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022
EPC													
Start-up													
CTT distillation nº1													
CTT distillation nº2													

Successful production for the Blackcycle project

Production		
CTT distilled	55	tons
HTT generated	32	tons
LTT generated	23	tons



Composition of the liquids obtained from distillation at TRL7

Compound	wt%		
	CTT	LTT	HTT
Benzene	2,66	6,9	0
Toluene	9,74	21,26	0,01
Ethylbenzene	2,55	4,47	0,02
p-Xylene	5,51	12,03	0,05
m-Xylene	0,00	0,00	0,00
Styrene	1,78	3,77	0,04
o-Xylene	1,02	1,29	0,01
Limonene	0,15	0,19	0,02

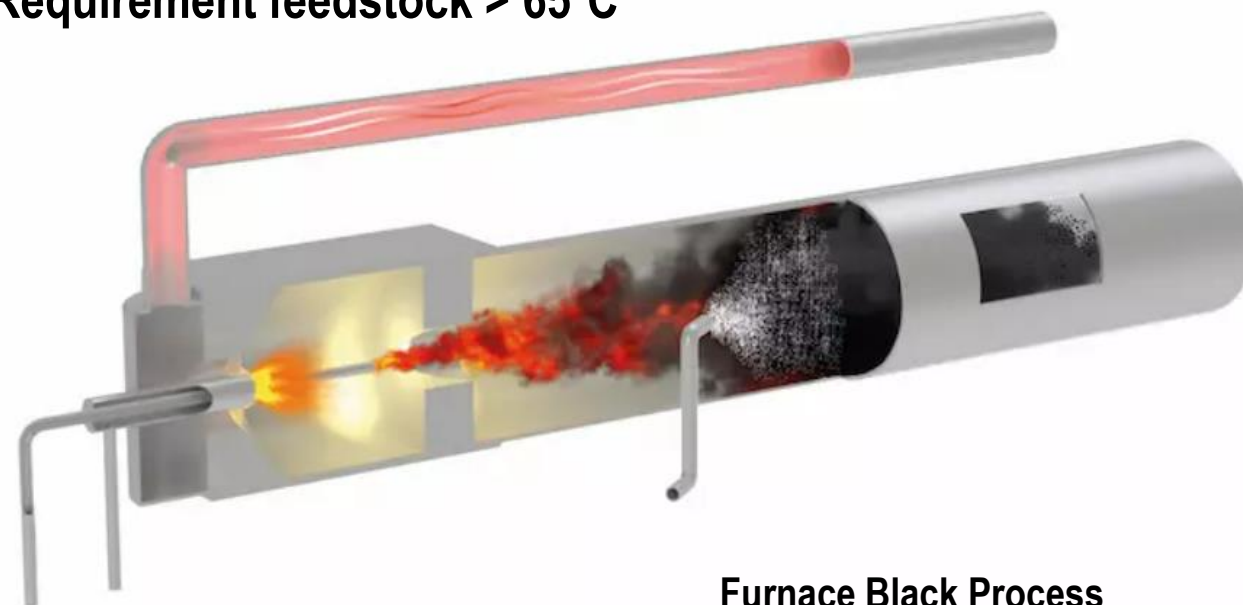
Low wt%
of light
compounds

Objectives achieved after distillation at TRL7

Properties	CTT-PYRUM
Sulphur, wt. %	0.80
Nitrogen, wt. %	0.92
Carbon, wt. %	88.8
Hydrogen, wt. %	9.20
C/H molar ratio	0.804
Oxygen, wt. %*	0.3
Flash point (°C)	<25 °C
*O% = 100% - S% - N% - C% - H%	

**After distillation:
HTT Flash Point > 90 °C**

Requirement feedstock > 65°C



Furnace Black Process



THANK YOU !



Horizon2020
European Union Funding
for Research & Innovation

This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 869625.

A major Milestone in TRL 7 achieved: Production of several tons sCB using 100% r-oil

Who are we?



- Leading global supplier of carbon black
- More than 160 years of experience
- 14 plants and 4 technical centers
- 1,475 employees

orion

Delivering sustainable solutions

Speaker:

Dr. Helmut Gromes

ORION Engineered Carbons



Sustainable Carbon Black – 3 Activity-areas

- 
- 1. Analyse Tire Tars (-Oils) in the Orion-CBO-Lab.**
 - Crude Tire Tar (CTT), Heavy Tire Tar (HTT), Light Tire Tar (LTT)
 - 2. Production of 3 different sustainable Carbon Blacks.**
 - sN234 (30 kg at TRL5 (Mini plant) / 1,600 kg at TRL7 (Pilot plant)
 - sN347 (30 kg at TRL5 (Mini plant) / 480 kg at TRL7 (Pilot plant)
 - sN550 (30 kg at TRL5 (Mini plant) / 1,000 kg at TRL7 (Pilot plant)
 - 3. Evaluate in-Rubber properties of sN234, sN347 and sN550 produced with 100% HTT**

RFID IS A STRATEGIC ENABLER TO CONNECT TIRES TO A LARGER ECOSYSTEM AND BUILD DATA DRIVEN SERVICES



20909 / 20910
20911 / 20912

PASSIVE & AFFORDABLE

CAN BE READ THROUGHOUT LIFECYCLE

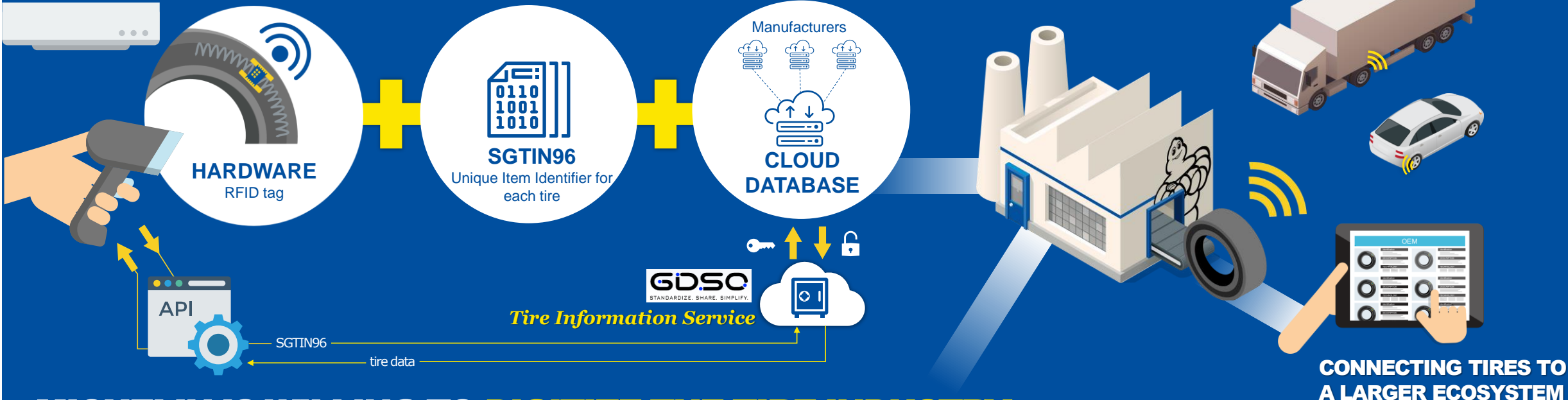
CAN BE READ WHILE MOVING / ROLLING

UNIQUE ID

SECURE & NORMED

FOUNDATION TO

ASSOCIATE TIRE DATA



MICHELIN IS WILLING TO DIGITIZE THE TIRE INDUSTRY AND FOSTER MARKET ADOPTION OF RFID

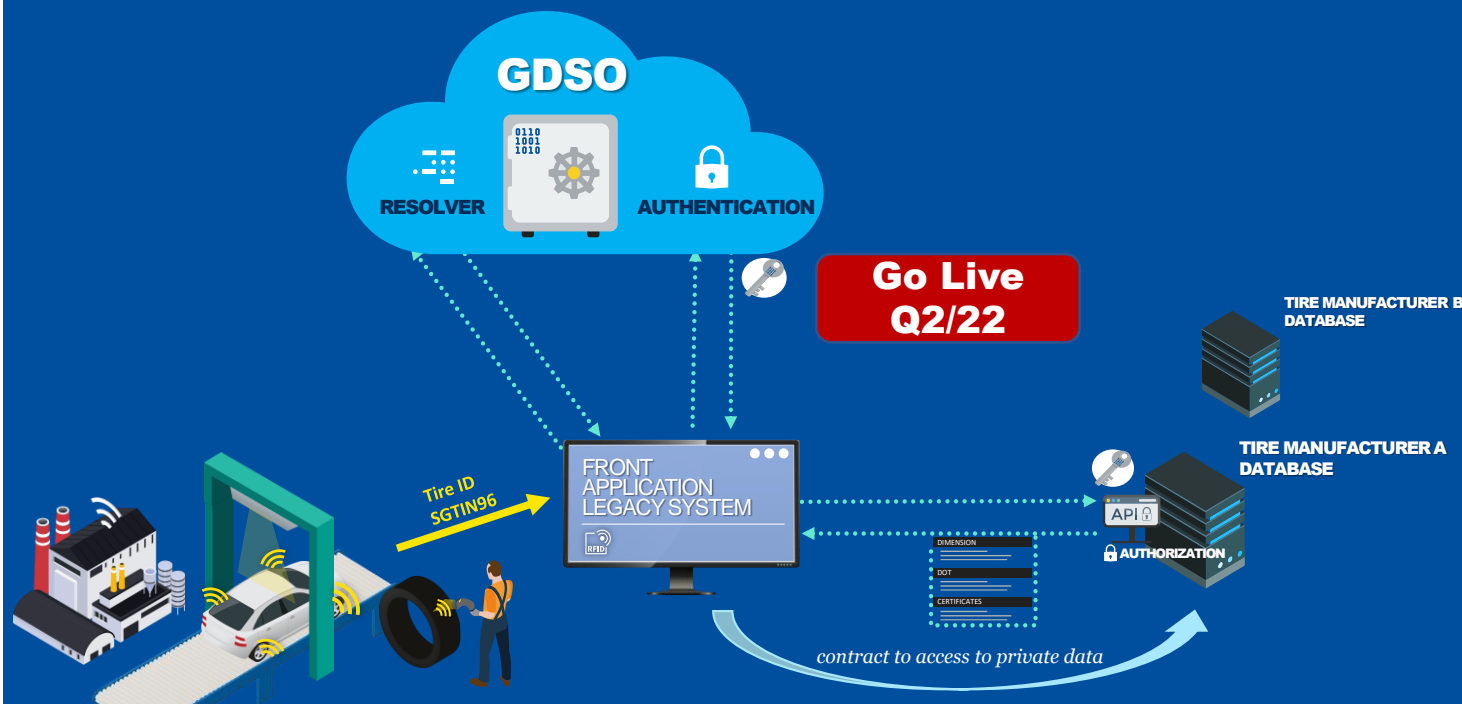


IS LAUNCHED UNLOCKING POTENTIALS TO LEVERAGE AND EXCHANGE DATA

OBJECTIVES: STANDARDIZE TIRE DATA AND MANAGE THE SERVICE TO RETRIEVE DATA FROM SEVERAL TIRE MANUFACTURERS BASED ON A UNIQUE ITEM IDENTIFIER (SGTIN96)

MEMBERS:       

ASSOCIATES:    



GDSO Tire Information Service

Find by SGTIN-96
Pure Identity (but hexadecimal accepted)

EPC

How it works ?

1. Resolver <https://api.michelin.com/tid-ultim-v1/gdso/>
2. Authentication [michelin.support](https://api.michelin.com/tid-ultim-v1/gdso/urn:epc:id:sgtin:086699.0762575.63647563790)
3. API request <https://api.michelin.com/tid-ultim-v1/gdso/urn:epc:id:sgtin:086699.0762575.63647563790>

Different info can be available based on B2B agreements with the tyre manufacturers

Unique Item Identifier urn:epc:id:sgtin:086699.0762575.63647563790

Technical specifications

Brandname MICHELIN

Commercial long description 235/35 ZR19 (91Y) EXTRA LOAD TL PILOT SPORT 4 S MI

Tireline PILOT SPORT 4 S

Tire size 235/35R19

Load index 91

Speed symbol Y

Extra-load true

Directional false

Asymetrical true

Product IDs

Manufacturer code 0762575

European Article Number 3528707625755 (EAN)

Markings

3PMSF false M+S false OEM Tire Marking OEM Name

Tire information

TIN 6U 17 029X 3921

Country of origin FRA

* *Global Data Service Organisation
for Tyres and Automotive Components*

TIRE IDENTIFICATION – ELT SORTING
BLACKCYCLE WORKSHOP

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22/11/2022

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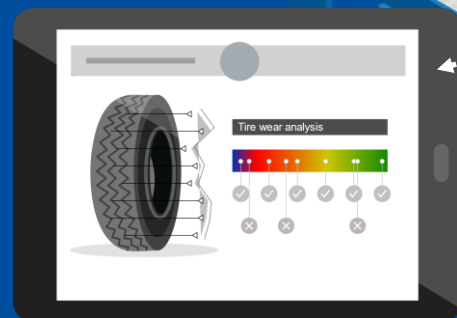
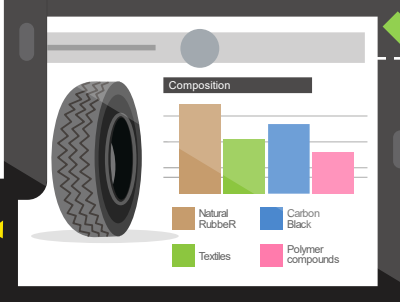
RFID WILL OPTIMIZE ELT* SORTING, IMPROVE CIRCULAR ECONOMY AND USAGE KNOWLEDGE



ESPR mandating a
**DIGITAL PRODUCT
PASSEPORT**

**RETRIEVING TIRE
INFORMATION (DIMENSION,
SEALANT, TMS...)**
With RFID

**RETRIEVING TIRE
COMPONENTS DATA**
With RFID



**PAIRING ELT INFO /
TREAD DEPTH**
With camera

REUSE

RETREAD

RECYCLE

*Increase reuse and
retread rates*

*Improve recycling and
material recovery*

**COLLECT RECYCLING
CERTIFICATE AND USAGE DATA**

POC FROM 2022



** End of Life Tires*

IN THE MEANTIME **REGOM** HAS DEVELOPED A **VISION AI ANALYSIS SYSTEM** TO START IMPROVING ELT SORTING



ACTIVITIES

- Design, manufacturing, and sale of sorting machines for ELT and linked software
- R&D of tyre reuse solutions
- Promotion for reusable tyres

OBJECTIVES

- Improve sorters' working conditions
- Refine & optimize valorization
- Adapt to tomorrow's market

5 years of R&D

+1,5M tyres tested

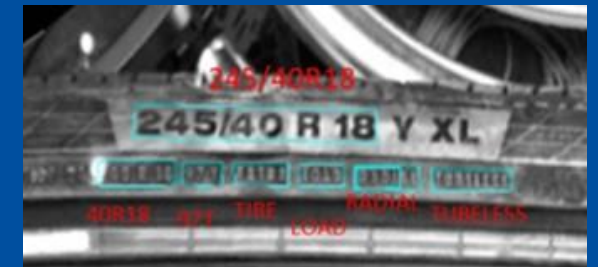
Algorithm 100% internally developed

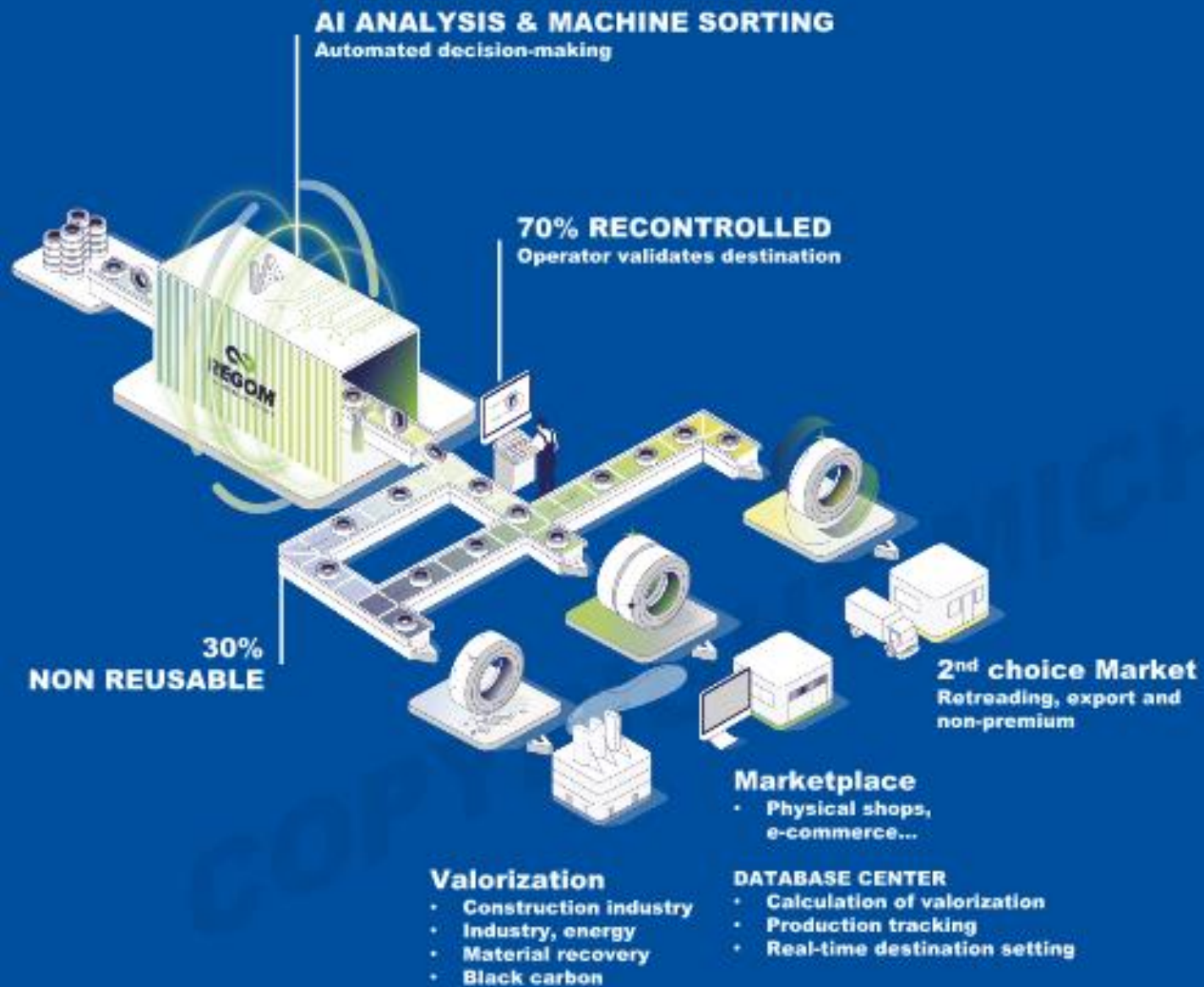
- ✓ *industrial speed rate : 1 tyre every 3s*
- ✓ *800 tyres analyzed per hour*



A.I. decision-making based on analysis and recognition of :

- ✓ *brand*
- ✓ *profile*
- ✓ *dimension*
- ✓ *remaining tread depth*





SORT YOUR TYRES TO MATCH THE RIGHT VALORIZATION OUTPUTS

- Reuse
 - ✓ online and offline sales
 - ✓ norms labels, quality controls
- Retreading
 - ✓ specific brands,
 - ✓ low remaining tread depth
- Material recovery
 - ✓ after shredding and granulation
- Pyrolysis
- Micronization
- Devulcanization

RFID POC LAUNCHED ON TC58 ELT SORTING LINE

- RFID gate installed in addition to current REGOM AI analysis / sorting machine on conveyor
- Objective is to demonstrate RFID system capabilities on an ELT sorting line (reading rate, gate position and environment integration, real time connection, frozen or wet tires...) to better specify an enhanced RFID system and required operating modes and ultimately support the development of new ELT recycling streams



EXECUTIVE SUMMARY



Tire identification enables to optimize ELT sorting and improve value

REGOM solution based on vision AI analysis system already enables to automatize pre-sorting

Deployment of RFID tags in tires and RFID systems by ELT collectors will further unlock sorting potentials and support the development of new material recovery streams

Access to data linked to materials will certainly require an independent governance

A regulatory framework could ease the adoption within the tyre recycling industry



BLACK
CYCLE

Move to the green revolution

THANK YOU

Together To Make The Circular Economy A Reality

Networking Session : Who is who ?



What's the point ?

- Discover the players in the sector
- Learning to know each other
- Swap



Networking Session : Who is who ?

- ✓ 11 numbered tables on the board
- ✓ 6-8 participants per table
- ✓ Each participant introduces himself in 1 minute:
 - ✓ Who am I?
 - ✓ Motivation to participate in the event (search for skills, etc.)
 - ✓ Card exchanges
- ✓ 3 rounds = 20 contacts

AT EACH ROUND YOU WILL BE AWARDED A TABLE NUMBER

REFER TO THE LIST OF PARTICIPANTS

Be careful
3 ROUNDS ARE ORGANIZED



Networking lunch

Come back at 2.30 p.m. for the
Working Groups session

Day 1 : Afternoon

Working Groups

2.30pm



- Technical dissemination : **Room Ampurias**
- Regulation and Policy : **Room Zaragoza**
- Social acceptance : **Room Rosellon**

4.30pm



Coffee Break

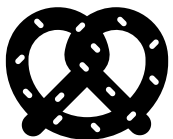
5.00pm



Closing Session :

Share results of the working groups : **Room Zaragoza**

7.00pm



Cocktail

To end this day and continue to interact together: Join us en el tubo





Networking Session : Who is who ?



Move just to the next
room



Technical dissemination : Room Ampurias

Regulation and Policy : Room Zaragoza

Social acceptance : Room Rosellon



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Move to the green revolution

Closing Session

Share results of the working groups

To Create a massive tire CIRCULAR ECONOMY 3 key questions :



How to deploy innovations,
creating value for project
partners and beyond thanks
to its replication



How to manage waste status
for the implementation of
value chain



**How to prepare social
acceptance for the
implementation of value chain**



Working Group
Technical dissemination

Working Group
Regulation and Policy

Working Group
Social acceptance

The European BlackCycle project is a POWERFUL Tool to create a MASSIVE tire circular economy!!!





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**BLACK
CYCLE**

Move to the green revolution

See you to the final workshop
of the BLACKCYCLE project

Keep on following
@BLACKCYCLE on LinkedIn !



Sites visits ICB – CSIC and Sisener-Greenval Pyrolysis Plant



8.15 am

- 8.00am --> Departure from the hotel at 8.15am



9.00 am

- Pyrolysis plant Sisener-Greenval
 - 9.00 to 10 am



10.45 am

- ICB-CSIC laboratories
 - 10.45 to 11.45 am



Bus BLACKCYCLE

8.45 am

- 8.30am --> Departure from the hotel at 8.45 am



9.00 am

- ICB-CSIC laboratories
 - 9.00 to 10.00am



10.45am

- Pyrolysis plant Sisener-Greenval
 - 10.45 to 11.45 am



12.15 am

- Return to the hotel 12.15 am





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CYCLE

Move to the green revolution

THANK YOU

Together To Make The Circular Economy A Reality