Pyrum Innovations AG

Company Presentation

Q1 / 2022

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Global End-of-Life-Tire (ELT) market accounts for approx. 30.9 mt p.a.

… as tightening regulatory environment forces countries and corporates to take action

Global ELTs in 2019

Tightening regulatory environment

Landfill Ban
The landfill of End-of-Life-Tires and shredded tires is prohibited

Ban on incineration
Prohibition of burning rubber products
Prohibited the use of shredded tire granulate outdoors

Extended Producer Responsibility (EPR)
Recycling becomes a corporate concern

EU Waste Directive
Impediment of recovered materials usage

Increasing cost of CO_2
Burning tires becomes more and more expensive

Sources: World Business Council for Sustainable Development (WBCSD): Global ELT Management (2019)

Pyrum offers patented[1] technology with strong value proposition…

… converting rubber into several high value chemical products – thermolysis oil, carbon and gas

How Pyrum creates value

Gate fees for input factors

I. *Plants owned and operated*
II. *Plant sales to third party operators*

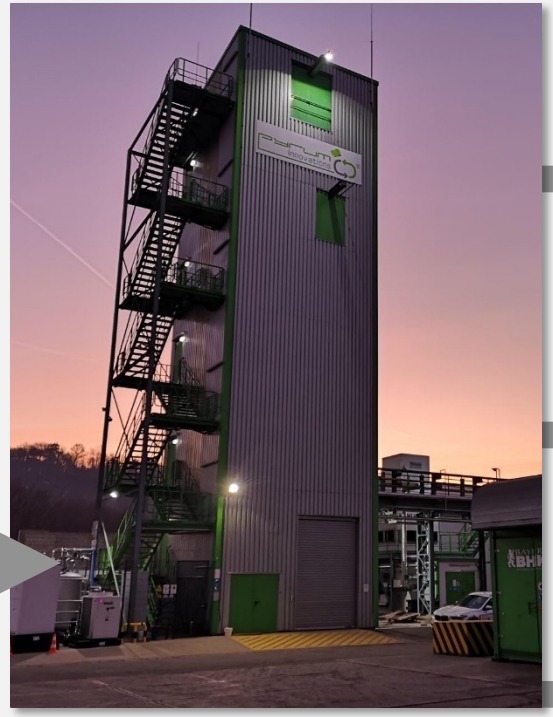
Pooling sale of raw materials

Bulk sales in the markets and recycling energy for own use

Waste material: End-of-Life-Tires and rubber waste

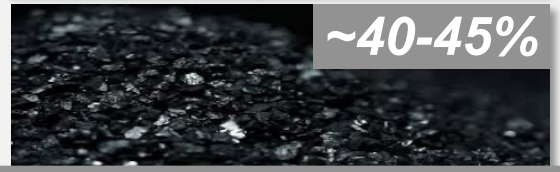
Shredding (Steel/Fiber extraction)

Thermolysis recycling process

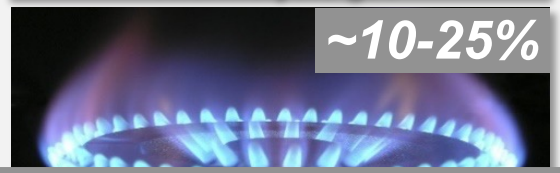


Thermolysis oil - "ThermoTireOil"

Thermolysis carbon



Thermolysis gas[2]



Raw material for industry

Recovered carbon black[3]

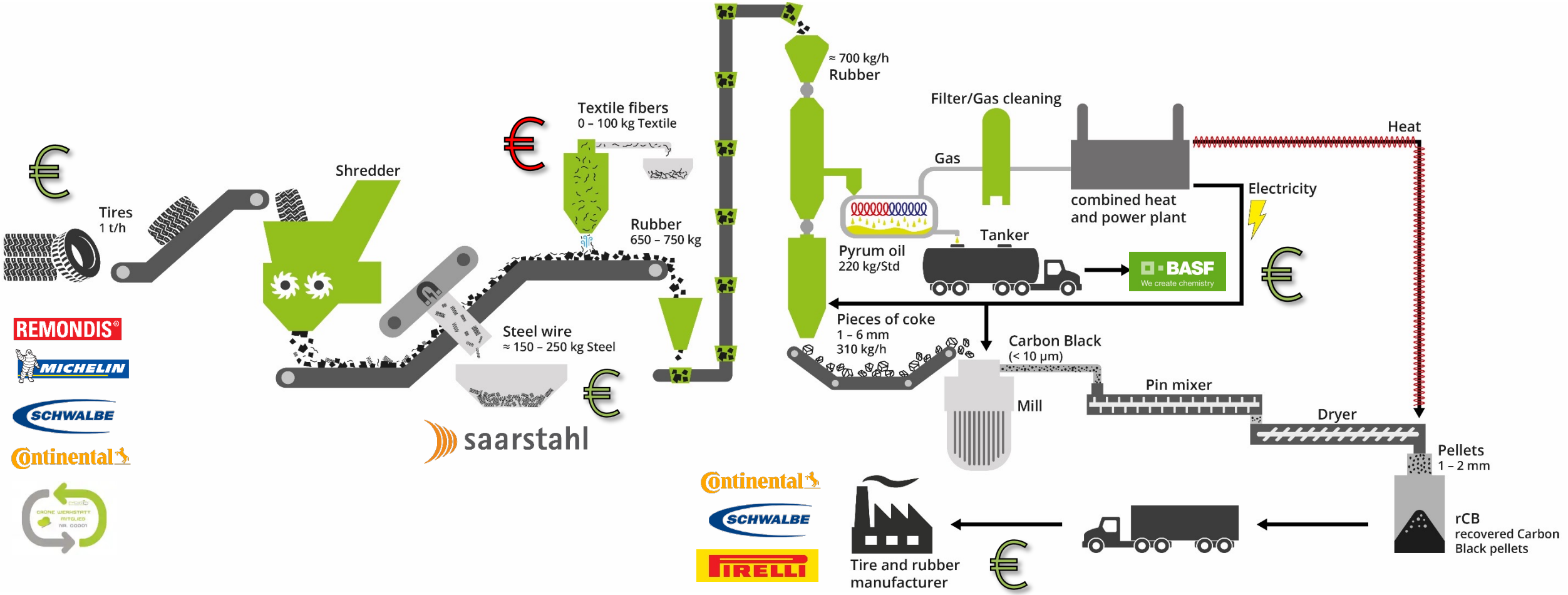
Power and heat fed back

Notes: (1) Patents are owned by Pyrum Innovations International S.A. (2) 1/3 of the thermolysis gas consists of hydrogen; (3) Carbon black is a rubber-reinforcing additive used in a multitude of rubber products (e.g., tires)

Pyrum value chain…

… converting rubber into several high value chemical products – thermolysis oil, carbon and gas

How Pyrum creates value



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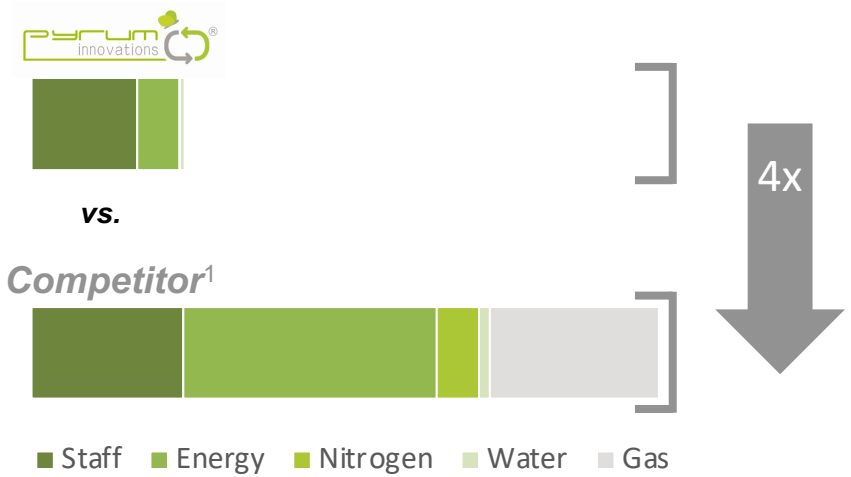
What makes Pyrum so unique?

Pyrum is well ahead of its competitors in terms of technology, timing and economics

Key costs comparison (illustration)



Awarded and Government supported technology

Key criteria comparison

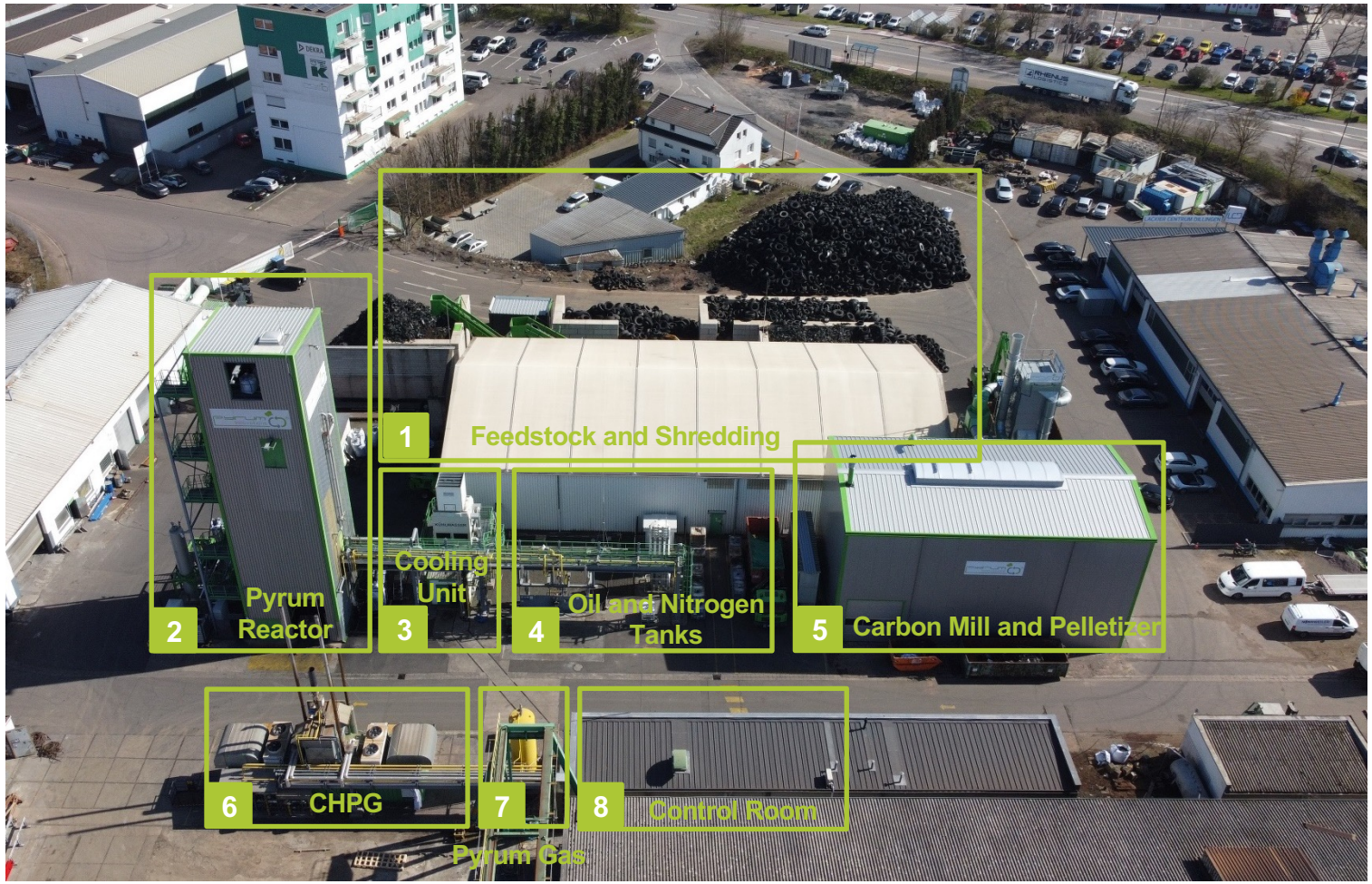
Technology	Process	Economics	Environmental
Technology Controlled process conditions that result in controlled product quality	***Process*** Continuous process. Elapsed time between entry and exit of waste max. 40 minutes	***Staff*** 2-3 workers / shift to run 1 line	***REACH*** Only European company with REACH certificate for oil from ELT
Reliability Dillingen plant is running on an industrial scale since May 2020	***Lifespan of main reactor*** 10 years guaranteed by Pyrum as the reactor has no moving parts	***Market value oil*** min. 150 / max. 350 EUR per ton[3]	***Emissions*** Low emissions due to electrical heating and environmentally friendly energy production
Energy Fully self-sufficient	***Maintenance*** Stops only every 3 months[2]	***Market value carbon*** EUR 650 - 700 per ton	***Limited PAHs*** Just several seconds tires are exposed to temperatures between 450 and 550 °C

Source: Company info | Notes: (1) Compared to the average competitor using Batch or turning oven (Pyrum is the only company currently having its own patented technology. Patents are owned by Pyrum Innovations International S.A.); (2) Compared to competitors which need to stop process every day. Each of the 150 heating sources can be replaced while the reactor is running; (3) According to terms & conditions of the BASF agreement

Dillingen plant consists of one industrial production for end-of-Life-Tires…

… and has been in test operation since 2015 and running on industrial scale since May 2020 with commercial sales

Overview of the operational unit[1]



Comments

1. **Feedstock (End-of-Life-Tires) and shredding unit**: granulating whole tires and separating rubber from steel and textile fibers
2. **Pyrum reactor:** patented[2] 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)[3]
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

Notes: (1) Current capacity of 6,600 ton p.a.; (2) Patents are owned by Pyrum Innovations International S.A.); (3) Pelletizer in delivery, not yet operational

Value chain provides favourable economics …

… as Pyrum is being paid both for receiving their feedstock and sales of products

Sources and operation output from used tires

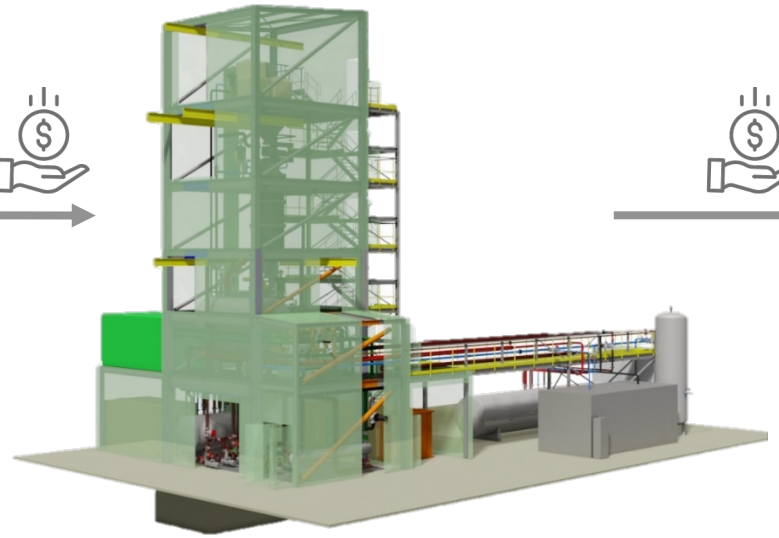
Source of used tires	Recycling process	Output

Source of used tires

- Car garages
- Tire manufacturers
- Municipalities
- Waste collection companies

Daily[1] input:
~ 15 tons in Dillingen plant 1
= 1.500 Tires

Recycling process



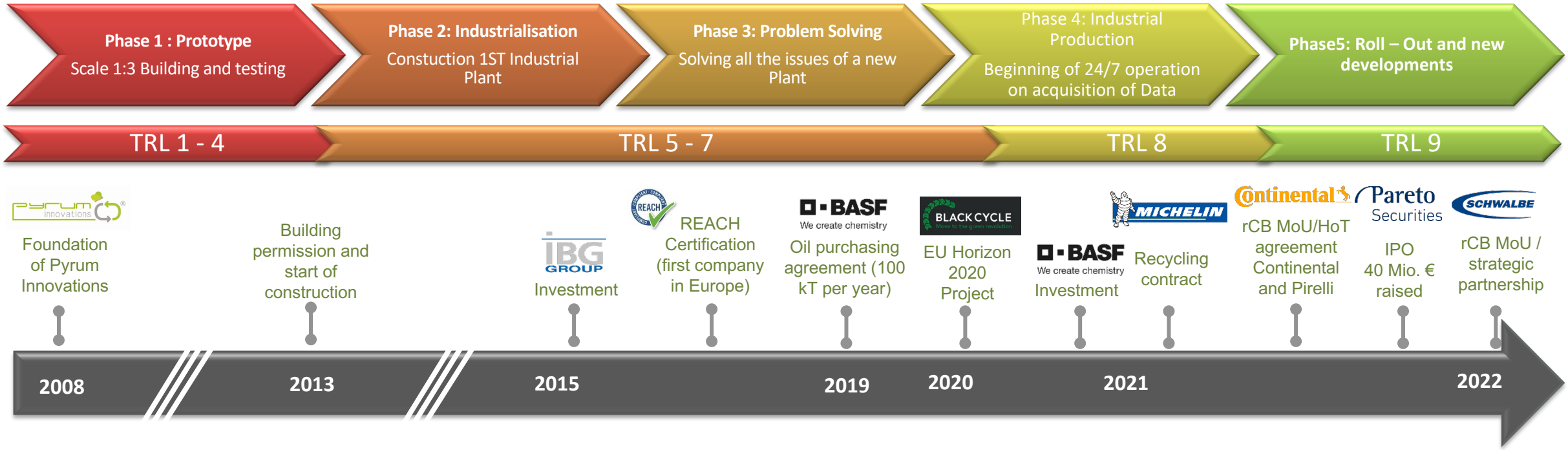
Output

Thermo-lysis oil	Daily output: **~ 4 tons**
Thermo-lysis carbon	Daily output: **~ 5 tons**
Thermo-lysis gas	Daily output: **~ 2.5 tons**
Steel wire	Daily output: **~ 3 tons**
Textile fibers	Daily output: **~ 0.5 ton**

Sources: Company info | Notes: (1) Management view on a typical daily input/output

Pyrum is assuming to be some years ahead of competition

Key milestones



Key News since IPO September 2021

Start building Pyrum Unit 2 and 3 in Germany

Winner of "TOP 100" best and most Innovative German Companies

Purchase of ELDAN Shredding units and Sales Partnership with ELDAN

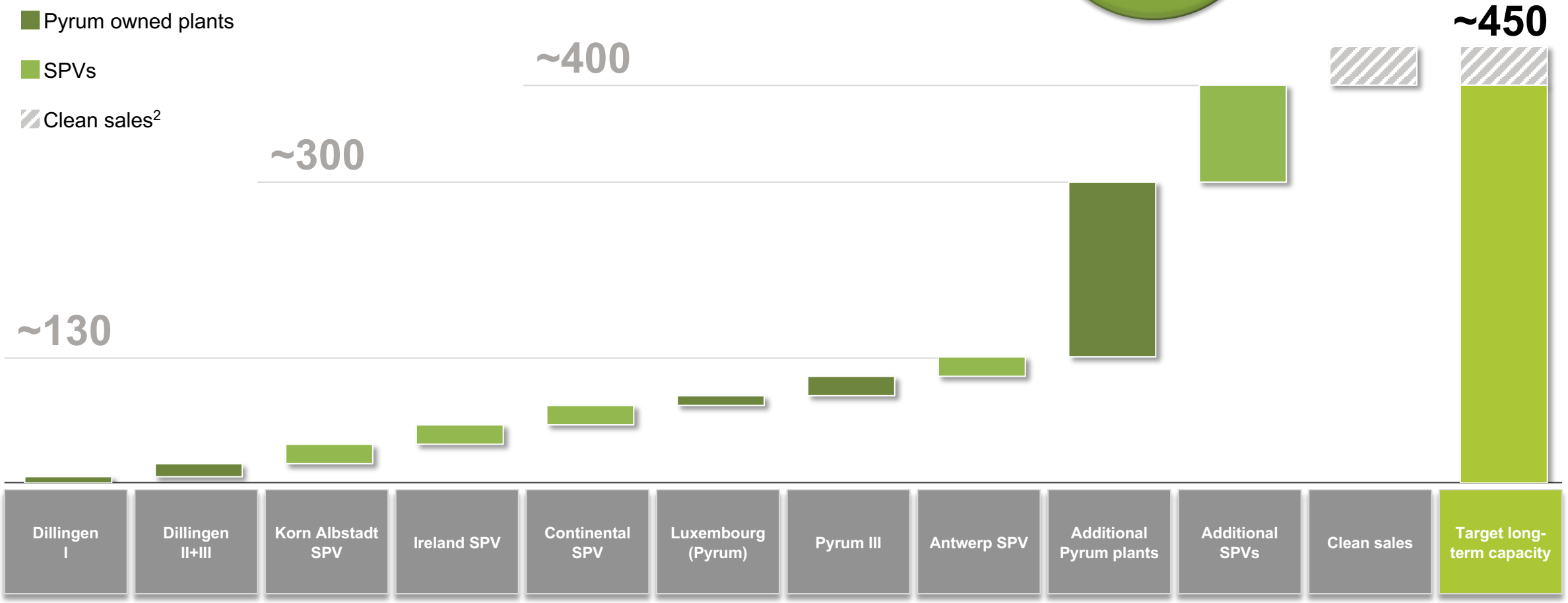
Successful Phase 1 of Blackcycle with 40.000 Liters of Oil delivered

Source: Company info

Potential roll-out scenario

Plant SPVs and plant sales accelerate capacity build-up

Illustrative roll out capacity (thousand tonnes p.a.)[1]



The forward-based information on this slide is shown as an example of a possible future development and is therefore solely for illustrative purposes. Such figures are based on multiple assumptions and there are no agreements entered into to support development illustrated. Such figures are not estimates or forecast and should therefore not be relied upon. Actual figures may therefore deviate materially. See risk factors section for further information.Sources: Company information | Notes: (1) Shown at 100% capacity, Pyrum intends to hold an ownership stake of 15-30%; (2) Owned by third parties, Pyrum to receive maintenance and service fee

Pyrum follows several R&D projects …

… accompanied by renowned research institutes and blue-chip companies

R&D project pipeline

	High priority			Prio 2
Idea				
Why develop?	▶ CFRP are built into every wind turbine, aircraft or electric vehicle ▶ Blades of wind turbines have to be renewed every 15-25 years, each with a weight up to 25 tons ▶ As of today, there is NO recyc-ling option for CFRP and the waste is dumped on landfills ▶ Member of “Infinity” project[3]	▶ Hydrogen is part of the Pyrum process gas ▶ Filter technology: separates the hydrogen in a pure and clean way ▶ Consumption of electric generator degreases ▶ Separate hydrogen and sell it as a new product	▶ Development of the “tire of the future”- “BlackCycle-Project” ▶ Made out of (up to) 85% raw materials from End-of-Life-Tires ▶ Project covering the entire recycling chain together with partner, i.e. Michelin/Orion ▶ Enhancing rCB value	▶ PUR is an ideal recycling material ▶ Homogeneous waste / little or not mixed with other waste ▶ Pyrum can guarantee a very stable end product quality ▶ Huge market potential facade isolation / mattresses
Status	**Start Phase 2[4]: November 2020**	**Start: September 2020**	**Start: May 2020**	**Start: September 2020**

Source: Company info Notes: (1) Carbon Fiber Reinforced Polymers; (2) Polyurethane; (3) The aim of the "Infinity" project is to develop, establish and demonstrate a sustainable process cycle for carbon fibre composite materials using novel recycling technologies, materials and processing methods; (4) *Phase 1 (feasibility study) started in 2017 and was successfully completed in 2019*

Sustainability is in the core of Pyrum …

... as Pyrum's technology reduces carbon emissions by up to 98% compared to the incineration of End-of-Life-Tires

Sustainable development goals

ISCC International Sustainability & Carbon Certification


ISCC PLUS Certificate

ISCC-PLUS-Cert-DE100-10300121

SGS Germany GmbH
Europa Allee 12, D-49685 Emstek
certifies that

Pyrum Innovations
Dieselstr. 8
66763 Dillingen
Germany

complies with the requirements of the certification system
ISCC PLUS
(International Sustainability and Carbon Certification)

This certificate is valid from 31. August 2021 to 30. August 2022

The site of the system user is certified as:
collecting point and pyrolysis plant

The scope of the certificate includes the following chain of custody options:
mass balance

Emstek, 31.08.2021
Place and date of issue

Potential to reduce

CO_2 by up to 98%

in typical cement plant[1]

EU Taxonomy

- ***Climate change mitigation*** ✓
- ***Climate change adoption*** ✓
- ***Sustainable and protection of water & marine resources*** ✓
- ***Transition to circular economy*** ✓
- ***Pollution prevention and control*** ✓

Notes: (1) In a typical cement plant, approx. 50.000 tons of used tires are incinerated annually and given Pyrum Innovations recycling plants with a total capacity of 50,000 tons per year) depending on specifications

Highlights

Pyrum addresses global environmental problems with revolutionary scalable technology