

CHANGING PERSPECTIVES



Foreword

End-of-life tyres have long been seen as a waste that needs to be properly managed. At the same time, our world is suffering from an extreme depletion of virgin resources and materials that could bring new benefits to society are left unused in applications where their hard-won material properties could be utilised. We need to shift our perspective from problem to solution, from burden to asset, from nerdy to sexy, and create conditions to extract the value that still exists in the material. This benefits both the environment and the economy. And it is an inspiring, evolving, and fulfilling endeavor.

What leads to new perspectives? It is possibly a difficult question with no simple answer. However, what we do know is that people who are exposed to new perspectives, are likely to take action. And often, it is when a new perspective is allowed that change occurs. Tyre recycling offers many surprises and unexpected opportunities and is, in many ways, a goldmine for innovation.

To see something from a different angle, knowledge needs to be provided from a new perspective, and sometimes even several. That is why we work with new facts, emotions, traceability, innovation, and design. It is about spreading knowledge and finding new perspectives.

Swedish Tyre Recycling has identified and developed five identities, known as sources of knowledge, as tools for the ability to inform, educate, and disseminate knowledge in a broader, more flexible, and accurate way. These sources of knowledge range from inspiration, curiosity, and creativity to feeling comfortable and safe in using recycled materials. In addition, we work on various activities and a new structure to enable a new type of sustainable value creation. This is what this publication is all about!

Welcome to New Perspectives!

Cover art: Illustration by Johanna Tham. Interpretation of tyre recycling from various perspectives.

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Swedish Tyre Recycling

Extended producer responsibility

Swedish Tyre Recycling ("SDAB") has been a non-profit circular economy organisation since 1994, operating under the extended producer responsibility for tyres. Together with local partners, the organisation coordinates the collection and recycling of approximately 90,000 tonnes of tyres that are discarded annually in Sweden. Initially, the producer responsibility focused on ensuring that tyres were not left in nature. Today, the focus is on increasing material recycling and creating value and utility from the recycled tyre material in harmony with people and the environment.

Tyre recycling in Sweden evolved as a result of the parliamentary Circular Economy Proposition, which aimed to reduce significant amounts of waste streams and initiate resource recovery by using materials we already have. When the proposition was adopted, the concept of producer responsibility became the focal point. As a result, in 1994, the Ordinance for Producer Responsibility for Tyres was introduced, and Swedish Tyre Recycling was established.

Producer responsibility for tyres means that manufacturers and importers placing tyres on the Swedish market are responsible

for ensuring their proper end-of-life management. The system is financed through recycling fees paid by producers to the system, typically the fees are forwarded through the value chain to the distributors, who then allocate the fee to consumers when purchasing new tyres. This means that the fees cover the cost of collecting tyres that have reached the end of their life from workshops and other authorised collection points, free of charge throughout the country, and transporting them to recycling facilities. The collection and recycling system are managed through a tailored web and mobile application, which provides a comprehensive overview of the process to streamline collection and facilitate all involved partners.

Swedish Tyre Recycling strengthens its role as a producer responsibility organisation with a focus on value creation. It is an expert organisation with extensive experience that aims to contribute knowledge and curiosity about recycled tyre rubber and develop a recycling organisation that inspires creativity and innovation.

www.sdab.se



The images show Swedish Tyre Recycling's flagship facility in Linköping. The facility covers an area of 4 hectares and processes 42 000 tonnes of used tyres.



Photos: True North



ELTRP

End-of-life Tyre Research Portal

Recycled tyre rubber is a material that is surrounded by perceptions and queries regarding both its content and utilisation. It is something that the industry in general, and Swedish Tyre Recycling in particular regularly addresses. Along the way, it has become clear that perceptions often stem from a lack of information and knowledge, while there has also been missing a readily available source of information about the material. Recycled tyre rubber is indeed a well-researched material, but for the opportunity to educate and disseminate knowledge about the material, there has also been a need for a central research portal with consolidated information, report, and articles about the material and its applications.

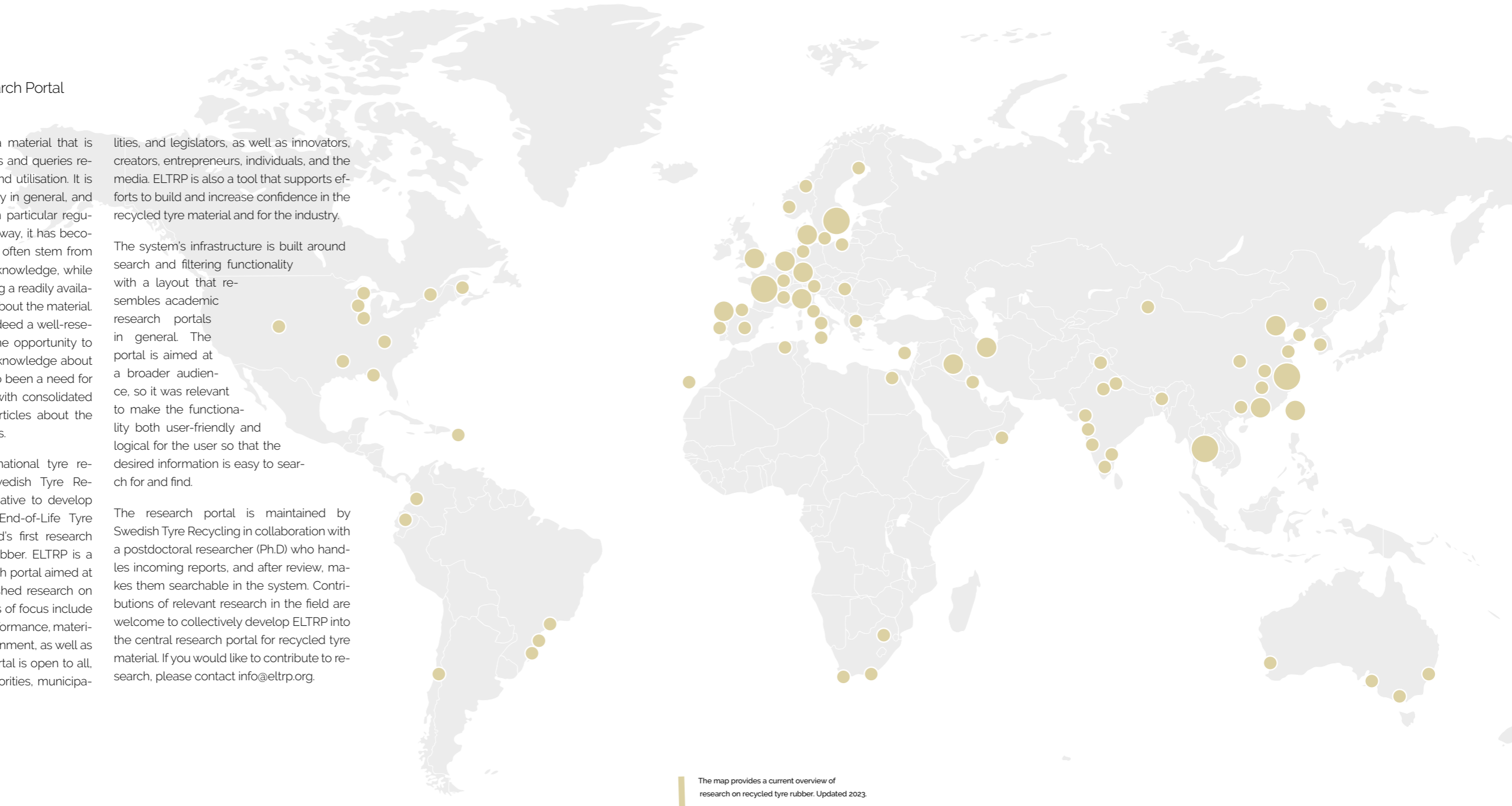
With support from international tyre recycling organisations, Swedish Tyre Recycling has taken the initiative to develop and implement ELTRP (End-of-Life Tyre Research Portal), the world's first research portal on recycled tyre rubber. ELTRP is a society-supporting research portal aimed at providing access to published research on recycled tyre rubber. Areas of focus include chemical composition, performance, material usage, health and environment, as well as products. The research portal is open to all, including academics, authorities, municipa-

lities, and legislators, as well as innovators, creators, entrepreneurs, individuals, and the media. ELTRP is also a tool that supports efforts to build and increase confidence in the recycled tyre material and for the industry.

The system's infrastructure is built around search and filtering functionality with a layout that resembles academic research portals in general. The portal is aimed at a broader audience, so it was relevant to make the functionality both user-friendly and logical for the user so that the desired information is easy to search for and find.

The research portal is maintained by Swedish Tyre Recycling in collaboration with a postdoctoral researcher (Ph.D) who handles incoming reports, and after review, makes them searchable in the system. Contributions of relevant research in the field are welcome to collectively develop ELTRP into the central research portal for recycled tyre material. If you would like to contribute to research, please contact info@eltrp.org.

www.eltrp.org



The map provides a current overview of research on recycled tyre rubber. Updated 2023.

CERUB

Sustainability certification

In 2020, the world's first sustainability certification, CERUB (Circular Economy Rubber), was introduced. It serves as a traceability system and a quality stamp for a responsible recycled process specially designed for recycled tyre rubber. This sustainability certification, built on a self-declaration and external audit, is unique within the recycling industry and serves as a tool to enhance the value of the material and the recycling process. CERUB brings together tyre manufacturers, recycling companies, producer responsibility organisations, material distributors, product and service providers to create a secure and sustainable circular economy.

The certification supports the ease of using recycled tyre material and ensures that the entire recycling chain meets the highest standards regarding health and the environment. It guarantees a responsible production chain, transparent material flow, an

compliance with all regulatory requirements for intended end use. CERUB also forms the foundation for meeting the so-called End-of-Waste criteria to reclassify waste and use recycled material as a new raw material. The CERUB certification serves as a basis for End-of-Waste classification. When removing a worn-out tyre from the rim, it is classified as waste, and to use the material, it is necessary to undergo this formal End-of-Waste process, while also being able to demonstrate traceability, which the CERUB certification provides.

CERUB is an initiative of the four producer responsibility organisations in Sweden, Finland, Norway, and the Netherlands, with the ambition to be applied in multiple countries worldwide. The CERUB certification is applied when the tyre has been processed into shreds and granulate, but there is interest in using the certification on newly manufactured tyres as well.

www.cerub.org



Traceability

CERUB-certified material can be traced throughout the production chain, from the collection of tyres to the recovery of recycled material. With certification, you can safely prove that you are a reliable and responsible supplier of material. Traceability ensures that the use of recycled materials in new products and materials is verified. For those who utilize recycled tyre material, the CERUB label shows that the company is committed to a responsible and transparent production chain.

Safety & usability

CERUB-labelled materials and products are of high quality and always a safe choice for users. CERUB-certified material meets strict standards and certification criteria and thus meets the high operating requirements of various technical applications. CERUB ensures that the quality of the production chain is comprehensively managed. The safe handling and use of materials are ensured by appropriate instructions. Certified material is easy and safe to utilize.

Circular economy

With CERUB, you can stand out and show your commitment to sustainable material recovery and environmentally friendly, safe circular economy products. By utilizing locally produced recycled materials, companies can secure the availability of raw materials and improve their own security of supply in a turbulent raw material market. CERUB companies are reliable and responsible material suppliers who save natural resources and money. CERUB-labelled products are competitive in procurement and stand out as pioneers in the sustainable development market.

Innovations

CERUB is a tool for businesses to support the transition to a sustainable and responsible circular economy. Certification allows recycling companies to demonstrate the reliability and responsibility of the recycled material they deliver. Confidence in materials improves competitiveness, enables new types of business and innovative solutions for tyre-based materials and products. CERUB provides a basis for innovation because the origin, production chain and properties of recycled materials are well known. By using reliably made, locally recycled materials, you reduce your dependence on virgin resources and you are able to do things a little differently. CERUB-labelled materials and products are the best choice for true pioneers.

Source: cerub.org



Rubber Hall currently consists of a dozen creators from around the world and welcomes additional innovators, entrepreneurs, designers, creators, artists, and students, among others, to showcase their products and creations on the platform.



Rubber Hall

Inspiration platform

While there are varying opinions about recycled tyre material, there is also widespread curiosity, fascination, and a great interest to learn more. Often, this revolves around the unexpected innovative possibilities that the material in its recycled form presents. Across the world, recycled tyre rubber is used in design and construction materials, yet, overall, it remains a relatively unknown recycling material. To showcase examples of the various uses for the material, the image and inspiration platform Rubber Hall was created.

Rubber Hall brings together designers and creators who have fully or partially integrated recycled tyre material to craft creations in areas ranging from society and architecture to interior design and fashion. Together, they have established a place for inspiration, curiosity, and creativity, along

with an opportunity to highlight that many of the material's applications are reflected in our daily lives in a more natural way than is known. The idea behind the name is derived from the meaning of the word "Hall" as a meeting place among people; however in this instance, as a meeting place between a person and one or more objects. Rubber Hall invites individuals to a space to observe, reflect, and be inspired, but above all, to gain new perspectives. Rubber Hall makes the recycled rubber a desired material in everyone's life.

In several locations across Sweden, Rubber Hall exists in a physical format as a showroom, open and accessible to those interested. Here, both raw materials, material samples, and finished products are displayed. Would you like to visit showrooms? Please contact media@sdab.se.

www.rubberhall.com



Orbit Materials

Raw material supplier

The sales and marketing company Orbit Materials is located close to customers' operations and aims to contribute to their value creation. The customers' need for high-performance materials is channelled through Orbit Materials' marketing and sales organisation to Swedish Tyre Recycling's manufacturing units. Materials are sorted, customised, and tested based on the properties that customers seek. After all, a tyre is not just a "tyre". Depending on the type of tyre and the specific part of the tyre being considered, different materials and properties can be extracted. This is what also makes tyre rubber unique, as a material that is perfectly suited for Repurposed Performance. Orbit Materials is a specialised raw material supplier that produces unique rubber fractions with desired properties for specific uses.

The materials – rubber, steel, and textiles – that Orbit Materials markets have properties and qualities that can enhance the functionality and performance in a particular application. Orbit Materials sorts out top-quality material fractions that are best suited for the specific application and meet the customer's needs. This could involve integrating the material into everything from everyday products and functional surfaces to construction materials. The aim is for an already existing material to provide at least the same sustainable function as other materials. Selection criteria can vary from UV resistance, temperature tolerance, insulating properties, elasticity, natural rubber content (renewable) and more.



Repurposed Performance

Different tyres contain rubber with customised properties that can add new value in various applications. Should the rubber be soft in cold conditions, insulating, UV-resistant etc.? Orbit Materials tailors it to the customer's needs. The image below displays the material in various processed forms; Rought Cut, Fine Cut, Granulate and, Powder, as well as Steel and Textile.



Photo: Leo Bulow Creative

Activities

In addition to the five communication platforms, Swedish Tyre Recycling is involved in several supporting activities, ranging from regular and ongoing initiatives to more occasional concepts. A recurring activity involves collaborative efforts with the tyre industry and tyre importers to collectively work towards a common sustainable goal. In collaboration with the Swedish Tyre Industry and tyre importers, Swedish Tyre Recycling launched a white paper on sustainability in 2020. This paper is primarily based on the idea of defining "good recycling" and extending the material's lifespan in new ways, thus reducing the environmental impact of extracting new materials. Sin-

Art of Recycling

A new initiative and concept initiated by Swedish Tyre Recycling is an art and design project called Art of Recycling. The concept aims to invite creators, designers, and artists to interpret tyre recycling through their creativity. The idea behind these collaborations is to view the world from new perspectives. Swedish Tyre Recycling invited illustrator Johanna Tham to provide her own interpretation of tyre recycling. The result led to three different themes: circular, graphic, and landscape. Johanna is the first creator of the Art of Recycling concept. Here, she provides a description of her illustrated interpretations.

Are you interested in being part of Art of Recycling? Please feel free to contact media@sdab.se, and we will provide more information.

ce 2020, Swedish Tyre Recycling has been producing annual reports focusing on various themes related to tyre recycling. The themes have included Ecosystem (2020), followed by Carbon Cycle (2021), and in 2022, the theme was Innovation. Innovation is an area with numerous development projects supported by Swedish Tyre Recycling, including water purification, phosphorous capture, rubber concrete, 3D-printing, industrial design, pyrolysis, and devulcanisation. Other regular activities include physical and digital showrooms and exhibitions, workshops, seminars, lobbying efforts, and the production of articles for the media.



Circular

"The circular can be associated with both the shape of the wheel and recycling chains. Here, I wanted to create a playful, abstract representation of roads, paths, and flows. I was thinking about materials transitioning into something else. The wheel represents motion. The winding shapes remind us to take new paths to gain new perspectives!"



Graphically

"In the design assignment, I aimed to work with abstract motifs that encourage interpretation by the viewer. The guiding principles I started from were "Changing perspectives" and "New possibilities". Various components and materials are brought together to reveal different characteristics. New opportunities arise when they are disassembled and reassembled".



Landscape

"Here, I contemplated sediment, layers, and time. The millions of years it has taken Mother Earth to create different materials such as steel and rubber. The abstract landscapes aim to remind us of the care for nature and ecology".

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