

## TRANSICIÓN E – THE TOP 8 QUESTIONS ABOUT ZEBRA-LIFE

The ZEBRA-LIFE project recently took centre stage in an episode of the “Transición E” podcast, made in collaboration with CENER (listen to the podcast in Spanish here <https://bit.ly/48bjGqF>).

Recognizing the importance of making this insightful conversation accessible to all, we’ve translated the key points into English, overcoming language barriers to ensure everyone can learn about this groundbreaking initiative.

In this special episode, host Julia Elizalde, journalist and Communication Manager of CENER, invites our partners Vicente López, Innovation Manager from Biomass Department from CENER, Fermín Oliva, Product Area Senior Scientific of Repsol Technology Lab, and Ángel Valdivielso, Chief Technology Officer of Roka Furadada. Together, they explore ZEBRA-LIFE project, our ambitious endeavor that seeks to transform industrial waste or by-products, notably black liquor, into innovative products.



### 1 WHAT IS THE MAIN OBJECTIVE OF THE ZEBRA-LIFE PROJECT?

At the heart of the ZEBRA-LIFE project lies the ambition to harness the potential of black liquor, a by-product of the paper manufacturing process. The project aims to transform this substance into products with high antioxidant properties and the capability to absorb UV radiation. This innovative approach seeks to develop renewable products for industrial use in different applications (food, rubber, cosmetics, fuel, and lubricants). Providing an alternative to the current energy valuation process of black liquor, this initiative promotes a sustainable cycle within the circular economy.

## 2 HOW DOES THE PROJECT AIM TO UTILIZE BLACK LIQUOR FROM THE PAPER INDUSTRY?

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The ZEBRA-LIFE project leverages a novel technology to exploit the lignin contained in the black liquor generated in paper production, aiming for its transformation into high-value antioxidant products. Utilizing the “OHRIGINS” technology, the initiative focuses on lignin’s conversion, creating these valuable products. This process embodies a strategic shift in resource utilization, viewing black liquor not as waste but as a vital feedstock for sustainable product development. This strategic utilization targets the conversion of waste into renewable resources, reducing environmental impact and enhancing sustainability and expanding the products portfolio in the paper industry.

## 3 WHAT ARE THE INNOVATIVE ASPECTS OF THE OHRIGINS TECHNOLOGY DEVELOPED BY CENER?

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"OHRIGINS" technology, the pioneering development by CENER, stands at the forefront of the ZEBRA-LIFE project's innovation. This technology takes on the challenge of breaking down lignin, which is a tough, natural substance found in black liquor. Imagine lignin as a complex puzzle that "OHRIGINS" technology skilfully takes apart to create valuable new pieces. By doing this, "OHRIGINS" harks back to traditional wood processing but revolutionizes it with a modern twist, avoiding the common problem where lignin pieces stick back together (repolymerization) under heat and pressure. This innovative approach ensures that we can produce new materials that are packed with antioxidants, beneficial for protecting various commodities from aging and wear.

Moreover, lignin's portrayal as the "new oil" underscores its immense chemical potential and economic value. Remarkably affordable, lignin emerges as both a chemical marvel and an economically viable option. This leap forward showcases the project’s commitment to pioneering new paths in technology, marking a significant stride toward environmentally friendly product creation in the paper industry.

## 4 WHAT ARE ANTIOXIDANTS, AND WHY ARE THEY IMPORTANT IN THE PROJECT?

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Antioxidants are the focal point of this episode titled “Natural Antioxidant from the Paper Industry Activity”. They are vital components used across various industries to preserve the quality and extend the lifespan of products. In ZEBRA-LIFE, antioxidants are derived from lignin solubilized in black liquor, showcasing a sustainable and smart approach to reusing this by-product.



## 5 WHAT CHALLENGES HAVE BEEN FACED DURING THE PROJECT, AND HOW ARE THEY BEING ADDRESSED?

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Every groundbreaking project encounters its share of challenges, and ZEBRA-LIFE is no exception. Central to overcoming these obstacles is the intricate task of integrating the "OHRIGINS" technology with the paper mill operations, ensuring both economic and environmental viability. This endeavour required a deep understanding of traditional paper production processes, notably the creation of black liquor through pulp cooking, and the strategic deployment of technology to valorize lignin effectively. Moreover, the project confronted the complexity of applying the derived antioxidant across diverse sectors such as lubricants, fuels, and cosmetics, requiring tailored formulations to meet specific industry standards.

Our collaborative approach was key to tackling these hurdles. By pooling our knowledge and resources, we ensure the project remains on the cutting edge of technology and sustainability, addressing challenges through collective expertise and innovative problem-solving.

## 6 HOW DO CONSORTIUM PARTNERS WORK TOGETHER FOR THE PROJECT'S GOALS?

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The ZEBRA-LIFE project thrives on a dynamic collaboration among leading institutions: CENER spearheads the project with its "OHRIGINS" technology, while each partner of the consortium contributes its unique expertise, resources, and commitment to innovation. This collaborative effort underscores a multidisciplinary approach to tackling industrial waste and showcases a united front in the pursuit of sustainable innovation. Each partner plays a crucial role in adapting the technology for diverse industrial applications, highlighting the project's wide-reaching impact across sectors.



## 7 HOW DOES THE ZEBRA-LIFE PROJECT CONTRIBUTE TO THE CIRCULAR ECONOMY? HOW DOES IT ALIGN WITH AND MEASURE SUCCESS AGAINST THE EUROPEAN GREEN DEAL AND BROADER ENVIRONMENTAL SUSTAINABILITY GOALS?

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The ZEBRA-LIFE project makes a significant contribution to the circular economy by innovatively using black liquor, transforming a traditional waste product into valuable, eco-friendly resources. By doing so, it exemplifies resource efficiency and waste reduction while introducing renewable products with wide-ranging applications. Endorsed by the European Commission's LIFE program, ZEBRA-LIFE aligns with the European Green Deal's ambitions by significantly reducing industrial waste, contributing to Europe's progression towards a climate-neutral future. This initiative is a testament to how collaboration and technological innovation can drive substantial environmental improvements, embodying a commitment to sustainability and reflecting the core objectives of the European Green Deal.

## 8 WHAT ARE THE NEXT STEPS ON THE HORIZON FOR THE ZEBRA-LIFE PROJECT?

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Moving forward, the ZEBRA-LIFE project is gearing up for an exciting phase with the establishment of a pilot plant in Aoiz (Navarra-Spain), at the CENER's [BIO2C](#) facility, slated to begin operations in January 2025. This plant will be instrumental in producing semi-industrial batches of the project's innovative products, tailored to the specific needs of each collaborating partner. A crucial aspect of this next step is the continuous process evaluation to ensure the technology's scalability and applicability across different industries. By 2026, a comprehensive techno-economic feasibility study will offer insights into the economic and environmental benefits of the OHRIGINS technology, marking a significant milestone in demonstrating the project's viability and its alignment with the European Green Deal's sustainability goals.

## A SUSTAINABLE VISION

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Highlighting 100% innovation, the ZEBRA-LIFE project, takes a bold step forward in environmental solutions. By transforming black liquor into valuable, eco-friendly products, it addresses a crucial waste challenge and charts a course towards a more sustainable industry. Supported by the European Commission, this initiative demonstrates that sustainable industrial practices are achievable through the collective effort and ingenuity of dedicated partners.

We extend special thanks to Transición E and Julia Elizalde for their invaluable role in promoting initiatives like ours, which are crucial for reaching the wider society and making a meaningful impact. We also extend our gratitude to our partners for their insightful contributions and explanations.