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The IRODDI project successfully proves how an industrial bioeconomy model can also work with products that are not intended for energy use

This BBI JU-funded project met its objective of obtaining new high-value and cost-effective bioproducts from the oil and fat refining process.

Happily, after 36 months of enthusiastic hard work from an international and multidisciplinary team, the innovative project **IRODDI** (**Innovative Refining process for valorization of vegetable Oil Deodorizer DIstillates**), funded by BBI JU, concluded by demonstrating that waste (bio)materials such as by-products of the **refining industry of vegetable oils and fats** (technically known as deodorizer distillates) are a profitable source of resources to obtain **high-value products,** beyond energy uses for biofuel production.

In this sense, IRODDI represents an example of direct application of how the **bioeconomy and circularity have a place in the industrial environment**, providing benefits to both today's industries and society. The **technologies developed** in the project have successfully led to the integral transformation of low-value resources into chemical products of direct commercial application. Specifically, the following processes have been successfully developed:

- In combination with **bio-based ionic liquids**, deodorising distillates have become key ingredients for **readily biodegradable detergents** that exhibit higher efficacy and lower toxicity than their oil-based counterparts. The technologies developed for the production of these compounds are green, as they generate only water as a residue in the production process.
- Using highly selective, non-wasteful **enzymatic technologies**, deodorising distillates have been converted into ingredients for **biodegradable biolubricants** that pollute much less than those currently used commercially.
- New green (non-wasteful) processes have been developed to extract high-value molecules (**squalene**) present in deodorising distillates and are successfully applied in **sectors such as cosmetics**, resulting in very high-quality products.

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The **consortium** that has made IRODDI possible is made up of **partners from four EU countries**: **Tecnalia Research & Innovation Foundation** (project coordinator and leader in the application of products), **BIOPLAT** (dedicated to the exploitation, communication and dissemination of the project), **Instituto de la Grasa - CSIC** (in charge of the extraction of valuable compounds), **Kliner Profesional** (dedicated to the neutralisation of surfactants by FFAs) and **Sophim Iberia** (supplier of raw materials with FFAs of different composition), from Spain; **FeyeCon** (responsible for applying a CO_2 fractionation technology for the extraction of FFAs and obtaining valuable compounds such as squalene and tocopherols). and **Zer0-E** (responsible for process simulation, LCA and cost analysis), from the Netherlands; **Fraunhofer** (responsible for developing an enzymatic neutralisation process for deodorant distillates), **IoLiTec** (designed and produced environmentally friendly ILs for use as reagents in FFA neutralisation processes) and **Jowat** (involved with the application of fatty polyols developed from FFAs in polyurethane adhesives), from Germany; and **Sophim** (used the squalene isolated by FEY in cosmetic applications), from France.

Thanks to the **excellence, commitment and joint effort** demonstrated by these **11 partners**, IRODDI has contributed to the bioeconomy and circularity objectives of the European Union, managing **natural resources** in a sustainable way, reducing the dependence of the different industries on non-renewable resources, helping to mitigate **climate change** and strengthening the European commercial competitiveness.

All this is reflected in the final video produced by the project and which, under the title '**Achievements and impacts**', clearly and concisely sets out the results achieved, also highlighting its value as a pioneering initiative in the direct application of the principles of circular economy to a real industrial process.

For all these reasons, **IRODDI can serve as an example** for many new ideas under development aimed at making the most of the resources available to society in a sustainable way.

PRESS CONTACT
Project's coordinator (Fundación Tecnalia Research & Innovation)
Olga Gómez de Miranda - olga.gomez@tecnalia.com Pablo Ortiz – pablo.ortiz@tecnalia.com

Communication coordinator (Spanish Technology & Innovation Platform 'Biomass for the Bioeconomy' – BIOPLAT)
Margarita de Gregorio – margadegregorio@bioplat.org

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