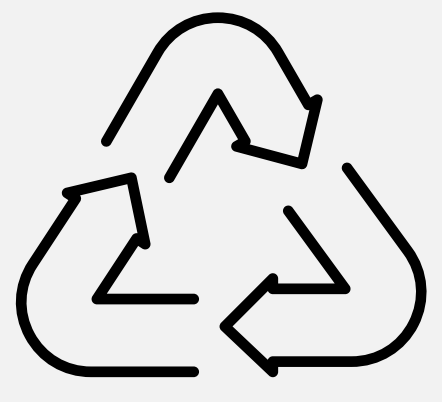


Circular Product Design

examples from the agricultural sector

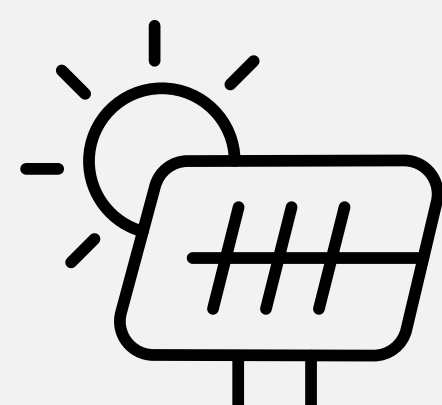


BASF's certified soil-biodegradable ecovio® for mulch films

BASF's ecovio® M2351 for mulch films is a certified soil-biodegradable biopolymer for use in agriculture. It offers key benefits like increased crop yield, reduced herbicide and water use. After use, the film biodegrades naturally in agricultural soil, leaving no persistent microplastics, as it is broken down by soil microbes into CO₂, water, and biomass. This aligns with circular design principles for reducing waste and avoiding long-term environmental impacts.

Mulch films made of ecovio® promote sustainable farming and food production by enhancing soil health and productivity, as well as reducing labour through less time-consuming management of the end-of-life treatment, as the film does not require removal post-harvest. Due to its mechanical properties, ecovio® M 2351 can be used to make mulch films with layer thicknesses of 12, 10 and 8 µm or 25 µm, if needed.

Source:
https://plastics-rubber.basf.com/global/en/performance_polymers/products/ecovio/ecovio_mulch_film

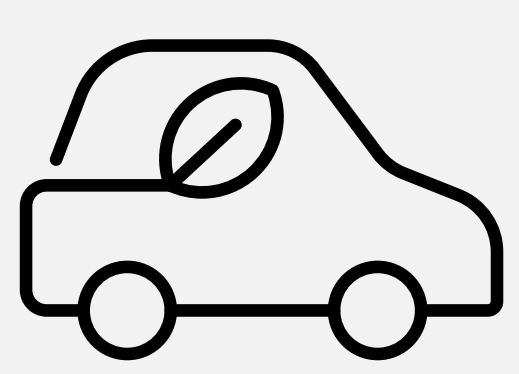


Empowering Farmers through Circular Innovation: Covestro's Solar Greenhouse Dryers

Covestro's Public-Private Partnership initiative SUSTAIN, co-funded by KfW-DEG (the German Development Bank), addressed challenges faced by 5,000 banana farmers by introducing farm-based solar greenhouse dryers (GHD) and solar cold storages. By providing these circular solutions, farmers were able to preserve their production for longer periods, reduce waste and unlock new revenue streams. The GHD, made with Covestro's polycarbonate, efficiently dried fruits like bananas without nutrient loss, enhancing both shelf life and marketability. This circular design—reusing energy sustainably and minimizing waste—helped increase farmers' income while contributing to local nutrition, as dried bananas became part of mid-day meals and snacks for vulnerable groups like children and diabetic patients.

By forming partnerships with organizations across India, Sri Lanka, Nepal, and Bangladesh, Covestro is aiming to scale up its circular design model to empower marginal farmers and uplift communities.

Source:
<https://www.covestro.com/en/company/covestro-worldwide/india/covestro-in-india/sustainability/inclusive-business-india/covestro-solutions-unsdg-good-practices>

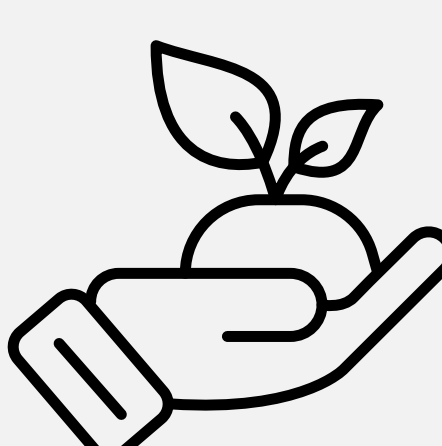


Advancing Circular Design: ExxonMobil's and Winpack's Collaboration on Sustainable Mulch Films to Address Plastic Waste Challenges

ExxonMobil partnered with Winpack Group, a leading Chilean converter of flexible films, to enhance the sustainability of the converter's mulch films by increasing the amount of post-consumer recycle (PCR) in its products without compromising performance. ExxonMobil's technical expertise in circularity was leveraged to develop a three-layer mulch film. By incorporating Exceed™ XP 8358ML performance PE, Winpack was able to boost PCR content from 12% to 20% while significantly improving key mechanical properties like tear resistance (up by 227%) and dart puncture strength (up by 46%). These improvements were critical for preventing soil contamination during film collection, which is a common issue with low-quality mulch films.

This collaboration highlights how circular product design can help address plastic pollution challenges. By enhancing the durability and recyclability of the mulch films, Winpack not only reduced the likelihood of their products ending up in landfills but also increased the potential for these films to be collected and recycled into new applications.

Source:
https://www.exxonmobilchemical.com/en/resources/library/library-detail/111797/winpack_mulch_film_case_study_en



RIGK initiative advancing sustainable recycling

The Recycling Initiative for Industrial and Commercial Plastic Packaging (RIGK) provides an example of an initiative that focuses on the recovery and recycling of packaging and products, particularly in sectors like agriculture, industry, and commerce. It provides innovative, legally compliant, and cost-effective recovery and recycling systems for producers and packers of agricultural plastics and packaging. This service is part of RIGK's broader mission to ensure the responsible disposal of plastic materials in a sustainable and efficient manner, with a focus on the agricultural sector. To achieve this objective, voluntary disposal initiatives are organized to ensure responsible, environmentally friendly recovery of these materials, addressing the significant use of plastics and chemicals in agriculture.

Leveraging the expertise of its specialists and a vast network, the initiative continuously improves its solutions and collaborates with industry organizations like the European Association of Plastics Recycling & Recovery Organisations (EPRO). This collaboration includes organizing the International Recycling Forum, a global meeting point for the recycling of agricultural plastics. The overall mission is to ensure sustainable, efficient recycling systems that benefit both the environment and agricultural end-users.

Source: <https://www.rigk.de/en/about-rigk/facts-figures/rigk-for-agriculture>