

BIOECO-UP

# BIO-PRODUCTS FROM WASTE



**EVEN WASTE CAN HAVE A VALUE:** Did you know that everyday consumer products can be obtained using waste from agricultural production and the food industry?



**THIS MEANS CIRCULAR ECONOMY....** In fact, this approach represents an application of the principle of circularity, whereby a by-product of an agricultural or industrial process can become raw material for another process, even in a commercial sector different from that of origin.



**...AND SUSTAINABILITY!** This virtuous approach improves the Sustainability of our Society, with a more responsible approach, which minimizes the amount of waste that is sent to incineration or landfill and attributes a value to what for us is waste.



**DO YOU KNOW YOUR ROLE?** You too can contribute to this! if each of us carries out accurate separation and timely disposal of waste, it facilitates downstream transformation, for example of the organic fraction into compost.

## SOME EXAMPLES



From the waste it is possible to extract cellulose, which can be used for paper and packaging, or chitin, from the exoskeletons of crustaceans, to make bioplastics or health products, or useful components (saccharides) for diets or animal feed



From the waste of the tomato industry it is possible to obtain a bio-coating, to coat packaging materials used in the food industry



From the waste of the citrus industry it is possible to extract cellulose from which to obtain fibers for use in textiles



From waste from the apple juice production industry, such as peels and seeds, it is possible to obtain a paste for use in the cosmetics sector



From agricultural and food waste it is possible to obtain biofuels, soil improvers for agricultural use, bioplastics and raw materials for industry.



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<https://www.b-plas.it/en/>



<https://www.b-plas.it/en/cross-life-project/>



<https://www.prolific-project.eu/>



<https://ingreenproject.eu/>



<https://agrimax-project.eu>



<https://www.it.tomapaint.com/>

Fossil fuels are a resource whose exploitation has favoured industrial development in the last century, but which have caused damage to the environment and geopolitical and social problems. Moreover, the use of fossil resources has led to global warming, nowadays one of the major challenges we have to face.

As the world's population and resource consumption grows, waste generation has also increased. This excessive accumulation in waste materials harms the ecosystem and human beings by depleting water quality, air quality, and biodiversity.

Therefore, the idea of a “circular (bio)economy” has emerged, where products are made, used and re-used, rather than being discarded. Scientific research is studying methods to develop economically viable and sustainable solutions to make this paradigm possible. The aim is to manage resources in a responsible way, while preserving human health and environment.

The transformation of organic by-products into fuels or high-value chemicals is becoming a strategic field of the so-called “green chemistry”. This allows to convert the by-products from agro-industry, food industry and in principle even household waste, into valuable products. The economic advantage of this approach, compared to processes from conventional sources, is given by the availability of raw material, sometimes even at almost-zero cost. Compost is also a precious asset for farmers to combat soil desertification by reducing the need for water.

The challenge is to reduce costs for by-products transformation and increase sustainability, guaranteeing high yields of the desired product. Examples include not only the production of energy, but also the synthesis of biofertilizers, materials for the textile industry, for the furniture industry, for cosmetics and home-caring, and others. In order to do this, new technologies and processes have been or are going to be developed and industrially implemented, such as new procedures for the extraction of chemical compounds (eg, microwave-based extraction), new enzymes and new type of bio-reactors.