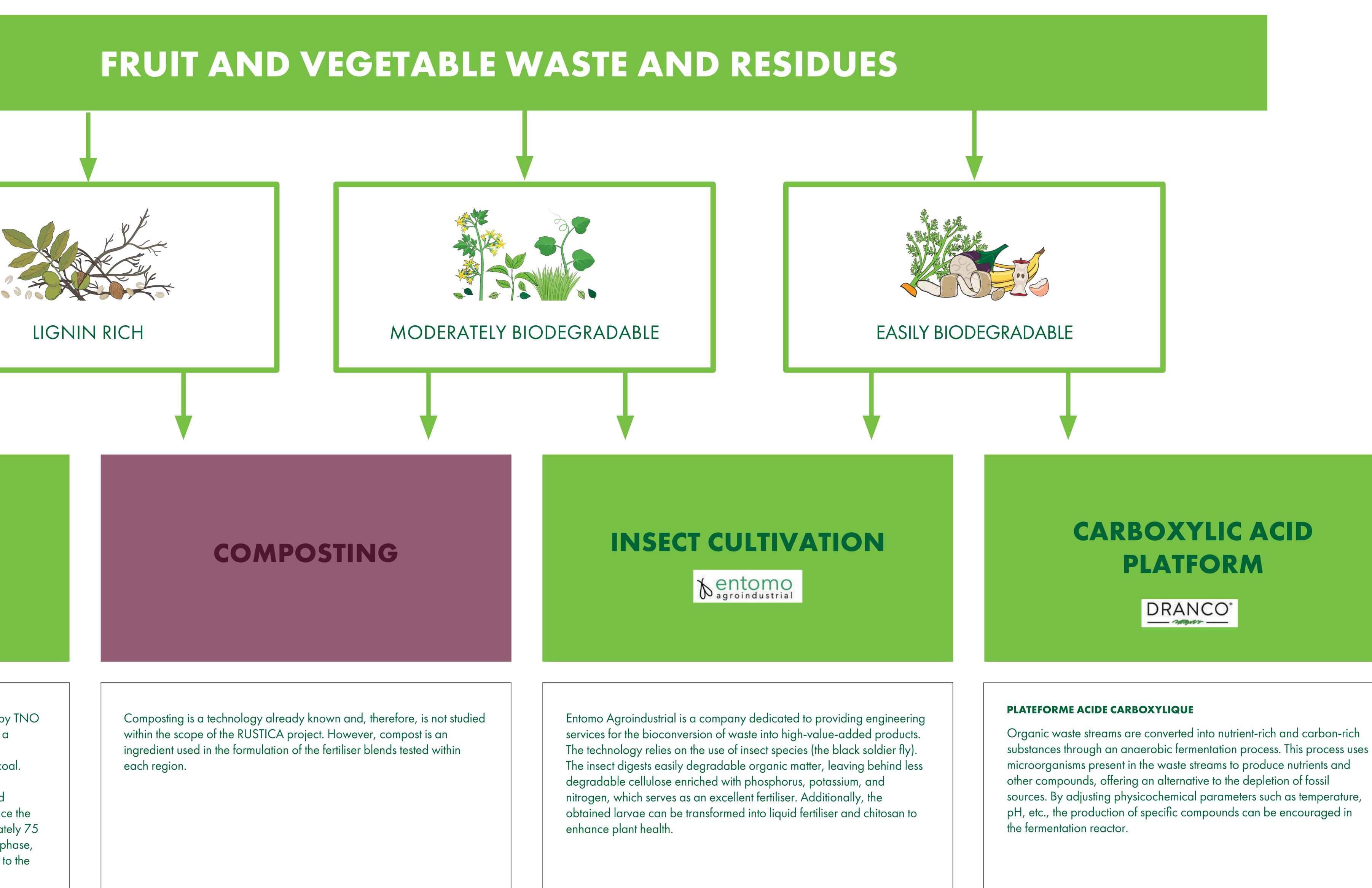
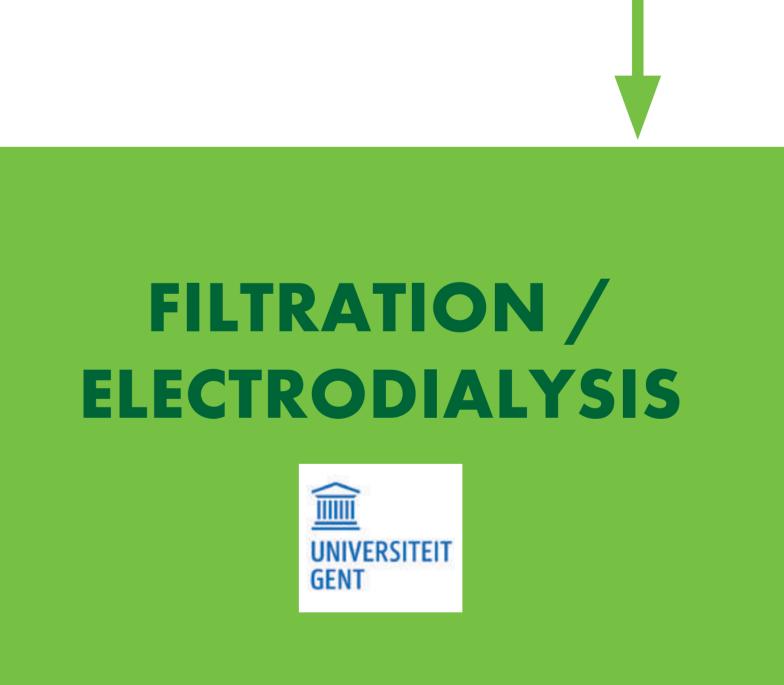


**PYROLYSIS** TNO innovation for life

The biochar production technology developed in a pilot facility by TNO is called ENERCHAR. It is based on a grate gasifier technology, a conventional method applied under gasification conditions. This technology allows for the co-production of bioenergy and charcoal. Under gasification conditions, lignocellulosic bio-residues are devolatilized and the resulting solid material is highly porous and carbon-rich. The released gaseous phase is a fuel that can replace the use of natural gas for electricity and heat production. Approximately 75 to 80% of the bio-residues (dry) are converted into the gaseous phase, and 20 to 25% into biochar. The biochar is analysed according to the European Biochar Certificate to ensure its quality.

## **O** IS THE 5 TECHNOLOGIES OF THE RUSTICA PROJECT





Electrodialysis (ED) is based on electrochemistry. It is fuelled by a complex solution derived from the anaerobic fermentation of food waste, composed of mineral nutrients (e.g., K+, NH4+, NO3-, PO43-, also known as NPK) and volatile fatty acids (VFA). An electric field is applied in an ED stack consisting of multiple ion-exchange membranes, where NPK is selectively separated from the VFA in the solution. This separation process results in a highly pure NPK solution. However, the minerals are further concentrated to produce a value-added liquid nutrient concentrate (NPK).

MICROBIAL **CULTIVATION** Avecom

The CAP water, derived from Dranco technology, is delivered to Avecom, mixed with nutrients, and diluted with tap water. This organic-rich liquid fraction is then continuously introduced into an aerobic fermentation process. Subsequently, the effluent from the process is dehydrated by centrifugation, and finally, the microbial protein paste is dried by spray drying to obtain a powder as the end product.