

CircuTray-UP – Circular economy for PET trays in food packaging

Resource-efficient Circular Economy – Plastic Recycling Technologies (KuRT)

The “CircuTray-UP” research team is working on new sorting and processing technologies for PET trays. The aim is to produce new, safe food packaging from this food and non-food packaging. On a technical scale, “CircuTray-UP” is demonstrating a process for recycling PET packaging.

The project is being funded as part of the funding initiative “Resource-efficient Circular Economy – Plastic Recycling Technologies (KuRT)”. “KuRT” is part of the BMBF research concept “Resource-efficient Circular Economy” and is aimed at high-quality recycling of plastics.

Circulation for post-consumer PET trays

PET trays are used in everyday life for packaging foodstuffs such as meat, fish, fruit and vegetables or takeaway products, but they are also widely used in the non-food sector. The trays are made from the same material as beverage bottles: polyethylene terephthalate (PET). There is a widespread, well-established, and successful recycling scheme for this plastic.

At present, PET trays are not recycled to a high standard using current technology. This applies to both mono material and multi-layer composites with PE or other polymers. They are sorted into PET fractions in lightweight packaging sorting plants (LVP). A considerable proportion of this material then ends up in energy recovery and is lost to the PET cycle.

The low level of processing of post-consumer PET trays is mainly due to the high proportion of foreign plastics (PE, EVOH, EVA, PUR) and tray-specific material properties. These have a detrimental effect on processing plants that are geared towards PET bottles. In addition, food and non-food trays are collected together via the dual systems. This calls into question the food compliance of reuse in the food sector.

Recycling through optimised separation technology

The “CircuTray-UP” researchers’ approach: The implementation phase starts with currently available PET tray fractions, which are obtained in modern waste sorting plants. They contain far too much foreign material for direct reutilization. The three project partners – the Fraunhofer Institute for Process Engineering



PET trays are used in the food and non-food sectors.

and Packaging IVV, SRH Kunststoffe and Unisensor – are working on the positive sorting of mono-PET trays and subsequent optimized mechanical processing. In the further course of the project, Fraunhofer IVV and LÖMI will produce PET recyclates from residue fractions with a high proportion of multi-layer PET sorting fractions and process residues – using physical solvent-based recycling. The Öko-Institut is analyzing the innovative products and processes and assessing their sustainability.

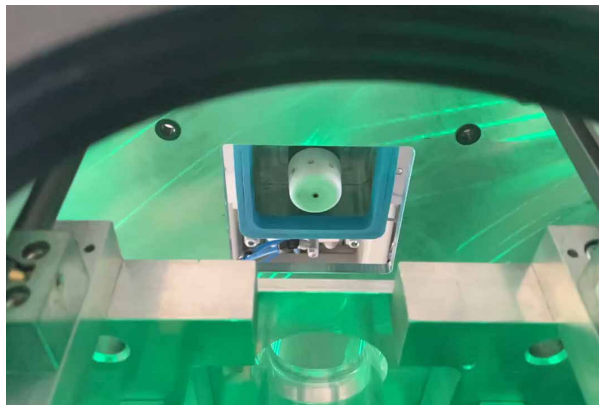
In a further step, the companies Reifenhäuser and silver plastics will process the PET recyclates into films, laminate them with a migration barrier made of virgin PET and thermoform trays.

Fraunhofer IVV will test the function of the barrier, thus guaranteeing the safe use and recyclability of the trays at the end of their life.

Great potential for circularity

The concept has great potential for the circular economy: around 430 kilotonnes of PET recyclates are currently produced each year, of which only 162 kilotonnes are reused in food packaging in the form of PET bottles. If the PET trays collected by the dual systems in Germany – around 120 kilotonnes – could be processed into high-quality PET and made food-safe, the yield could be almost doubled. In addition, the comprehensive recycling of PET trays is currently the only way to provide PET recyclates for the production of PET trays without disrupting the established PET bottle cycle.

The PET processor SRH and the PET tray manufacturer silver plastics are responsible for implementing the project results. The plant manufacturers Reifenhäuser and LÖMI will provide the necessary equipment for the closed-loop value chain. Accompanying communication of the results with other participants in the value chain is intended to support the rapid and comprehensive implementation of the technologies in the European economic area.



A thermoforming test rig for PET recycling.

Funding initiative

Resource-efficient Circular Economy – Plastic Recycling Technologies (KuRT)

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CircuTray-UP – Innovative technologies for implementing a circular economy for PET trays in food packaging

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Contact

Dr. Martin Schlummer
Fraunhofer Institute for Process Engineering and Packaging IVV
Giggenhauser Str. 35
85354 Freising, Germany
Phone: +49 8161 491750
E-mail: martin.schlummer@ivv.fraunhofer.de

Project partners

SRH Kunststoffe; silver plastics GmbH & Co. Kommanditgesellschaft; Reifenhäuser Cast Sheet Coating GmbH & Co. KG; UNISENSOR Sensorsysteme GmbH; LÖMI GmbH Großostheim; Öko-Institut. Institut für angewandte Ökologie e. V.

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