Master's thesis

Energy- and Resource-Efficient Washing and Extrusion in Plastics Recycling towards Food-Grade Quality

AEE - Institute for Sustainable Technologies (AEE INTEC)

AEE INTEC was founded in 1988 and is now one of Europe's leading applied research institutes in the field of renewable energy and resource efficiency. In the three target group areas of *Buildings, Cities & Networks* and *Industrial Systems* as well as three technological working groups *Renewable Energies*, *Thermal Storage* and *Water and Process Technologies* the range of R&D projects carried out extends from basic research projects to the implementation of demonstration plants.

Research project

The master's thesis is part of the FFG project **"greenPLAST-food" – Green Plastic Recycling Factory for Food Contact Materials**, which develops sustainable and energy-efficient processes for recycling polypropylene (PP) and polyethylene (PE) packaging waste into high-quality food-grade recyclates. The work focuses on optimized decontamination and energy efficiency.

Master thesis

The master's thesis investigates the washing and extrusion processes in plastics recycling, focusing on decontamination efficiency, energy use, and material quality. Process conditions (e.g. water input, temperature, extrusion parameters) will be analyzed regarding their impact on contamination removal, recyclate quality and energy efficiency, contributing to optimized and climate-friendly recycling.

The tasks of the master's thesis include:

- Washing trials with the friction washer at the LIT Factory (JKU Linz)
- Extrusion experiments under varying parameters to assess process stability and material quality
- Evaluation of decontamination efficiency before and after processing
- Data evaluation and analysis, including material characterization, flake cleanliness, and literature review

What we look for

- Solution-oriented, creative, independent, and reliable way of working
- Basic knowledge of mass- and energy balances and laboratory work
- Willingness to travel to Linz for experimental work at the LIT Factory (all travel costs covered)
- Openness to working with large-scale recycling equipment (shredder, friction washer, extruder)
- Motivation to conduct analytical work in the laboratory at AEE INTEC in Gleisdorf

We offer

- Paid master's thesis with close involvement in an ongoing research project
- Support from experienced employees, competent technical support
- *Duration:* around 6 months, from November 2025

Contact

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