RECLAIM

AI-driven portable, robotic material recovery facility for remote areas

Objective: To develop the first portable, robotic **Material Recovery Facility** (**prMRF**) tailored to local-scale material recovery

Decentralised processing of waste for small, less accessible regions

Cost-effective solution due to no cost for transporting waste to central MRFs

Industrial-level efficiency in sorting recyclable waste

Increased material recovery due to the processing of high quality (fresh & non-compacted) waste

Consortium:

FORTH Foundation for Research and Technology - Hellas

L-Università ta' Malta

KU LEUVEN

Hellenic Recovery Recycling Corporation

IRIS

ROBENSO We sort recyclables

AIMPLAS Plastics Technology Centre

AXIA INNOVATION

ISWA International Solid Waste Association

ΣΦΟΔΣΑ ΙΟΝΙΩΝ ΝΗΣΩΝ

The RECLAIM project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement no. 101070524.

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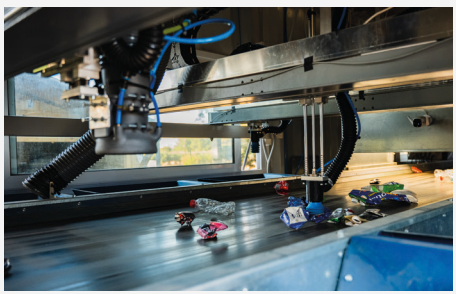
Technologies

RECLAIM improves and exploits technology in robotics, computer vision and AI to achieve fully automated local-scale material recovery with industrial-level efficiency.

Improve robotic technology used for recyclable recovery

Results achieved:

- **Piston-driven vacuum grippers** efficiently pick waste, greatly lowering cost of waste
- **Each €50K robotic picker does 30 picks/min** offering the most picks per euro in market
- **Robust design, durable and reliable performance** in challenging environments
- **Modular grippers** can be easily swapped to deal with different waste compositions
- **Easy robot maintenance** with the rest of the prMRF fully functional



- **High airflow gripper** rapidly sorts small/mid-size waste without transferring to collection bins, reducing sorting time

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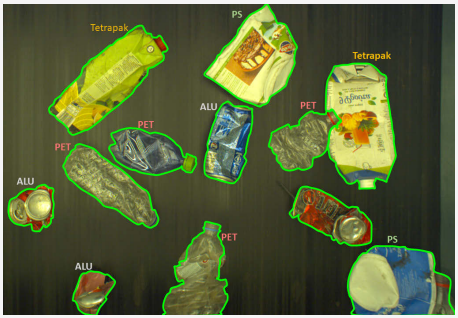
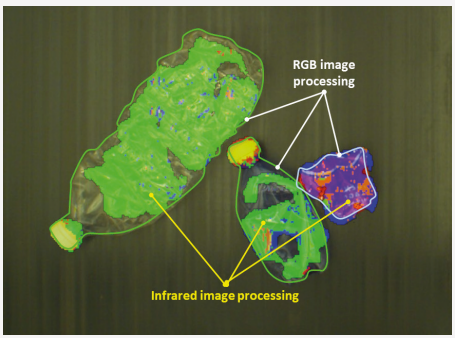
Technologies

Artificial Intelligence for recyclable waste identification, categorisation and localisation

Results achieved:

- **AI-driven computer vision** is trained with 1 million prMRF images to help achieve 90% accuracy on waste to material mapping
- **Fast image processing** with 10 frames per second for improved waste identification
- **Infrared waste categorisation** based on chemical properties achieves 90% accuracy in material chemometrics
- **Machine Learning-based** fusion of RGB and infrared data boosts waste categorisation accuracy to 99% and increases purity of recyclables





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Project Impact:

Operational Efficiency of prMRF
Results achieved:

Demonstrates the feasibility of decentralised waste processing which enables the development of new policies at local, national, and EU levels.

prMRF operation reduces CO2 savings
Results achieved:

Automated, robotic waste sorting process contributes to material recycling and the reduction of 310 kg of CO2 per hour.

Consortium:

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