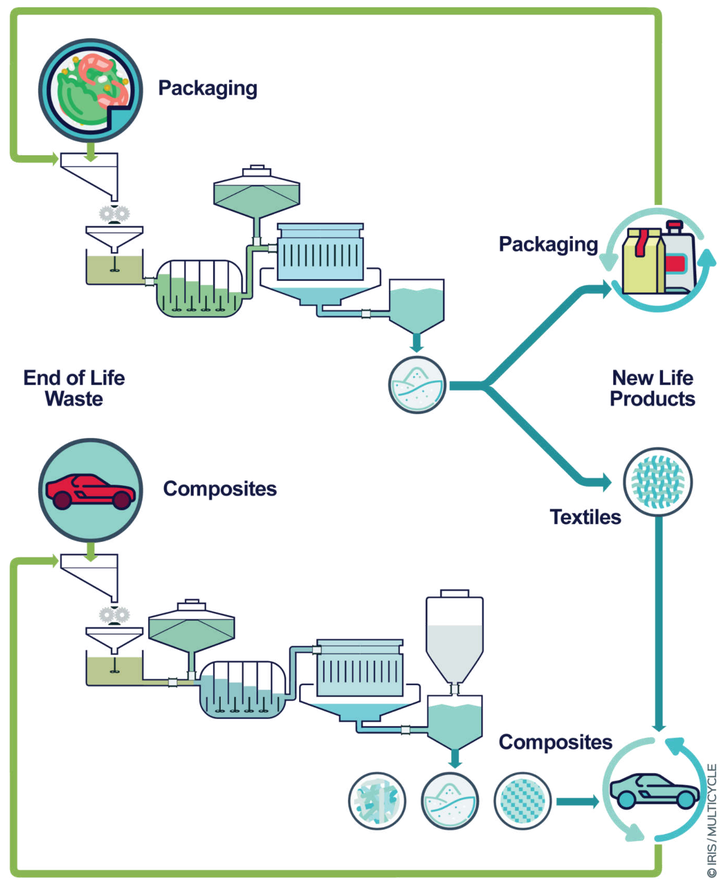
multicycle

Advanced and sustainable recycling processes and value chains for plastic-based multi-materials

Project Essentials

- Nov 2018 – Oct 2021: Innovation Action delivering an **industrial recycling pilot plant for thermoplastic-based multi-materials allowing selective recovery of pure plastics and fibres from mixed wastes without downgrading**
- Based on patented CreaSolv® process
- Demonstrating **shift to a circular economic model** in multilayer packaging / flexible films and fibre-reinforced thermoplastic automotive composites - potential in many others segments

CreaSolv® trademark registered by CreaCycle GmbH



Key Features

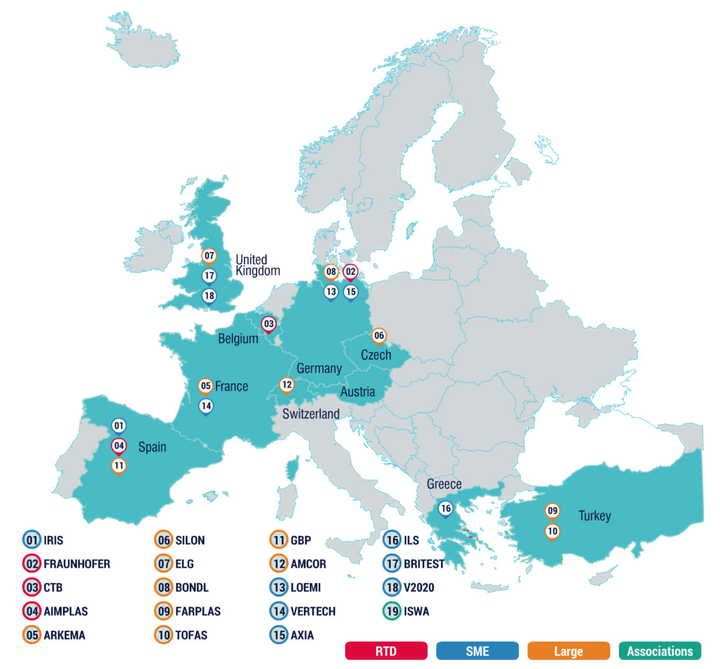
- **Process upscaling, optimisation and digitalisation** for industrial readiness (TRL7)
- Recovery of pure plastics and fibres from mixed wastes - **direct substitution** of virgin resources
- Processing and formulation of **recovered materials into valuable products –** multiple packaging, composite / textile semi-finished and final demonstrators targeted
- Confirmation of impacts through **techno-economic feasibility** and **environmental, social and economic sustainability** evaluations

Underpinning Exploitation

- **Training / capacity building** programme for current and future workforce in plastics recycling
- **Decision support systems** and **policy recommendations** promoting waste management and resource efficiency improvements
- **Circular Plastics Helix** within the CrowdHelix Network as a hub for a permanent virtual community accelerating innovation

One year in...

- **Representative industrial scrap and post-consumer wastes extensively sampled,** including all major classes of flexible packaging thermoplastics (both single polymer and multi-materials), and automotive carbon and glass reinforced plastic composites
- Lab characterization and small-scale batch pilot experimentation - **critical process parameters for stable plant operation identified**
- Different photonic techniques screened and combined to monitor packaging and composite waste feedstock and an **AI-equipped PAT platform being assembled**
- Pilot plant design programme underway
- Recovered material streams generated for further evaluation



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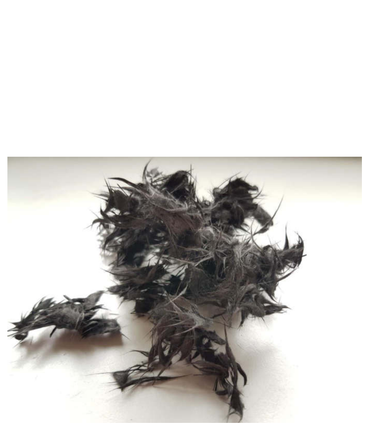
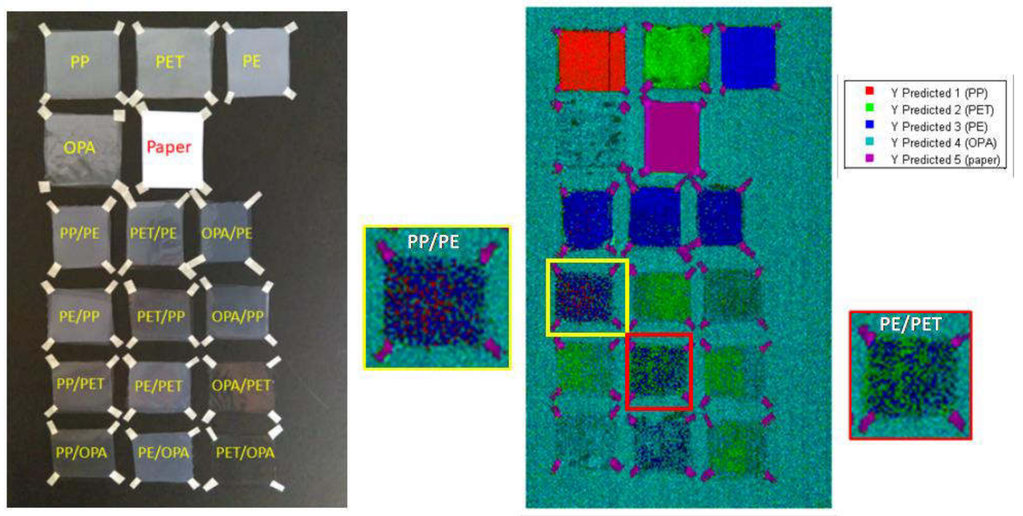
From waste...



...to new materials

Treatment of end of life flexible film and automotive scrap yields both high purity mono-polymers and recovered reinforcing fibres



A combination of direct imaging (left) and HSI monitoring (right) of various mono- and multilayer films shows the ability to identify single and combined materials.

Coming up...

- Finalised **pilot plant assembled and commissioned** with installed control hardware / software platform during Q2 2020
- **Production of significant quantities of secondary raw materials** for subsequent validation and demonstration of reuse in a variety of packaging and automotive applications

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