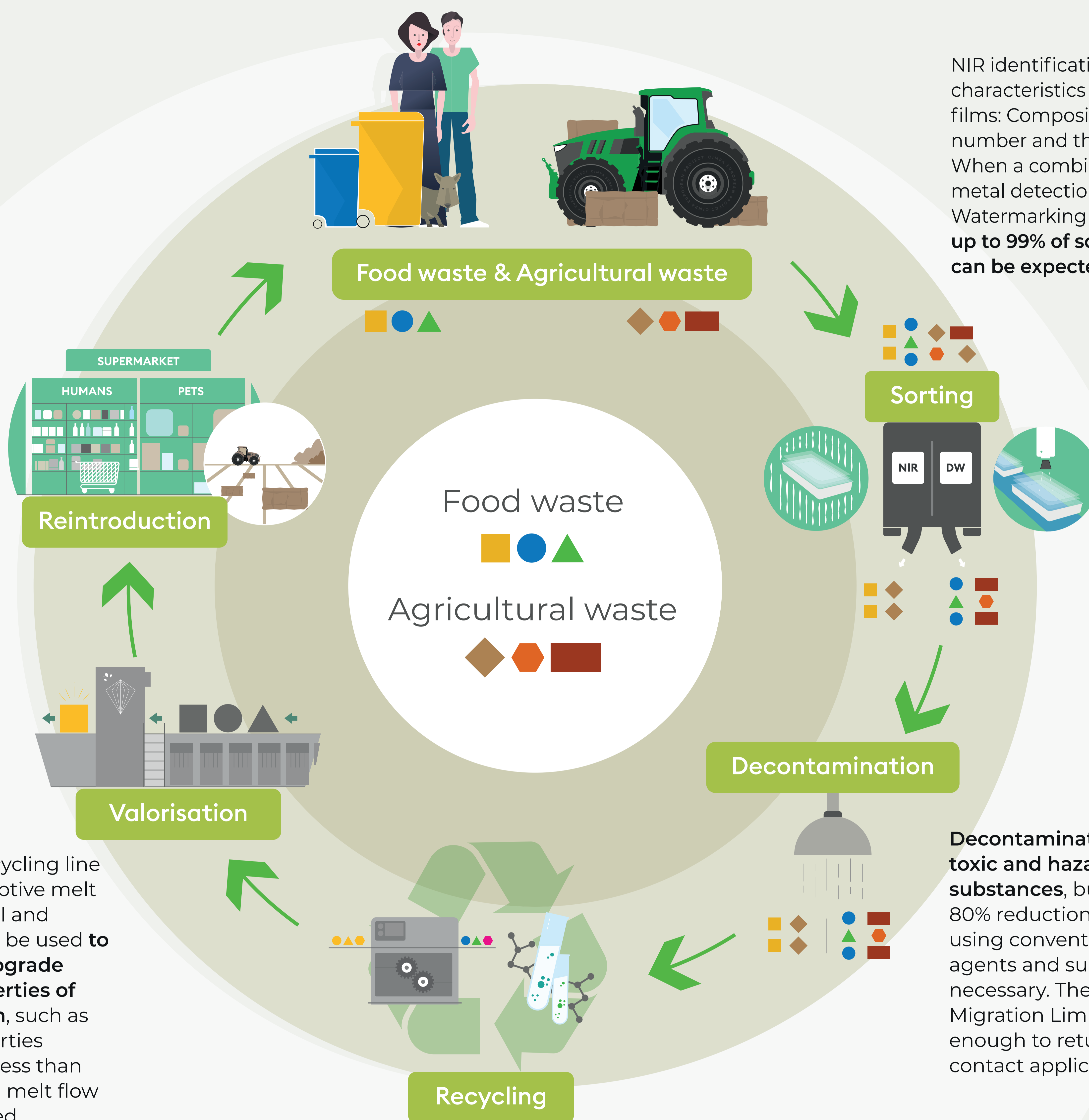




cimpa

a circular multilayer plastic approach for value retention of end-of-life multilayer films



NIR identification relies on inner characteristics of the multilayer films: Composition, transparency, number and thickness of layers... When a combination of NIR, metal detection and Digital Watermarking is used, **up to 99% of sorting efficiency can be expected.**

A novel pilot recycling line with in-line adaptive melt rheology control and addition will be used to **stabilize and upgrade targeted properties of recycled stream**, such as melt flow properties (targetting e.g. less than $\pm 15\%$ variance in melt flow index for recycled feedstock).

Physical recycling is based on dissolution and precipitation of the polyolefin contained in the **multilayer films that cannot be mechanically recycled**. The process uses a low boiling point solvent, and up to 90% recovery of the PO present should be reached.

The objective of **mechanical recycling is to make new high gas barrier films**. 2 innovative processes will be used : continuous extensional flow mixing and multinanolayering extrusion. Bi-axial stretching can also improve the barrier properties if needed.

Decontamination will remove toxic and hazardous substances, but also more than 80% reduction of VOCs, by using conventional stripping agents and supercritical CO₂ if necessary. The Overall Migration Limit should be low enough to return to food contact applications.

Legislation & Standards

The recycling processes will be developed according to current European legislation. **Modification of such legislation and standards could be proposed** to increase multilayer films recyclability.

New design

New designs will be proposed including :
 Multilayer structures more recyclable
 Multilayer compositions including recycled materials

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Partners

