

ELIOT aims to provide new innovative and green technologies for EoL of commonly used natural fibres and biobased resins with increased resource efficiency and fully align these biomaterials with the circular economy principles.

To this end, the project is being proposed and developed innovative solutions for the EoL of the new generation of biocomposites by:

Different EoL approaches are being evaluated, including mechanical, thermal, chemical and biological methods for waste recovery and recycling. A comparison of the advantages and disadvantages of the EoL methods in terms of cost and environmental sustainability are being conducted.

ELIOT sets the basis for a wider uptake of biocomposite materials in the aircraft industry (and other industrial sectors using composite materials) by providing cost-effective methods for their EoL treatment.

1. Reviewing the current treatment technologies for conventional FRP composite waste.
2. Evaluating their potential suitability to be applied to the biocomposite waste and selecting those treatment alternatives that appear as the most feasible.
3. Tailoring the selected treatment technologies to the characteristics of biocomposites and testing them at laboratory scale.
4. Demonstrating their technical feasibility and life-cycle sustainability under pre-industrial scale.

RESULTS:

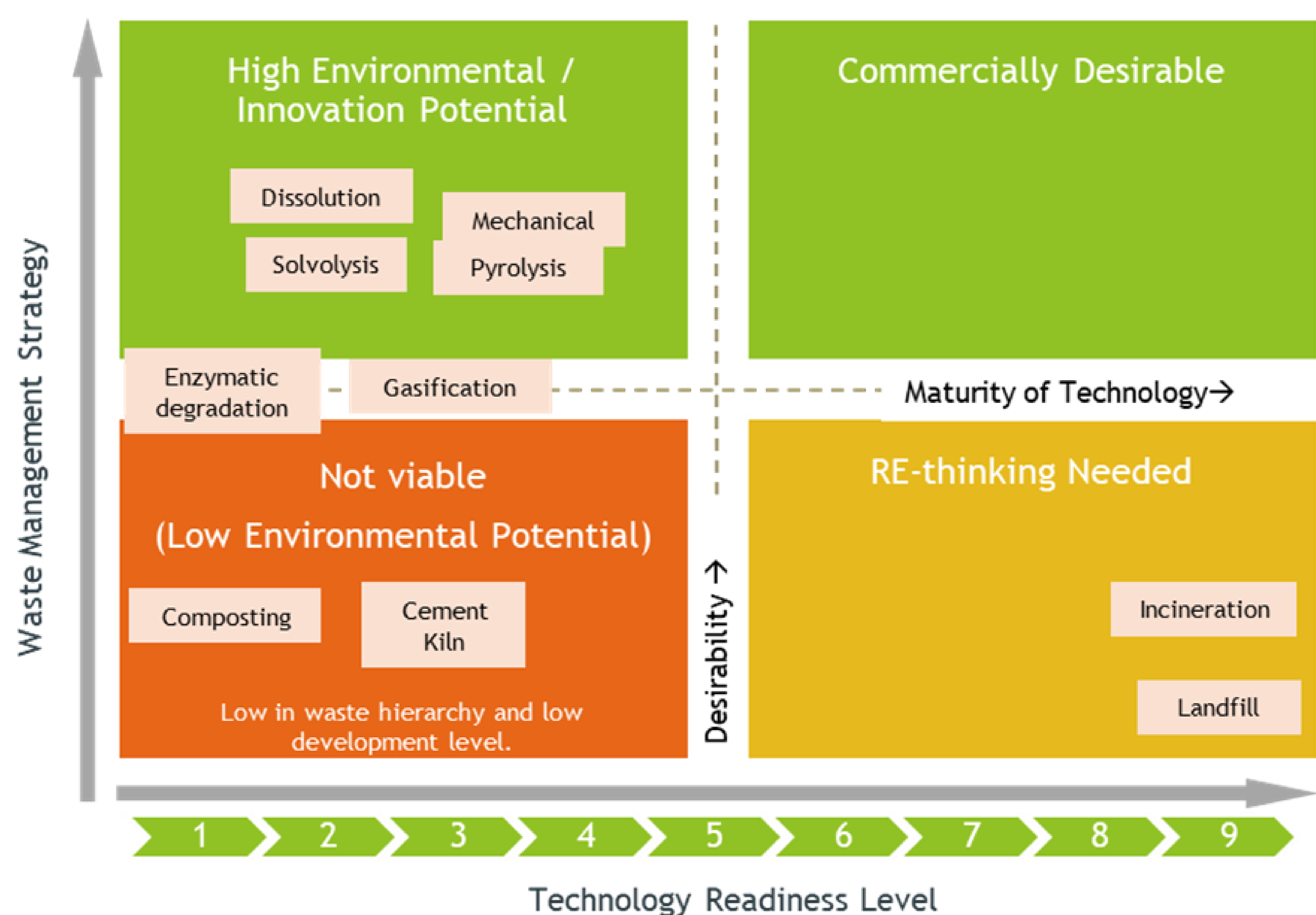
After a multi-criteria decision analysis (MCDA), four EoL technologies were selected (figure 1), and they were tested at laboratory scale for biocomposites made of:

- Carbon fibre and bioepoxy resin
- Flax fiber and bioepoxy resin
- Basalt fibre and PFA (poly furfuryl alcohol) resin

Figure 1 shows the results of this MCDA and the technologies selected were the following:

- Mechanical recycling
- Conventional pyrolysis
- Solvolysis
- Dissolution

Figure 1: TRL versus waste management strategy for the EoL technologies evaluated by the MCDA



The next step of the project is the selection of the two best EoL technologies based on the laboratory scale results and try them at pilot plant scale together with the LCA data collection.

ELIOT will set the basis for a wider uptake of biocomposite materials in the aircraft industry (and other industrial sectors using composite materials) by providing cost-effective methods for their EoL treatment.