附件1. 领域说明

**1. Specific Challenge**

The global market for plastics continues to grow due to their physical properties and benefits such as light weight, reduction of food waste, durability and cost. After being used, plastics should be separated in order to be subject to the most appropriate waste treatment processes. This is increasingly difficult and inefficient due to, for example, consumers' inaccurate identification of the appropriate types of plastics for recycling. Other plastic types, such as polystyrene, can even not be recycled if they have traces of food.

Despite the worldwide efforts for degradation or recycling, large amounts of mixtures of plastics and other polymers end up in landfills or are used for the generation of energy. These methods lead to environmental contamination through the production of CO2 or due to plastics reaching water courses and the sea where they persist and become toxic for the whole food chain. Novel biotechnological approaches should be applied for the sustainable biological degradation of mixtures of recalcitrant and degradable plastics.

**2. Scope**

Proposals will develop environmentally friendly and sustainable solutions for managing the waste of plastics mixtures based on the use of communities of microorganisms with a set of complementary enzymes. The enzymes may be native or engineered using state of the art biotechnologies. The microbial organisms will turn plastic mixtures into chemical constituents facilitating mineralisation, composting of otherwise recalcitrant and toxic polymers and facilitating production of high value products. Polymers such as polystyrene can also be included in the proposals.

Proposals should:

* produce cocktails of enzymes using communities of microorganisms capable of degrading mixtures of biodegradable and currently non-biodegradable plastics into more basic chemical constituents;
* use a multidisciplinary approach based on biotechnology;
* create high value products and valorise mixed plastic waste.