附件1. 领域说明

**1. Specific Challenge**

Environmental pollution is a major global issue affecting natural resources and the environment in generic terms and creating important concerns for human health in particular. Pollutants resulting from human action are detrimental to ecosystems at different functional levels, representing an important economic load for society.

Standard remediation strategies have different levels of efficiency; in certain cases they increase the health risk of workers or simply postpone the problem. Advanced bioremediation approaches, which use naturally occurring microorganisms, in the form of emerging technologies for the treatment of contamination in various ecosystems foresee more sustainable and gentle alternatives to physicochemical options. These technologies comprise, amongst others biomineralisation, electrobioremediation, microbe-assisted phytoremediation, protein and metabolic engineering, nano-biotechnology and systems biology.

While the merits of using microorganisms to depollute their environment and to transform harmful contaminants into harmless end-products are well known (environmental friendliness, low toxicity), a number of challenges remain. These include for instance, their effectiveness to treat in treating compounds that are biodegradable (e.g. toxic metals), time efficiency, specificity of the environment, level of concentration of the contaminants, the combined biological activity of the microbial community over time and space and the consumption of energy.

**2. Scope**

Proposals should cover the following activities:

· Research and innovation for efficient and low cost remediation strategies using microorganisms by means of emerging biotechnologies that require minimum or zero external energy or chemicals and that reduce the remediation time;

· Work to ensure remediation in soil, sediments, mines, surface water, groundwater or industrial water;

· Develop a system to remove different contaminants, including complex mixtures, covering hydrocarbons and their derivatives, recalcitrant compounds, metals, nanomaterials, paints and coatings, nutrients, pharmaceuticals or micropollutants and toxic contaminants;

· Include field trials to prove an acceptable performance for field applications will be a plus.

This topic is part of the EU-China flagship initiative on Biotechnology for Environment and Human Health, which will promote substantial coordinated and balanced research and innovation cooperation between the EU and China. China-based legal entities have to apply for funding under the Chinese co-funding mechanism with the National Natural Science Foundation of China (NSFC).

Activities should start at TRL[[1]](#footnote-2)3 and achieve TRL 6 at the end of the project.

Expected impact:

· Remediation of at least two toxic contaminants of different nature;

· Proof of the feasibility to scale up the technology for field testing, including an assessment of the related environmental benefits and risks;

· A quantified demonstration of the benefits compared to standard physicochemical remediation approaches, in particular regarding time and energy efficiency.

· Relevant indicators and metrics, with baseline values, including demonstration activities should be clearly stated in the proposal.

1. TRL概念及相关要求详见：https://ec.europa.eu/research/participants/data/ref/h2020/other/wp/2018-2020/annexes/h2020-wp1820-annex-g-trl\_en.pdf [↑](#footnote-ref-2)