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NSFC-FUNDED CONSORTIUM

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Project website: www.electra.site



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**ELECTRICITY
DRIVEN
LOW ENERGY
AND
CHEMICAL INPUT
TECHNOLOGY
FOR
ACCELERATED
BIOREMEDIATION**

A Flagship project of the EU-China Cooperation Initiative. It is a 4-year Research Innovation Action consisting of one EC- funded consortium working closely together with a NSFC-funded Chinese consortium.



THE ELECTRA PROJECT

The ELECTRA consortium aims to jointly develop and test highly innovative BES-based bioremediation technologies at the laboratory scale in environmentally relevant conditions and bring the four most efficient technologies to the field in both China and Europe.

The scientific hypothesis of ELECTRA

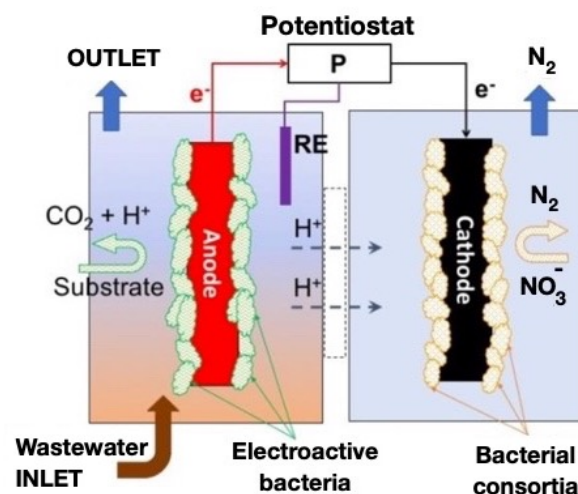
In the environment, electron flow typically limits degradation, and is difficult to control; this major hurdle can be overcome with electromicrobiology. Microorganisms interacting with solid state electron donors or acceptors can be deployed within many different matrices, for tackling different pollutants and using diverse technological approaches minimizing or eliminating energy and/or chemical needs.

ELECTRA technologies are expected to perform better in terms of risk management, energy consumption and chemicals requirement than standard physico-chemical remediation approaches.

ELECTRA's experts will deliver innovative environmental BES-based biotechnologies, tailored for different environmental matrices and accelerating the elimination of several classes of pollutants and mixtures thereof in these matrices including wastewater, groundwater and solid matrices such as flooded soils and sediments.

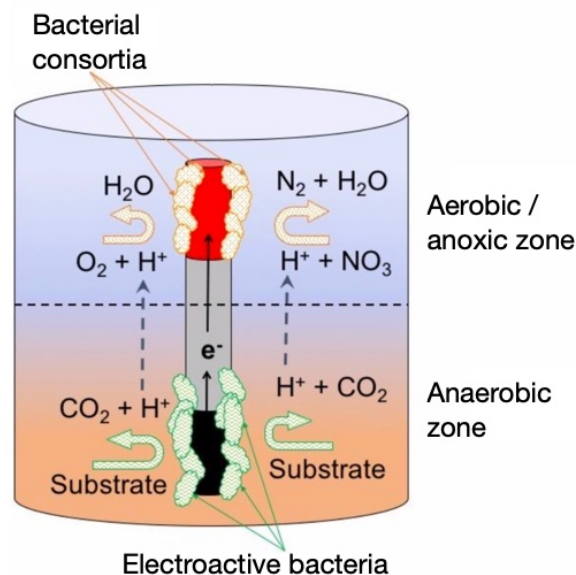
Contaminants addressed: **Hydrocarbons** and their halogenated derivatives; **Metals** (Sb, Pb, As, Hg, Cd, Zn); **Nutrients** (NH_4^+ and NO_3^-); **Emerging micropollutants:** antibiotics, flame retardants, endocrine disrupting chemicals and pesticides.

Typical BES technologies



Adopted from Ramirez-Vargas et al., Water 10: 1128 (2018)

Wastewater treatment technology



Adopted from Ramirez-Vargas et al., Water 10: 1128 (2018)

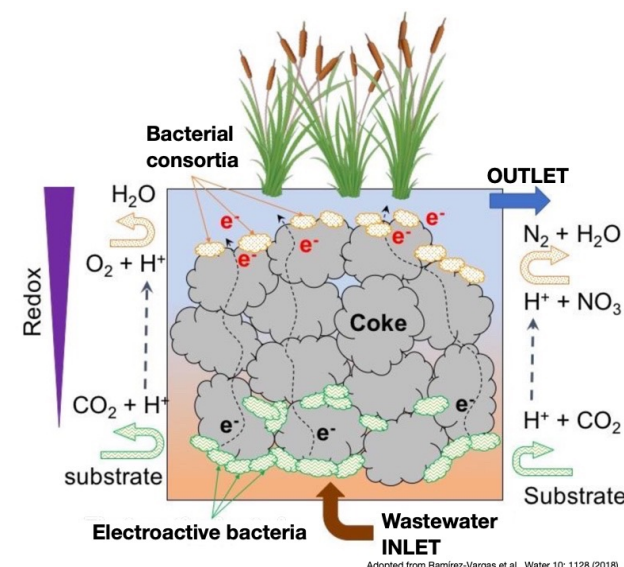
SNORKEL Technology

ELECTRA TECHNOLOGIES

ELECTRA will lift bio-electrochemical systems (BES) to a next level for field applications and in-situ remediation of pollutants.

The ELECTRA consortium is working on bringing from TRL 3 to TRL 5 the following BES-based technologies:

- Tubular BES Technologies (4)
- Fluidized BES Technology
- Cassette System
- Snorkel Technology
- Redoxstat Technology
- Alternately Polarized Electrodes Technology
- METland Technology
- Conductive Nanoparticles
- Biogenic Nanoparticles
- BES-enhanced Phytoremediation



Adopted from Ramirez-Vargas et al., Water 10: 1128 (2018)

METland technology