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Bioelectrochemical systems for enhancement and monitoring of waste treatment

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Treating environmental contaminants is a very important, and largely overlooked, environmental issue, that has received considerable public attention over the last few years.Bioelectrochemical systems (BESs) have gained increasingly popularity over the last years especially in monitoring and clean-up of contaminants. BES are systems that combine wastewater treatment with energy production and resource recovery by harness the electro-activity of microorganisms.There have been recent reports of researchers developing large scale BES systems based around water and waste water treatment systemsand how they can occur naturally around stable groundwater plumes. These approaches use a proprietary mix of micro-organisms to maximise electricity and power output, we however focused on the naturally occurring microbial consortia at the site to maximise degradation capacity rather than power output and upcycle waste biomass materials in the form of Biochar as a cheap and sustainable electrode material in different scales.Current production monitoring used as a real-time view of the process. For further understanding of the results, further geochemical analysis was performed to provide additional insight on the process. This works shows clearly the applicability and efficiency of such systems in the remediation process and can be used as a non-destructive way to indirectly reveal process leading in understanding basic fundamental physical behaviours under specific conditions.