

HUMANFORHYDRO: Valorization of ligno-HUMic-like compounds derived from sewage sludge for the degradation of organic pollutants and production of HYDROgen



HUMANFORHYDRO

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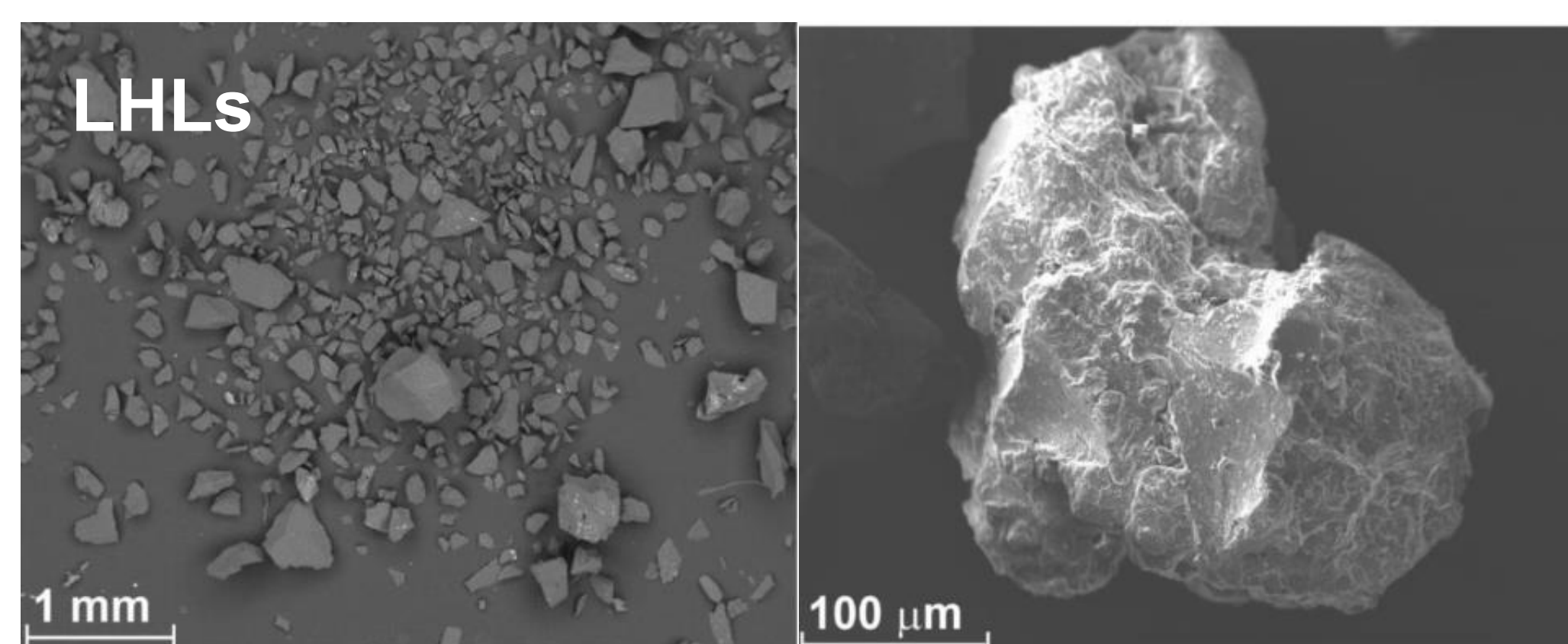


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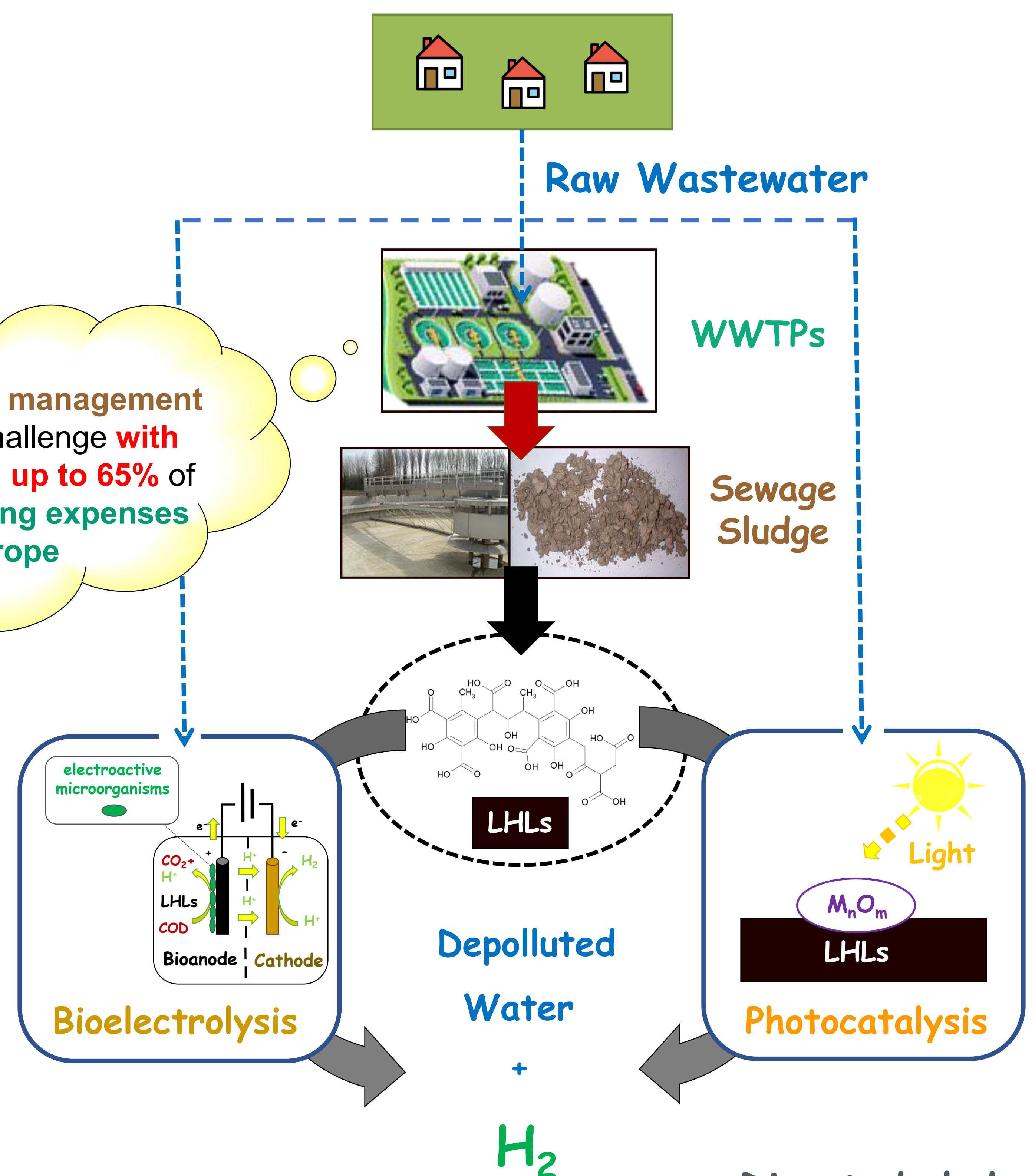
Introduction

Increasing restrictions on conventional disposal methods have prompted strategies to recover valuable sludge components such as lipids, proteins, carbohydrates and fibrous materials for conversion into biofuels, platform chemicals, or fertilizers, thereby reducing waste and supporting a circular economy



Among these fractions, Ligno-Humic-Like compounds (LHLs), up to 30% of sludge mass, remain underutilized. Their aromatic and redox-active properties make them effective electron shuttles and supports for photocatalysis, enhancing pollutant degradation and hydrogen production

Sewage sludge management is a growing challenge with costs reaching up to 65% of WWTP operating expenses in Europe



Project Objectives and Consortium



Objectives

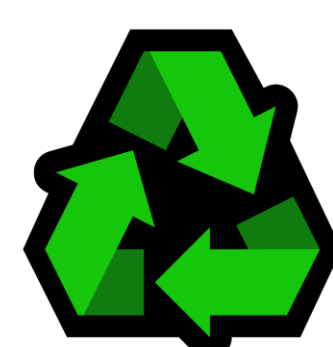
Development of innovative de-hydrogenative processes suitable to achieve synergically the remediation of polluted aquatic streams (wastewater), the exploitation of ligno-humic-like compounds (LHLs) largely present in sewage sludge and generation of clean energy, thus favouring circular economy



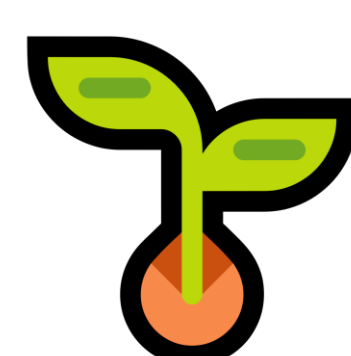
Methodologies

- Isolation and characterization of LHLs extracted from Sewage Sludge
- Synthesis and characterization of metal oxides supported onto LHLs
- Wastewater treatment and H₂ production (Bioelectrolysis and Photocatalysis)

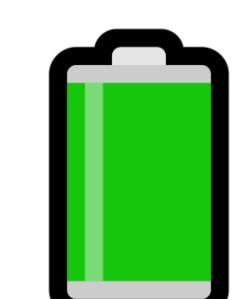
Expected results and impact



Resource Recovery



Environment
Pollutant degradation
Reduced impact



Improved Technologies
bioelectrolysis & photocatalysis



Energy
H₂ production

Implementation

Different types of Sludge (Primary Sludge, Sewage Scum and Digested Sludge) from different wastewater treatment plants will be analysed and characterized

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