

# The potential of Phytoremediation derived maize biomass for the production of biomethane via Anaerobic Digestion.

Ana Maria Paulo<sup>1</sup>, Paula M.L. Castro<sup>1</sup>, Ana P.G.C. Marques<sup>1\*</sup>

<sup>1</sup>Universidade Católica Portuguesa, CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Rua de Diogo Botelho, 1327, 4169-005 Porto, Portugal

**Abstract.** Maize is an energetic plant with ability for heavy metals removal from contaminated soil. The growth and ability for heavy metals removal by this energetic culture was tested using an industrialised soil contaminated with zinc (Zn) and cadmium (Cd) vs. an agricultural soil. Plants biomass production and metal accumulation was monitored and resulting biomass (roots, stems and cobs) was used for biogas production in several biomethane assays (BMP) in a factorial design with different inoculum to substrate ratios being tested. The biogas produced during the anaerobic digestion was monitored until stable production and its composition was analysed through gas-chromatography. It was possible to observe that maximum methane production seems to be proportional to the amount of anaerobically degradable substrate and is quickly obtained (ca. 8 days after incubation). It was also noticeable that the metals present in the industrial soil were not damaging to the anaerobic biodegradation of the biomass. The production of biomethane from metal contaminated soils' phytoremediation derived maize biomass appears thus as a possibility to counterpart biogas production in an increasingly demanding status of renewable energy requirements.

Please help us understand your paper better by completing below form, and it will not be published

<b>First Author</b>	Position: Dr.
	Research Field: Aerobic and anaerobic biological treatment processes; Physiology of bacteria involved in the biodegradation of pollutants
	Homepage URL: <a href="https://www.cbqf.esb.ucp.pt/en/CV-Ana-Maria-da-Silva-Paulo">https://www.cbqf.esb.ucp.pt/en/CV-Ana-Maria-da-Silva-Paulo</a>
<b>Second Author</b>	Position: Prof.
	Research Field: Developing bioprocesses and nature based solutions, including biodegradation of pollutants and wastewater treatment and soil phytomanagement combined with the recovery of biobased products, and microbial assisted crop production in forestry and agriculture.
	Homepage URL: <a href="https://www.cbqf.esb.ucp.pt/en/docentes-paula-castro-en">https://www.cbqf.esb.ucp.pt/en/docentes-paula-castro-en</a>
<b>Third Author</b>	Position: Dr.
	Research Field: Remediation of disturbed soils using plant-based technologies ; Energy solutions from biomass
	Homepage URL: <a href="https://www.cbqf.esb.ucp.pt/en/CV-Ana-Paula-Guimaraes-Correia-Marques">https://www.cbqf.esb.ucp.pt/en/CV-Ana-Paula-Guimaraes-Correia-Marques</a>

\* Corresponding author: [amarques@ucp.pt](mailto:amarques@ucp.pt)