

<https://doi.org/10.7250/CONNECT.2023.086>

THE RAW MATERIAL BASE OF BIO-WASTE FROM PROCESSING AS AN OPPORTUNITY FOR THE DEVELOPMENT OF THE BIOGAS SECTOR IN POLAND

Piotr Jurga^{1*}, Rafał Pudelko², Stelios Rozakis³, Krystian Mocny⁴

^{1,2,4} *Department of Bioeconomy and Systems Analysis, Institute of Soil Science and Plant Cultivation, State Research Institute (IUNG-PIB), 24-100 Pulawy, Poland*

³ *Bioeconomy and Biosystems' Economics Lab, School of Environmental Engineering, Technical University of Crete, 73100 Chania, Greece*

* **Corresponding author.** E-mail address: pjurga@iung.pulawy.pl

Abstract – Given the current geopolitical situation, as well as ongoing climate change, immediate action is imperative to develop sustainable energy production capacities and circular bioeconomy chains. The biogas sector, including 3rd generation biogas plants, can respond to intensive development pace ensuring sustainable energy production with lower carbon footprint. This is true for Poland, which has a highly developed agricultural and food production sector but a limited number of biogas plants and no biomethane production facilities. In this study the authors' objective is to support evidence-based policy advice by providing spatial analysis of bio-waste production potential in Poland. For this purpose, data was extracted from the so-called Waste Database (Polish: Baza Danych o Odpadach – BDO) and presented at district (powiat) level. Spatial and Geographical Information System (GIS) was applied to allocate waste resource potential for Poland related to national and regional development of biogas sector in the country. Thus the functioning of a system for the registration of waste data, including bio-waste from processing, is an outcome to demonstrate available resource availability per each manufacturing sector. Results indicate that Poland does have a quantitative and qualitative bio-waste potential for biogas production. Most of the bio-waste is not treated in the districts where it is generated. Having knowledge of the geographical distribution of the feedstock supply and demand, together with the use of other substrates, the authors can provide valuable information for the development of the biogas sector at regional and national level.

Keywords – *Bioeconomy; biogas; bio-waste; GIS; Poland*

Acknowledgement

We would like to thank Małgorzata Wydra for her help with editing the English manuscript of this paper.