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Projects in last 5 years (chronological); with distinction into PI (kierownik) and RF (wykonawca):	<p>1) Białowiec A. 2016-2018. Optimization of biogas production in the Periodic Anaerobic Bioreactor in Bartosowe Kosiny. Works commissioned by Novago sp. o.o. - PI,</p> <p>2) Białowiec A., Pulka J., Tyburczy A. 2017. Research on the properties of wastes extracted from the Periodic Anaerobic Bioreactor in Kosiny Bartosowe - sector 1. The basis of the research is the agreement on the performance of research works entitled "Investigations of properties of wastes extracted from the Periodic Anaerobic Bioreactor in Kosiny Bartosowe", Works commissioned by Novago sp. o.o. - PI,</p> <p>3) Białowiec A., Pulka J., Woźniakowski B. 2017. Research on the properties of wastes extracted from the Periodic Anaerobic Bioreactor in Kosiny Bartosowe - sector 2. Works commissioned by Novago sp. o.o. - PI,</p> <p>4) Białowiec A., Stępień P. 2017. Research on the average domestic price, average price in the Lower Silesian Voivodship, the average price in the north-central region of the Lower Silesian Voivodship for the acceptance by the installation of waste code 200201 (biodegradable green waste), taking into account the impact of the type waste treatment technology code 200201 for the above prices and regarding the specified, in the Provincial Waste Management Plan for the province of Lower Silesia for the years 2016-2022, the amount of 260 PLN / Mg as the average cost of processing waste 200201 in RIPOK MBP + green, in terms of correctness of its determination waste treatment technology 200201. Works commissioned by WPO Alba SA - PI,</p> <p>5) Białowiec A., Liszewski M., Bąbelewski P., Pietr S., Stegenta S., Sobieraj K. 2017. Selection of the composition of substrates based on the best-terra compost and composting technology at the factory composting plant at the "Boguszowice" sewage treatment plant. as part of the Bon for Innovations program Project number: POIR.02.03.02-24-0019 / 17 - PI,</p> <p>6) Białowiec A., Woźniakowski W., Wróbel J., Moskal H., Kaldun B. 2005-2018. Grant from program 1 / 1.1.1 / 2015 action 1.1.1. PO IR POIR (NCBiR) "An innovative technological line for the conversion of organic waste into innovative, high-quality solid fuels". Beneficiary: Ekopartner-Recykling sp. o.o. Project number: UDA-POIR.01.01.01-00-0334/15. Function: Director of the Research and Development Department.</p> <p>7) Białowiec A., Liszewski M., Bąbelewski P., Medyńska-Juraszyk A., Pietr S. 2018-2019. Supervision of certification of substrates and plant cultivation aids prepared from waste components being at the disposal of Best-Eko sp. z o.o sewage sludge, selectively collected ashes and composts. Works commissioned by Best-Eko sp. o.o. - PI</p> <p>8) Scientific internship at Iowa State University, Department of Agricultural and Biosystems Engineering, in the period from 01/08/2018 to 30/04/2019 as part of the Fulbright Senior Award, title of the research project "Research on pollutants emission from Carbonized Refuse Derived Fuel into environment" - PI,</p> <p>9) Białowiec A., Stegenta S., Fugol M., Prask M. 2019 Development of an innovative, effective method of biological biomass purification in anaerobic conditions - a project implemented as part of the Bon for the innovation program. Project number: POIR.02.03.02-10-0024/18 - PI</p> <p>10) Białowiec A., Sygula E. 2020-2024 "Investigation of the influence of technological parameters of pyrolysis and substrate properties on the release of volatile organic compounds from biochar. NCN funding, Preludium BIS program, decision number DEC-2019/35/O/ST8/03353 - PI.</p>
Research topic and funding	
1) PhD topic:	The research on the enhancement of the biomethane production from biowaste by the addition of modified carbon materials
2) Research discipline in Doctoral School	Environmental Engineering, Mining and Energy
3) Short description of the research problem to be solved in the PhD:	<p>Carbon materials (CM) including biochar, hydrochar and activated carbon can promote methane production rate, however, it is still unknown which one is the best and which property of CM is most closely related to the improvement of biomethane production rate.</p> <p>Scientific aim of the project is the determination of the mechanism of the influence of carbon materials on the biomethane production and the possibilities of carbon materials properties modification to achieve the highest yield of the biomethane.</p> <p>Hypotheses:</p> <p>The CM with the higher buffering capacity (BC), caused by higher alkalinity, cationic exchange capacity, and presence of functional groups, will mitigate the H⁺ from hydrolytic phase and stabilize the pH conditions preferable for methanogenic microorganisms;</p> <p>The CM with the highest sorption capacity (SC), caused by the high specific surface area cationic exchange capacity, and presence of functional groups, will mitigate the toxic by-products of anaerobic digestion of organic matter and regulate the biodegradable organic compounds availability for heterotrophic microorganisms</p> <p>The CM with the highest electric conductivity (EC), caused by cationic exchange capacity, and presence of functional groups and minerals, will enhance the direct interspecies electron transfer.</p> <p>Biochars with lower zeta potential (ZP) selectively immobilize sulfate reducing bacteria on the surface resulting the higher densification of methanogens in the solution and exclusion of other groups of microorganisms.</p>
4) Professional skills for PhD candidate (e.g. master program, specializations, softwares, language, analytical techniques):	A Ph.D. candidate should have research experience in the field of biomass and biowaste management, biochar production and application. Should have an education related to environmental or process or agricultural engineering or environmental protection or environmental biotechnology. Should have the ability to mathematical modeling of biochemical processes. Demonstrate scientific achievements in the form of scientific publications in JCR journals, participation in international conferences, initiative, and readiness to undergo internships at a foreign research center. The candidate's scientific interests should be related to the mechanism of organic matter decomposition, biotechnology, mathematical modeling of processes, and data processing. The candidate should have experiences in innovations. The candidate should have at least B2 level English language skills.
5) Details of the project to support PhD research	
a) Project title:	none
b) Agreement number:	none
c) Number of months in the project to support PhD (in months; starting from 1st of October 2021):	0
6) Project website:	