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<b>UPWr Base of Knowledge - link</b>	<a href="https://bazawiedzy.upwr.edu.pl/info/seam?id=UPWR903a39c81e8e493eb3646a16ed2782f5&amp;affil=&amp;lang=pl">https://bazawiedzy.upwr.edu.pl/info/seam?id=UPWR903a39c81e8e493eb3646a16ed2782f5&amp;affil=&amp;lang=pl</a>
<b>Researchgate:</b>	<a href="https://www.researchgate.net/profile/Andrzej_Bialowiec">https://www.researchgate.net/profile/Andrzej_Bialowiec</a>
<b>Personal website / Working group website:</b>	<a href="https://upwr.edu.pl/en/research/leading-research-group/waste-and-biomass-valorization-group-wbvg">https://upwr.edu.pl/en/research/leading-research-group/waste-and-biomass-valorization-group-wbvg</a>
<b>Projects in last 5 years (chronological; with distinction into PI (kierownik) and RF (wykonawca)):</b>	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>4) Białowiec A., Stepien 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.</li> <li>5) Białowiec A., Liszewski M., Bąbelski P., Pietr S., Stegata 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 "Boguzowice" sewage treatment plant, as part of the Bon for Innovations program Project number: POIR.02.03.02-24-0019 / 17 - PI.</li> <li>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.</li> <li>7) Białowiec A., Liszewski M., Bąbelski 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</li> <li>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.</li> <li>9) Białowiec A., Stegata 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</li> <li>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.</li> </ol>
<b>Research topic and funding</b>	
1) PhD topic:	Research on the release of volatile organic compounds from carbonized solid fuel produced from municipal solid waste
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>Recent work showed that carbonized solid fuel (CSF) produced from municipal solid waste (MSW) due to torrefaction, may be used to replace fossil fuels. Besides the positive effects of CSF, some negative effects, including the release of volatile organic compounds (VOCs) have also been reported. However, a detailed understanding of the reasons for such negative effects has not been investigated and understood deeply yet. Contaminants, including VOCs within CSF, may pose an environmental and human health risk. Since there are only a limited number of reported studies on the presence of VOCs in CSF and the quantitative studies of VOCs emission from CSF.</p> <p>Humans can be exposed to CSF-associated (toxic) VOC's directly through inhalation of particles. Such exposure can pose a significant threat to human health due to the toxic, mutagenic, and carcinogenic effects of VOCs emitted from CSF. During handling, storage, and application of VOC-rich CSF, the people involved could be exposed to VOCs which could be a health and safety hazard. Unfortunately, there is limited systematic information on the impact of various torrefaction conditions and the composition of processed MSW feedstock on the emission of VOCs from CSF.</p> <p>The scientific aim of this project is the qualitative and quantitative characterization of the VOCs emission from CSF in relation to torrefaction temperature and the content of fabrics, kitchen waste, paper, different plastics, rubber, wood, and its mixtures.</p> <p>It is hypothesized that it is possible to mitigate the VOCs emission from CSF by optimization of the torrefaction conditions and controlling of the MSW feedstock components (fabrics, kitchen waste, paper, different plastics, rubber, wood) content.</p> <p>The execution of the studies on the mechanism of VOCs emissions, including the kinetics of the emission from CSF is important to environmental engineering, mining, and energy discipline. It is expected that results obtained on heterogeneous type of feedstock – MSW, will provide the procedure of CSF quality and human health risk evaluation, which could be used for examination of CSF obtained from other types of MSW. This opens a wide niche for investigation in fundamental science, e.g., explanation of VOCs formation and emission mechanism, the potential impact of VOCs on workers during CSF storage.</p> <p>The project has an interdisciplinary character, and will include the following tasks:</p> <p>Task 1. CSF generation from MSW – the aim of the task will be the production of CSF from the 12 components of MSW and 66 mixtures (between the components) under controlled conditions of torrefaction.</p> <p>Task 2. Determination of physical, and chemical properties of MSW components, and generated CSFs – the aim of the task will be the physical and chemical characterization of feedstock and CSF for evaluation of the phenomenon of pollutants transformation during thermal treatment.</p> <p>Task 3. Investigation of the VOCs emission from CSF - the aim of the task will be the characterization of VOCs emission from CSF to air, and the evaluation of the human risk by modeling of VOCs concentration level during the storage and comparison with human health threshold values.</p> <p>Task 4. Determination of the model of the impact of technological parameters of CSF production and the MSW feedstock quality on the VOCs emission from CSF – the aim of the task will be the building the mathematical model, which may be useful for prediction of the potential risk posed by CSF to the environment and human health.</p> <p>Task 5. The validation of the model of the impact of technological parameters of CSF production and MSW feedstock quality on the VOCs emission from CSF – the aim of this task is to validate obtained model predictions (task 4) with the result of the VOCs emission from CSF produced from real MSW. This task will be done during the Ph.D. student internship at Iowa State University.</p>
4) Professional skills for PhD candidate (e.g. master)	A Ph.D. candidate should have research experience in the field of biomass and biowaste management. Should have an experience in torrefaction and pyrolysis or biogas research. Experience in physical and chemical analysis of biochar, waste, solid fuels. Experience in regression analysis. Should have an education related to waste management and renewable energy. Should have the ability to perform the statistical analysis. Demonstrate scientific achievements in the form of scientific publications in JCR journals, participation in conferences, initiative, and readiness to undergo internships at a foreign research center. The candidate should have at least B2 level English language skills.
5) External research funding	The doctoral dissertation will be implemented as part of the NCN project - Preludium BIS 2
a) Project title:	Research on the release of volatile organic compounds from carbonized solid fuel produced from municipal solid waste
b) Agreement number:	Decision number: DEC-2020/39/O/ST8/02750
c) Number of months in the project to support PhD (in months; starting from 1st of October 2020):	48
6) Additional information:	<p>Employment conditions:</p> <ul style="list-style-type: none"> <li>- scholarship duration: 48 months, starting from 01.10.2021</li> <li>- scholarship: PLN 5,000 (gross) before evaluation, PLN 6,000 (gross) after evaluation (the amount may include public and legal burdens in accordance with applicable laws regulations)</li> <li>- the scholarship is granted in accordance with the rules contained in the granting of scholarships in research projects regulations financed by the National Science Centre (NCN)</li> <li>- the student will be required to realization the 6-month foreign research internship financed by the National Agency for Academic Exchange (NAWA) in 2024 at Iowa State University, requiring additional application.</li> </ul>
7) The following documents should be attached to the application	<ol style="list-style-type: none"> <li>1. Cover letter</li> <li>2. CV</li> <li>3. List of scientific achievements including scientific papers, participation in conferences, research projects, scholarships, patents, and other activities</li> <li>4. Document confirming the average grade for first or second cycle studies or uniform master's or equivalent studies (certificate from the dean's office or diploma supplement containing information on the average; grade average - should be provided without thesis and diploma examination).</li> <li>5. Copy of the diploma of completion of first or second-cycle studies or uniform Master's or equivalent studies or a photocopy of the original of the diploma certified as a true copy by a notary public or a certificate (template at the bottom of the page) from the relevant dean's office confirming the completion of the study program together with information about the planned date of defense (it is required providing a diploma of completion by September 1 of the year of recruitment). Please see the information: "legalisation of diploma" <a href="https://upwr.edu.pl/en/research/upwr-doctoral-school/recruitment-2/information-for-foreigners">https://upwr.edu.pl/en/research/upwr-doctoral-school/recruitment-2/information-for-foreigners</a></li> <li>6. 2 letters of recommendation about suitability for scientific work</li> <li>7. Documentation confirming knowledge of foreign languages at the required level (certificates, certificates issued by the organizational unit responsible for teaching a foreign language at a given university).</li> <li>- list of certificates confirming knowledge of foreign languages.</li> <li>8. Documentation confirming the achievements demonstrated in the list of scientific achievements</li> </ol>
8) Deadline for submission	27.07.2021, 23:59 CET
9) Form of submission	Pursuant to the recommendations of the Ministry of Science and Higher Education, the application documentation should be provided only via e-mail to the address Szkoła.doktorska@upwr.edu.pl with the note Preludium Bis 2 Andrzej Białowiec
10) Competition settlement conditions	<p>Evaluation of the candidate's competences and achievements 28.07.2021</p> <p>Announcement of the results of the recruitment on 30.07.2021</p>