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Personal website / Working group website:	
2) Research discipline represented by supervisor	Environmental Engineering, Mining and Energy
3) Professional development (Degrees and Titles in chronological order year, month):	2012 academic degree – post-doctoral degree of technical sciences, discipline - environmental engineering, specialty - waste management, obtained at Gdańsk University of Technology, Faculty of Civil and Environmental Engineering, 2005 academic degree - doctor of agricultural sciences, discipline – environmental management, specialty - waste management, obtained at the University of Warmia and Mazury in Olsztyn, Faculty of Environmental and Agricultural Development, 2000 academic degree - master's degree, engineer, specialization - environmental protection, specialization: water and wastewater technology, obtained at the University of Warmia and Mazury in Olsztyn, Faculty of Environmental Protection and Fisheries.
Previous experience in working with PhDs (in chronological order year, month)	
- defended PhDs (name, title, date):	1) PhD. Eng. Sylwia Stegenta "Abiotic and biotic determinants of CO emission in the composting process", public thesis defense on 08.05.2018, University of Life Sciences in Wrocław, Faculty of Life Sciences and Technology, Supervisor. Doctoral dissertation with honors. 2) PhD. Eng. Jakub Pulka. "Technical and environmental conditions of sewage sludge torrefaction", public defense of doctoral thesis on 10.07.2018, Warsaw University of Technology, The Faculty of Building Services, Hydro and Environmental Engineering, Supervisor.
- commenced PhDs, with official approval from the discipline/faculty council (name, title):	1) 2016 open doctoral program, Wrocław University of Environmental and Life Sciences, Faculty of Life Sciences and Technology, Supervisor. 2) Krzysztof Rać "The degradation of organic matter under conditions of hyperbaric composting of agricultural waste". 2017 open doctoral program, Wrocław University of Environmental and Life Sciences, Faculty of Life Sciences and Technology. Supervisor. 3) Paweł Stępień "Modeling and identification of torrefaction parameters of organic waste" 2017 open doctoral program, Warsaw University of Technology, The Faculty of Building Services, Hydro and Environmental Engineering, Supervisor.
- PhD supervision, before official approval from the discipline/faculty council (name, title):	1) Kacper Świechowski - The influence of selected properties of biochar on the methane fermentation process.
5) Projects in last 5 years (chronological; with distinction into PI (kierownik) and RF (wykonawca)):	1) Białowiec A. 2013-2014: ERANET: SE Bioemethane. Small but efficient - Cost and Energy Efficient Biomethane Production. Co-financing amount: PLN 250,000. Team leader in the company Instytut Energii sp. o.o. 2) Białowiec A. 2013-2014 Investigation of mass change of stored municipal waste in compressed form. Works ordered by Zakład Usług Komunalnych "USKOM" sp. o.o. based in Mława - project manager, 3) Białowiec A., Stegenta S., Bukowski P. 2014-2015. Emission tests of bio-stabilization reactors of the Bio-Com under-size fraction in Zakład Sita Starol Sp. z o.o. in Chorzów. Works commissioned by Selma - project manager, 4) Białowiec A., Stegenta S., Bukowski P. 2015. Research on the intensity of the occurring oxidative biological changes in prisms for biostabilization of the undersown fraction. Works ordered by Miejskie Przedsiębiorstwo Oczyszczania w Warszawie sp. o.o. - project manager, 5) Białowiec A., Pulka J. 2015. Studies on the morphological and fractional composition of municipal waste subjected to mechanical processing in the Regional Municipal Waste Treatment Plant in Lubawka, province Lower Silesia. Works commissioned by Przedsiębiorstwo Gospodarki Komunalnej "Sanikom" sp. o.o. - project manager, 6) Białowiec A. 2016-2018. Optimization of biogas production in the Periodic Anaerobic Bioreactor in Bartosowe Kosiny. Works commissioned by Novago sp. o.o. - project manager, 7) 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. - project manager, 8) 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. - project manager, 9) 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

6) Most important publications from last 5 year (JCR) / patents from last 5 years (maximum 5):	<p>1) Białowiec A., Pulka J., Stepien P., Manczarski P., Golaszewski J. 2017. The RDF/SRF torrefaction: An effect of temperature on characterization of the product - Carbonized Refuse Derived Fuel. Waste management, 70, 91-100. Doi: https://doi.org/10.1016/j.wasman.2017.09.020</p> <p>2) Stegenta S., Dębowski M., Bukowski P., Randerson P.F., Białowiec A. 2018. The influence of foil reactors perforation on greenhouse gases emission rate during aerobic biostabilization of the undersize fraction of municipal wastes. Journal of Environmental Management. 207, 355-365. Doi: https://doi.org/10.1016/j.jenvman.2017.11.054</p> <p>3) Białowiec, A., M. Micuda, J.A. Koziel. 2018. Waste to carbon: densification of torrefied refuse-derived fuel. Energies, (11)11, 3233; doi: 10.3390/en11113233.</p> <p>4) Dudek, M.; Świechowski, K.; Manczarski, P.; Koziel, J.A.; Białowiec, A. The Effect of Biochar Addition on the Biogas Production Kinetics from the Anaerobic Digestion of Brewers' Spent Grain. Energies 2019, 12, 1518. Doi: https://doi.org/10.3390/en12081518</p> <p>5) Białowiec, A., J.A. Koziel, P. Manczarski. 2019. Stomatal conductance measurement for toxicity assessment in zero-effluent constructed wetlands: effects of landfill leachate on hydrophytes, International Journal of Environmental Research and Public Health, 16(3), 468; doi: 10.3390/ijerph16030468</p>
7) Do you plan to seek support of second supervisor?	YES
First and Last Name:	Jacek Koziel
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2) Research discipline represented by second supervisor	Other
3) Professional development (Degrees and Titles in chronological order year, month):	<p>Ph.D. ('98) Civil Engineering, University of Texas at Austin; MS ('93) Environmental Quality Engineering, University of Alaska Anchorage; MS ('89) Mechanical Engineering, Warsaw University of Technology</p> <p>Professor (7/18-present), Associate Professor (7/07-6/18), Assistant Professor (8/04-6/07) Agricultural and Biosystems Engineering, Iowa State University, Ames, IA</p> <p>Assistant Professor (7/00-8/04), Texas Agricultural Experiment & Extension Service, Texas A&M University, Amarillo, TX</p> <p>Fulbright Scholar (9/15-6/16), Wroclaw University of Environmental and Life Sciences, Poland</p> <p>Visiting Professor (8/08-6/09), Wageningen University & Research, Animal Sciences Group, The Netherlands</p> <p>Visiting Scientist (8/90-7//91), Fraunhofer Institute of Toxicology and Experimental Medicine, Hannover, Germany</p> <p>Postdoctoral Fellow/Research Associate (7/98-6/00), University of Waterloo, Analytical Chemistry, Canada</p> <p>Engineer-in-Training since '94, Alaska</p>
Previous experience in working with PhDs (in chronological order year, month)	
- defended PhDs (name, title, date):	<p>1) Somchai Rice, "Chemical and sensory analysis of cold-hardy grapes and wine", May 2019; 2) Simone Soso, "Simultaneous chemical and sensory analyses of semiochemicals", December 2016; 3) Patrick Woolcock, "Chemical analysis of hot gas from fast pyrolysis", May 2013; 4) Neslihan Akdeniz, "Characterization of gaseous emissions from emergency mortality composting", August 2008; 5) Ling Li, "Stack gas desulfurization with fly ash and oxidation with concomitant production of wastewater coagulants", May 2008.</p>
- commenced PhDs, with official approval from the discipline/faculty council (name, title):	
- PhD supervision, before official approval from the discipline/faculty council (name, title):	
5) Projects in last 5 years (chronological; with distinction into PI (kierownik) and RF (wykonawca)):	<p>2018. Mitigation of PRRS transmission with UV light treatment of barn inlet air: proof-of-concept. NPB. \$42K</p> <p>2018. Employing enviro. mitigation technol.: Treating swine odor and improving air quality with black light. IPPA. \$75K</p> <p>2018. Mitigation of NH3 & odor emissions; impr. indoor air quality in poultry housing w/ black UV light, USP&EA \$75K</p> <p>2018. Evaluation of current products for use in deep pit swine manure storage structures for mitigation of odors and reduction of NH3, H2S, and VOC emissions from stored swine manure. NPB. \$100K</p> <p>2015-17. Comprehensive evaluation of wet scrubber and photocatalysis technologies for mitigation of particulate matter, odor, VOCs, NH3, and H2S emissions, Indiana Soybean Alliance, \$138K</p> <p>2013-14. Improvement to the Air Management Practices Tool (AMPAT): Phase I, Indiana Soybean Alliance, \$68K</p>

6) Most important publications from last 5 year (JCR) / patents from last 5 years (maximum 5):	<p>1.Rice, S., D.L. Maurer, A. Fennell, M. Dharmadhikari, J.A., Koziel. 2019. Evaluation of volatile metabolites emitted in-vivo from cold-hardy grapes during ripening using SPME and GC-MS: a proof-of-concept, <i>Molecules</i>, 24(3), 536; doi: 10.3390/molecules24030536.</p> <p>2.Tursumbayeva, M., J.A. Koziel, D.L. Maurer, B. Kenessov, S. Rice, 2019. Development of time-weighted average sampling of odorous volatile organic compounds in air with solid-phase microextraction fiber housed inside a GC glass liner: proof-of-concept. <i>Molecules</i>, 24(3), 406; doi: 10.3390/molecules24030406.</p> <p>3.Maurer, D., J.A. Koziel. 2019. On-farm pilot-scale testing of black ultraviolet light and photocatalytic coating for mitigation of odor, odorous VOCs, and greenhouse gases. <i>Chemosphere</i>, 221, 778-784; doi: 10.1016/j.chemosphere.2019.01.086.</p> <p>4.Rice, S., M. Tursumbayeva, M. Clark, D. Greenlee, M. Dharmadhikari, A. Fennell, J.A., Koziel. 2019. Effects of harvest time on aroma of white wines made from cold-hardy Brianna and Frontenac gris grapes using headspace solid-phase microextraction and gas-chromatography-mass-spectrometry-olfactometry, <i>Foods</i>, 8(1), 29; doi: 10.3390/foods8010029.</p> <p>5.Árena, U., M. Barlaz, P. He, I.I. D'Adamo, S. Astals, J.E. Bogner, S.C. Bolyard, J.M.C. L. de Brito, P.S. Calabrò, P. Canu, C. Chroni, B. Clarke, H. Corvellec, G. Costa, M.R. Gent, A.G. Izquierdo, J.A. Koziel, N. Lapa, B. Leckner, L. Lombardi, M. Materazzi, H. Oonk, K. Pivnenko, K.R. Reddy, H. van der Sloot, J.O. Sundqvist, F. Tatàno, T. Townsend, D. Turner, J. Vehlow, T. Wang, Y. Wang, J. White, Y. Zeng, C. Zurbrugg. 2018. Thank you: A journal is as good as its reviewers. <i>Waste Management</i>, 77(7): iii-vi. doi: 10.1016/j.wasman.2018.06.050.</p>
1) PhD topic:	Carbon monoxide production intensification during biowaste composting to produce biosyngas
2) Research discipline in Doctoral School	Environmental engineering, Mining and Energy
3) Short description of the research question that are going to be solved within this PhD (minimum 1000 characters):	<p>The main goal of the research is to understand the basics of the carbon monoxide production during biowaste composting. Due to the fact that composted material is always biodegradable waste with a high carbon content, CO emission is inevitable. However, getting knowledge about its mechanisms and determining the impact of the composting process parameters will allow to control the production of this gas to minimize its release or increase it for the production of biosyngas. Biosyngas, defined as gas consisted of a hydrogen and carbon oxide, is widely used. The project assumes the exploration of knowledge about the carbon monoxide production, which has so far been considered in terms of the negative impact on the environment, so that the CO generated during biowaste composting will be considered a useful product.</p> <p>Three kinds of biowaste mixes of different fresh weight ratio will be composted in laboratory scale (branches, kitchen waste, leaves). The parameters affecting the composting process will be analyzed: organic matter content of each biowaste mixes (50, 60, 70%), process temperature (45, 55, 60°C), biowaste moisture (40, 50, 60, 70%) and oxygen saturation (5, 10, 15%). The process will be carried out in controlled temperature reactors with a volume of 0.25 or 4 L, placed in a climatic chamber with a specified temperature. Measurements of CO concentrations during the composting process will be carried out twice daily every 12 hours using thermochemical analyzer. The properties of composted biowaste will be determined as initial values as well as properties of the obtained compost to compare them with the legal requirements for composts and calculate the efficiency of the process. Based on the obtained experimental data, a mathematical model describing the phenomenon of production and intensification of CO production rate will be developed by black box type models using multiple regression, PCA, PLS analysis and/or a neural network.</p>
4) Basic professional skills for PhD candidate (e.g. master program, specializations, softwares, language, analytical techniques, minimum 500 characters):	<p>Candidate for a PhD student should have research experience in the field of biological waste treatment, including composting. He/she should have an education related to environmental engineering or waste management. Exhibit scientific achievements in the form of scientific publications in journals from the JCR list, participation in research projects, participation in international conferences, initiative and readiness to carry out internships at a foreign research center. Candidate's scientific interests should be related to the kinetics of organic matter decomposition processes, modeling the impact of technological factors on the course of the composting process and CO production. The candidate should have an English language knowledge of at least B2.</p>
5) External research funding	National Science Centre
Project title:	Carbon monoxide production intensification during biowaste composting to produce biosyngas
Agreement number:	Application submitted as part of the Preludium program - during the evaluation
Number of months in the project to support PhD (in months; starting from 1st of October 2019):	24
6) Project website:	
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