

Barbara Mendecka, PhD, Environmental Engineering

Scientific Curriculum Vitae

SURNAME	Mendecka
NAME	Barbara
DATE OF BIRTH	10/05/1986
PLACE OF BIRTH	Mikołów (Polonia)
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Summary

	Barbara Mendecka obtained her Ph.D. title at the Silesian University of Technology in 2015 with the thesis: Multi-criteria optimization of renewable energy use in the municipal sector. Her research currently focuses on the optimization of sustainable energy systems in different engineering applications oriented particularly on waste to energy, renewable energy, storage systems and refrigeration technologies. In her works, she applies thermodynamics and exergy analysis coupled to thermoecological cost, thermoeconomics, exergoeconomics, multicriteria decision making and LCA.
Statistics:	H- index - [Google Scholar]; {Scopus} [10];{9} Number of citations- [Google Scholar]; {Scopus} [187];{158}

Educational background

2015	Doctor of Philosophy in Environmental Engineering, Silesian University of Technology, Faculty of Energy and Environmental Engineering, Gliwice, Poland, 2015 (thesis: Multi-criteria optimization of renewable energy use in municipal sector)
2013	Postgraduate studies in Innovation Management, Silesian University of Technology, Faculty of Organization and Management, Gliwice, Poland
2011	Postgraduate studies in Energy Audits and Certification in Civil Engineering, Silesian University of Technology, Faculty of Energy and Environmental Engineering, Gliwice, Poland
2010	Master Degree in Environmental Engineering, with major in Municipal Power Engineering, Silesian University of

	Technology, Faculty of Energy and Environmental Engineering, Gliwice, Poland
2009	Bachelor Degree in Environmental Engineering, with major in Municipal Power Engineering, Silesian University of Technology, Faculty of Energy and Environmental Engineering, Gliwice, Poland

Certificates and courses

2018	openLCA Advanced, Life Cycle Assessment openLCA software training, Asti, Italy
2013	Innovation Manager, TUV NORD, 2013
2013	Innovative academic entrepreneurship
2011	Workshop Advanced system analysis with special stress on LCA and financial analysis
2010	Enterprising Scientist

Professional experience

06.2020 - present	Post - doc researcher
	research grant: Studio di laterizi innovativi con materiale di scarto, ING-IND/11, Tuscia University, Department Of Industrial Engineering, CINTEST - Centre for technological innovation and territorial development
01.2019 - present	Collaborator
	European Project "GEOENVI" - Tackling the environmental concerns for deploying geothermal energy in Europe, funded by the European Programme Horizon 2020, call H2020 - LC - SC3 - 2018 - Single Stage, Consorzio Interuniversitario per lo sviluppo dei sistemi a grande interfase
01.2017 - 06.2020	Post - doc researcher
	research grant: Analisi del ciclo di vita di alternative di trattamento dei residui dell' utilizzo delle olive, ING.IND/09 University of Florence, Department Of Industrial Engineering
01.2016-12.2016	Post - doc researcher
	research grant: Sviluppo ed applicazioni di metodologie LCA-oriented a support della sostenibilità nei processi produttivi e di conversione dell' energia, ING.IND/17 University of Florence, Department Of Industrial Engineering

01.2013-12.2014	Researcher
	Scientific grant: Optimization of energy and media management process in public buildings: influence of renewable energy use funded by the Ministry of Science and Higher Education within the internal target subsidy for scientific research aimed at the development of young scientists Silesian University of Technology, Institute of Thermal Technology Gliwice, Poland
09.2010-04.2013	Researcher
	National Strategic Program Integrated System for Reducing Energy Consumption in the Maintenance of Buildings, task Increase in the use of renewable energy in civil engineering (consortium leader - Silesian Technical University), project funded by the National Centre for R&D
01.2011 - 12.2012	Collaborator
	National R&D Project: Project and implementation of perimetric integrity evaluation system for a natural gas city gate station., project nr OR00 0112 12 (PBR-11/RIE-6/2010) funded by the National Centre for R&D
01.2011-12.2016	owner of Infracert: energy consulting and management, thermovision measurements
Review activities	Journals: Energy The International Journal, European Journal of Operational Research, Renewable Energy, Applied Energy, Energy Strategy Reviews, Journal of Cleaner Production, Sustainability, Wind Energy Technology, Wind Energy
	Conferences: ECOS, CPOTE, SDEWES
01.2011-present	owner of Infracert: energy consulting and management, thermovision measurements
Other	Co-author of 1 patent application related to refrigeration cycle: Cooling-heating vapor-compressor machine with no throttling system of the expansion of circulating medium
Teaching activity	2010 - 2015
	National training for regional leaders: Low-energy houses as the future in construction sector, LEED and BREEAM certification (training) 100 h Technical thermodynamics (laboratory) 120 hours Technical thermodynamics (exercises) 30 hours Heat transfer (laboratory) 30 hours Heat transfer (exercises) 60 hours Basic of municipal energy systems (project) 180 hours Financial engineering in energy sector (project) 30 hours

	Basic of metrology and experimental techniques (laboratory) 30 hours Low emission combustion and flue gas control (laboratory) 15 hours Environmental engineering in agriculture (project) 60 h Energy saving building design (laboratory) 60 h
Languages	Languages: Polish (native), English, Italian (fluent)

Patents

1. Joachim Koziół, Wiesław Gazda, Barbara Mendecka, Robert Gładysz: *Compressor-type cooling-and-heating machine with non-throttle recirculated medium expansion system*. Ref. No: PL412141 (A1) / PL225728 (B1), Year: 05/2017

Scientific publications

Books

1. Piotr Ziembicki, Joachim Koziół, Barbara Mendecka: *Zarządzanie w energetyce komunalnej*. 10/2018; Oficyna wydawnicza Uniwersytetu Zielonogórskiego., ISBN: 978-83-937619-7-5

Book Chapters

1. Barbara Mendecka, Magdalena Piłat: *Metody optymalizacji wielokryterialnej. Multicriteria optimization methods.. Przegląd uwarunkowań i metod oceny efektywności wykorzystania odnawialnych źródeł energii w budownictwie.*, Edited by Joachim Koziół, 12/2012: chapter 13: pages 261-275; Silesian University of Technology., ISBN: 978-83-7335-976-5
2. Barbara Mendecka, Joachim Koziół: *Przegląd metod modelowania procesów cieplnych w budynkach i grupach budynków. The review of heat transfer modeling method of building and complex of buildings.. Przegląd uwarunkowań i metod oceny efektywności wykorzystania odnawialnych źródeł energii w budownictwie.*, Edited by Joachim Koziół, 12/2012: chapter 3: pages 83-102; Silesian University of Technology., ISBN: 978-83-7335-976-5
3. Barbara Mendecka: *Przegląd przykładów modelowania urządzeń i elementów konstrukcji budynków do energetycznego wykorzystania OZE. Przegląd uwarunkowań i metod oceny efektywności wykorzystania odnawialnych źródeł energii w budownictwie. Praca zbiorowa. Pod red. Joachima Koziola.*, Edited by Joachim Koziół, 01/2012: pages 103-119; Wydawnictwo Politechniki Śląskiej.

Journal Publications

1. Barbara Mendecka, Lidia Lombardi; Francesco Micali.; De Risi Arturo. *Energy Recovery from Olive Pomace by Hydrothermal Carbonization on Hypothetical Industrial Scale: a LCA Perspective*. Waste and Biomass Valorization 2020, 1-17, doi:10.1007/s12649-020-01212-0.
2. Barbara Mendecka, Giovanni Di Ilio, Lidia Lombardi, *Thermo-Fluid Dynamic and Kinetic Modeling of Hydrothermal Carbonization of Olive Pomace in a Batch Reactor*, Energies. 13 (2020) 4142. <https://doi.org/10.3390/en13164142>.
3. Lidia Lombardi, Barbara Mendecka, Simone Fabrizi. *Solar Integrated Anaerobic Digester: Energy Savings and Economics*. Energies 13, (2020) 4292. <https://doi.org/10.3390/en13174292>. 2
4. Maria Laura Parisi, Melanie Douziech, Lorenzo Tosti, Paula Pérez-López, Barbara Mendecka, Sergio Ulgiati, Daniele Fiaschi, Giampaolo Manfrida, Isabelle Blanc. *Definition of LCA Guidelines in the Geothermal Sector to Enhance Result Comparability*. Energies 13 (2020): 3534. <https://doi.org/10.3390/en13143534>.
5. Barbara Mendecka, Laura Tribioli, Raffaello Cozzolino, *Life Cycle Assessment of a stand-alone solar-based polygeneration power plant for a commercial building in different climate zones*, Renewable Energy. 154 (2020) 1132-1143. ., DOI:10.1016/j.renene.2020.03.063.

6. Barbara Mendecka, Lidia Lombardi, Joachim Koziół: *Probabilistic multi-criteria analysis for evaluation of biodiesel production technologies from used cooking oil*. *Renewable Energy* 147 (2020) 2542-2553., DOI:10.1016/j.renene.2017.05.037.
7. Barbara Mendecka, Lidia Lombardi, *Life cycle environmental impacts of wind energy technologies: A review of simplified models and harmonization of the results*, *Renewable and Sustainable Energy Reviews* 111 (2019) 462-480., DOI:10.1016/j.rser.2019.05.019.
8. Francesco Micali, Barbara Mendecka, Lidia Lombardi, Marco Milanese, Giovanni Ferrara, Arturo De Risi, *Experimental investigation on high-temperature hydrothermal carbonization of olive pomace in batch reactor*, in: *AIP Conf. Proc.*, 2019. ., DOI:10.1063/1.5138845.
9. Barbara Mendecka, Raffaello Cozzolino, Martina Leveni, Gino Bella, *Energetic and exergetic performance evaluation of a solar cooling and heating system assisted with thermal storage*, *Energy*. 176 (2019) 816-829. <https://doi.org/10.1016/j.energy.2019.04.024>.
10. Martina Leveni, Giampaolo Manfreda, Raffaello Cozzolino, Barbara Mendecka, *Energy and exergy analysis of cold and power production from the geothermal reservoir of Torre Alfina*, *Energy*. 180 (2019) 807-818. ., DOI:10.1016/j.energy.2019.05.102.
11. Barbara Mendecka, Lidia Lombardi, Paweł Gładysz: *WtE efficiency improvements: integration with solar thermal energy*. *Waste Management and Research*, 37 (2019) 419-434. ., DOI:10.1177/0734242X19833159.
12. Wojciech Stanek, Barbara Mendecka, Lidia Lombardi, Tomasz Simla: *Environmental assessment of the wind turbine systems based on thermo-ecological cost*. *Energy* 07/2018; 160., DOI:10.1016/j.energy.2018.07.032
13. Barbara Mendecka, Lidia Lombardi, Wojciech Stanek: *Analysis of life cycle thermo-ecological cost of electricity from wind and its application for future incentive mechanism*. *Energy Conversion and Management* 05/2018; 170, 15 August 2018., DOI:10.1016/j.enconman.2018.05.084
14. Barbara Mendecka, Lidia Lombardi, Paweł Gładysz, Wojciech Stanek: *Exergo-Ecological Assessment of Waste to Energy Plants Supported by Solar Energy*. *Energies* 03/2018; 11(4-4):773., DOI:10.3390/EN11040773
15. Lidia Lombardi, Barbara Mendecka, Ennio Carnevale, Wojciech Stanek: *Environmental impacts of electricity production of micro wind turbines with vertical axis*. *Renewable Energy* 07/2017,, DOI:10.1016/j.renene.2017.07.010
16. Lidia Lombardi, Barbara Mendecka, Ennio Carnevale: *Comparative life cycle assessment of alternative strategies for energy recovery from used cooking oil*. *Journal of Environmental Management* 05/2017; 216., DOI:10.1016/j.jenvman.2017.05.016
17. Barbara Mendecka, Alicja Stoltmann: *Application of multi-criteria methods to compare different solutions of supplying buildings in electricity from photovoltaic systems*. *E3S Web Conf.*, 2016. 10/2016; 10:00056., DOI:10.1051/e3sconf/20161000056
18. J. Koziół, B. Mendecka: *Evaluation of economic, energy-environmental and sociological effects of substituting non-renewable energy with renewable energy sources*. *J. Sustain. Dev. Energy, Water Environ. Syst.* 3 (2015) 333-343. DOI:10.13044/j.sdewes.2015.03.0025
19. Barbara Mendecka, Joachim Koziół: *Application of the method of data reconciliation for minimizing uncertainty of the weight function in the multicriteria optimization model*. *Archives of Thermodynamics* 03/2015; 36(1):83-92., DOI:10.1515/aoter-2015-0006
20. Rynek Energii, Barbara Mendecka, Joachim Koziół: *Ocena efektów ekologicznych substytucji paliw nieodnawialnych przez odnawialne źródła energii*. *Rynek Energii* 12/2014; Nr 6(115) - 2014.
21. Barbara Mendecka, Joachim Koziół, Wiesław Gazda: *Określenie czynników determinujących nieustalony przepływ ciepła w ścianach komór chłodniczych o nieznanymi rozmiarach i właściwościach materiałowych*. *Technika Chłodnicza i Klimatyzacyjna*, 2013 | nr 12 | 534--536
22. Wojciech Kostowski, Barbara Mendecka, Krzysztof Gorny, Janusz Skorek, Damian Kasprzak, Janusz Rajnhold, Aleksandra Linkowska, Andrzej Kozik: *Designing a perimetric integrity evaluation system for a natural gas city gate station*. in: *Proc. 2012 13th Int.* DOI:10.1109/CarpathianCC.2012.6228662
23. Aleksander Nawrat, Janusz Skorek, Karol Jedrasiak, Krzysztof Daniec, Wojciech Kostowski, Roman Koteras, Adam Czornik, Barbara Mendecka, Dariusz Jarczyk, Damian Kasprzak: *Application of IR*

thermography for evaluating the integrity of a natural gas delivery station. in: Proc. 2012 13th Int. Carpathian Control Conf. ICC 2012, 2012: pp. 515-520. DOI: 10.1109/CarpathianCC.2012.6228698.

Speaker at conferences, conference proceedings,

1. Barbara Mendecka, Laura Tribioli, Raffaello Cozzolino, *A Life Cycle Assessment of a commercial standalone polygeneration power plant in different climate zones*, in: ECOS 2019 - Proc. 32nd International conference on Efficiency, Cost, Optimisation, Simulation and Environmental Impact of Energy Systems, Poland, Wrocław, 2019:
2. Lidia Lombardi, Andrea Stasio, Barbara Mendecka, Simone Fabrizi, *Solar integrated anaerobic digester as an effective contribution to the circular economy s*, in: ECOS 2019 - Proc. 32nd International conference on Efficiency, Cost, Optimisation, Simulation and Environmental Impact of Energy Systems, Poland, Wrocław, 2019:
3. Francesco Micali, Barbara Mendecka, Lidia Lombardi, Arturo de Risi, Giovanni Ferrara2, *Simplified kinetic model of HTC conversion of olive pomace*, in: ECOS 2019 - Proc. 32nd International conference on Efficiency, Cost, Optimisation, Simulation and Environmental Impact of Energy Systems, Poland, Wrocław, 2019:
4. Barbara Mendecka, Lidia Lombardi, *Techno-economic performance of concentrated solar power integration into waste to energy power plant*, in: ECOS 2018 - Proc. 31st International conference on Efficiency, Cost, Optimisation, Simulation and Environmental Impact of Energy Systems, Portugal, Guimaraes 2018.
5. Raffaello Cozzolino, Martina Leveni, Barbara Mendecka, Giampaolo Manfreda: *Cold and power from geothermal resources: orc coupled with absorption chiller-energy and exergy analysis of two case studies*. 5th International Conference on Contemporary Problems of Thermal Engineering CPOTE 201, Gliwice, Poland; 09/2018
6. Raffaello Cozzolino, Barbara Mendecka, Martina Leveni, Gino Bella: *Energetic and exergetic performance evaluations of a solar assisted adsorption chiller with thermal storage*. 5th International Conference on Contemporary Problems of Thermal Engineering CPOTE 2018, Gliwice, Poland; 09/2018
7. Barbara Mendecka, Lidia Lombardi, Joachim Koziol: *Multi-criteria analysis of biodiesel production technologies from used cooking oil..* 4th International Conference Contemporary Problems of Thermal Engineering Sustainable Energy Systems for our Common Future, 14-16 September 2016, Gliwice, Silesia, Poland; 09/2016
8. Barbara Mendecka, Lidia Lombardi, Ennio Carnevale: *Energy recovery from used cooking oil*. 4th International Conference on Sustainable Solid Waste Management, Limassol, 23-25 June 2016; 06/2016
9. Lidia Lombardi, Luca Cipriano, Ennio Carnevale, Barbara Mendecka: *Evaluation of municipal solid waste management scenarios through a LCA approach: a case study*. 4th International Conference on Sustainable Solid Waste Management, Limassol, 23-25 June 2016; 06/2016
10. Lidia Lombardi, Barbara Mendecka, Ennio Carnevale: *Environmental impacts of electricity production of micro wind turbines with vertical axis..* 29th International conference on Efficiency, Cost, Optimisation, Simulation and Environmental Impact of Energy Systems, 19 - 23 June 2016, Portorož, Slovenia; 06/2016
11. Wojciech Stanek, Barbara Mendecka, Lidia Lombardi: *Environmental assessment of the wind turbine systems based on thermo-ecological cost..* 4th International Conference Contemporary Problems of Thermal Engineering Sustainable Energy Systems for our Common Future, 14-16 September 2016, Gliwice, Silesia, Poland; 06/2016
12. Lidia Lombardi, Barbara Mendecka, Ennio Carnevale: *Analysis of environmental impact of wind turbines at increasing size..* 29th International conference on Efficiency, Cost, Optimisation, Simulation and Environmental Impact of Energy Systems, 19 - 23 June 2016, Portorož, Slovenia; 06/2016

13. Barbara Mendecka: Substitution of energy in a building: Multi-criteria optimization model based on uncertain data. Proceedings of the 9th Conference on Sustainable Development of Energy, Water and Environment Systems. Venice-Stambul, 2014.
14. Barbara Mendecka, Jozachim Koziol: *Zastosowanie rachunku wyrównawczego do uwiarygodnienia wag kryteriów przy optymalizacji wielokryterialnej.*. Polski Mix Energetyczny, Ustroń; 01/2014
15. Barbara Mendecka, Joachim Koziol: Evaluation of economic, energy-environmental and societal effects of non-renewable energy substitution with renewable energy sources. Proceedings of the 8th Conference on Sustainable Development of Energy, Water and Environment Systems. Dubrovnik Croatia, 2013.
16. Barbara Mendecka, Joachim Koziol: *Planning as a new tool for renewable energy sources management and its application in the municipal organizations.*. XIVth International Symposium on Heat Transfer and Renewable Sources of Energy; 09/2012
17. Joachim Koziol, Barbara Mendecka: Planning as a new tool for renewable energy sources management and its application in the municipal organizations. Proceedings of the XIVth International Symposium on Heat Transfer and Renewable Sources of Energy, Szczecin Poland 2012, pp.165-170.
18. Joachim Koziol, Barbara Mendecka: Wybrane problemy współczesnej energetyki komunalno-bytowej. Dostępne narzędzia oszczędności energii na poziomie lokalnych samorządów. Energy management tools available at local government level. Gliwice Poland, 2012, pp. 31-37
19. Barbara Mendecka: *The economic efficiency of energy substitution for municipal and living application in the low-density housing district.*. 1-st International Congress on Thermodynamics, Poznań; 01/2011
20. Barbara Mendecka, Joachim Koziol, Orszulik Magdalena: *Propozycja kompleksowych badań nad zwiększeniem wykorzystania odnawialnych źródeł energii w budownictwie.*. Problemy badawcze energetyki cieplnej; 01/2011
21. Tadeusz Kruczek, Barbara Mendecka: Wpływ nieustalonego stanu temperatury na wyniki termowizyjnej diagnostyki obiektów. Modelowanie w mechanice. 50. Sympozjon, Ustroń Poland, 2011. pp. 92-93
22. Tadeusz Kruczek, Barbara Mendecka: Badania termowizyjne obiektów w otwartej przestrzeni w warunkach nieustalonego stanu temperatury. XIV Sympozjum Wymiany Ciepła i Masy, Szczecin Poland 2010.