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## Summary

More than 20 years of experience in teaching, research, and consultancy activities on topics related with energy planning and management, thermal energy, biomass for bioenergy and bioproducts, natural fibers for composites manufacture, and industrial machines and systems. More than sixty scientific papers, books/book chapters, and conference presentations.

## Professional Experience

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2021/10-current: Adjunct Professor, Composite Materials and Engineering Center, Voiland College of Engineering and Architecture, Washington State University, Pullman, WA, USA.

2020/10-2021/09: Visiting Professor, Composite Materials and Engineering Center, Voiland College of Engineering and Architecture Washington State University, Pullman, WA, USA.

2018/11-2020/09: Chair of the Department of Applied Chemistry and Systems of Production, Universidad de Cuenca, Cuenca, Ecuador.

2015/09-current: Professor (Full), Universidad de Cuenca, Cuenca, Ecuador.

2014-2015: Postdoctoral Research Associate, Washington State University, Pullman, WA, USA.

2010-2014: Graduate Research Assistant, Washington State University, Pullman, WA, USA.

2007-2015: Associate Half-time Professor, Universidad de Cuenca, Cuenca, Ecuador.

2001-2007: Part time Lecturer, Universidad de Cuenca, Cuenca, Ecuador.

1996-2001: Part time Lecturer, Salesian Polytechnic University, Cuenca, Ecuador.

1996-2005: Production Manager at INDALUM Ltd., Cuenca, Ecuador.

## Expertise and Research Interests

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- Energy efficiency and Energy management & auditing
  - Planning of Energy Systems
  - Biomass thermochemical conversion
  - Natural fibers: Characterization and conversion into fuels, energy, and bioproducts
  - Wood/fiber composites manufacture and testing
  - Electrolytic Hydrogen (production, use, planning)
  - Design of Machine Elements
  - Industrial Equipment
  - Thermal Power Plants

- Use of analytical techniques/equipment for materials' characterization and processing: SEM (Scanning Electron Microscopy); Confocal and optical microscopy; AFM (atomic force microscopy); GC (Gas Chromatography); Py-GC/MS (Pyrolysis-Gas Chromatography/Mass Spectrometer); HPLC (High Performance Liquid Chromatography); IC (Ion Chromatography); TG/DTG (thermogravimetry/differential thermogravimetry); FTIR (Fourier Transform Infrared Spectrometry); DSC (differential scanning calorimetry); Elemental analysis equipment (CHNS); Bomb calorimeter; Particle size analyzer; Equipment for mechanical testing (bending, tension, compression, impact); Rotational, capillary, and torque rheometers; X-ray diffractometry; UV-Vis Spectrometry; X-ray density profile analyzer; DCAA (dynamic contact angle analysis); Auger, spoon, and tube furnace pyrolysis reactors; High pressure reactors; Equipment/processes for biomass characterization (extractives, lignin, and carbohydrates content; ash and moisture content; calorific value); Industrial equipment (e.g., hydraulic presses, hydraulic pumps, heat exchangers); Machine tools (lathe, drill, planner milling, and CNC lathe and milling machines); 3D printers.

## Educational Qualifications

Post-doctorate, Civil and Environmental Engineering Department and Department of Biological Systems Engineering, Washington State University, Pullman, WA, USA.  
 Ph.D. Biological and Agricultural Engineering, Washington State University, Pullman, WA, USA.  
 M.S. Planning of Energy Systems, State University of Campinas (UNICAMP), Campinas, SP, Brazil.  
 B.S. Mechanical Engineering, University of Orient, Santiago de Cuba, Cuba (Ranking 1/144). Gold Degree and *Summa cum Laude*.

## Publications

1. Cisneros, J.F., **Pelaez-Samaniego, M.R.**, Pinos, V., Nopens, I., Alvarado, A., 2021. Development of an automated tracer testing system for UASB laboratory-scale reactors, *Water*, 13, 1821, <https://doi.org/10.3390/w13131821>
2. Garcia-Perez, T., Ortiz-Ulloa, J., Jara-Cobos, L., Zalamea-Piedra S., **Pelaez-Samaniego, M.R.**, 2021. Sugarcane bagasse ash for removal of hydrogen sulfide within biogas, submitted to *Waste and Biomass Valorization*.
3. M. Astudillo-Flores, E. Zalamea-Leon, A. Barragán-Escandón, **M.R.Pelaez-Samaniego, J.** Calle-Siguenza, 2021. Modelling of solar thermal energy for household use in equatorial latitude by using the F-Chart model, *Renewable Energy and Power Quality Journal (RE&PQJ)* 19:269-275. <https://doi.org/10.24084/repqj19.273>.
4. Sánchez-Alvarracín, C., Albuja-Arias, D., Criollo-Bravo, J., Garcia-Avila, F., **Pelaez-Samaniego, M.R.**, 2021, Management of used lubricant oil and its regeneration potential in a Latin-American medium size city, *Recycling* <https://doi.org/10.3390/recycling6010010>
5. **Pelaez-Samaniego, M.R.**, Perez, J.F., Ayiania, M., Garcia-Perez, T., 2020. Chars from wood gasification for removing H<sub>2</sub>S from biogas, *Biomass and Bioenergy* 142, 105754, <https://doi.org/10.1016/j.biombioe.2020.105754>
6. **Pelaez-Samaniego, M.R.**, Espinoza-Abad, J.L., Jara-Alvear, J., Arias-Reyes, P., Maldonado, F., Recalde, P., Rosero, P., Garcia-Perez, T., 2020. Potential and impacts of cogeneration in tropical climate countries. Ecuador as a case study, *Energies*. 13-5254, <https://doi.org/10.3390/en13205254>.
7. Ortiz-Ulloa, J.A., Abril-González, M.F., **Pelaez-Samaniego, M.R.**, Zalamea-Piedra, T.S., 2020. Biomass yield and carbon abatement potential of banana crops (*Musa spp.*) in Ecuador, *Environmental Science and Pollution Research*, <https://doi.org/10.1007/s11356-020-09755-4>

8. Pérez, J.F., **Pelaez-Samaniego, M.R.**, Garcia-Perez, M., 2019. Torrefaction of fast-growing Colombian wood species, *Waste and Biomass Valorization* 10 (6), 1655-1667. <https://doi.org/10.1007/s12649-017-0164-y>
9. Ponce-Jara, M.A., Castro, M., **Pelaez-Samaniego, M.R.**, Espinoza-Abad, J.L., 2018. Electricity sector in Ecuador: an overview of the 2007-2017 decade, *Energy Policy*, 113: 513–522 <https://doi.org/10.1016/j.enpol.2017.11.036>
10. **Pelaez-Samaniego, M.R.**, Smith, M., Zhao, Q.Z., Garcia-Perez, T., M., Frear, C., Garcia-Perez, M., 2018. Charcoal from anaerobically digested dairy fiber for removal of hydrogen sulfide within biogas, *Waste Management* 76: 374-382 <https://doi.org/10.1016/j.wasman.2018.03.011>.
11. **Pelaez-Samaniego, M.R.**, Hummel, R.L., Liao, W., Ma, J., Jensen, J., Kruger, C., Frear, C., 2017. Approaches for adding value to anaerobically digested dairy fiber, *Renewable and Sustainable Energy Reviews*, 72: 254-268. <https://doi.org/10.1016/j.rser.2017.01.054>.
12. Garcia-Nunez J.A., **Pelaez-Samaniego M.R.**, Garcia-Perez M.E., Fonts I., Abrego J., Westerhoof R.J.M., Garcia-Perez M., 2017. Historical Developments of Pyrolysis Reactors: A Review, *Energy and Fuels*, <https://doi.org/10.1021/acs.energyfuels.7b00641>.
13. Ramos-Carmona, S., Pérez, J.F., **Pelaez-Samaniego, M.R.**, Barrera, R., Garcia-Perez, M., 2017. Effect of torrefaction temperature on properties of Patula Pine, *Maderas: Ciencia y Tecnologia* 19(1) 39-50. DOI:10.4067/S0718-221X2017005000004.
14. **Pelaez-Samaniego, M.R.**, Englund, K.R., 2016. Wood waste materials for sugars production via enzymatic hydrolysis, *Waste and Biomass Valorization*, 8(3), 883-892. <https://doi.org/10.1007/s12649-016-9652-8>.
15. Oasma, A., Fonts, I., **Pelaez-Samaniego, M.R.**, Garcia-Perez, E., Garcia-Perez, M., 2016. Pyrolysis-oil multiphase behavior and phase stability: A review, *Energy and Fuels* 30 (8): 6179–6200. <https://doi.org/10.1021/acs.energyfuels.6b01287>.
16. **Pelaez-Samaniego, M.R.**, Yadama, V., Garcia-Perez, M., Lowell, E., Zhu, R., Englund, K., 2016, Interrelationship between lignin-rich dichloromethane extracts of hot water-treated wood fibers and high-density polyethylene (HDPE) in wood plastic composite (WPC) production, *Holzforschung* 70(1): 31–38, DOI: 10.1515/hf-2014-0309.
17. Ferraz, G. P., Frear, C., **Pelaez-Samaniego, M.R.**, Englund, K., Garcia-Perez, M., 2016. Hot Water Extraction of Anaerobic Digested Dairy Fiber for Wood Plastic Composite Manufacturing, *BioResources*. 11(4): 8139–8154.
18. **Pelaez-Samaniego, M.R.**, Yadama, V., Garcia-Perez, M., Lowell, E., 2015. Abundance and Characteristics of Lignin Liquid Intermediates in Wood (*Pinus ponderosa* Dougl. ex Laws.) during Hot Water Extraction, *Biomass and Bioenergy*, 81: 127–128. <https://doi.org/10.1016/j.biombioe.2015.06.012>.
19. Hilbers, T., Wang, Z., Pecha, B.M., Westerhof, R.J.M, Kersten, S.R.A., **Pelaez-Samaniego, M.R.**, Garcia-Perez, M., 2015. Cellulose-lignin Interactions during slow and fast pyrolysis, *Journal of Analytical and Applied Pyrolysis*, 114: 197–207. <https://doi.org/10.1016/j.jaap.2015.05.020>.
20. **Pelaez-Samaniego, M.R.**, Yadama, V., Garcia-Perez, M., E. Lowell, McDonald, M., 2014, Effect of temperature during wood torrefaction on the formation of lignin liquid intermediates, *Journal of Analytical and Applied Pyrolysis* 109: 222–233. <https://doi.org/10.1016/j.jaap.2014.06.008>.
21. **Pelaez-Samaniego, M.R.**, Riveros-Godoy, G., Torres-Contreras, S., Garcia-Perez, T., Albornoz, E, 2014. Production and use of electrolytic hydrogen in Ecuador towards a low carbon economy, *Energy*, 64: 626–631. <https://doi.org/10.1016/j.energy.2013.11.012>.

22. Mesa-Pérez, J.M., Cortez, L.A.B., Marín-Mesa, H.R., Rocha, J.D., **Pelaez-Samaniego, M.R.**, Cascarosa, E., 2014. A statistical analysis of the auto thermal fast pyrolysis of elephant grass in fluidized bed reactor based on produced charcoal, *Applied Thermal Engineering* 65(1-2): 322–329. <https://doi.org/10.1016/j.applthermaleng.2013.12.072>.
23. **Pelaez-Samaniego, M.R.**, Yadama, V., Garcia-Perez, T., Lowell, E., Amidon, T., 2014. Effect of hot water extraction on particleboard produced from hardwood and softwood, *Holzforschung* 68(7): 807–815. <https://doi.org/10.1515/hf-2013-0150>
24. **Pelaez-Samaniego, M.R.**, Yadama, V., Lowell E, Espinoza-Herrera R, 2013. A review of wood thermal pretreatments to improve wood composite properties, *Wood Science and Technology*, 47: 1285–1319. <https://doi.org/10.1007/s00226-013-0574-3>.
25. **Pelaez-Samaniego, M.R.**, Yadama, V., Lowell, E., Amidon, T., Chaffee, T.L., 2013. Hot water extracted wood fiber for production of wood plastic composites (WPCs), *Holzforschung* 67(2): 193–200. <https://doi.org/10.1515/hf-2012-0071>
26. **Pelaez-Samaniego, M.R.**, Mesa-Perez, J., Rocha, J. D., Cortez, L. A. B., Sanchez, C. G., Mesa, H. M., 2011. Use of blends of gasoline with biomass pyrolysis-oil derived fractions as fuels in an Otto engine, *Energy for Sustainable Development* 15: 376–381. <https://doi.org/10.1016/j.esd.2011.06.001>
27. **Pelaez-Samaniego, M.R.**, Garcia-Perez, M., Cortez, L.B., Rosillo-Calle, F., Mesa, J., 2008. Improvements of Brazilian Carbonization Industry as Part of the Creation of a Global Biomass Economy. *Renewable and Sustainable Energy Reviews* 12: 1063–1086. <https://doi.org/10.1016/j.rser.2006.10.018>
28. **Pelaez-Samaniego, M.R.**, Garcia-Perez, M., Cortez, L.A.B., Oscullo, J., Olmedo, G., 2007. Energy Sector in Ecuador: Current Status. *Energy Policy* 35: 4177–4189. <https://doi.org/10.1016/j.enpol.2007.02.025>
29. **Pelaez-Samaniego, M.R.**, García Pérez, T., Energy Efficiency in Ecuador: Status and alternatives to improve energy efficiency, *Journal of the Faculty of Chemical Sciences*, 7, July 2009, University of Cuenca, Cuenca, Ecuador, ISSN 13901869 (In Spanish).
30. **Pelaez Samaniego, M.R.**, T. Garcia Perez, Quantification of the energy potential of some biomass resources in Ecuador and potential uses, *Journal of the Faculty of Chemical Sciences*, 6: 45–60, 2008, University of Cuenca, Ecuador, ISSN 13901869 (In Spanish).
31. **Pelaez Samaniego, M.R.**, Uses of biomass for the production of energy, *Journal of the Faculty of Chemical Sciences*, 5: 21–30, 2007, University of Cuenca, Ecuador, ISSN 13901869 (In Spanish).
32. Guillén Gordín, R., Martínez Reyes, A., Villar Vázquez, I., **Pelaez Samaniego, R.**, 2005. Simulation of heat and mass transfer in self-ventilated cooling towers, *Rev. Tecnol. Química*, 25(1):73–80 (Spanish).

### Papers in preparation and submitted

1. Rhodes, K., **Pelaez-Samaniego, R.**, Kiziltas, A., Preston, J., Meysami, M., Geda, A., Yadaman, V., 2021. Mechanical and viscoelastic properties of basalt-hemp hybrid reinforced polypropylene, submitted to *Materials Today Communications*.
2. Haghghi Mood, S., **Pelaez-Samaniego, M.R.**, Garcia-Perez, M., 2021. Engineered Biochar for Environmental Applications: A review, in preparation to be submitted to *Renewable and Sustainable Energy Reviews*
3. **M.R. Pelaez-Samaniego**, K.Rhodes, T. Garcia-Perez, Y-C. Chang, J. Zhang, V. Yadama, 2021. Basalt Fiber-Polypropylene 3D printed composites, in preparation to be submitted to *Composites Part B*.

4. T. Garcia-Perez, **M.R. Pelaez-Samaniego**, J. Delgado-Noboa, E. Chica-Martinez, 2021. Improvement of Andean soils with biochar, to be submitted to *Journal of Soil Science and Plant Nutrition*.
5. J.F. Cisneros, **M.R. Pelaez-Samaniego**, U. Rehman, I. Nopens, A. Alvarado, 2021. Selection of RANS turbulence closure models for CFD simulation of an upflow anaerobic sludge blanket reactor, in preparation for submitting to *Computers & Chemical Engineering Journal*.
6. J.F. Cisneros, F. Cobos, **M.R. Pelaez-Samaniego**, I. Nopens, A. Alvarado, 2021. UASB reactors efficiency improvement through modelling. A review, in preparation to be submitted to *Energy*.
7. Jerves, R., Yadama, V., Aro, M., **Pelaez-Samaniego, M.R.**, 2021. Cross-laminated strand veneer lumber (CLSVL) from thermally modified strands for construction applications, in preparation to be submitted to *Composites Part B*.
8. **Pelaez-Samaniego, M.R.**, Yadama, V., Nassiri, S., Garcia-Perez, T., 2021. Addition of chars in construction materials: a path for properties improvement and carbon sequestration, in preparation to be submitted to *Resources, Conservation & Recycling* or *Construction and Building Materials*
9. Espinoza-Abad, J.L., Maldonado, F., **Pelaez-Samaniego, M.R.**, Jara-Alvear, J., Mendieta-Munoz, R., 2021. Cogeneration in Ecuador: Expected economic, social and environmental impacts, to be submitted to *Energy Economics* or *Energy*.

## Technical Reports

1. Espinoza, J.L., **Pelaez-Samaniego, M.R.**, 2017. Study of the potential of cogeneration and trigeneration in Ecuador.
2. Englund, K., Azadfar, M., Schneider, G., Chetan, L., **Pelaez-Samaniego, M.R.**, 2017. Feedstock Supply Chain Analysis-MSW, NARA, <https://nararenewables.org/documents/2017/03/feedstock-supply-chain-analysis-msw.pdf/>
3. Chen, S., Kruger, C., Yorgey, G., García-Pérez, M., Ai, P., Ayiania, M., Dunsmoor, A., Englund, K., Ewing, T., Frear, C., Gao, A.H., Ghogare, R.J., Hall, S.A., Jensen, J., Ma, J., Manoharan, G., Martinez, J., Nasir, A., Parlina, I., **Pelaez-Samaniego, M.R.**, Pereira-Ferraz, G., Rajagopalan, K., Smith, M., Suliman, W., Wang, D., Yao, Y., Yu, L., 2017. Technology Research and Extension Related to Anaerobic Digestion of Dairy Manure, A Project Report for the Washington State University, Agricultural Research Center and the Washington State Department of Agriculture.
4. Chen, S., Frear, C., García-Pérez, M., Jensen, J., Sjoding, D., Kruger, C., Abu-Lail, N., ..., Garcia-Nunez, J., Hall, S., Harsh, J., Iqbal, H., Kennedy, N., Ma, J., Mitchell, S., Pecha, B., **Pelaez-Samaniego, R.**, Seker, A., Smith, M., Suliman, W., Yorgey, G., Yu, L., Zhao, Q., 2016. Advancing Organics Management in Washington State: The Waste to Fuels Technology Partnership (Government No. 16-07-008), Washington State University.
5. **Pelaez-Samaniego, M.R.**, 2009. Study of the feasibility of producing electrolytic hydrogen in the Hidropaute Unit of Business (Ecuador).
6. **Pelaez-Samaniego, M.R.**, 2008. Combustion of rice-husk to produce energy in Ecuador.

## Conference presentations (O-oral presentation, P-poster)

1. T.Garcia-Perez, J.F.Perez, M.Ayiania, J.Ortiz-Ulloa, L.Jara-Cobos, S.Zalamea-Piedra, **M.R.Pelaez-Samaniego**, Chars from biomass combustion and gasification for biogas

- treatment, 2020 Thermal & Catalytic Sciences Virtual Symposium TCS 2020, Richland, WA, USA **(O)**.
2. Ortiz-Ulloa, J.A., Abril-González, A., **Pelaez-Samaniego, M.R.**, Zalamea-Piedra, S., 2019. Quantification of the yearly residual biomass generation and carbon abatement potential of banana crops in Ecuador. 5th International Congress on Water, Waste and Energy Management (WWEM19) Paris, France **(O)**.
  3. **Pelaez-Samaniego, M.R.**, Sustainability, Business Models and Techno-economic Analysis of Biomass Pyrolysis Technologies, I Workshop on Development of Theoretical and Experimental Advances on Thermochemical Processes, U. Nacional de Medellin, Colombia, 6-10 March 2017 **(O)**.
  4. Ramos Carmona, S., **Pelaez-Samaniego, M.R.**, Perez, J.F., Characterization of pyrolysis products of torrefied biomass with dendroenergy potential in Colombia, 6<sup>th</sup> International Symposium on Energy from Biomass and Waste VENICE 2016. 14-17 Nov., Venice-Italy. ISBN 978-88-6265-009-0 **(O)**.
  5. **Pelaez-Samaniego, M.R.**, Englund, K., Schneider, G., Wood waste from MSW/C&D as a biofuel feedstock, 2nd Northwest Wood-Based Biofuels+Co-Products Conference, Seattle, May 3-4, 2016 **(O)**.
  6. **Pelaez-Samaniego, M.R.**, Yadama, V., Lowell, E., Amidon, T., Perez-Bayer, J., Garcia-Perez, T., Adoption of biorefinery concepts in wood composite facilities by means of wood thermochemical pretreatment operations, Proceedings of the VIII CIADICYP, The VIII IberoAmerican Congress on Pulp and Paper Research, Nov. 26-28, 2014, Medellín, Colombia (ISSN 978-958-764-211-7) (<http://www.riadicyp.org>) **(P)**.
  7. Zhou, S., Westerhof, R., **Pelaez-Samaniego, M.R.**, Pecha, B., Garcia-Perez, M., 2014. Understanding the Role of Primary and Secondary Pyrolysis Reactions on the Formation of Mono-Phenols and Lignin Derived Oligomers from Lignocellulosic Materials, *XXIV Congreso Iberoamericano de Catalisis*, CICat 2014. ISBN: 978-958-8848-98-3, 15-19 September 2014, Medellín-Colombia, Proceedings.
  8. Garibay-Garcia, G.A., **Pelaez-Samaniego, M.R.**, Garcia-Perez, M., Espinoza-Herrera, R., Torrefacción de la biomasa del Eucalyptus nitens utilizando Nitrógeno, 3ra Reunión Anual de la División de Materia Condensada, Universidad Autónoma de México, Campus Morelia, Morelia, 24-26 Sept. 2014 **(O)**.
  9. **Pelaez-Samaniego, M.R.**, Englund, K., 2014, Characterization of waste wood materials for the production of biofuels, NARA Renewables Annual Meeting, Seattle, Sept. 15-15, 2014. **(P)**.
  10. **Pelaez-Samaniego, M.R.**, Yadama, V., Zhu, R., Garcia-Perez, M., Englund, K., 2014, Contribution of lignin to the rheology of wood plastic composites produced with hot water extracted wood, 68th International Forest Product Society (FPS) 2014 Convention, Quebec, Canada, Aug.10-13, 2014. **(O)**.
  11. **Pelaez-Samaniego, M.R.**, Yadama, V., Garcia-Perez, M., Zhu, R., Lowell, E., Amidon, T.E., Abundance and properties of lignin on hot water extracted wood surface and impact on the production of bioproducts and biofuel, Northwest wood-based biofuels + coproducts conference, Seattle, WA, Apr. 28-30 2014 **(P)**.
  12. Lowell E., **Pelaez-Samaniego M.R.**, V.Yadama, T.E.Amidon, T.L.Chaffee, *Advantages of hot-water extraction pre-treatment in the manufacture of wood composites*, 67<sup>th</sup> Convention co-organized by the Forest Products Society and the Society of Wood Science and Technology, June 11-13<sup>th</sup>, 2013, Austin, TX **(O)**.
  13. **Pelaez-Samaniego, M.R.**, V.Yadama, E.Lowell, T.E.Amidon, T.L.Chaffee, *Adding value to wood residues through thermochemical processes*, National Convention of the Society of American Foresters, October 24-28, 2012, Spokane, WA **(P)**.

14. **Pelaez-Samaniego, M.R.**, V.Yadama, E.Lowell, T.E.Amidon, *Integration of hot-water extraction into wood composite manufacturing process for value added products*, International Conference on "Future of Panel Industry-Challenges and Key Issues", 26–28<sup>th</sup> September 2012, IPIRTI, Bangalore, India **(O)**.
15. **Pelaez-Samaniego, M.R.**, V.Yadama, E.Lowell, T.E.Amidon, T.L.Chaffee, *Effect of Hot-Water Extraction on Wood-Plastic Composites Properties*, Forest Products Society's 66th International Convention, June 3–5, 2012, Washington, DC, USA **(O)**.
16. **Pelaez-Samaniego, M.R.**, V.Yadama, E.Lowell, T.E.Amidon, T.L.Chaffee, *Wood-based composites from hot-water extracted biomass*, Forest Products Society's 66<sup>th</sup> International Convention, June 3–5, 2012, Washington, DC, USA **(P)**.
17. **Pelaez-Samaniego, M.R.**, V.Yadama, E.Lowell, T.E.Amidon, T.L.Chaffee, *Integration of hot water extraction in particleboard production*, Technical presentation, International Wood Composites Symposium, April 11–13<sup>th</sup>, 2012, Seattle, WA, USA **(P)**.
18. **Pelaez-Samaniego, M.R.**, V.Yadama, E.Lowell, T.E.Amidon, T.L.Chaffee, *Wood plastic composites produced from hot-water extracted pine*, Technical presentation, International Wood Composites Symposium, April 11–13<sup>th</sup>, 2012, Seattle, WA, USA **(P)**.
19. Cortez, L.A.B.; Mesa Pérez, J.M.; Rocha, J. D.; **Pelaez-Samaniego, M.R.**; Mesa, H. R. M.; Jordan, R. A.; *Obtenção de biocombustível pela esterificação de ácidos carboxílicos gerados na pirólise de palha de cana e capim elefante*, 11/2009, III Congresso da Rede Brasileira de Tecnologia de Biodiesel, 3: 765–767, Brasilia, DF, Brasil, 2009 **(O)**.
20. Riveros-Godoy, G., **Pelaez-Samaniego M.R.**, Cavaliero K.C., *Reduction of emissions by the substitution of Diesel vehicles by Fuel-cells in the public transport*, First International Congress in Environment, 27-30 Nov. 2007, University of Cuenca, Cuenca–Ecuador **(O)**.
21. Mesa Pérez, J., R. Viltre Rodríguez, J. Marin Mesa, J D Rocha, **M.R. Peláez-Samaniego**, L.A.B. Cortez, *Bio-flex obtained from the biomass pyrolysis as fuel use*, AGRENER 2006, Unicamp, June 2006 **(O)** (<http://www.proceedings.scielo.br/pdf/agrener/n6v1/029.pdf>)
22. Martínez A., Brito A., **Peláez Samaniego M.R.**, *Exergetic balance of the RETO CV 25-18 boiler with horizontal whirlwind oven*, Third Iberoamerican Congress of Mechanical Engineering CICIM 97 (23–26 of September of 1997), Havana, Cuba **(O)**.
23. Martínez A., **Peláez Samaniego, M.R.**, Brito A., *Calculation of the irreversibilities of the RETO CV 25-18 boiler*, Third International Conference of Sugar Mill Thermoenergetics (18–20 of November of 1996), Villa Clara, Cuba **(O)**.
24. **Peláez Samaniego M.R.**, *Mathematical Modeling of Self-ventilated Cooling Towers*, Eighth National Forum of University Students and Technical Sciences, Villa Clara, Cuba (26–29 June 1996) **(O)**.

## Books

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**Pelaez-Samaniego, M.R.**, Espinoza-Abad, J.L., 2015. Editors of the book: Renewable Energies in Ecuador: Current status, tendencies and perspectives (Energías renovables en el Ecuador: Situación actual, tendencias y perspectivas), Universidad de Cuenca, Gráficas Hernández, Cuenca-Ecuador (In Spanish). ISBN 978-9978-14-317-9.

## Peer reviewed book chapters

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1. **M.R. Pelaez-Samaniego**, S. Haghghi Mood, T. Garcia-Perez, J. Garcia-Nunez, V. Yadama, M. Garcia-Perez, 2021. *A review of biomass carbonization technologies and equipment*, In "Sustainable Biochar for Water and Wastewater Treatment", Editors: Mohan, D., Mlsna, T.E., Pittman Jr., C.U., Elsevier (in press)

2. M. Ponce-Jara, **M.R.Pelaez-Samaniego**, M.Moreano-Alvarado, C.Velasquez-Figueroa, M. Castro, 2021. *An assessment on energy policies and challenges to promote solar PV in South America: The Ecuadorian case*, In Ecuador perspectives of the past, present and future. A multi-criteria approach to social evolution, M. Avila Calle and G. Casado Lopez editors, Nova Science Publishers, New York. ISBN 978-1-53619-533-0
3. Suarez, L., De La Hoz, K., **Pelaez-Samaniego, M.R.**, Perez, J.F., 2018. Torrefacción de madera: un método de mejora de la biomasa para aplicaciones energéticas, In: *Aplicaciones agro-energéticas con maderas de rápido crecimiento y oportunidades preliminares de mercado*, Perez, J.F., Ramirez, G.L., Compiladores, U. de Antioquia (UdeA), Medellin.
4. Garcia-Perez, M., Garcia-Nunez, J.A., **Pelaez-Samaniego, M.R.**, Kruger, C.E., Fuchs, M.R., Flora, G., 2015. *Sustainability, Business Models and Techno-economic Analysis of Biomass Pyrolysis Technologies*. Chap. 10, In: *Innovative Solutions in Fluid-Particle Systems and Renewable Energy Management*, Ed. K.Tannous. Hershey, PA: IGI Global. doi:10.4018/978-1-4666-8711-0 (<http://www.igi-global.com/chapter/sustainability-business-models-and-techno-economic-analysis-of-biomass-pyrolysis-technologies/132889>).
5. **Pelaez-Samaniego, M.R.**, Garcia-Perez, M., Barriga, A., Martí Herrero, J., Montero, A., Mayer, F.D., García-Nuñez, J., 2015. *Estado de uso de la biomasa lignocelulósica para la producción de bioenergía, biocombustibles y bioproductos en Ecuador*, In: *Renewable Energies in Ecuador: Current status, tendencias and perspectives*, M.R.Pelaez-Samaniego and J.L.Espinoza Abad, Editors. U. Cuenca, Gráficas Hernández, Cuenca-Ecuador (In Spanish). ISBN 978-9978-14-317-9, Ch. 2, 29-115.
6. **Pelaez-Samaniego, M.R.**, Riveros Godoy, G., Torres-Contreras, S., García-Pérez, T., García-Renté, M., Albornoz-Vintimilla, E., 2015. *Hidrógeno electrolítico: perspectivas de producción y uso en Ecuador*, In: *Renewable Energies in Ecuador: Current status, tendencias and perspectives*, M.R.Pelaez-Samaniego and J.L.Espinoza Abad, Editors. U. de Cuenca, Gráficas Hernández, Cuenca-Ecuador (In Spanish). ISBN 978-9978-14-317-9, Ch. 4, p. 159-211.
7. Aguilera-Ortiz, E., **Pelaez-Samaniego, M.R.**, 2015. *Estado de la energía geotérmica en Ecuador*, In: *Renewable Energy in Ecuador: Current status, tendencias and perspectives*. M.R.Pelaez-Samaniego and J.L.Espinoza Abad, Editors. U. de Cuenca, Gráficas Hernández, Cuenca-Ecuador (In Spanish). ISBN 978-9978-14-317-9, Ch. 8, p. 384-406.
8. Rocha, J.D., Mesa-Pérez, J.M., Cortez, L.A.B., de Brito, O., Marin-Mesa, H., **Pelaez-Samaniego, M.R.**, "Alternative uses for residual trash in seed pastures production", Editors: F.H.D. de Souza, E.B. Pott, O. Primavesi, A.C.C. Bernardi e A.A. Rodrigues, ISBN 85-86764-09-4 EMBRAPA, São Carlos-SP, 241p. 2006, Chap. 7: Potentials for using residual trash of elephant grass pasture to produce energy, p. 121-142 (In Portuguese).

## Research Experience and Funded Projects

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- 03/2020-03/2022: PI of the project "*Use of lignocellulosic residues from the agroindustry and plastics from recycling to produce composite materials and ethanol in biorefinery concepts*", sponsored by University of Cuenca and the Polytechnic Salesian University (~USD 150,000).
- 11/2019-11/2020: Co-PI of the project "*Calibration and validation of F-Chart model for solar thermal energy collectors considering typical orientations of roofs in the Ecuadorian Andes*", sponsored by the University of Cuenca and the Polytechnic Salesian University (USD 76,387.71).

- 03/2018-03/2020: Co-PI of the project "*Study of the physical and chemical changes in organic solids produced through irradiation of heavy ions*", sponsored by the University of Cuenca (DIUC, 2018) (USD 36,000.00).
- 06/2017-03/2019: PI of the project: "*Sewage sludge to produce charcoal with properties for biogas cleaning*", sponsored by the University of Cuenca (DIUC, 2017) (~USD 39,870.00).
- 06/2017-03/2019: Co-PI of the project: "*Production of biochar for soil amendment in the Ecuadorian Southern Andes*", sponsored by the University of Cuenca (DIUC, 2017) (~USD 40,000.00).
- 12/2016-08/2017: Co-PI of the project "*Study of the potential of cogeneration and trigeneration in Ecuador*", sponsored by CELEC E.P. (USD 263,000.00)
- 05/2016-05/2018: Researcher for the project "*Upflow anaerobic sludge blanket (UASB) reactors engineering at laboratory scale*", sponsored by University of Cuenca (~USD 40,000.00).
- 08/2014-07/2015: Researcher for the Northwest Advanced Renewables Alliance (NARA) (<https://nararenewables.org/>). In charge of evaluating the feasibility of producing sugars for bio-isobutanol using waste wood materials via acid pretreatment followed by enzymatic hydrolysis.
- 09/2011-07/2014: Researcher in the project "*Converting low value forest biomass to higher value by-products including biofuels, biopolymers, and specialty composites using hot water based biorefinery*", sponsored by the USDA Forest Service Research and Development Woody Biomass, Bioenergy, and Bioproducts 2009 Grant (USD 190,000.00).
- 2009: PI of the project "*Study of the feasibility of producing electrolytic hydrogen in the Hidropaute Unit of Business*", sponsored by CELEC E.P. (USD 36,000.00).
- 2009: PI of the project "*Biochar production in the Southern Ecuadorian Highlands*", sponsored by the University of Cuenca (USD 25,000.00).
- 2007/08: PI of the project "*Combustion of rice-husk to produce energy in Ecuador*", sponsored by the Ministry of Electricity and Renewable Energy of Ecuador (USD 48,000.00)
- 2006/2007: Researcher in the project Feasibility of using sugar-cane trash to produce pyrolysis bio-oil, UNICAMP, Brazil, sponsored by The State of São Paulo Research Foundation (FAPESP) (USD 35,000.00).

## Courses taught

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### Undergraduate level

- Industrial Equipment (16 terms)
- Design of Machine Elements (17 terms)
- Machine Tools (25 terms)
- Calculus & Differential Equations (4 terms)
- Thermodynamics (2 terms)
- Heat Transfer (4 terms)
- Thermal Machines (2 terms)
- Heat Exchangers (2 terms)
- Dynamics of Automobiles (4 terms)

### Graduate level

- Renewable Energies (U. de Cuenca) (2 terms)

- Energy Management (Polytechnic School of the Army - ESPE, Quito, and University of Cuenca) (3 terms)
- Energy Efficiency and sustainability (U. of Cuenca) (3 terms)
- Oxygenated and High-Performance Fuels (U. de Cuenca) (1 term)

Courses taught on Professional updating:

- Combustion and Thermal energy
- Energy efficiency in industrial plants
- Cogeneration

**MS thesis and diploma works supervised**

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- Five MS thesis supervised
  - More than twelve diploma works supervised

**PhD dissertations, MS thesis, and diploma works evaluation committee**

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- One PhD dissertation (Universidad Nacional de Colombia, Bogota, Colombia)
  - One PhD dissertation (Universidad Nacional de Colombia, Medellin, Colombia)
  - One PhD dissertation (Pontificia Universidad Javeriana, Medellin, Colombia)
  - Five MS thesis (Universidad de Cuenca)
  - More than twenty-five diploma works supervised/evaluated

**Academic honors, scholarships, and prizes**

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- 2020/09: Invited Professor, Composite Materials and Engineering Center (CMEC), Washington State University, Pullman, WA, USA.
- 2017/09: Invited international member of the jury for the evaluation of research programs funded by COLCIENCIAS (Colombian Research Center)
- 2013: Alfred & Genevieve Gallucci Scholarship for Graduate Studies Achievement Award in Biological Systems Engineering, Washington State University, Pullman, WA, USA.
- 2012: Scholar from Washington State University, PhD Program in Biological and Agricultural Engineering.
- 2010: Fulbright (Faculty Development)-USDOS Scholarship holder to study a PhD in Biological and Agricultural Engineering at Washington State University (Pullman, WA, USA).
- 2004: First Ecuadorian citizen that received a Global Sustainable Energy Partnership Scholarship (<http://www.globalelectricity.org/en/>) (former e8 Group) for studying Renewable Energies, under the program Education for Sustainable Energy Development (ESED), used for conducting an MS program at UNICAMP, Brazil.
- 2004: Beneficiary of a scholarship (not used) from the Quebec Government (Canada) for studying an MS program in Bioenergy at the Laval University.
- 2004: Beneficiary of a scholarship (not used) from the IECE (Ecuadorian Institute of Educational Loans and Scholarships) ([www.iece.fin.ec](http://www.iece.fin.ec)) for studying an MS program in Bioenergy at the Laval University.
- 1996: Beneficiary of a scholarship (not used) from the Universidad de Oriente, Santiago de Cuba, for pursuing an MS program in Energy (Mechanical Engineering) at the same university.
- 1996: First Prize and Special Mention in the Mechanical Engineering Committee of the XII National Forum of University Students in the Technical Sciences, Central University of

Las Villas, Cuba, with the work entitled "Mathematical modeling of self-ventilated cooling towers".

- 1996: Gold Degree and best graduating class (*Summa Cum Laude*). Faculty of Mechanical Engineering, University of Orient, Santiago de Cuba (GPA 4.89/5, Rank 1/144).
- 1991/96: Scholar from the IECE (Ecuadorian Institute of Educational Loans and Scholarships) ([www.iece.fin.ec](http://www.iece.fin.ec)) for studying Mechanical Engineering at the University of Orient, Cuba.
- 1990: Flag bearer and best graduating class (GPA 20/20). Franciscan Private High-School. Ecuador.

### **Other professional and academic experience**

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- 2018/11-2020/09: Chair of the Department of Applied Chemistry and Systems of Production, University of Cuenca.
- 2019/10: Member of the Scientific Board of the First Ecuadorian Congress of Renewable Energies and Energy Efficiency, U. of Azuay, U. of Cuenca, and Polytechnic Salesian Univ., Cuenca-Ecuador.
- 2017/09: Member of the jury for evaluation of research programs funded by COLCIENCIAS (Colombian Research Center)
- 2016/06-2016/09: Director of the School of Industrial Engineering, U. de Cuenca, Cuenca-Ecuador.
- 2015/08-2016-07: Member of the Board of Directors of the School of Industrial Engineering, U. de Cuenca
- 2013/06: Short stage at the EMSL/PNNL (Environmental Molecular Science Laboratory, Pacific Northwest National Laboratory), Richland, WA, USA. Topic: Characterization of torrefied wood using TOF/SIMS (Time of Flight/Secondary Ion Mass Spectrometry).
- 2012/08-2014/07: Graduate Research Associate, Department of Civil and Environmental Engineering, Washington State University, Pullman, WA, USA.
- 2012: Member of the Scientific Board of the First Ecuadorian Congress of Sustainable Energy, 26-28 September, University of Cuenca, Cuenca-Ecuador.
- 2010: Organizer of the Master's program in Planning and Management of Energy Systems, University of Cuenca, Ecuador.
- 2008-2020: Invited speaker at various academic and scientific events in Cuenca (Ecuador), Medellin (Colombia), Bogota (Colombia), and Quito (Ecuador) on topics related with Energy, Sustainability, Environment, and Materials.

### **Former or current affiliations and involvement in professional organizations**

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- Society of American Foresters (SAF).
- Member of the International Biochar Initiative (<http://www.biochar-international.org/>)
- State Alumni Member: Bureau of Educational and Cultural Affairs International Exchange Alumni (Fulbright Scholarship).
- WSU Alumni Association.
- Biomass Engineering Club (Department of Biological Systems Engineering, WSU).
- Society of Mechanical Engineers of Ecuador (Azuay), member since 2007.

### **Reviewer of journals (more than 150 papers reviewed so far)**

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Renewable and Sustainable Energy Reviews; Science of the Total Environment; Energy Conversion and Management; Waste Management; Energy; Industrial Crops and Products;

International Journal of Hydrogen Energy; International Journal of Energy Research; Journal of Industrial and Engineering Chemistry; Biomass and Bioenergy; Energy and Fuels; PLOS One; Journal of Polymers and the Environment; BioResources; Maderas: Ciencia y Tecnología; Wood Material Science and Engineering; Revista DYNA Industria e Ingeniería; International Journal of Sustainable Energy; International Journal of Renewable Energy Technology; Journal of Environmental Science and Renewable Resources; AIMS Energy; Ingeniería y Universidad: Engineering for Development (Colombia); CIT Información Tecnológica (Chile); Revista Internacional de Contaminación Ambiental (UNAM, México); Revista Energética (Universidad Nacional de Colombia, Manizales); Revista Tecnológica ESPOL (Ecuador); Revista INGENIUS (Universidad Politécnica Salesiana, Ecuador); Revista Colombia Forestal (Univ. Distrital F. J. de Caldas, Bogota).

### Reviewer of book chapters

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- Reviewer of a chapter in the book "Production of Biofuels and Chemicals from Lignin" (2016), edited by Prof. Smith and Prof. Fang, Springer-Verlag book series "Biofuels and Biorefineries" (<http://www.springer.com/us/book/9789401796118>).

### Editor of journals

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- Former Revista de la Facultad de Ciencias Químicas, U. de Cuenca, Ecuador.
  - Ingenius, UPS, Cuenca, Ecuador

### Languages skills & Level of proficiency (B-Basic; I-Intermediate; P-Proficient)

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<u>English</u> :	Speaking P	Reading P	Writing P
<u>Portuguese</u> :	Speaking P	Reading P	Writing P
<u>French</u> :	Speaking B	Reading I	Writing B
<u>Spanish</u> :	Mother Tongue		