

University Academic Curriculum Vitae

Personal information

Name: Vittoria Benedetti
Nationality: Italian
Email: vittoria.benedetti@unitn.it

Education since leaving school

- 2012, Bachelor Degree in Energy Engineering (Università degli Studi di Padova, Italy).
- Spring 2014, semester abroad at Boston University, Boston, MA, USA.
- 2015, Master Degree in Energy Engineering (Università degli Studi di Padova, Italy).
- 2019, PhD in Sustainable Energy and Technologies (Free University of Bolzano, Italy).
- 2020, Esame di Stato in Ingegneria Industriale (Università degli Studi di Trento, Italy).

Present appointment

- Assistant Professor (RTT) since September 2024 at Department of Civil, Environmental and Mechanical Engineering, University of Trento.

Professional experience

From / to	Job title	Name of academic Institution	Academic level
March - May 2015	Internship	PNNL, Pacific Northwest National Laboratory, Richland, WA, USA.	Intern
October 2017 - March 2018	Visiting PhD student	KIT, Karlsruhe Institute of Technology, Karlsruhe, Germany.	PhD student
November 2018 - July 2022	Research associate (AR)	Faculty of Engineering, Free University of Bolzano	Research associate
Spring semester 2024	Lecturer	University of Trento	Researcher (RTDa)
August 2022 - September 2024	Assistant Professor	Faculty of Engineering, Free University of Bolzano	Researcher (RTDa)
November 2024 - now	Lecturer	IMT Atlantique, Nantes, France	Researcher (RTT)

Projects

Team member in the following projects:

- NEXT: Novel EXTension of biomass poly-GENERATION to small-scale gasification systems in South-Tyrol (2016-2017).
- BIO2LIQ: BIOmass-to-LIQuid as a strategy to enhance gasification potential in a biorefinery perspective (2016-2018).
- GAS SOLUTION: Analysis of European small scale GASification technologies and identification of new SOLUTIONs (2017-2018).
- HB PONICS: Hydrothermal carbonization of Biogas digestate for hydroPonics: an innovative concept of bio-refinery (2018-2020).
- BIOPOLYCOMP: Biochar polymer composites with specific properties for innovative applications in material technology (2020-2023).
- FRONTSH1P: A FRONTrunner approach to Systemic circular, Holistic & Inclusive solutions for a new Paradigm of territorial circular economy (2021-2024).
- HYBREHEAT: Advanced control strategies for high-efficiency, low-emission hybrid heat generation (2024-2025)

**Experience in
academic
teaching**

Experience in preparing project proposals for Interreg, PRIN, Green Deal – Horizon 2020, Horizon Europe, LIFE, and FGG founded projects.

- Energy efficiency in wood production and final use - Lectures/Exercises, Free University of Bolzano, 30 hours, under-graduate level (A.A. 2019/2020 - A.A. 2021/2022).
- Energetics - Exercises, Free University of Bolzano, 10 hours, under-graduate level (from A.A. 2018/2019 to A.A. 2021/2022).
- Energetics - Lectures/Exercises, Free University of Bolzano, 34 hours, under-graduate level (A.A. 2022/2023).
- Impianti di climatizzazione – Lectures/Exercises, University of Trento, 80 hours, master level (A.A. 2023/2024 – 2024/2025 – 2025/2026).
- Building HVAC Systems – Lectures/Exercises, University of Trento, 26 hours, master level (A.A. 2024/2025).
- Building HVAC Systems – Lectures/Exercises, University of Trento, 30 hours, master level (A.A. 2025/2026).
- Exergetic Efficiency – IMT Atlantique, Nantes (France), 12:30 hours, master level (A.A. 2024/2025).
- Energy and Building Simulation – IMT Atlantique, Nantes (France), 12:30 hours, master level (A.A. 2025/2026).
- 2019 - co-supervisor of the master thesis of Taufer, Noah Luciano entitled: "An experimental investigation into the coupling of Hydrothermal Carbonization of digestate and Supercritical Water Gasification of liquid by-products".
- 2021 - co-tutor of Joel Prevedi, a high-school intern at the Bioenergy and Biofuels Laboratories.
- 2018 - 2021 - co-supervisor of the doctoral thesis of Paini, Jacopo entitled: "Valorization of food processing waste in a biorefinery perspective: integration of extraction technologies and thermochemical conversion routes".
- 2021 - 2022 - co-supervisor of the master thesis of Cazzanelli, Alessandro entitled: "Different perspectives for the valorization of low-grade residual biomass: modelling analysis of gasification and aerobic digestion processes".
- 2022 - co-tutor of Elena Perrone, a high-school intern at the Bioenergy and Biofuels Laboratories.
- 2023 - co-supervisor of the master thesis of Fasoli, Sara entitled: "Potential energy conversion pathways for food waste valorization in the Italian and South-Tyrolean context".
- 2023 - co-supervisor of the bachelor thesis of Paoletti, Giulia entitled: "State of the art of biofuel production technologies and future perspective".
- 2023 - co-supervisor of the bachelor thesis of Zandonatti, Nicolas entitled: "Potential energy conversion pathways for food waste valorization in the Italian and South-Tyrolean context".
- 2024 - co-supervisor of the master thesis of Shuh, Anton entitled: "Renewable hydrogen production from biomass using gasification activated carbon".
- 2024 - tutor for the internship of Cinzia Santoni, master student from Università di Verona, and co-supervisor of her master thesis entitled: "Valorizzazione di scarti agricoli mediante produzione di biochar e compost: analisi sperimentale dei processi".
- 2024 - co-supervisor of the doctoral thesis of Maufthai, Mawaheb – on-going.
- 2025 - co-supervisor of the master thesis of Franzoi, Dominique entitled: "Predictive model for energy consumption in residential buildings: a case study in Trentino".
- 2025 - supervisor of the master thesis of Singh, Ankur entitled: "Developing a dynamic tool for calculation of specific requirements for green hydrogen production".

- 2025 - co-supervisor of the master thesis of Batistotti, Ilaria entitled: "Architettura resiliente in alta quota: un nuovo progetto per il rifugio "Pian dei Fiacconi" (Canazei, TN)".
- 2025 - co-supervisor of the master thesis of Somnavilla, Damiano entitled: "Modellazione digitale parametrica per la stima dei costi e il dimensionamento degli impianti radianti a pavimento".
- 2025 - supervisor of the master thesis of Dalponte, Paolo entitled: "Analisi multi-scenario dell'integrazione edificio-impianto in sistemi energetici rinnovabili ibridi".
- March/October 2024 - Lecturer for EnTRAINER: Energy Transition Audits toward Decarbonization - Corso sugli audit di transizione energetica per professionisti dell'energia - Efficienza energetica innovativa e soluzioni di decarbonizzazione come misure per gli audit sulla transizione energetica.
- March 2026 - Lecturer at the Department of Sustainability and Planning, Aalborg University (Aalborg, Denmark), within the Erasmus+ programme. Lecture title: *Towards the energy transition: Insights from the Trentino Province (Italy)*.

Research and scholarships

Date granted	Award Holder(s)	Funding Body	Title
March 2015	Vittoria Benedetti	Fondazione Scipione Maffei and Bartucci Spa	Borsa di studio Scipione Maffei
February 2018	Vittoria Benedetti	DAAD, Germany	Short-term Grants

Publications

Bibliometric indexes (Scopus, April 2026):

Documents: 42, Citations: 1,040, h-index: 19

Conference proceedings

- V. Benedetti, F. Patuzzi, M. Baratieri, Gasification Char as a Potential Substitute of Activated Carbon in Adsorption Applications, in: Energy Procedia, 2017. doi:10.1016/j.egypro.2017.03.380.
- V. Benedetti, F. Patuzzi, M. Baratieri, Biomass gasification char as a low-cost adsorbent for CO₂ capture, Eur. Biomass Conf. Exhib. Proc. 2017.
- V. Benedetti, S.S. Ail, F. Patuzzi, R. Rauch, M. Baratieri, Valorization of char from biomass gasification as catalyst support: preliminary results of Fischer-Tropsch tests, in: Eur. Biomass Conf. Exhib. Proc., 2018.
- M. Pecchi, F. Patuzzi, V. Benedetti, D. Basso, M. Baratieri, Evaluation of the overall reaction enthalpy change of hydrothermal carbonization process by means of differential scanning calorimetry at high pressure, in: Eur. Biomass Conf. Exhib. Proc., 2019.
- G. Cavazzini, S. Bari, V. Benedetti, P. McGrail, G. Pavesi, G. Ardizzon, Influence of the Use of an Innovative Nanofluid on Net Power Production in ORCs for low grade waste heat recovery applications, 5th Int. Semin. ORC Power Syst., 2019.
- S. Piazza, S.S. Ail, V. Benedetti, F. Patuzzi, M. Baratieri, Studies on conversion of biomass-derived syngas to liquid fuels via fischer-tropsch synthesis, in: Eur. Biomass Conf. Exhib. Proc., 2019.
- J. Paini, V. Benedetti, M. Baratieri, F. Patuzzi, Apple pomace hydrothermal carbonization for downstream valorization of residues after subcritical water extraction, in: Eur. Biomass Conf. Exhib. Proc., 2020.

- H. de Souza Oliveira, F. Catania, G. Cantarella, V. Benedetti, M. Baratieri, N. Münzenrieder, Recycled Carbon-based Strain Sensors: An Ecofriendly Approach using Char and Coconut Oil, IEEE IFETC, 2021.
- J. Paini, V. Benedetti, M. Baratieri, F. Patuzzi, Integrated biorefinery of food processing byproducts: Subcritical water pretreatment of apple pomace coupled with hydrothermal carbonization and subsequent anaerobic digestion, in: Eur. Biomass Conf. Exhib. Proc., 2021.
- C. Caligiuri, M. Z. Qureshi, M. Renzi, V. Benedetti, F. Patuzzi, M. Baratieri, Wood packaging waste valorization: design of a producer gas combustion test-rig for fundamental flame studies, in: Eur. Biomass Conf. Exhib. Proc., 2023.
- A. Gurusekaran, H. de Souza Oliveira, V. Benedetti, M. Baratieri, N. Münzenrieder, M. Ciocca, P. Lugli, L. Petti, Autonomous shape memory hinge for space applications powered using solar energy, IEEE Metroaerospace, 2023.
- F. Patuzzi, S. D'Aronco, G. Zuccon, A. Ceccon, V. Benedetti, M. Baratieri, E. Boselli, E. Longo, Grapestalk project - A sustainable approach for the valorization of grape stalks from the winemaking process, in: Eur. Biomass Conf. Exhib. Proc., 2025.
- M. Mouftahi, V. Benedetti, M. Renzi, M. Baratieri Decarbonising Alpine Energy Communities: A Case Study of Renewable Power Integration in Egna (BZ), in Proceedings of the 15th REHVA HVAC World Congress - CLIMA 2025.

Journal articles in refereed academic journals

- V. Benedetti*, F. Patuzzi, M. Baratieri, Characterization of char from biomass gasification and its similarities with activated carbon in adsorption applications, Appl. Energy. 227 (2018) 92–99. doi:10.1016/j.apenergy.2017.08.076.
- S.S. Ail, V. Benedetti, M. Baratieri, S. Dasappa, Fuel-Rich Combustion Synthesized Co/Al₂O₃ Catalysts for Wax and Liquid Fuel Production via Fischer-Tropsch Reaction, Ind. Eng. Chem. Res. 57 (2018) 3833–3843. doi:10.1021/acs.iecr.7b04174.
- G. Cavazzini, S. Bari, P. McGrail, V. Benedetti, G. Pavesi, G. Ardizzon, Contribution of Metal-Organic-Heat Carrier nanoparticles in a R245fa low-grade heat recovery Organic Rankine Cycle, Energy Convers. Manag. 199 (2019) 111960. doi:10.1016/j.enconman.2019.111960.
- V. Benedetti*, E. Cordioli, F. Patuzzi, M. Baratieri, CO₂ Adsorption study on pure and chemically activated chars derived from commercial biomass gasifiers, J. CO₂ Util. 33 (2019) 46–54. doi:10.1016/j.jcou.2019.05.008.
- V. Benedetti*, S.S. Ail, F. Patuzzi, M. Baratieri, Valorization of char from biomass gasification as catalyst support in dry reforming of methane, Front. Chem. 7 (2019) 1–12. doi:10.3389/fchem.2019.00119.
- S. Vakalis, K. Moustakas, V. Benedetti, E. Cordioli, F. Patuzzi, M. Loizidou, M. Baratieri, The “COFFEE BIN” concept: centralized collection and torrefaction of spent coffee grounds, Environ. Sci. Pollut. Res. 26 (2019) 35473–35481. doi:10.1007/s11356-019-04919-3.
- V. Benedetti*, S.S. Ail, F. Patuzzi, D. Cristofori, R. Rauch, M. Baratieri, Investigating the feasibility of valorizing residual char from biomass gasification as catalyst support in Fischer-Tropsch synthesis, Renew. Energy. 147 (2020). doi:10.1016/j.renene.2019.09.050.

- S. Piazza, S.S. Ail, V. Benedetti, F. Patuzzi, M. Baratieri, Fuel-lean combustion synthesized cobalt catalysts for Fischer-Tropsch reaction, *Catal. Today*. (2020) 0–1. doi:10.1016/j.cattod.2020.06.088.
- M. Pecchi, F. Patuzzi, V. Benedetti, R. Di Maggio, M. Baratieri, Thermodynamics of hydrothermal carbonization: Assessment of the heat release profile and process enthalpy change, *Fuel Process. Technol.* 197 (2020). doi:10.1016/j.fuproc.2019.106206.
- V. Benedetti*, M. Scatto, M. Baratieri, P. Riello, Valorization of Biomass Gasification Char as Filler in Polymers and Comparison with Carbon Black, *Waste and Biomass Valorization*. (2020). doi:10.1007/s12649-020-01243-7.
- J. Paini, V. Benedetti, G. Ferrentino, M. Baratieri, F. Patuzzi, Thermochemical conversion of apple seeds before and after supercritical CO₂ extraction: an assessment through evolved gas analysis, *Biomass Convers. Biorefinery*. (2020). doi:10.1007/s13399-020-00858-z.
- M. Pecchi, F. Patuzzi, V. Benedetti, R. Di Maggio, M. Baratieri, Kinetic analysis of hydrothermal carbonization using high-pressure differential scanning calorimetry applied to biomass, *Appl. Energy*. 265 (2020) 114810. doi:10.1016/j.apenergy.2020.114810.
- L. Menin, S. Vakalis, V. Benedetti, F. Patuzzi, M. Baratieri, Techno-economic assessment of an integrated biomass gasification, electrolysis, and syngas biomethanation process, *Biomass Convers. Biorefinery*. (2020). doi:10.1007/s13399-020-00654-9.
- L. Menin, V. Benedetti, F. Patuzzi, M. Baratieri, Techno-economic modeling of an integrated biomethane-biomethanol production process via biomass gasification, electrolysis, biomethanation, and catalytic methanol synthesis, *Biomass Convers. Biorefinery*. (2020). doi:10.1007/s13399-020-01178-y.
- S. Celletti, A. Bergamo, V. Benedetti, M. Pecchi, F. Patuzzi, D. Basso, M. Baratieri, S. Cesco, T. Mimmo, Phytotoxicity of hydrochars obtained by hydrothermal carbonization of manure-based digestate, *J. Environ. Manage.* 280 (2021) 111635. doi:10.1016/j.jenvman.2020.111635.
- F. Patuzzi, D. Basso, S. Vakalis, D. Antolini, S. Piazza, V. Benedetti, E. Cordioli, M. Baratieri, State-of-the-art of small-scale biomass gasification systems: an extensive and unique monitoring review, *Energy*. 223 (2021) 120039. doi:10.1016/j.energy.2021.120039.
- N.L. Taufer, V. Benedetti*, M. Pecchi, Y. Matsumura, M. Baratieri, Coupling hydrothermal carbonization of digestate and supercritical water gasification of liquid products, *Renew. Energy*. 173 (2021) 934–941. doi:10.1016/j.renene.2021.04.058.
- S. Celletti, M. Lanz, A. Bergamo, V. Benedetti, D. Basso, M. Baratieri, S. Cesco, T. Mimmo, Evaluating the aqueous phase from hydrothermal carbonization of cow manure digestate as possible fertilizer solution for plant growth, *Frontiers Plant Science* (2021). | <https://doi.org/10.3389/fpls.2021.687434>.
- J. Paini, V. Benedetti, S.S. Ail, M.J. Castaldi, M. Baratieri, F. Patuzzi, Valorization of wastes from the food production industry: A review towards an integrated agri-food processing biorefinery, *Waste and Biomass Valorization*, (2021). <https://doi.org/10.1007/s12649-021-01467-1>.
- J. Paini, V. Benedetti, L. Menin, M. Baratieri, F. Patuzzi, Subcritical water hydrolysis coupled with hydrothermal carbonization for apple pomace integrated cascade

valorization, *Bioresource Technology* 342 (2021) 125956. <https://doi.org/10.1016/j.biortech.2021.125956>.

- V. Benedetti, M. Pecchi, M. Baratieri, Combustion kinetics of hydrochar from cow-manure digestate via thermogravimetric analysis and peak deconvolution, *Bioresource Technology* 353 (2022) 127142. <https://doi.org/10.1016/j.biortech.2022.127142>.
- F. Rizzioli, V. Benedetti*, F. Patuzzi, M. Baratieri, D. Bolzonella, F. Battista. Valorization of orange peels in a biorefinery loop: Recovery of limonene and production of volatile fatty acids and activated carbon. *Biomass Convers. Biorefinery* (2023), ISSN: 2190-6815, <https://doi.org/10.1007/s13399-023-03738-4>.
- K. Sharma, K. Kohansal, A.J. Azuara, L. Rosendahl, V. Benedetti, D. Yu, T. H. Pedersen, Green and Facile Recycling of Bauxite Residue to Biochar-Supported Iron-Based Composite Material for Hydrothermal Liquefaction of Municipal Solid Waste. Available at SSRN (2023), <https://ssrn.com/abstract=4352971> or <http://dx.doi.org/10.2139/ssrn.4352971>.
- A. Abdelaal, V. Benedetti, A. Villot, F. Patuzzi, C. Gerente, M. Baratieri, Innovative Pathways for the Valorization of Biomass Gasification Char: A Systematic Review. *Energies* 2023, 16(10), 4175; <https://doi.org/10.3390/en16104175>.
- V. Benedetti*, A. Cascioli, M. Pecchi, M. Baratieri, Fast screening of catalyst performances in hydrothermal processes for biofuel production using differential scanning calorimetry, *Bioresource Technology* 405 (2024) 130934. <https://doi.org/10.1016/j.biortech.2024.130934>.
- V. Benedetti*, S. Piazzzi, M. Scatto, E. Santello, M. Kollmer, G. Itskos, K. Atsonios, F. Patuzzi, & M. Baratieri (2025). Gasification of wood packaging waste and valorization of char in polymer composites. *Waste Management*, 207. <https://doi.org/10.1016/j.wasman.2025.115128>
- M. Z. Qureshi, C. Caligiuri, M. Renzi, V. Benedetti, D. Z. Fine, F. Patuzzi, & M. Baratieri (2025). Renewable heat generation from waste gasification: Infrared thermal imaging and flue gas emissions monitoring of producer gas flame. *Applied Thermal Engineering*, 280, 128122. <https://doi.org/10.1016/j.applthermaleng.2025.128122>
- A. Aref, A. Cascioli, V. Benedetti, E. Longo, E. Boselli, F. Patuzzi & M. Baratieri (2026). Hydrothermal liquefaction of glutamic acid: DSC kinetics and GC×GC-ToF/MS analysis, *Fuel*, 413, 137600, <https://doi.org/10.1016/j.fuel.2025.137600>.
- F. Eze, M. Danovska, V. Benedetti, A. Prada (2026). Performance assessment of air-to-water heat pumps in alpine regions under present and future climate: impacts of start-up and defrosting cycles, *Energy*, 353, 141016, <https://doi.org/10.1016/j.energy.2026.141016>.

*: corresponding author

Further data

Presentations at scientific conferences over past 3 years (invited or selected, keynote, nature and status of conference).

- V. Benedetti, L. Menin, S. Piazzzi, D. Antolini, M. Kollmer, F. Patuzzi, M. Baratieri, Thermal energy, fillers and pigments from wood packaging waste, Chania 2023, Chania, Greece. (Oral)

- V. Benedetti, A. Cascioli, S. Fasoli, A. Aref, F. Patuzzi and M. Baratieri, Continuous Hydrothermal Liquefaction of microalgae for biocrude oil production, ATI 2023, Carpi, Italy (September 2023). (Oral)
- V. Benedetti, Soluzioni sistemiche circolari per la valorizzazione degli scarti legnosi, La bioeconomia a nord-est, tra policy ed esperienze concrete, Udine, Italy (December 2023).
- V. Benedetti, S. Piazzzi, D. Antolini, M. Kollmer, M. Scatto, E. Santello, K. Atsonios, G. Itskos, F. Patuzzi, M. Baratieri, A circular approach applied to industrial wood packaging waste: gasification and char addition in polymer composites, EUBCE 2024, Marsille, France. (Oral)
- V. Benedetti, Circular Systemic Solution 1: WOOD PACKAGING, Soluzione Sistemica Circolare per imballaggi in legno, GREEN MED Expo&Symposium 2024, Napoli, Italy. (Oral)
- V. Benedetti, S. Piazzzi, M. Scatto, M. Renzi, C. Caligiuri, F. Patuzzi, M. Baratieri A polygenerative approach for the valorization of wood packaging waste, ATI 2024, Genova, Italy (September 2024). (Oral)
- V. Benedetti, M. Danovska, A. Prada, Modeling and optimization of hybrid heat pump systems with biomass boilers for enhanced bioenergy integration in building heating, EUBCE 2025, Valencia, Spain.
- V. Benedetti, S. Piazzzi, M. Kollmer, M. Scatto, K. Atsonios, M. Renzi, F. Patuzzi, M. Baratieri, Gasification-centered circular valorization of wood packaging waste – Insights from the FRONTSH1P project, CEBC 2026, Graz, Austria. (Oral)

Participation to scientific committees

- Member of the Scientific Committee for the European Biomass Conference and Exhibition since 2023.
- Member of the Organizing and Scientific Committee of the Building Simulation Applications (BSA) 2026 conference.

Editorial activities

- 2021 - 2022: Guest editor for the Special Issue entitled "Advances in Biomass Energy Conversion and Thermochemical Processes" in MDPI – Energies (IF: 3.004).
https://www.mdpi.com/journal/energies/special_issues/biomass_thermochemical_processes#editors
- 2022 - 2023: Guest editor for the Special Issue entitled "The Early Career Collection: Sustainable Process Engineering" in Frontiers in Chemical Engineering
<https://www.frontiersin.org/research-topics/45306/the-early-career-collection-sustainableprocess-engineering#overview>

Reviewer for international journals

Energy, Renewable Energy, Ecology and Environment, Applied Energy, Bioresource Technology, Journal of Cleaner Production, Biomass Conversion and Biorefinery, Waste Management, MDPI - Sustainability.

**Language
competence**

ENGLISH

Understanding		Speaking	Writing
Reading	Listening	C1	C1
C1	C1		

March 2022: C1 certification obtained by Free University of Bolzano.

GERMAN

Understanding		Speaking	Writing
Reading	Listening	B2	B2
B2	B2		

July 2021: B2 certification obtained by the Autonomous Province of Bolzano-Bozen.

Date

24.04.2026