

# University Academic Curriculum Vitae

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## Personal information

Name: Jacopo Carlo Alberizzi

## Education since leaving school

- 2011, Bachelor's degree Electrical Engineering, University of Pavia
- 2013, Master's degree Electrical engineering, University of Pavia
- 2016, Master's degree Renewable Engineering and Management, University of Barcelona
- 2021, Ph.D. Sustainable Energy and Technologies, Free University of Bozen - Bolzano

## Present appointment

- Research Assistant – Free University of Bozen - Bolzano
- From October 2024

## Professional experience

Chronological list of all previous employments (each with job title, starting and finishing dates, level, employer, responsibilities)

From / to	Job title	Name of academic Institution	Academic level	responsibilities
October 2024	Research Assistant (AR)	Free University of Bozen - Bolzano	Research Assistant	ReNon Project
May 2024 / October 2024	Free Lance Engineer			Optimization methods for the design and development of renewable energy communities
Feb. 2024 / Apr. 2024	Research Engineer	Trama Tecno-Ambiental		Optimization methods for the electrification of rural communities with renewable energy technologies
Feb. 2023 / Jan 2024	Technologist	Free University of Bozen		iNEST Project - Green and digital transition for advanced manufacturing technology
Apr. 2022 /	Research Assistant	Free University of Bozen	Research Assistant	Green Seed Project

Feb. 2023	(AR)			
Nov. 2020 / Nov 2021	Research Assistant (AR): Cool Car Project (Fesr Project)	Free University of Bozen - Bolzan	Research Assistant	Electric and Thermal optimization of electric batteries used in electric vehicles.
Nov 2017 / Oct 2020	Ph.D. Sustainable Energy and Technologies	Free University of Bozen	Free University of Bozen	Free University of Bozen
Oct 2014 / Aug. 2016	Field Application Engineer	NXP Semiconductors		Development of software application based on microprocessors and microcontrollers

**Other academic responsibilities**

- Supervision of M.Sc. Thesis. Support to Ph.D. students with their research program and objectives

**Research and scholarships**

- Summary of current research and scholarship
- Summary of research and scholarship during the previous five years
- Summary of significant achievements in research and scholarship
- Research grants and contracts

Date granted	Award Holder(s)	Funding Body	Title	Amount received
15/02/2023 – 31/01/2024		University of Bozen Bolzano	iNest Project	41.283,88 €
01/04/2022 – 14/02/2023		University of Bozen Bolzano	Green SEED Project	16.946,13 €
01/11/2020 – 30/11/2021		University of Bozen Bolzano	Cool-Car Project	24.225,46 €
01/11/2017 – 31/10/2020		University of Bozen Bolzano	PhD Scholarship	59.500,2 €

Research and development of optimization algorithms applied to energy systems and fluid machines using Matlab and Python programming languages. Support to the preparation of research projects at local and EU level. Participation in research projects granted by the European funds. The research activities focused on three main topics:

- Development of advanced methods and optimization algorithms to compute the optimal sizing and design of hybrid renewable energy

systems. The research activity and the developed methods have been applied to off-grid, grid connected energy systems and energy communities focusing on Multi-objective optimization approaches that took into account the technical and economic feasibility of the proposed solutions as well as the project sustainability.

- Development of advanced methods and optimization algorithms to optimize the optimal management and unit commitment of the controllable assets of energy systems, such as internal combustion engines, micro gas turbines, hydraulic machines, and electric batteries.
- Optimal modelling of fluid machines parameters to optimize their operation in energy systems and reduce their greenhouse gases emissions.

## Publications

Publications over the last 15 years in chronological order within each category following the International Standard for bibliographic references with DOI whenever possible. With multiple authorship the main author's name appears in *Italics*. In addition, in the left-hand margin please star (\*) what you consider were especially significant publications. For accepted but not yet published works please indicate expected publication date. PUBLICATIONS WILL ONLY BE EVALUATED WHEN THEY CAN BE TRACED IN PUBLIC CATALOGUES.

### Journal papers:

1. Jacopo Carlo Alberizzi, Joaquim Meléndez Frigola, Mosè Rossi, Massimiliano Renzi: Optimal sizing of a Hybrid Renewable Energy System: Importance of data selection with highly variable renewable energy sources. *Energy Conversion and Management* 223 (2020) 113303. <https://doi.org/10.1016/j.enconman.2020.113303>.
2. Francesco F. Nicolosi, Jacopo C. Alberizzi, Carlo Caligiuri, Massimiliano Renzi: Unit commitment optimization of a micro-grid with a MILP algorithm: Role of the emissions, bio-fuels and power generation technology. *Energy Reports* Volume 7, November 2021, Pages 8639-8651. <https://doi.org/10.1016/j.egy.2021.04.020>.
3. Jacopo Carlo Alberizzi, Massimiliano Renzi, Maurizio Righetti, Giuseppe Roberto Pisaturo and Mosè Rossi: Speed and Pressure Controls of Pumps-as-Turbines Installed in Branch of Water-Distribution Network Subjected to Highly Variable Flow Rates. *Energies* 2019, 12(24), 4738; <https://doi.org/10.3390/en12244738>
4. J. C. Alberizzi, J. M. Frigola, M. Renzi, J. Colomer, M. A. P. Estevez and A. F. Moreno, "Optimal Day-ahead Scheduling of Heat Pump Heating Systems Partially Fed by Renewable Generation," 2022 11th International Conference on Power Science and Engineering (ICPSE), Eskisehir, Turkey, 2022, pp. 72-78, doi: 10.1109/ICPSE56329.2022.9935507.
5. Jacopo C. Alberizzi, Mosè Rossi, Massimiliano Renzi: A MILP

algorithm for the optimal sizing of an off-grid hybrid renewable energy system in South Tyrol. Energy Reports Volume 6, Supplement 1, February 2020, Pages 21-26. <https://doi.org/10.1016/j.egy.2019.08.012>.

6. Jacopo C. Alberizzi, Massimiliano Renzia, Alessandra Nigro, Mosè Rossi: Study of a Pump-as-Turbine (PaT) speed control for a Water Distribution Network (WDN) in South-Tyrol subjected to high variable water flow rates. Energy Procedia Volume 148, pages 226-233. <https://doi.org/10.1016/j.egypro.2018.08.072>
7. Lingkang Jin, Mosè Rossi, Andrea Monforti Ferrario, Jacopo Carlo Alberizzi, Massimiliano Renzi, Gabriele Comodi: Integration of battery and hydrogen energy storage systems with small-scale hydropower plants in off-grid local energy communities. Energy Conversion and Management, Volume 286, June 2023, article number 117019. <https://doi.org/10.1016/j.enconman.2023.117019>
8. Michael K. Kostner, Ariele Zanfei, Jacopo C. Alberizzi, Massimiliano Renzi, Maurizio Righetti, Andrea Menapace: Micro hydro power generation in water distribution networks through the optimal pump as turbine sizing and control. Applied Energy, Volume 352, Decembre 2023, article number 121802 (<https://doi.org/10.1016/j.apenergy.2023.121802>).
9. J. C. Alberizzi, M. A. Pérez Estevez, M. Renzi, L. Jin, M. Rossi, A. Alberizzi: Optimal Management of a Hydro – Wind Energy System with Hydrogen Storage. 2023 12th International Conference on Power Science and Engineering (ICPSE), Eskisehir, Turkey, Sept. 2023. DOI:10.1109/ICPSE59506.2023.10329307

#### **Conference Proceedings:**

1. Massimiliano Renzi, Jacopo C. Alberizzi, Carlo Caligiuri: A Mixed Integer Linear Programming Algorithm for the Optimal Management of Energy Systems Fuelled with Bio-Fuels. 4th SEE sdewes conference Sarajevo 2020.
2. Jacopo C. Alberizzi and Massimiliano Renzi: Comparison of Batteries and Pumping Hydro with PaTs as energy storage technologies for a micro-hybrid generation system: Multi-objective optimization through a MILP algorithm. 100RES 2020 – Applied Energy Symposium (ICAE) 100% RENEWABLE: Strategies, technologies and challenges for a fossil free future. Pisa, Italy, October 29th – 30th, 2020.
3. Jacopo Carlo Alberizzi, Joaquim Meléndez Frigola, Mosè Rossi and Massimiliano Renzi: Optimal management of the energy systems using a Pumping Hydro Energy Storage (PHES). PROCEEDINGS OF ECOS 2020 - THE 33RD INTERNATIONAL CONFERENCE ON EFFICIENCY, COST, OPTIMIZATION, SIMULATION AND ENVIRONMENTAL IMPACT OF ENERGY

SYSTEMS JUNE 29-JULY 3, 2020, OSAKA, JAPAN

4. Lingkang Jin, Mosè Rossi, Gabriele Comodi, Andrea Monforti Ferrario, Jacopo C. Alberizzi, Massimiliano Renzi: Energy storage solutions in small-scale hydropower plants: an Italian case study. 5th SEE sdewes conference Vlore 2022, 22 - 26 May.
5. Martina Cumerlato, Mosè Rossi, Jacopo Carlo Alberizzi, Maurizio Righetti, Massimiliano Renzi: Exploitation of the hydropower potential downstream of a weir. PROCEEDINGS OF ECOS 2022 - THE 35TH INTERNATIONAL CONFERENCE ON EFFICIENCY, COST, OPTIMIZATION, SIMULATION AND ENVIRONMENTAL IMPACT OF ENERGY SYSTEMS 1-3 JULY, 2022, COPENHAGEN, DENMARK.
6. Federico Callioni, Jacopo C. Alberizzi, Manuel Antonio Perez Estevez, Massimiliano Renzi: ENERGY STORAGE SERVICES OPTIMIZATION IN THE CONTEXT OF A BATTERY SWAPPING BUSINESS MODEL. Proceedings of ECOS 2024, Rhodes, Greece.

#### Book Chapters

1. Michael K. Kostner, Ariele Zanfei, Andrea Menapace, **Jacopo C. Alberizzi**, Massimiliano Renzi, Michele Larcher & Maurizio Righetti Digitisation for Sustainable Water Supply Systems: The Case of Optimal Pressure Management. In: Borgianni, Y., Matt, D.T., Molinaro, M., Orzes, G. (eds) Towards a Smart, Resilient and Sustainable Industry. ISIEA 2023. Lecture Notes in Networks and Systems, vol 745. Springer, Cham. [https://doi.org/10.1007/978-3-031-38274-1\\_48](https://doi.org/10.1007/978-3-031-38274-1_48)
2. Jacopo Alberizzi, Le prospettive mondiali e la cornice italiana della transizione energetica in: LE SMART CITIES AL TEMPO DELLA RESILIENZA A CURA DI GIUSEPPE FRANCO FERRARI Isbn: 9788857584904

#### Further data

International and National conference presentations:

- Congresso annuale ATI 2018 – Pisa (Italy)
- ICEER 2019 6th International Conference on Energy and Environment Research (ICEER 2019) (Aveiro Portugal)
- ECOS 2020, 33rd International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems – Japan – Osaka – June 2020
- 100RES 2020 - Applied Energy Symposium (ICAE) 100% RENEWABLE, Pisa (Italy) October 2020
- ICPSE 2023 – 12<sup>th</sup> Conference of Power Science and Engineering, Eskisheir (Turkey) – 22-24 September 2023

#### Statement of interest

I am an electrical engineer with a Ph.D. in Sustainable energy and Technologies achieved in the Free University of Bozen-Bolzano. For the past seven years I have dedicated my professional career and interests to research. First with a PhD in Sustainable Energy and Technologies and

then as a postdoctoral researcher at the Free University of Bolzano where I focused my research on hybrid renewable energy systems. I started to study and develop optimization techniques for the design and management of off-grid energy systems, applying the developed tools to practical use cases both within existing projects (for example the E-Land H2020 project with the University of Girona and the INEST project with the Free University of Bozen - Bolzano) and in local case studies, such as the electrification of mountain huts in the province of Bolzano. Subsequently, I focused on energy communities contributing to the development of research projects like the ADAPTERS project funded by the Free University of Bolzano. I also had a brief experience in the private sector in the Spanish company Trama Tecnoambiental as R&D Engineer, where my tasks included managing TTA's current research activities, developing the company's R&D strategy, developing research proposals, and supporting engineering and consulting units with innovative solutions. I think that those experiences provided me all the skills I need to be a suitable candidate for this position.

**Language competence**

Italian (Native), Spanish (C2), English (C1), German (B2), Catalan (B2)

**Driving license**

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