

Alberto Grimaldi

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*Ph.D. Student in Energetics @PoliTO
Energy and Nuclear Engineer*

Energy and Nuclear Engineer and PhD Student in Energetics at Politecnico di Torino, specialized in Renewable Energy Systems.

Decarbonization and Electrification are the humankind targets that must be achieved in the next years.

Work Experience

2021–Present **Ph.D. Student in Energetics**

Location: Energy Center - DENERG @PoliTo - Via Paolo Borsellino 38/16, Turin, Italy.

Supervisor: Prof. Andrea Lanzini.

Research Title: Hybrid Utility-Scale Grid-Connected Electrochemical Storage Systems.

2021 **Master Thesis and Internship**

Location: Environment Park @CO2 Circle Lab, Turin, Italy.

Supervisor: Prof. Massimo Santarelli.

Main Tasks: Master Thesis and Internship carried out in collaboration with Università degli Studi di Udine (UniuD) and Massachusetts Institute of Technology (MIT), Boston, USA. The principal topic of the Master Thesis and Internship project is related to the Renewable Chemical Looping Reforming process (water and carbon dioxide splitting) for the Syngas production adopting unconventional materials (perovskiti). It is a Carbon Capture Utilization and Storage (CCUS) Technology aimed to convert CO₂ and H₂O into CO and H₂ through redox reactions occurring inside a reactor.

2020–2021 **Teaching Assistant**

Location: Energy Department @PoliTO, Turin, Italy.

Main Tasks: Student collaboration aimed at providing assistance to students of the master's course "Solar Thermal Technologies" and to students of the bachelor's course "Energy Challenges and Environmental Sustainability". The collaboration of the master course provides project counseling sessions related to the a simulation of a solar domestic hot water and solar cooling systems using Polysun software, while the collaboration of the bachelor's course consists of counseling sessions during the exercise lectures and laboratory tests using the GIS (Geographic Information System) software for Renewable Energy.

2019–2020 **Teaching Assistant**

Location: Energy Department @PoliTO, Turin, Italy.

Main Tasks: Student collaboration aimed at providing assistance to students of bachelor's course "Introduction to Electrical Engineering/ Electrical Machines" during the laboratory tests.

Education

- 2021–Present **Ph.D. Student, Energetics, Energy Center - Politecnico di Torino, Turin, Italy**
PhD in Energetics "Hybrid Utility-Scale Grid-Connected Electrochemical Storage Systems" founded by Energy Center and PoliTo DENERG energy department and supervised by professor Andrea Lanzini. Research focused on techno-economic analysis of hybrid utility-scale electrochemical energy storage devices integrated with renewable power plants and connected to the electrical distribution network in collaboration with Edison S.p.A..
- 2019–2021 **M.S. Degree, Energy and Nuclear Engineering, Politecnico di Torino, Turin, Italy**
Final Mark: 110 Cum Laude - Global Average: 28.41/30 - Current Grade Average (GPA): 3.88/4. The fundamental topics of my studies are focused on Energy, Exergy Cost and Exergo-Economic analysis applied to a wide range of energy systems aimed at providing powerful optimization and design improvement processes using proper software.
- 2016–2019 **B.S. Degree, Energy Engineering, Politecnico di Torino, Turin, Italy**
Thesis topic: Thermoelectric Power Plant "Archimede" Priolo Gargallo.
Energy analysis of the power plant situated in Sicily that claims to be the first global application based on the integration between a combined gas-steam plant and CSP (Concentrating Solar Power) plant. Supervisor: Prof. Carlo Cima (Politecnico di Torino).

Education Projects

- 2022 Ageing and Energy Performance Analysis of a Utility-Scale Lithium-Ion Battery Energy Storage System for Power Grid Applications through a Data-Driven Empirical Modelling Approach (Matlab).
- 2020 Hybrid Flywheel-Battery Energy Storage System (Matlab, Simulink).
- 2020 Methanation Plant (Aspen Plus).
- 2020 Phase Change Material Storage Unit (COMSOL).
- 2020 Simulation of a Solar DHW and Solar Cooling Installation (Polysun).

Languages

- Italian Native
English Fluent

Certifications and Awards

- Best Presentation Award of the World Energy Storage Conference 2022, November 2022.
- IELTS, British Council, December 2016.
- ECDL (European Computer Driving License), AICA, January 2016.

Technical and Soft Skills

- Programming Python, MATLAB (Simulink and Simscape).
- Software Microsoft Office (Word,Excel), Aspen Plus, COMSOL, Polysun, WaSP.
- Soft Skills Goal Oriented, Analytical Thinking, Communication Skills, Team Working, Time Management, Public Speaking, Trade-Show Presentation, Writing Scientific Papers.

Interests

- Hobby Amateur Football Player, Snowboarding, Trail Running, New Technologies, Art, Cinema
- Other Driving License, Available to travel on business abroad.