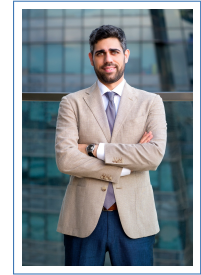


# Stefano Mazzone, PhD

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## Professional Summary

**Professor and Senior Consultant** in energy **optimization and decarbonization** with extensive experience in the **public and private sectors**. Proven track record of achieving **high-impact results through innovative solutions** and strategic leadership.

## Work Experience

- Nov 2023 – Present **Expert Committee Member, Italian Government, Presidency of the Council of Ministers, Rome, Italy**  
Consulting expert for the Ministry for institutional reforms and regulatory simplification.
- Provides expert support to the Ministerial Commission on **environmental and energy security policies** in collaboration with the Minister of the Environment and Energy Security.
  - Contributes to evaluating policies and regulatory frameworks to ensure alignment with national energy security goals.
- Mar 2023 – Present **Assistant Professor, University of Roma Tor Vergata, Rome, Italy**  
Tenured Assistant Professor in Energy Conversion Systems and Turbomachinery.
- Conducts research on multi-energy system optimization and clean energy environments, focusing on Carbon Capture and Storage (CCS) and Carbon Capture and Utilization (CCU).
  - Develops innovative cogeneration technologies for simultaneous generation of **hydrogen, water, and e-fuels**.
  - Teaches Master's course on advanced decarbonized energy systems and Bachelor's course on Energy Systems and Renewable Energy Resources.
- 2024 – Present **Co-Founder - Head of Technical Committee, Evercomm EMEA, Luxembourg**
- Led technical deployment of NxSuite Digital Platform for advanced Energy System Decarbonization.
- Apr 2022 – Mar 2023 **Co-Founder - CTO, MEDS Venture Global Pte Ltd, Singapore**  
Co-founded MEDS Venture Global, a company focused on Multi-Energy Decarbonized Solutions.
- Member of the Executive & Technology Management committee, responsible for technical deployment of DECAPLAN™ Digital Platform aimed at achieving Net-Zero Multi-Energy Systems.
  - Invented two patents related to digital energy optimization (IP Technology Disclosures 2022-332 and 2022-333).
- Jan 2019 – Present **Founder, Energy Smart Solutions Pte Ltd, Singapore**  
Founded a company providing consulting and solutions for Net-Zero Decarbonized projects, achieving substantial savings.
- Completed consulting projects for clients like Worley-Parsons, Jurong Port, and Jurong Town Corporation, generating up to \$50 million in savings and reducing CO2 emissions by 25%.
  - Developed master planning and design strategies for greenfield projects involving integrated energy systems tailored to diverse end-user demands.
  - Focused on optimal dispatch and unit commitment problem-solving, integrating renewable energy, cogeneration, energy storage systems, and AI-based performance monitoring.



- July 2016 – **Senior Research Fellow**, *Nanyang Technological University (NTU)*, Singapore
- Aug 2022 Research lead in Energy Conversion Systems, focusing on Smart Multi-Energy Systems (SMES).
- Spearheaded the design of an \$8 million cogeneration power plant at Jurong Port, realizing \$1 million CAPEX savings and achieving 15% primary energy savings and 20% CO2 emissions reduction.
  - Utilized the ©E-OPT software platform for validating the design of district cooling systems and optimization of smart districts.
  - Coordinated a team of research associates, PhD candidates, and master’s students, actively involved in steering committee meetings with national agencies and industry partners.
  - Developed the Optimal Planning simulation tool for SMES, modeling various components such as engines, chillers, and thermal energy storage.
  - Applied advanced mathematical methods like hybrid evolutionary and simultaneous algorithms, integrated with AI, to optimize system performance.
- Nov 2018 – **Consultant**, *Shell*, Singapore
- June 2019 Conducted an energy and CO2 footprint reduction study for the Shell Jurong Island Petrochemicals Complex.
- Performed pinch point analysis and optimized plant configuration to reduce energy consumption.
  - Developed a roadmap targeting a 95% CO2 reduction by 2035.
- June 2014 – **Research Fellow**, *University of Roma Tre*, Rome, Italy
- June 2016 Researcher in Energy Conversion Systems with a focus on Concentrated Solar Power (CSP).
- Developed component models for CSP power plants as part of the OMSoP European Project.
  - Led technical and economic analyses to optimize CSP power plant performance.
  - Managed laboratory testing for solar and turbomachinery applications.
- Mar 2016 – **Project Evaluator**, *Italian Ministry for University and Research*, Italy
- June 2016 Evaluation of MIUR-DAAD Joint Mobility Program.

## Education

- Jan 2011 – **PhD in Industrial and Mechanical Engineering**, *University of Roma Tre*, Rome, Italy
- Jun 2014 Thesis: *IGCC Power Plant Simulator: Gas Turbine and Steam Cycle*.
- Oct 2007 – **Master’s Degree in Industrial and Mechanical Engineering**, *University of Roma Tre*, Rome, Italy
- May 2010 Graduated with Laude; Thesis: *Steam Cycle Simulator for Combined Power Plants*.
- Oct 2004 – **Bachelor’s Degree in Industrial and Mechanical Engineering**, *University of Roma Tre*, Rome, Italy
- Dec 2007 Thesis: *Emulsions in Reciprocating Engines*.

## Technical Skills

|                |  |
|----------------|--|
| Energy Systems | Energy Conversion, Modeling of Power Plant Components, Thermodynamic, <b>Decarbonization</b> Turbomachinery, Steam Cycles, Solar Power Plants, Heat Transfer Devices |
| Optimization   | <b>Optimization Techniques</b> , <b>AI and ML</b> , Neural Networks, Unit Commitment & Master Planning   |
| Programming    | Fortran 77, Matlab, Python, Neuro Dimension, Aspen Suite, ANSYS, AutoCAD   |

## Languages

|         |                          |
|---------|--------------------------|
| Italian | Native                   |
| English | Professional Proficiency |
| German  | Basic Proficiency        |

## Awards

- 2024 Best Paper Award, ICEEE 2024 International Conference
- 2020 Outstanding Reviewer, Applied Energy International Journal, ELSEVIER
- 2020 Distinguished Scientist, Sustainable Development of Energy, Water and Environment Systems
- 2015 Best Paper Award, SASE 2015 International Conference



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## Patent

- 2023 TD2022-332 - Energy Dispatch and Energy Planner V2
- 2023 TD2022-333 - Optimal MasterPlanning and Real Time Dispatching
- 2019 TD2019-038 - Energy Dispatch and Energy Planner V1

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## Interests

Photography (Professional Level), Traveling, Chess (Semi-Pro), Cycling, Soccer, Horse Riding, Swimming, Diving, Cinema, Music, and Art

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## References

- 2023 **Nastasi, B., Mazzoni, S.** Renewable Hydrogen Energy Communities layouts towards off-grid operation. *Energy Conversion and Management*, 291, art. no. 117293. DOI: 10.1016/j.enconman.2023.117293.
- 2023 **Mazzoni, S., Magnolia, G., Vellini, M., Gambini, M.** Decarbonisation and Optimization Strategies in Distributed Energy Community characterized by Demand of Electricity, Cooling, and Heating. *ECOS 2023*, 36th International Conference, p. 2019–30, DOI: 10.52202/069564-0183.
- 2023 **Gambini, M., Mazzoni, S., Vellini, M.** The Role of Cogeneration in the Electrification Pathways towards Decarbonization. *Energies*, 16(15), art. no. 5606. DOI: 10.3390/en16155606.
- 2023 **Magnolia, G., Gambini, M., Mazzoni, S., Vellini, M.** Renewable energy, carbon capture and sequestration, and hydrogen solutions as enabling technologies for CO2 reduction: An application to the 2030 Italian national energy scenarios. *Cleaner Energy Systems*, 4. DOI: 10.1016/j.cles.2022.100049.
- 2023 **Atzori, D., Tiozzo, S., Vellini, M., Gambini, M., Mazzoni, S.** Industrial Technologies for CO2 Reduction Applicable to Glass Furnaces. *Thermo*, 3, pp. 682–710. DOI: 10.3390/thermo3040039.
- 2022 **Nastasi, B., Mazzoni, S., Groppi, D., Romagnoli, A., Astiaso Garcia, D.** Comparing optimal Hydrogen solutions in Renewable Energy Community in Islands. *SDEWES 2022*.
- 2021 **Mazzoni, S., Ooi, S., Desideri, U., Nastasi, B., Comodi, G., Romagnoli, A.** The Adoption of a Planning Tool Software Platform for Optimized Polygeneration Design and Operation - a District Cooling Application in South-East Asia. *Applied Thermal Engineering*, 199, art. no. 117532.
- 2021 **Bartolini, A., Mazzoni, S., Comodi, G., Romagnoli, A.** Distributed energy systems to lower carbon emissions in future industrial districts. *Applied Energy*, 301, art. no. 117324.
- 2021 **Nastasi, B., Mazzoni, S., Groppi, D., Romagnoli, A., Astiaso Garcia, D.** Optimized integration of Hydrogen technologies in Island energy systems. *Renewable Energy*, 174, pp. 850-864.
- 2021 **Mazzoni, S., Sze, J.Y., Nastasi, B., Ooi, S., Desideri, U., Romagnoli, A.** A techno-economic assessment on the adoption of latent heat thermal energy storage systems for district cooling optimal dispatch and operations. *Applied Energy*, 289, art. no. 116646.
- 2021 **Nastasi, B., Mazzoni, S., Groppi, D., Romagnoli, A., Astiaso Garcia, D.** Solar power-to-gas application to an island energy system. *Renewable Energy*, 164, pp. 1005-1016.
- 2020 **Rigo-Mariani, R., Chea Wae, S.O., Mazzoni, S.** Impact of the Economic Environment Modelling for the Optimal Design of a Multi-Energy Microgrid. *IECON Proceedings*, 2020, pp. 1837-1842.
- 2020 **Baldasso, E., Mondejar, M.E., Mazzoni, S., Romagnoli, A., Haglind, F.** Potential of liquefied natural gas cold energy recovery on board ships. *Journal of Cleaner Production*, 271, art. no. 122519. DOI: 10.1016/j.jclepro.2020.122519.
- 2020 **Rigo-Mariani, R., Ooi, S., Mazzoni, S., Romagnoli, A.** Comparison of Optimization Frameworks for the Design of a Multi-Energy Microgrid. *Applied Energy*, Volume 257.
- 2019 **Mazzoni, S., Ooi, S., Nastasi, B., Romagnoli, A.** Energy Storage Technologies as techno-economic parameters for Masterplanning and Optimal Dispatch in Smart Multi Energy Systems. *Applied Energy*, Volume 254.
- 2019 **Mazzoni, S., Ooi, S., Desideri, U., Comodi, G., Romagnoli, A.** The Role of Multi-Energy Polygeneration Plants in the Optimization Process of District Cooling and Heating Design and Operation. *SDEWES 2019*.
- 2019 **Li, Z., Xu, Y., Fang, S., Mazzoni, S.** Optimal Placement of Heterogeneous Distributed Generators in a Multi-Energy Microgrid under Uncertainties. *IET Renewable Power Generation*, August 2019.
- 2019 **Mazzoni, S., Ooi, S., Romagnoli, A.** Cogeneration Power Plants for Smart-District Optimal Operations: CO2 and Primary Energy Savings in a real industrial application. *AIP Conference Proceedings*, 2123, art. no. 020099.
- 2019 **Bartolini, A., Romagnoli, A., Mazzoni, S., Comodi, G.** Influence of users type on costs and primary energy savings potential for decentralized energy systems. *ECOS 2019*.
- 2018 **Ji, D., Wei, Z., Mazzoni, S., et al.** Thermoelectric generation for waste heat recovery: Application of a system level design optimization approach via Taguchi method. *Energy Conversion and Management*, 172, pp. 507-516.
- 2018 **Mazzoni, S., Cerri, G., Chennaoui, L.** A Simulation Tool for Concentrated Solar Power based on Micro Gas Turbine Engine. *Energy Conversion and Management*, Volume 174, pp. 844-854.



- 2018 **Mazzoni, S., Ooi, S., Romagnoli, A.** Application of Electrochemical Energy Storage Technologies as key Parameters for Optimal Dispatch in Microgrid. *SDEWES 2018*, Palermo, Italy.
- 2017 **Mazzoni, S., Arreola, M.J., Romagnoli, A.** Innovative Organic Rankine arrangements for Water Savings in Waste Heat Recovery Applications. *Energy Procedia*, 143, pp. 361–366.
- 2016 **Cerri, G., Chennaoui, L., Giovannelli, A., Mazzoni, S.** Turbomachinery based Engine: Concurrent Production of Power and Cool used for Sea Water Desalination. *8th International Gas Turbine Conference*, Brussels, Belgium.
- 2015 **Cerri, G., Chennaoui, L., Mazzoni, S., Pustina, L.** Power, Cool and Pure Water by an Integrated Turbomachinery Based Innovative GICE Engine with CryoDesalination. *Energy and Water in the Gulf Cooperation Council Countries*, 12-14 April, Ras Al Khaimah, UAE.
- 2015 **Alavi, B., Cerri, G., Chennaoui, L., Mazzoni, S.** Energy Saving by Refrigeration Vapour Compression Plant Power Regeneration. *Energy and Water in the Gulf Cooperation Council Countries*, Ras Al Khaimah, UAE.
- 2014 **Cerri, G., Chennaoui, L., Giovannelli, A., Mazzoni, S.** Expander Models for a Generic 300 MW F Class Gas Turbine for IGCC. *ASME TurboExpo 2014*, Dusseldorf, Germany.
- 2013 **Cerri, G., Mazzoni, S., Salvini, C.** Steam Cycle Simulator for CHP Plants. *ASME TurboExpo 2013*, San Antonio, Texas, USA.
- 2012 **Mansouri Majoumerd, M., Brehaus, P., Smrekar, J., Assadi, M., Basilicata, C., Mazzoni, S., Chennaoui, L., Cerri, G.** Impact of fuel flexibility needs on a selected GT performance in IGCC application. *ASME TurboExpo 2012*, Copenhagen, Denmark.

