ANTONIO SGARAMELLA

EDUCATION AND TRAINING

1 JAN 2025 – CURRENT Rome, Italy

POSTDOCTORAL FELLOW Sapienza, University of Rome

Level in EQF EQF level 8

1 JAN 2022 – 31 DEC 2024 Rome, Italy

PHD IN ENERGY AND ENVIRONMENT Sapienza, University of Rome

The decarbonization of the transport sector represents one of the most pressing and complex challenges of the global energy transition. In this talk, I am excited to share the research I conducted during my Ph.D., with a particular focus on hydrogen refuelling infrastructure for heavy-duty mobility: a crucial enabler for the deployment of green hydrogen in the transport sector. My work addresses core technical, economic, and operational aspects of hydrogen refuelling stations, including the "chicken-and-egg" dilemma between vehicle uptake and infrastructure rollout, the optimization of system-level costs, and comparative analyses between hydrogen and battery-electric mobility in Europe toward 2050. By combining energy systems modelling, infrastructure cost assessments, and policy evaluation, I aim to provide actionable insights for both private stakeholders and policymakers to support the design of robust, future-proof decarbonization pathways.

Field of study Transport sector decarbonization, Energy planning **Final grade** With honors **Level in EQF** EQF level 8

Thesis Decarbonization of transport sector: a comprehensive technical, economic and operational analysis on hydrogen refuelling stations

27 FEB 2019 – 17 MAY 2021 Rome, Italy

MASTER DEGREE IN ENERGY ENGINEERING Sapienza, University of Rome

Field of study Energy Engineering **Final grade** 110/110 **Level in EQF** EQF level 7

Thesis Renewable installation targets review in the light of the Hydrogen Roadmap Italy: energy-economic simulation

1 FEB 2020 – 1 JUL 2020 Budapest, Hungary

ERASMUS PROGRAM (ENERGY ENGINEERING) Budapest University of Technology and Economy

Level in EQF EQF level 7

20 SEP 2015 – 14 DEC 2018 Rome, Italy

BACHELOR DEGREE IN ENERGY ENGINEERING Sapienza, University of Rome

Field of study Energy Engineering **Level in EQF** EQF level 6

Thesis Evaluation of an Industrial Unconfined Vapor Cloud Explosion (UVCE) Environmental Impact

WORK EXPERIENCE

– ITALY

FREELANCER – 1 MAY 2022 – CURRENT

- Risk assessment correlated to hydrogen refuelling stations
- Techno-economic analysis of hydrogen refuelling stations
- Analysis of existing Italian and European hydrogen refuelling regulations

KERR SPA – ROME, ITALY

ENERGY TECHNOLOGY ENGINEER – 1 SEP 2021 – 31 DEC 2021

- Energy Diagnosis
- TerMus Software

- Sizing of sustainable technologies
- Feasibility study

– ITALY

PRIVATE TEACHER – 1 JAN 2012 – 31 DEC 2021

– ROME, ITALY

OCCASIONAL POMOTER – 1 JAN 2016 – NOV 2018

- Sale of products
- relations with people

– ITALY

LIFEGUARD – 15 JUN 2013 – 1 SEP 2014

- maintenance of residancial pool
- relations with people and suppliers
- Seasonal job

LANGUAGE SKILLS

Mother tongue(s): **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C1	C1	C1	C2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

SKILLS

Microsoft Word | Microsoft Office | Microsoft Excel | Outlook | Python Language - Basic knowledge | Matlab/ Simulik | Social Media | EnergyPLAN | HyRAM | AutoCad 2D -3D

PUBLICATIONS

2025

A techno-economic analysis of hydrogen refuelling and electric fast-charging stations: Effects on cost-competitiveness of zero-emission trucks

Energy

Link https://doi.org/10.1016/j.energy.2025.137066

2025

Hydrogen Refuelling and Charging Infrastructure for Trucks in Europe - a Cost Comparison

In collaboration with Fraunhofer ISI

Renewable and Sustainable Energy Reviews ("under review")

2025

Conversion of an existing diesel depot into an on-site hydrogen refuelling station for heavy-duty vehicles: A multi-objective optimisation

Energy Conversion and Management

Link https://doi.org/10.1016/j.enconman.2025.119916

2025

Hydrogen Valleys to foster local decarbonisation targets: a multi-objective optimisation approach for energy planning

Under review

Applied Energy

2025

Status and perspectives of hydrogen application in the heavy industry decarbonisation process: a comprehensive review

Renewable and Sustainable Energy Reviews

Link https://doi.org/10.1016/j.rser.2025.116083

2025

Application of machine learning to model waste energy recovery for green hydrogen production: a techno-economic analysis

Energy

Link https://doi.org/10.1016/j.energy.2024.134337

2025

Energy and environmental characterisation of Gas Adsorption Heat Pump fuelled with H2NG blends

Under review

International Journal of Hydrogen Energy

2024

HCNG refuelling station to accelerate the transition towards a real hydrogen economy: A techno-economic analysis

International Journal of Hydrogen Energy

Link https://doi.org/10.1016/j.ijhydene.2024.05.145

2023

How the cylinder initial conditions affect the HCNG refuelling process - A thermodynamic analysis to determine the most effective filling parameters

International Journal of Hydrogen Energy

Link https://doi.org/10.1016/j.ijhydene.2023.07.323

2023

Recent progresses in H2NG blends use downstream Power-to-Gas policies application: An overview over the last decade

International Journal of Hydrogen Energy

Link https://doi.org/10.1016/j.ijhydene.2023.06.141

2023

Optimal RES integration for matching the Italian hydrogen strategy requirements

Renewable Energy

Link https://doi.org/10.1016/j.renene.2023.119409

2024

Hydrogen blending in natural gas grid: energy, environmental and economic implications in the residential sector

Buildings

Link https://doi.org/10.3390/buildings14082284

2023

Hydrogen volumetric fraction effects on HCNG refuelling station CAPEX

10.1088/1742-6596/2648/1/012064

Journal of Physics

2023

Potential Role of green hydrogen as an energy carrier in smart energy system communities

10.1088/1742-6596/2648/1/012096

Journal of Physics

2023

Decarbonization of methanol production - Techno-economic analysis of Power-to-Fuel process in a Hydrogen Valley

10.1088/1742-6596/2648/1/012066

Journal of Physics

CONFERENCES AND SEMINARS

21 MAR 2022 – 22 MAR 2022 Online

World Online Conference on Sustainable Technologies

Oral presentation of the work "Increasing the Italian RES installation targets for accomplishing the electrolysers capacity goals set by the Italian Hydrogen Strategy".

14 SEP 2023 – 15 SEP 2023 Carpi, Italy

ATI Conference 2023

Presented work: "Hydrogen volumetric fraction effects on HCNG refuelling station CAPEX".

25 SEP 2023 – 29 SEP 2023 Dubrovnik, Croatia

Conference on Sustainable Development of Energy, Water and Environment Systems

Presented work: "HCNG refuelling station to accelerate the transition towards a real hydrogen economy: a techno-economic analysis".

30 JUN 2024 – 5 JUL 2024 Rodes, Greece

37th International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems

Presented work: Can hydrogen refuelling be cost-effective and competitive with electric charging for heavy-duty vehicles?

8 SEP 2024 – 12 SEP 2024 Rome, Italy

19th Conference on Sustainable Development of Energy, Water and Environment Systems

Presented work: "Improving the effectiveness of an on-site hydrogen refuelling station for heavy-duty vehicles: a multi-objective optimisation".