Michele Rocca

michele.rocca@unipi.it

+39 050 2217154

ACADEMIC ACTIVITY

2023 → **Fixed-term researcher (RTdA)** — DESTEC
NEST - Spoke 4: Clean hydrogen and final uses

2022-23 **Research grant** — Sapienza Università di Roma
"Monitoring of personal exposure of outdoor workers to solar UV radiation "

2021-22 **Research grant** — DICI
"Identification and quantification of on-board noise sources and transmission paths"

2020 **Research fellowship** — DESTEC
"Energy audit and energy renovation of a secondary school"

2016 **Research fellowship** — DESTEC
"Smart Systems for innovative strategies of IEQ assessment"

2014-15 **Research fellowship** — DESTEC
"Field measurements, modelling and simulations with lighting software"

EDUCATION

2016-20 **PhD** in **Energy Systems Territory and Construction Engineering** at the DESTeC dept. of the University of Pisa (*XXXII cycle*).
Research activity on: ***"Indoor Environmental Quality assessment: study of innovative strategies based on multi-criteria analysis"***.

2013 **MSc Building Engineer** at University of Pisa
Thesis: Visual ergonomics and visual comfort in indoor workplaces: Analysis of Video Display Terminal (VDT) Workstations: the CAD workstation

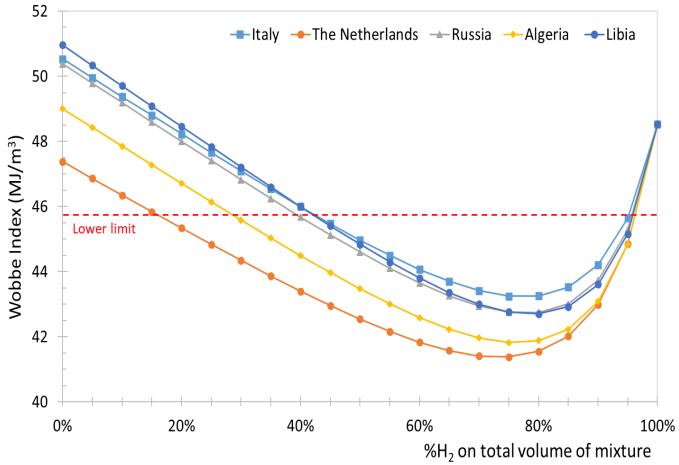
2010 **BSc Building Engineer** at University of Pisa
Thesis: Acoustic analysis at the nursery school G. Puccini in Pisa: Acoustic insulation of building structures, Acoustic classification, Environmental noise measurements.

MAIN RESEARCH KEYWORDS

Hydrogen; Indoor Environmental Quality; Energy performance of buildings; Lighting; Acoustics; Sound propagation in indoor work environments; Thermal and acoustic insulation of building envelope; Indoor and Outdoor electric lighting.

Hydrogen and methane blends

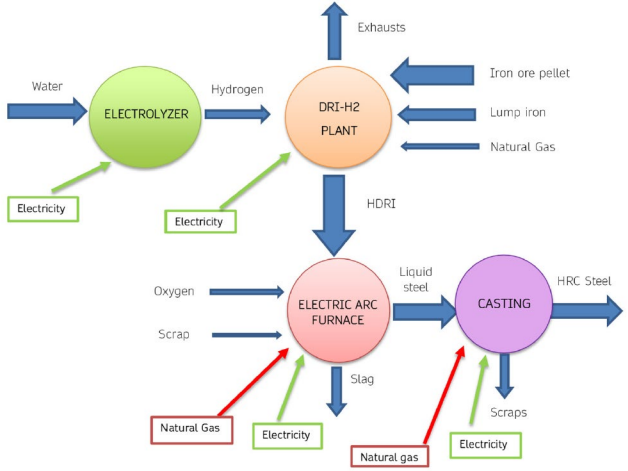
- Exploration of the concept of blended combustion, specifically focusing on hydrogen/methane mixtures in different percentages.
- Evaluation of the potential for green hydrogen injection into natural gas grid considering the corresponding photovoltaic capacity required.



*[Franco A., Rocca M. Industrial Decarbonization through Blended Combustion of Natural Gas and Hydrogen. Hydrogen **2024**, Vol. 5(3), pp. 519-539].*

Hydrogen use in hard-to-abate sectors

- Evaluation of possible contribution of hydrogen in hard-to-abate sector, with particular attention to the steel industry. The analysis has been carried out taking into consideration the final uses of the energy, maintaining the processes currently available, and evaluating possible changes to the processes.

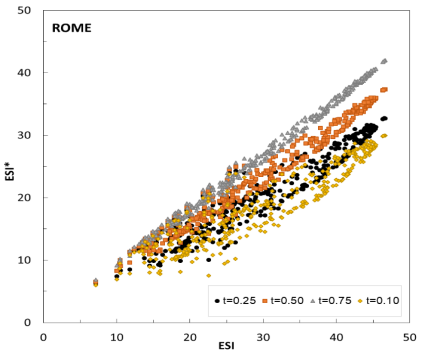


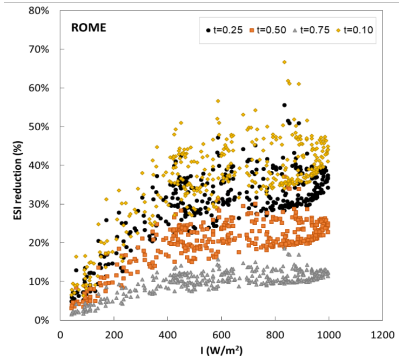
*[Franco A., Rocca M. Renewable Electricity and Green Hydrogen Integration for Decarbonization of "Hard-to-Abate" Industrial Sectors. Electricity **2024**. 5(3), pp. 471-490].*

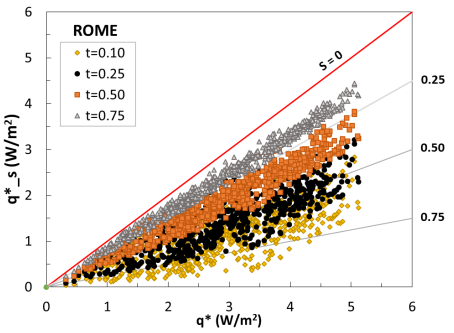
Solar radiation impact in urban areas

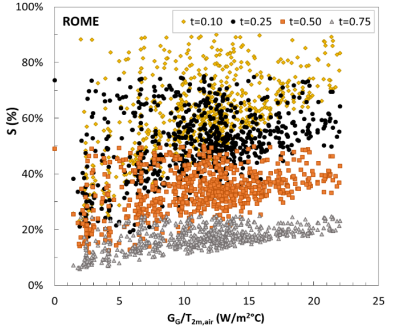
Analysis of the effects of textile solar shading systems on:

- livability and usability of the urban environment;
- energy savings associated with the potential benefit on summer thermal load reduction in buildings;
- outdoor collective health associated with the potential benefit on thermal stress and UV exposure reductions.





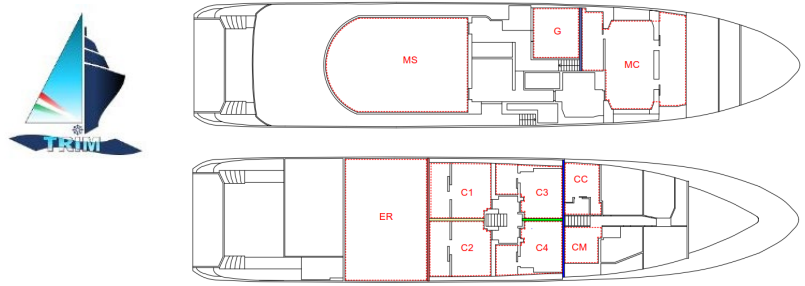


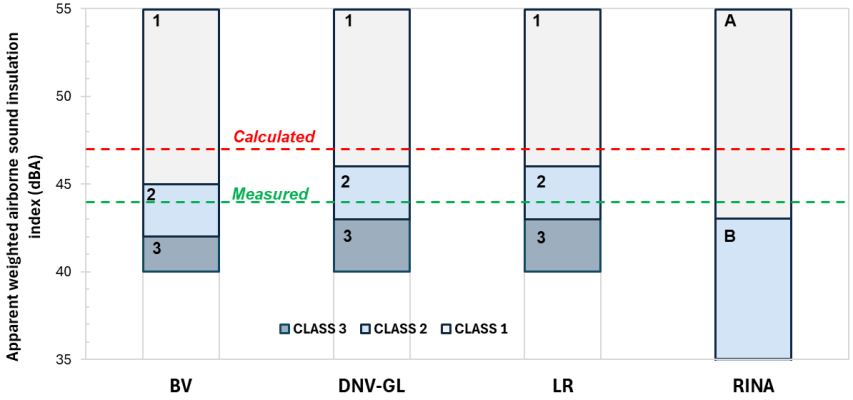


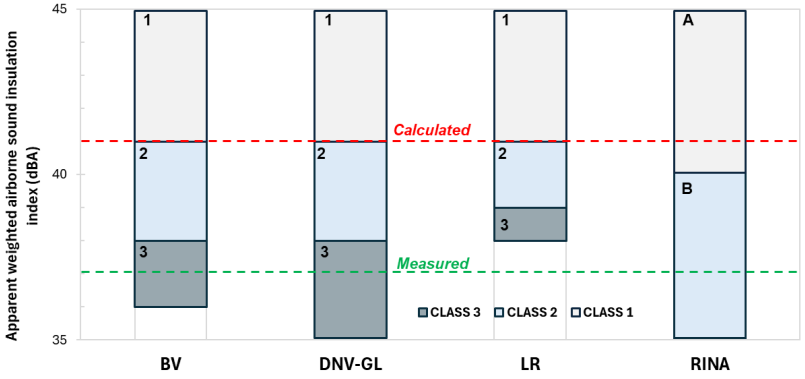
*[Rocca M., Salvadori G., Leccese F., Bisegna F. Textile solar shading systems for reducing the negative impacts of solar radiation in urban areas: a critical review. City and Environment Interactions **2025**, 28, art.nr. 100240].*

Sound insulation in yachts

- Creation of an international framework of the acoustics requirements and classification schemes for yachts.
- Exploration of acoustic simulation without resorting to very advanced calculation tools, for the determination of acoustic insulation characteristics of the internal partitions of yachts (bulkheads) in the design stage.



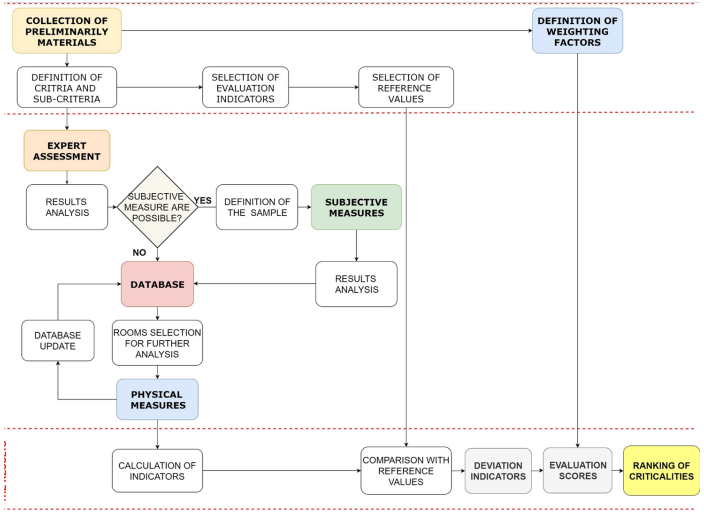




*[Rocca M., Di Puccio F., Forte P., Fidecaro F., Artuso F., Kanka S., Leccese F. Acoustic Measurements and Simulations on Yachts: An Evaluation of Airborne Sound Insulation. Journal of Marine Science and Engineering **2025**, Vol. 13(5), Article nr. 988].*

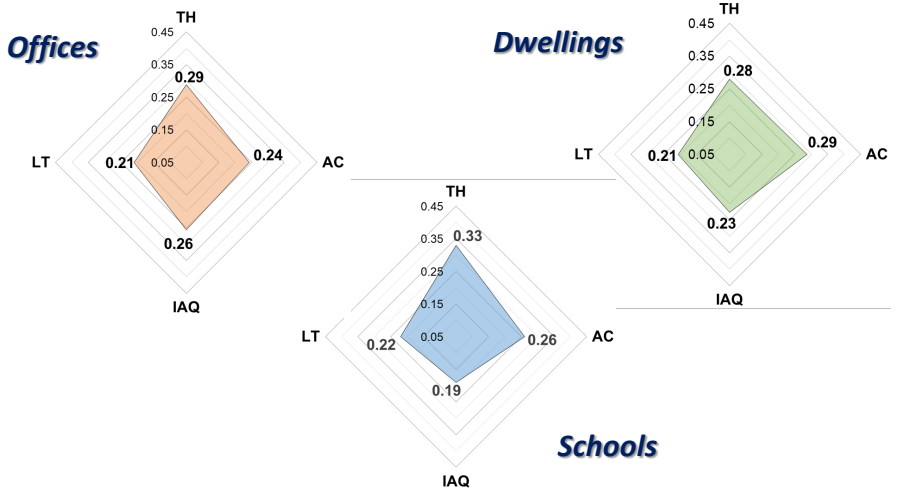
Indoor Environmental Quality evaluation procedure for existing buildings

- Development of a method for the evaluation of IEQ in existing buildings aimed at identifying critical aspects and creating criticality rankings.



*[Leccese F., Rocca M., Salvadori G., Belloni E., Buratti C. A multicriteria method to identify and rank IEQ criticalities: Measurements and applications for existing school buildings. Energy and Built Environment **2025**, 6(3), pp. 387-401].*

- Identification of appropriate weighting schemes to assess combined effects of multiple environmental factors on the IEQ in different building uses.



*[Leccese F., Rocca M., Salvadori G., Belloni E., Buratti C. Towards a holistic approach to indoor environmental quality assessment: Weighting schemes to combine effects of multiple environmental factors. Energy & Buildings **2021**, 245, Art. nr. 111056].*