

RICCARDO TOFFANIN

[GitHub](#) | [LinkedIn](#)

SUMMARY & SKILLS

I am an **energy engineer** and **project manager** with over six years of experience in **applied research** within national and European-funded smart grid and energy transition projects. I am skilled at modeling and optimizing energy systems, and analyzing energy data to uncover useful insights that help drive business decisions.

Languages: Italian (native), English (C1 - IELTS 2016), French (A2), Spanish (A2)

Simulation:

Programming: Python (pandas, numpy, scikit-learn, cvxpy, matplotlib, seaborn), MATLAB, C++

Data science: ingestion, pre-processing, visualization, statistical analysis and machine learning (regression, classification, clustering, time series forecasting)

WORK EXPERIENCE

Project Manager - Energy Systems

Oct. 2022 – Present

Azienda Elettrica di Massagno (AEM) - DSO

Massagno, Switzerland

- Developed a dynamic grid tariff, which was awarded the **2025 Swiss Watt d'Or** prize for energy innovation
- Led and participated in national and European research projects with academic and industrial partners
- Developed demand-side management algorithms in Python for battery energy storage systems (BESS)
- Developed a Python-based hydropower plant simulation tool to support concession renewal planning
- Implemented Model Predictive Control (MPC) in Python for a bidirectional electric vehicle (EV) for the field trials of the *V2X Suisse* project

Research Assistant

May 2019 – Sep. 2019

University of Applied Science and Arts of Southern Switzerland (SUPSI)

Lugano, Switzerland

- Modeled district heating networks and building HVAC systems in C++ and Python
- Created a Python tool for pre-feasibility analysis of district heating systems using GIS data
- Conducted CFD simulations in Ansys Fluent for solar fuel production in collaboration with Synhelion SA

Research Intern

Feb. 2018 – Oct. 2018

Institut de Recerca en Energia de Catalunya (IREC)

Barcelona, Spain

- MPC-based optimization of residential heat pumps with dynamic building models in a TRNSYS-MATLAB co-simulation environment for the master's thesis *Energy Flexibility Strategies for Residential Buildings in Mediterranean Climates*

Research Intern

Jul. 2016 – Sep. 2016

Concordia University

Montreal, Canada

- Modeled and analyzed the thermal and electrical performance of Building-Integrated Photovoltaic/Thermal (BIPV/T) systems using MATLAB under varying climatic and operating conditions

EDUCATION

Master of Science | *EIT InnoEnergy - Sustainable Energy Systems (SELECT)*

Aug. 2016 – Oct. 2018

Universitat Politècnica de Catalunya (UPC) - Second Year

Barcelona, Spain

Royal Institute of Technology (KTH) - First Year

Stockholm, Sweden

Bachelor of Science | *Energy Engineering*

Oct. 2013 – Jul. 2016

Politecnico di Milano

Milan, Italy

HONORS AND AWARDS

Swiss Federal Office of Energy (SFOE) award - Watt d'Or

2025

Development of an innovative dynamic grid tariff for the distribution grid — Description

EIT InnoEnergy - Scholarship

2016 - 2018

Monthly allowance for the master's degree in Sustainable Energy Systems (SELECT)

PUBLICATIONS

Main author:

- Toffanin, R., Caputo, P., Belliardi, M., & Curti, V. (2022). Low and Ultra-Low Temperature District Heating Equipped by Heat Pumps—An Analysis of the Best Operative Conditions for a Swiss Case Study. *Energies*, 15(9), 3344. <https://doi.org/10.3390/en15093344>
- Toffanin, R., Curti, V., & Barbato, M. C. (2021). Impact of Legionella regulation on a 4th generation district heating substation energy use and cost: the case of a Swiss single-family household. *Energy*, 228, 120473. <https://doi.org/10.1016/j.energy.2021.120473>
- Toffanin, R., Curti, V., & Barbato, M. C. (2020). Impact of Legionella regulation on a 4th generation district heating substation energy use and cost: the case of a Swiss single-family household. *Conference Proceedings of 6th International Conference On Smart Energy Systems*, Aalborg, Denmark
- Toffanin, R., Ge, H., & Athienitis, A. (2019). Integration of Building Integrated Photovoltaic-Thermal (BIPV-T) System with Heat Recovery Ventilators for Improved Performance Under Extreme Cold Climates. *Cold Climate HVAC 2018*, 97–110. https://doi.org/10.1007/978-3-030-00662-4_9
- Toffanin, R., Péan, T., Ortiz, J., & Salom, J. (2019). Development and Implementation of a Reversible Variable Speed Heat Pump Model for Model Predictive Control Strategies. *Building Simulation 2019*, 16, 1866–1873. <https://doi.org/10.26868/25222708.2019.210611>

Contributing author:

- Rocca, R., Leonori, S., Aznar, G. F., Toffanin, R., & Luengo-Baranguan, L. (2025). Optimal scheduling of district heat pumps conceived for implementation in Energy Management Systems to participate in demand response. *Energy Conversion and Management: X*, 27, 101074. <https://doi.org/10.1016/J.ECMX.2025.101074>
- Rocca, R., Elorza-Uriarte, L., Zubia, I., Farrace, D., Toffanin, R., & Rivas-Ascaso, D. M. (2024). Techno-economic analysis of electrical flexibility in combustion-based district heating systems: A Swiss case study. *International Journal of Electrical Power & Energy Systems*, 157, 109869. <https://doi.org/10.1016/J.IJEPES.2024.109869>
- Zavattoni, S. A., Good, P., Geissbühler, L., Rutz, D., Toffanin, R., Montorfano, D., Ambrosetti, G., & Barbato, M. C. (2024). Performance Evaluation of the Pressurized Synhelion Absorbing Gas Receiver. *SolarPACES Conference Proceedings*, 1, 97–110. <https://doi.org/10.52825/solarpaces.v1i.898>