ELECTRICAL, ELECTRONICS AND COMMUNICATIONS ENGINEERING

MUR DM 117/GTT - Study and testing of an energy model with zero environmental impact in a local public transport company

Funded By	GTT - GRUPPO TORINESE TRASPORTI S.P.A. [P.iva/CF:08559940013] MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [P.iva/CF:97429780584] Politecnico di TORINO [P.iva/CF:00518460019]
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Context of the research activity	The activities, which will contribute to make the local public transport companies carbon neutral, will be divided into three main lines of research: 1. electrification and hydrogen fueling of vehicles; 2. electrification and efficiency of industrial plants; 3. optimization of the overall energy system based on generation from renewable sources, storage and multi-commodity systems, plant power supply and charging of public transport vehicles. Progetto finanziato nell'ambito del PNRR - MUR DM 117/2023 - CUP E14D23002000004
Objectives	The objective of the research is to identify and test methodologies to make local public transport companies carbon neutral. These methodologies should be environmentally sustainable and economically competitive. The developed methodologies will be tested and implemented by the Gruppo Torinese Trasporti (GTT), the local public transport company of Turin. The activities will be divided into three main lines of research, considering that the types of consumptions for a transportation company are two: the direct consumption of public transportation vehicles (city and suburban buses, streetcars and subways) and the consumption of facilities serving plants and offices. Therefore, the three main lines of research are: 4. electrification and hydrogen fueling of means of transportation; 5. electrification and efficiency of industrial plants;

Objectives	6. optimization of the overall energy system based on generation from renewable sources, storage and multi-commodity systems, plant power supply and charging of public transport vehicles. For this reason, loads and generation systems will be characterized, and a multi-objective optimization system will be implemented to support infrastructure planning and management activities. The topic is linked to the research and innovation needs of the Turin Transportation Group and is closely related to the objectives of Missions 2 and 3 of the NRP, including energy transition and the development of a modern and sustainable transportation infrastructure that can be a model for all Italian public transport realities. The PhD student will work together with a research unit of Politecnico di Torino (DENERG) and GTT.

Skills and competencies for the development of the activity	• base knowledge in the field of electrical and energetic engineering • interest in coding • B2 in Italian and English according to the “Common European Framework of Reference for Languages: Learning, Teaching, Assessment” (CEFR) classification