**ABSTRACT**

This paper suggests a techno-economic process for the energy storage by using SCs in the train, with the aim to reduce the energy consumption. The proposed design of railway station use PV and wind sources, and batteries for energy storage system (ESS). For the train, SCs are implemented to the ESS where they are alimented breaking phases and from stations by a pantograph installed in an air power line in each stop. SCs are distinguished by high characteristics power and a wide number of charge/discharge cycles, they provide low particular energy and a fast charging time. An energy management approach is suggested to control the DC bus by voltage and the buck-boost converter by current. The Sizing of PI controller used for the stabilization of the DC bus of train and station is given. The whole system is modeled in MATLAB-Simulink. Simulations for the train and station show the suitability of the suggested power-train and control strategy.

**Keywords:** Energy management, railway system control, energy storage system, Super-capacitors.

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