Energy savings in metro-transit systems: a comparison between operational Italian and Spanish lines

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Abstract— For transportation in large cities, new technologies that impact the operation of metro-transit systems are being developed. The energy efficiency in metro-transit systems is a key topic that is being studied in order to reduce both consumption and costs. A review on approaches to managing the energy recovered from train braking is reported. Then, energy performance indexes are presented. Their assessment is possible due to highly specialized simulation tools that have been developed at the University of Rome Sapienza and Comillas Pontifical University, Madrid. The indexes are used to perform a comparison between an operational metro-line in Spain and one in Italy. The results confirm their accuracy and significant improvements in energy efficiency and environmental effects are presented.

Index Terms— Efficiency, energy saving, environmental sustainability, metro-transit system, regenerative braking, urban transport

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Citation:

Falvo, M.C.; Sbordone, D.; Fernández-Cardador, A.; Cucala, A.P.; Pecharromán, R.R.; López López, A.J.; "Energy savings in metro-transit systems: a comparison between operational Italian and Spanish lines", Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit, vol.230, no.2, pp.345-359. January, 2016.