

Event:

Energy in Buildings Athens Conference 2026

Date:

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Place:

Divani Caravel Hotel Athens, Greece



#	George Leoutsakos Mechanical Engineer MSc, DIC, PhD	
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Presentation title:	Air Conditioning Systems Design and Sustainability in Conventional and Driverless Metros	
The concept of air conditioning the public areas of Metro stations balances between the advantages of providing more attractive travel conditions to citizens who would prefer using the Metro instead of their cars, and the disadvantages of higher energy consumption, resulting greenhouse gases emissions, and the heat rejection from the chillers dumped inside the city's residential web, questioning the overall sustainability. Primarily, the present paper involves the evaluation of air conditioning trains and/or stations, then a design concept is presented for air conditioning (a) a typical conventional underground Metro station with open platforms and (b) a modern underground station served by driverless trains and Platform Screen Doors on the station platforms. Furthermore, the typical equipment and ductwork layout concept is outlined for each case, interfacing also with the necessary underground public areas' ventilation, as well as the tunnel ventilation in normal operation and smoke exhaust modes. The evaluation of the proposed design options considered the technical and operational design complexity, the overall energy consumption and the environmental and cost sustainability of each proposal. It was clearly concluded that it is well worth investing in train A/C, while Metro station A/C system installations should be implemented only when Platform Screen Doors are installed in the platforms, separating the platform areas from the tracks, safeguarding a drastic reduction of approx. 80% in the cooling loads, the energy consumption and the heat rejection at street level, resulting in a true case of energy, environmental and cost sustainability.		
Short CV (EN) :		
Dr Mechanical Engineer, 33 years experience in Metro/Tram Projects engineering for conventional/driverless systems. Worked for >100 Metro stations, >200 Metro Ventilation/HVAC and Electromechanical installations underground buildings, 20 Tramway stations, 10 depots, 6 bus and park&ride facilities plus consulting for Metro lines engineering abroad. Currently Engineering Director in Elliniko Metro S.A. in Athens, Greece. Also involved in Metro research projects within EU research frameworks. 55 publications in international journals/conferences.		