

Research calculates how passenger body heat affects energy consumption of airport buildings

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There's snow and ice on the runway, you've gone through check-in and security, but your flight's delayed, thank goodness the airport has a

decent heating system! Well, a study in the [*International Journal of Sustainable Aviation*](#) has investigated how much each passenger's body heat might be contributing to the departure lounge's overall heating budget.

Okan Kon and İsmail Caner of Balıkesir University in Turkey have offered useful insights into the impact of human heat generation in airport environments. Their work could lead to a new approach to the design and management of such spaces for better fuel efficiency. The team looked at how the [human body](#) contributes to heat buildup within an airport lounge by taking into account body temperature, [ambient temperature](#), [heat transfer](#) through air movement (convection) and evaporative cooling through sweating evaporation, as well as heat gains from heat radiating from skin surfaces.

They analyzed the heating effects associated with individuals sitting, standing or staff engaged in light work. They assumed that clothing has negligible thermal resistance in these various scenarios. The calculations showed that heat gain from each person ranges from a low of about 400 Watts to a peak of almost 600 Watts.

Having these figures to hand could help in the design of complex indoor spaces and the [air conditioning](#), ventilation, and [heating systems](#) they use. After all, if a packed airport lounge can rely on a certain proportion of its heating from the people in the lounge, then that part of that proportion might be cut from the overall demand on the heating system in the space.

Appropriate auditing of the heat gains and losses that take into account the people in the airport and their level of activity could make airport lounges and other complex indoor spaces more energy-efficient and even more comfortable. It could be used to offer advice for airport staff and passengers on clothing requirements too. This would benefit passengers

and [airport](#) operators alike.

More information: Okan Kon et al, Calculations of internal heat gain from occupants affecting the energy consumption of airport buildings, *International Journal of Sustainable Aviation* (2023). [DOI: 10.1504/IJSA.2023.134331](#)

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