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FP7 project CASCADE develops and tests a new ICT solution for an optimized energy operation of heating, ventilation and air conditioning systems at airports

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According to long-term forecast, the demand for air travel will continuously grow in Europe in the coming decades. The Instrument Flight Rules (IFR) movements are expected to increase in a range from 1.6% to 3.9% annually between 2009 and 2030. In 2030, a 1.4-2.2 fold expansion in air traffic is expected compared to 2009 ([Eurocontrol](#) [3], 2010[1]). In view of this, European airports are facing a major challenge to jointly develop their capacity while reducing their environmental impact and thus contributing to the 20/20/20 targets of the European Union.

In the same time, important energy saving potentials can be harnessed just by optimizing the energy operation of heating, ventilation and air conditioning systems in airport terminals. In a terminal building, air conditioning systems operate continuously to guarantee passenger comfort and account for about 50% of the energy consumption beside lighting, baggage handling and ICT systems. They are controlled by complex Building Automation Systems (BAS) and supervised by qualified Operation & Maintenance teams. Meanwhile, in many buildings, faults in the operation of the energy systems can remain undetected over days because the information lying in the data of the BAS remains unexploited.

In CASCADE, our Consortium is developing a solution that supports energy teams at airports to identify automatically faults and suboptimal operation in their heating, ventilation and air conditioning systems and to trigger corrective actions over an ISO 50001 based Energy Action Plan. As scientific Coordinator of the FP7 CASCADE project „CASCADE - ICT for Energy Efficient Airport“, I want to highlight today the successful implementation of the first project demonstration phase. The solution is currently tested in two major European airports: the Rome Fiumicino and the Milan-Malpensa airports. We have installed there hundreds of additional sensors and meters and gained access to BAS data bases. Our algorithms are analysing real-time data from large air handling units, compression chillers and water loops, night and day, and could deliver us interesting first results. It will significantly improve the energy consumption and carbon foot print of our pilot terminals once corrective actions will be implemented. Thus, synchronisation of systems or sensor faults as well as scheduling optimization could be identified by using our new tool. An innovative data analysis method for the automated fault detection and diagnosis based on qualitative models has been developed and applied to an air handling unit and could detect automatically a faulty cooler operation, just by learning from the data. One target goal was to reach 20% energy savings on targeted systems and a 3 years Return On Invest. We already know after a few months of continuous analysis that we are on a good way to reach our goals...!

And the energy operation of our airport pilots are not the only ones that need to be optimized. From our experience, the majority of our buildings' systems that ensure our comfort are candidates for an

optimization! So, hands on the energy operation of our buildings!

You are invited to visit our website: www.cascade-eu.org [4] and to follow us on Twitter: [#energyefficientAirport](https://twitter.com/energyefficientAirport) [5]

[1] <https://www.eurocontrol.int/publications/eurocontrol-long-term-forecast-...> [3]

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