


Event:  
Date:  
Place:

**ENERGY in BUILDINGS 2019**  
Saturday September 28, 2019  
Athens, Hellas



#	<b>Prof. João Francisco</b> (PhD in Mechanical Engineering)	
Title:	Coordinator Professor	
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Presentation title:	<b>CFD Simulation on PCM Charge and Discharge Process Applied to Compact Hybrid Thermal Storage Technologies</b>	
<p>This paper reports a CFD study developed under the SCORES project with the aim of optimizing the geometry of a latent thermal energy storage prototype (LTESP) to be applied on a hybrid thermal storage technology. Detailed numerical simulation of the melting and solidification process of a Phase Change Material (PCMs) was developed to study the heat transfer rate and the total time of charge and discharge process of different LTESP geometrical configurations. The optimization process was done considering several indicators such as: compactness of the system, energy storage capacity, heat transfer rate capacity, charge-discharge cycling time and PCM medium maximum temperature achieved during the charge process. The first CFD results have showed that introducing aluminum fins inside the PCM mass is an effective and inexpensive solution to enhance the thermal performance of the LTESP reducing the charging/discharging cycle time, increasing the average heat transfer rate and reducing the maximum temperature inside the PCM medium over the charge process.</p> <p>This work was financially supported by the SCORES project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 766464. This article reflects only the authors' view and the European Commission is not responsible for any use that may be made of the information it contains.</p>		

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CV:

João Francisco is a graduate of Mechanical Engineering from the Technical University of Lisbon. He received his MSc degree in 1990 at the same university. He received his Phd degree in Mechanical Engineering in 2004 in Porto University.

He is an ASHRAE member from 1993, and Specialist in Energy at the Portuguese Engineering Professional Association.

He is Coordinator Professor at the Mechanical Engineering Department of Setúbal High School of Technology (ESTSetúbal) of Polytechnic Institute of Setúbal (IPS) since April 2013, and Assistant Professor at the same place from February 1991.

He is the actual Head of the Mechanical Department of ESTSetúbal/IPS and the actual Coordinator of Mechanical Engineering Degree at IPS. He was Dean of ESTSetúbal/IPS from 1999 to 2008.

He is a Portuguese Expert in Building Energy Certification (EPDB) since 2006. He has issued more than six hundred service building certificates since that date.

He was the coordinator of 35 Qualified Expert Training course of the Energy Certification System from 2007 to 2009, involving almost 700 Engineers and Architects.

He was the Coordinator of the European IEE Promotion 3E Project (2008-2011).