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Presentation title:	**Study of Heat Transfer in a Latent Heat Storage System using Salt Hydrates for Domestic Heating Applications**	

Thermal energy storage (TES) consist a technology that can be used to decrease the energy demand of buildings. It is critical for renewable energy sources (RES) applications implementation such as solar or geothermal energy, as it provides a mean to store the excess energy produced. TES can be classified into sensible, latent heat and thermo-chemical storage. Latent heat thermal energy storage (LHTES) is the most promising due to its ability to store energy at nearly constant temperature corresponding to the phase transition temperature of the material. LHTES comprises at least a suitable phase change material (PCM) with its melting point in the desired temperature range, an adequate heat exchanger, and a container compatible with the PCM. The PCM choice for LHTES lies on the target application as the materials exhibits different characteristic properties. Salt hydrates have high energy storage density, low price, relatively good thermal conductivity and compatibility with plastics. However, they suffer from incongruent melting and super-cooling. Since one of the main drawback of all PCMs is their low thermal conductivity to fully exploit their potential in practical applications, a suitable heat exchanger is one of the key issues to be addressed.

In the present work, the initial assessment of the working performance of a laboratory-scale LHTES unit when salt hydrates are used as PCM material is attempted. Tests were carried out in a testing rig specifically developed for such experiments using a staggered finned heat exchanger. The melting and solidification behavior of commercial salt hydrates was studied. The operation temperatures were monitored collecting data based on the requirements of solar thermal energy storage for domestic applications. Results were used to understand the process duration and the effect of the heat transfer fluid flow rate in both melting and solidification processes.

CV:	

George Dogkas has a degree in Physics, with expertise on Solid State Physics, from the National and Kapodistrian University of Athens. He is a PhD Candidate at the National Technical University of Athens, Faculty of Mechanical Engineering, Laboratory of Applied Thermodynamics. He is also partner of the Technological Education Institute of Sterea Ellada, Department of Mechanical Engineering, Energy and Environmental Research Laboratory.

His research fields of interest are thermodynamics and heat transfer in general as well as especially Stirling and Vuilleumier machines and Phase Change Materials. His skills include CAD design, CFD and FEA simulations and programs development. He has a teaching experience on students of high school and university. He has published nine papers in international conferences and scientific journals and has attended seminars on CFD and hypercomputers.