

Thursday, 10 June 2021

9:00 – 10:25	Morning session A4	TES applications
Chairperson:		
9:00 – 9:25	Keynote lecture (#223) Phase change materials: is still the starring technology of thermal energy storage? Current applications, perspectives and research gaps <u>Prof. Luisa F. Cabeza</u> <i>University of Lleida, Spain</i>	
9:25 – 9:45	Experimental characterization of two latent heat storage prototypes for domestic heating application (#11) <u>Ass. Prof. Justin Chiu</u> <i>KTH Royal Institute of Technology, Sweden</i>	
9:45 – 10:05	Active PCM-based heat storage using biowax and a pillow-plate heat exchanger in a ZEB building (#164) <u>Dr. Alexis Sevault</u> <i>SINTEF Energy Research, Norway</i>	
10:05 – 10:25	Thermo-economic analysis of cascaded latent-heat stores in pumped thermal electricity storage systems (#36) <u>Dr. Yao Zhao</u> <i>Shanghai Jiao Tong University, China</i>	

9:00 – 10:20	Morning session B4	Systems
Chairperson:		
9:00 – 9:20	Simulations and optimization of BTES systems for commercial and non-residential buildings in project geo:base, and validation of BHE simulation (#115) <u>Prof. Dr. Lars Kühl</u> <i>Uteg Dr. Mands & Sauer GbR, Germany</i>	
9:20 – 9:40	Methods for the determination of the state-of-charge of a thermal energy storage device (#27) <u>Dr. Gabriel Zsembinszki</u> <i>University of Lleida, Spain</i>	
9:40 – 10:00	Analysis of the discharging process of latent heat thermal energy storage units by means of normalized power parameters (#94) <u>Dr. Andreas König-Haagen</u> <i>University of the Basque Country UPV/EHU, Spain</i> <i>University of Bayreuth, Germany</i>	
10:00 – 10:20	Experimental study of AI-based model predictive control strategy for thermal energy storage system (#118) <u>Ms. Doyun Lee</u> <i>University of Tokyo, Japan</i>	

9:00 – 10:20	Morning session C4	EES applications
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Chairperson:	
9:00 – 9:20	Multivalent Batteries and their perspective (#217) <u>Prof. Robert Dominko</u> <i>National Institute of Chemistry, Slovenia</i>
9:20 – 9:40	Development of an H₂-permeable, PdCu-based, composite membrane by using a reverse build-up method (#102) <u>Mr. Yasunari Shinoda</u> <i>Tokyo Institute of Technology, Japan</i>
9:40 – 10:00	Techno-economic evaluation of Brayton Battery configurations with power-to-heat extension (#13) <u>Mr. Sergej Belik</u> <i>German Aerospace Center, Germany</i>
10:00 – 10:20	Ni-doped CdS quantum dots sensitized 3D rosette-rod TiO₂ photoanodes for photoelectrochemical water splitting (#170) <u>Prof. Gülfeza Kardaş</u> <i>Çukurova University, Turkey</i>
10:20 – 10:45	Sponsor chat / Break

10:45 – 12:25	Morning session A5	TES applications
Chairperson:		
10:45 – 10:05	Coupling of building simulation with real time measurements of PCM components - a hardware in the loop approach (#122) <u>Mr. Stephan Vidi</u> <i>ZAE Bayern, Germany</i>	
10:05 – 10:25	Techno-economic assessment of thermal energy storage systems for small-scale CSP plants running organic Rankine cycles (#3) <u>Dr. Iñigo Ortega-Fernández</u> <i>CIC energiGUNE, Spain</i>	
10:25 – 10:45	Modeling phase change materials in advanced urban canopy models (#72) <u>Dr. Claudia Fabiani</u> <i>University of Perugia, Italy</i>	
11:45 – 12:05	An algorithm for optimal selection of thermal energy storage options in industrial waste heat recovery applications (#70) <u>Dr. Giovanni Manente</u> <i>University of Birmingham, United Kingdom</i>	
12:05 – 12:25	Giga scale pit storage as an essential part of district heating systems (#33) <u>Mr. Keith O'Donovan</u> <i>AEE Intec, Austria</i>	

10:45 – 12:25	Morning session B5	TCM materials
Chairperson:		

10:45 – 10:05	Experimental study of ettringite materials for thermochemical energy storage in buildings (#119) <u>Prof. Frédéric Kuznik</u> <i>CETHIL INSA Lyon, France</i>
10:05 – 10:25	Impact of Fe- and La-doping on the thermochemical heat storage capacity of CaMnO₃ (#97) <u>Dr. Emanuela Mastronardo</u> <i>Institute of Catalysis and Petrochemistry, Spain</i> <i>University of Messina, Italy</i>
10:25 – 10:45	Synthetic strategies for the enhancement of tricalcium aluminate hexahydrate hydrothermal cycling performances (#129) <u>Mr. Fabrizio Alvaro</u> <i>University of Messina, Italy</i>
11:45 – 12:05	Development of Co_{3-x}Ni_xO₄ (0 ≤ x ≤ 1) materials for thermochemical energy storage at lower red-ox temperature (#35) <u>Ms. Yasmina Portilla</u> <i>CIC energiGUNE, Spain</i>
12:05 – 12:25	Thermochemical storage of low-temperature wasted heat by organic salt hydrate material (#117) <u>Dr. Emanuele La Mazza</u> <i>University of Messina, Italy</i>

10:45 – 12:25	Morning session C5	Sensible materials
	Chairperson:	
10:45 – 10:05	Industrial byproducts characterization for high temperature solid particle solar tower systems used as thermal energy storage and heat transfer fluid (#213) <u>Dr. Alejandro Calderón</u> <i>University of Barcelona, Spain</i>	
10:05 – 10:25	The enabling role of nanoparticles in the development of anticorrosion coatings for molten salts thermal energy storage applications (#104) <u>Dr. Luis González-Fernández</u> <i>CIC energiGUNE, Spain</i>	
10:25 – 10:45	High temperature equilibria in molten nitrate salt - Thermal stability in purged and closed systems (#103) <u>Dr. Alexander Bonk</u> <i>German Aerospace Center, Germany</i>	
11:45 – 12:05	Hot corrosion resistance of Inconel 600 under molten salts at 675 °C for thermal energy storage tanks. (#160) <u>Mr. Adrià Urban</u> <i>University of Barcelona, Spain</i>	
12:05 – 12:25	Corrosion study of the use of nitrate molten salt nanofluids in Concentrated Solar Plants (#190) <u>Dr. Helena Navarro</u> <i>University of Birmingham, United Kingdom</i>	

12:25 – 12:55	Sponsor chat
12:55 – 14:00	Lunch break

14:00 – 15:40	Afternoon session A6	Climate
	Chairperson:	
14:00 – 14:20	Analyzing online news to understand thermal energy storage awareness and acceptance (#73) <u>Prof. Anna Laura Pisello</u> <i>University of Perugia, Italy</i>	
14:20 – 14:40	Analysis of electricity consumption in Slovenia until 2050 by integrating RES with the role of energy storage technologies (#191) <u>Ass. Prof. Uroš Stritih</u> <i>University of Ljubljana, Slovenia</i>	
14:40 – 15:00	A techno-economic analysis of compact thermal energy storage technology: energy & cost savings, load-shifting potential, and 2030 cost targets (#207) <u>Mr. Dylan Bardy</u> <i>Natural Resources Canada, Canada</i>	
15:00 – 15:20	The influence of distinctive urban morphologies on the microclimate in Singapore (#24) <u>Prof. Luisa F. Cabeza</u> <i>University of Lleida, Spain</i>	
15:20 – 15:40	Role of onsite thermal and electric storage in nZEBs (#14) <u>Dr. Fabian Ochs</u> <i>University of Innsbruck, Austria</i>	

14:00 – 15:45	Afternoon session B6	PCM materials
	Chairperson:	
14:00 – 14:25	Keynote lecture (#224) Trends in PCM development - From CalorSTOCK'94 to EnerSTOCK'21 <u>Prof. Halime Paksoy</u> <i>Çukurova University, Turkey</i>	
14:25 – 14:45	Effect of the processing method in trimethylolethane based composites for thermal energy storage systems (#114) <u>Dr. Ángel Serrano</u> <i>CIC energiGUNE, Spain</i>	
14:45 – 15:05	Parametric characterization of the variables that influence supercooling on PCMs (#202) <u>Dr. Laura Quant Colón</u> <i>University of the Basque Country UPV/EHU, Spain</i>	
15:05 – 15:25	Thermal characterisation of the novel Cu-67 wt. % Mg phase change material for thermal storage applications (#66)	

	<u>Dr. Carolina Villada Vargas</u> <i>German Aerospace Center, Germany</i>
15:25 – 15:45	Testing the use of UA-values for comparison of two different PCM-heat exchanger (#19) <u>Dr. Dominic Groulx</u> <i>Dalhousie University, Canada</i>

14:00 – 15:40	Afternoon session C6	TES applications
Chairperson:		
14:00 – 14:20	Parametric study of the PCM system for space cooling improved with the night-time ventilation for the enhanced solidification (#89) <u>Mrs. Eva Zavrl</u> <i>University of Ljubljana, Slovenia</i>	
14:20 – 14:40	Promotion of thermal comfort thanks to PCM: also still after 10 years of operation? (#105) <u>Mrs. Tabea Obergefell</u> <i>Fraunhofer Institute for Solar Energy Systems ISE, Germany</i>	
14:40 – 15:00	Thermal analysis and simulation of solar building heating systems utilizing heat pumps and phase change energy storage (#50) <u>Dr. José A. Almendros-Ibáñez</u> <i>Castilla-la Mancha University, Spain</i>	
15:00 – 15:20	Techno-economic evaluation of nitrate salt storage concepts at 620 °C (#107) <u>Mr. Freerk Klasing</u> <i>German Aerospace Center, Germany</i>	
15:20 – 15:40	Experimental comparison of small-scale and full-scale latent storage for integration in efficient heat pumps (#46) <u>Dr. Gabriel Zsembinszki</u> <i>University of Lleida, Spain</i>	
15:45 – 16:15	Participant networking / Break	

16:15 – 18:45	Short Oral-Poster session	TES applications
Chairperson:		
16:15 – 16:21	ASTEP project: development of high temperature thermal energy storage systems for industrial processes (#221) <u>Prof. Ruth Herrero-Martín</u> , <i>Polytechnic University of Cartagena, Spain</i>	
16:22 – 16:28	Groundwater influence on large-scale hot water tanks and pits for renewables-based district heating systems: technical assessment (#82) <u>Mr. Abdulrahman Dahash</u> , <i>University of Innsbruck, Austria</i>	
16:29 – 16:35	Experimental analysis of a small size vacuum insulated water tank (#29)	

	<u>Dr. Emiliano Borri</u> , <i>University of Lleida, Spain</i>
16:36 – 16:42	Experimental evaluation of a heat pump-latent storage system for increasing renewable share of the residential stock (#44) <u>Dr. Valeria Palomba</u> , <i>CNR ITAE, Italy</i>
16:43 – 16:49	Review of thermal energy storage in heat pump systems for heating and cooling (#116) <u>Dr. Eneja Osterman</u> , <i>University of Ljubljana, Slovenia</i>
16:50 – 16:56	Modelling very large thermal energy stores - comprehensive comparison of different models (#5) <u>Dr. Fabian Ochs</u> , <i>University of Innsbruck, Austria</i>
16:57 – 17:04	Radial diffusers with twist generation for arrow storage tanks – first experimental studies (#40) <u>Prof. Thorsten Urbaneck</u> , <i>Chemnitz University of Technology, Germany</i>
17:05 – 17:11	Economic optimization of seasonal thermal energy storage systems (#77) <u>Mr. Reto Hendry</u> , <i>Lucerne University of Applied Sciences and Arts, Switzerland</i>
Poster	Building a predictive model for a heat source system with thermal energy storage using machine learning (#111) <u>Mr. Yuki Matsuda</u> , <i>DAI-DAN Co., Ltd., Japan</i>
17:12– 17:22	Questions
17:22 – 17:28	Temperature distribution on directly irradiated spouted beds(#49) <u>Dr. J.A. Almendros-Ibáñez</u> , <i>Castilla-la Mancha University, Spain</i>
17:29 – 17:35	Business case improvement of a multi-energy plant containing a wood boiler, an organic Rankine cycle and two thermal energy storage vessels (#38) <u>Mr. Iad Al Koussa</u> , <i>Vito/EnergyVille, Belgium</i>
17:36 – 17:42	A study of spacing effect on pool boiling performance of three triangular pitched and vertically oriented tubes (#86) <u>Dr. Artem Nikulin</u> , <i>CIC energiGUNE, Spain</i>
17:43 – 17:49	Validation of numerical model for latent thermal storage operation and analysis of heat charge and discharge in TRNSYS (#54) <u>Mr. Rok Koželj</u> , <i>University of Ljubljana, Slovenia</i>
17:50 – 17:56	Development and analysis of a CFD results based system simulation model for a latent heat thermal energy storage unit with macro-capsules (#90) <u>Dr. Andreas König-Haagen</u> , <i>University of the Basque Country UPV/EHU, Spain, University of Bayreuth, Germany</i>
17:57 – 18:03	Experimental study of a novel three-fluids heat exchanger embedded with phase change materials for cooling applications (#17) <u>Mr. Boniface Dominick Mselle</u> , <i>University of Lleida, Spain</i>
18:04 – 18:10	Assessing shallow geothermal energy potential of Balikesir Region, Turkey with different thermal response testing procedures (#222) <u>Ms. Ayse Ö. Dölçek</u> , <i>Turkey</i>

18:10 – 18:20	Questions	
16:15 – 18:45	Short Oral-Poster session	PCM materials
	Chairperson:	
16:15 – 16:21	Formation mechanism of Al@Al₂O₃ core-shell type microencapsulated phase change material (#134) <i>Mr. Yuto Shimizu, Hokkaido University, Japan</i>	
16:22 – 16:28	Onset of natural convection during PCM melting (#12) <i>Dr. Dominic Groulx, Dalhousie University, Canada</i>	
16:29 – 16:35	Characterization of two phase change materials for domestic hot water application (#138) <i>Prof. Laurent Zalewski, Artois University, France</i>	
16:36 – 16:42	Synthesis of microcapsulated of PCMs with natural shell materials prepared according to green chemistry principles (#171) <i>Mr. Sedat Emir, Çukurova University, Turkey</i>	
16:43 – 16:49	Thermal contact resistance: implications for thermal energy storage systems (#2) <i>Ms. Veronika Stahl, German Aerospace Center, Germany</i>	
16:50 – 16:56	Development of a prototype to research on xylitol crystallization by shearing and seeding for its use as a phase change material (#130) <i>Mr. Miguel Navarro, University of Zaragoza, Spain</i>	
16:57 – 17:04	Possibilities and limitations of PCM development using phase diagrams (#43) <i>Mr. Christoph Rathgeber, ZAE Bayern, Germany</i>	
17:04 – 17:10	Shape-stabilized phase change materials obtained by single screw extruder for building applications: thermo-physical characterization (#154) <i>Ms. Rebeca Salgado, University of Barcelona, Spain</i>	
17:11 – 17:17	Sensitivity analysis of examination methods to determine the degradation of erythritol and HD-PE (#196) <i>Mrs. Franziska Klünder, Fraunhofer Institut For Solar Energy Systems ISE, Germany</i>	
17:20– 17:30	Questions	
17:31 – 17:37	Developing PCM-PVA gel composite bio-inspired by whale blubber for TES (#180) <i>Ms. Özge Güngör, Çukurova University, Turkey</i>	
17:38 – 17:44	Reduction of rotation phase supercooling in nano n-docosanol phase change slurries (#59) <i>Mr. Moritz Kick, Fraunhofer Institute for Solar Energy Systems ISE, Germany</i>	
17:45 – 17:51	Stability of latent heat storage units: evaluation based on the compatibility tests (#210) <i>Prof. Milan Ostrý, Brno University of Technology, Czech Republic</i>	
17:51 – 17:57	Own synthetize nano-enhanced fatty acid phase change materials	

	(NEPCM): a comparison of properties (#155) <i>Mr. Marc Majo, University of Barcelona, Spain</i>
17:58 – 18:04	Measuring crystallisation rates of phase change materials as a function of supercooling (#84) <i>Mr. Peter Hock, ZAE Bayern, Germany</i>
18:05 – 18:11	Development of microencapsulated phase change materials suitable for fluidized bed thermal energy storage systems (#185) <i>Mrs. Gizem Biçer Göktepe, Çukurova University, Turkey</i>
18:11 – 18:17	Thermal characterization of a latent heat thermal energy storage system through an 8.5 kWh experimental prototype (#21) <i>Dr. Raffaele Liberatore, ENEA, Italy</i>
18:18 – 18:24	Measuring thermophysical properties for an open-source PCM library (#51) <i>Mr. Lukas Müller, Lucerne University of Applied Sciences and Arts, Switzerland</i>
18:25 – 18:31	A review on phase change materials, utilization in the aeronautical field (#125) <i>Mr. Christos Potamitis, University of West Attica, Greece</i>
18:32 – 18:43	Questions
18:45 – 19:15	Photo shooting