

The 5th European sCO₂ Conference for Energy Systems – March 14th to 16th

Conference address: Vienna House Diplomat Prague | Evropská 15 | 160 41 Prague | Czech Republic



Tuesday - March 14 th		
	Room: Loft	
19:00 – 20:00	Reception & Evening Event <i>Buffet: open bar with soft drinks, wine, beer, snacks</i>	
Wednesday - March 15 th		
	Room: Belvedere I	
09:00 – 09:15	Welcome and Introduction <i>Dieter Brillert¹ and Václav Dostál²</i> <i>1: University of Duisburg - Essen / UDE</i> <i>2: Czech Technical University in Prague / CTU</i>	
09:15 – 09:45	Keynote Speech <i>Otakar Frýbort, Research Centre Řež</i>	
09:45 – 10:15	Coffee break	
	Heat Exchanger and Transfer (Session 01) Room: Belvedere I Chairman: Jörg Starflinger, University Stuttgart	sCO₂ Applications and Energy Systems (Session 02) Room: Belvedere IV Chairman: Václav Dostál, TU Prague
10:15 – 10:45	128 - Optimization of the air channels on the Diverse Ultimate Heat Sink for sCO₂ power cycle <i>Filip, Radomír (1); Tioual-Demange, Sarah; Taiclet, Guillaume (2)</i> <i>1: Research Centre Řež, Czech Republic</i> <i>2: Fives group, France</i>	125 - Part load analysis of a constant inventory supercritical CO₂ power plant for waste heat recovery in cement industry <i>Astolfi, Marco; Alfani, Dario; Binotti, Marco; Silva, Paolo; Persico, Giacomo</i> <i>Politecnico di Milano, Italy</i>
10:45 – 11:15	132 - Thermodynamic Analysis of a Reactive Particle-to-sCO₂ Heat Exchanger for Recovering Stored Thermochemical Energy <i>Siefering, Bryan; Umer, Muhammad (1); Stechel, Ellen (2); Fronk, Brian (1)</i> <i>1: The Pennsylvania State University</i> <i>2: Arizona State University</i>	116 - Performance and Cost Potential for Direct-Fired Supercritical CO₂ Natural Gas Power Plants <i>Pidaparti, Sandeep; White, Charles (1); Liese, Eric; Weiland, Nathan (2)</i> <i>1: National Energy Technology Laboratory/NETL Support Contractor</i> <i>2: National Energy Technology Laboratory</i>
11:15 – 11:45	147 - A methodology to design air-cooled condensers for supercritical power cycles using carbon dioxide and carbon dioxide mixtures <i>Rodríguez-de Arriba, Pablo; Crespi, Francesco; Sánchez, David; Muñoz, Antonio</i> <i>Department of Energy Engineering, University of Seville, Spain</i>	139 - Influence of variations of flue gas and ambient temperature on the dynamics and performance of a MW scale supercritical CO₂ waste heat to power unit <i>Olumayegun, Olumide; Marchionni, Matteo; Usman, Muhammad; Tassou, Savvas</i> <i>Brunel University London, United Kingdom</i>
11:45 – 12:00	Group photo	
12:00 – 13:15	Lunch	

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Wednesday - March 15 th		
	Panel Session Room: Belvedere I Chairman: Rene Pecnik, TU Delft Albannie Cagnac, Électricité de France / EDF	
13:15 – 14:45	Future outlook and challenges for implementing sCO₂ energy conversion systems <i>David Sánchez¹; Stefan Glos²; Leonhard Wolscht³</i> 1: Universidad de Sevilla 2: Siemens Energy AG 3: MAN Energy Solution	
14:45 – 15:15	Coffee break	
	Heat Exchanger and Transfer / sCO₂ Experiments and Loops (Session 03) Room: Belvedere I Chairman: Andreas Werner, TU Vienna	Fluid and Material Aspects (Session 04) Room: Belvedere IV Chairman: Andreas Jäger, TU Dresden
15:15 – 15:45	120 - Parametric analysis of heat exchanger design in a techno-economic optimization of a sCO₂ system <i>Geoteliip C. V., Thiago; Gampe, Uwe; Rath, Sebastian; Jäger, Andreas (1); Glos, Stefan (2)</i> 1: Technische Universität Dresden, Germany 2: Siemens Energy AG Mülheim, Germany	118 - Review of HAYNES(R) 282(R) alloy for supercritical CO₂ structural applications <i>Tossey, Brett; Deodeshmukh, Vinay (1); Pint, Bruce (2)</i> 1: Haynes International Inc., United States of America 2: Oak Ridge National Laboratory, United States of America
15:45 – 16:15	127 - Modeling of Autonomous Brayton Cycle (ABC) Loop with GAMMA+ code for Micro Modular Reactor Simulation Application <i>Choi, Sungwook; Lee, Jeong Ik</i> KAIST, Republic of South Korea	109 - Exergetic and Entropy Analysis of the PCRC and RCMCI Brayton Cycles Using s-CO₂ Mixtures. Case Study: Marine Applications <i>Tafur-Escanta, Paul Michael (1); Valencia-Chapi, Robert (2); Muñoz-Antón, Javier (1)</i> 1: Universidad Politécnica de Madrid, Spain 2: Universidad Técnica del Norte, Ecuador
16:15 – 16:45	151 - CO₂ purification for sCO₂ loop in Rez - summary of the test results <i>Berka, Jan (1); Hlinčík, Tomáš; Purkarová, Eliška; Vagenknechtová, Alice; Ballek, Jakub-Vojtěch</i> 1: Centrum vyzkumu Rez s.r.o., Czech Republic 2: University of Chemistry and Technology Prague - Department of Gaseous and Solid Fuels and Air Protectio	112 - Influence of the equation of state on the design of sCO₂-power cycles <i>Rath, Sebastian; Gampe, Uwe; Jäger, Andreas</i> TU Dresden, Germany
19:00	Dinner @ Vienna House Diplomat, Evropská 15, Prague	

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Thursday - March 16 th		
	sCO₂ Applications and Energy Systems / Heat Exchanger (Session 05) Room: Belvedere I Chairman: Paolo Silva, <i>Politecnico di Milano</i>	Turbomachines and Cycles (Session 06) Room: Belvedere IV Chairman: Teemu Turunen-Saaresti, <i>LUT University</i>
09:00 – 09:30	119 - Techno-economic analysis and optimization of sCO₂ power cycle <i>Son, In Woo; Lee, Jeong Ik; Jeong, Yongju</i> <i>The Korea Advanced Institute of Science and Technology (KAIST), Republic of South Korea</i>	111 - Further development of a through-flow program by considering real gas equations of state <i>Ren, Haikun; Schuster, Sebastian; Brillert, Dieter</i> <i>University of Duisburg-Essen, Chair of Turbomachinery, Germany</i>
09:30 – 10:00	130 - Performance analysis of PTES layouts evolving sCO₂ for industrial WHR integration <i>Maccarini, Simone; Barberis, Stefano; Mehdi, Shamsi Syed Safeer; Gini, Lorenzo; Traverso, Alberto</i> <i>Thermochemical Power Group, Department of Mechanical Engineering, University of Genova, Italy</i>	155 - Design and Computational Assessment of a Supercritical CO₂ Compressor for Waste Heat Recovery Applications <i>Romei, A.; Persico, G.; Gaetani, P. (1); Bellobuono, E. F.; Toni, L.; Valente, R. (2)</i> <i>1: Laboratory of Fluid Machines, Energy Dept., Politecnico di Milano, Italy</i> <i>2: Centrifugal Compressor and Expanders, NPD Baker Hughes, Nuovo Pignone, Italy</i>
10:00 – 10:30	134 - Experimental and Numerical Study on Thermal Hydraulic Performance of Trapezoidal Printed Circuit Heat Exchanger for Supercritical CO₂ Brayton Cycle <i>Ji, Yuxuan; Wang, Zheng; Wang, Mingxuan; Liu, Yafei; Xu, Haoran; Zhu, Peiwang; Xiao, Gang</i> <i>Zhejiang University, People's Republic of China</i>	145 - Design and Evaluation of Low Specific Speed Expander for Geothermal Energy Application <i>Patil, Abhay; Nielson, Jordan; Smith, Natalie (1); Weiss, Nathan (2)</i> <i>1: Southwest Research Institute, United States of America</i> <i>2: Sage Geosystems Inc, United States of America</i>
10:30 – 11:00	Coffee break	
	sCO₂ Experiments and Loops (Session 07) Room: Belvedere I Chairman: Otakar Frýbort, <i>Research Centre Řež</i>	Turbomachines and Cycles (Session 08) Room: Belvedere IV Chairman: Uwe Gampe, <i>TU Dresden</i>
11:00 – 11:30	114 - System analysis of experimental sCO₂ cycle Sofia <i>Kriz, Daniel; Vlcek, Petr; Frybort, Otakar</i> <i>Research Centre Rez, Czech Republic</i>	106 - Transient simulation and analysis of a supercritical CO₂ heat removal system under different abnormal operation conditions <i>Hofer, Markus (1); Hecker, Frieder (2); Buck, Michael; Starflinger, Jörg (1)</i> <i>1: University Stuttgart, Germany</i> <i>2: Simulator Centre of KSG/GfS</i>
11:30 – 12:00	113 - Design and setup of the suCOO-Lab sCO₂ test facility at TU Dresden <i>Rath, Sebastian; Gampe, Uwe; Breitskopf, Cornelia; Jäger, Andreas</i> <i>TU Dresden, Germany</i>	115 - Dynamic Simulation and Experimental Validation of a 35 MW Heat Pump Based on a Transcritical CO₂ Cycle <i>Wolscht, Leonhard (1); Knobloch, Kai (2); Jacquemoud, Emmanuel; Jenny, Philipp (1)</i> <i>1: MAN Energy Solutions, Switzerland</i> <i>2: Department of Energy Conversion and Storage, Technical University of Denmark</i>

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12:00 – 12:30	110 - Study of PID-based S-CO₂ System Control Method <i>Kim, Gi Hyeon; Lee, Jeong Ik</i> <i>Korea Advanced Institute of Science and Technology, Republic of South Korea</i>	124 - Analysis of the potential of CO₂ based mixtures to improve the efficiency of cogenerative waste heat recovery power plants <i>Morosini, Ettore (1); Donielli, Michele (2); Alfani, Dario; Astolfi, Marco (1); Marcoberardino, Gioele Di (2); Manzolini, Giampaolo (1)</i> <i>1: Politecnico di Milano, Italy</i> <i>2: Università degli studi di Brescia, Italy</i>
12:30 – 13:30	Lunch	
	sCO₂ Experiments and Loops (Session 09) Room: Belvedere I Chairman: Marco , Astolfi Politecnico di Milano	Turbomachines and Cycles (Session 10) Room: Belvedere IV Chairman: Rene Pecnik, TU Delft
13:30 – 14:00	131 - The steady behavior of the supercritical carbon dioxide natural convection loop <i>Draskic, Marko; Bugeat, Benjamin; Pecnik, Rene</i> <i>TU Delft, The Netherlands</i>	146 - Design of Compact Radial Turboexpanders for sCO₂ Power Systems <i>Romei, Alessandro; Persico Giacomo (1); Biliotti, Davide, Minani, Alberto (2); Lottini, Fabrizio; Marconcini, Michele (3)</i> <i>1: Politecnico di Milano</i> <i>2: Baker Hughes, Nuovo Pignone</i> <i>3: Università degli Studi di Firenze</i>
14:00 – 14:30	121 - Performance comparison of temperature sensors for closed cycles operating with supercritical CO₂ <i>Belleoud, Pierre; Anselmi, Eduardo (1); Chetwynd-Chatwin, Jason (2); Roumeliotis, Ioannis (1)</i> <i>1: Cranfield University, Bedfordshire, United Kingdom</i> <i>2: Rolls-Royce plc, Bristol, United Kingdom</i>	122 - Design of an axial sCO₂ turbine for a demo plant in an industrial environment <i>Glos, Stefan; Musch, Christian; Stueer, Carmen; Wechsung, Michael</i> <i>Siemens-Energy, Germany</i>
14:30 – 15:00	108 - sCO₂ Test Facility at TU Wien: Design, Operation and Results <i>Illyés, Viktoria; Thanheiser, Stefan; Schwarzmayr, Paul (1); David, Pierre-Luc; Guerif, Xavier (2); Werner, Andreas; Haider, Markus (1)</i> <i>1: TU Wien, Austria</i> <i>2: Kelvion Thermal Solutions</i>	136 - Design and testing of a supercritical CO₂ compander for 2 MW <i>Schmitz, Ulrich; Sauerborn, Markus; Bohn, Juergen; Enneking, Martin; Brenner, Jens</i> <i>Atlas Copco Energas GmbH/Atlas Copco Gas and Process</i>
	Room: Belvedere I	
15:00 – 15:15	Closing Session <ul style="list-style-type: none"> - Best paper award - Announcement of the conference location and date for 2025 	