



**XV KONFERENCJA  
PROBLEMY BADAWCZE ENERGETYKI CIEPLNEJ  
30 października - 3 grudnia 2021**

**XV CONFERENCE ON  
RESEARCH & DEVELOPMENT IN POWER ENGINEERING  
30 November - 3 December 2021**



### Conference Schedule

	<b>Tuesday, 30 November 2021</b>
09:00	<b>Registration</b>
11:00-11:30	<b>Welcome speech</b>
	<b>Keynote/Invited Speaker Session</b>
11:30-11:55	Laaniste Madis, Representative of the European Commission - Energy efficiency in recent EU energy policy initiatives
12:00-12:25	Prof. Tetyana Morozyuk, Technische Universität Berlin - Power to X
12:30-13:00	D.Sc. Daniel Moëll, Siemens Energy - SGT 800 - future operation on hydrogen
13:00-14:00	<b>Lunch break</b>

	<b>A1 Session</b>
14:00-14:15	Martyna Tomala - On-line optimization of turbine components heating
14:20-14:35	Radosław Wiśniewski - Modernization of 30MW-class condensing steam turbine for combined-cycle operating parameters
14:40-14:55	Paweł Trawiński - Turbine stage expansion model including internal air film cooling and novel method of calculating theoretical power of cooled stage
15:00-15:15	Sylwia Kruk-Gotzman - Techno-economic evaluation of Combined Cycle Gas Turbine (CCGT) and Adiabatic Compressed Air Energy Storage (ACAES) integration concept
15:20-15:40	Tomasz Staśko - Influence of the shape of the blade profiles at high operating amplitudes of the Cycloidal Rotor Fan
15:40-16:00	<b>Coffee break</b>
16:00-16:15	Dariusz Mikielewicz - Analysis of Organic Rankine Cycle efficiency and evaporator dimensions in function of the reduced pressure
16:20-16:35	Grzegorz Żywica - Design and development of oil-free microturbines for micro CHP ORC systems
16:40-16:55	Sergio F. Mussati - Optimization of dual-purpose thermal desalination plants
17:00-17:15	Ariana Pietrasanta - Optimization of geothermal energy-powered multi-effect distillation and reverse osmosis desalination systems
17:20-17:35	Iliya Iliev - Innovative method for waste heat recovery from coal-fired boilers through additional economizer

	<b>Wednesday, 1 December 2021</b>	
	<b>Keynote/Invited Speaker Session</b>	
9:00-9:30	Juergen Klebes, Mitsubishi Power Europe - Hydrogen- and Ammonia direct fired gas turbines	
9:30-10:00	D.Sc. Isidor Giglmayr, Siemens Energy - Modern CHP solutions on the example of Nowa EC Czechnica	
10:00-10:20	<b>Coffee break</b>	
	<b>A2 Session</b>	
10:20-10:35	Rafał Nowakowski, PGE EC S.A., Research and development paths in district heating to 2030 with perspective up to 20250	
10:50-10:15	Dominique Ochem, CEA - Safety 3rd generation Reactors	
11:20-11:45	Paweł Balas, Veolia - Digitization solutions in heating engineering	
11:45-12:00	<b>Coffee break</b>	
12:00-12:15	Krzysztof Dolecki - Review of heat management systems for high voltage accumulator in electric vehicles and its perspectives.	KTiS PAN - closed session
12:20-12:35	Bartosz Stanek - An experimental study on parabolic trough collector in simulated conditions by metal-halide solar radiation simulator	
12:40-13:00	Daniel Węcel - Operation analysis of parabolic trough solar collector	
13:00-14:00	<b>Lunch break</b>	

	<b>A3 Session</b>	<b>B3 Session</b>
14:00-14:15	Paweł Ziółkowski - Negative carbon dioxide gas power plant with gasification of sewage sludge	Wojciech Kosman - Analysis of steam cycles operation under low loads to match a molten salt energy storage
14:20-14:35	Rafał Kobyłecki - The replacement of combustion by thermal processing as a promising approach towards a zero-emission energy conversion from biomass	Krzysztof Rusin - Experimental studies of pebbles-packed thermal energy storage system performance
14:40-14:55	-	Jakub Ochmann - Computational Fluid Dynamics investigation of stone packed bed dedicated to Adiabatic Compressed Gases Energy Storage Systems
15:00-15:20	-	Chmielewski Adrian - Impact of solar energy on the heating and cooling demand of rooms with different orientation in Polish climatic conditions
15:20-15:40	<b>Coffee break</b>	
15:40-15:55	Sebastian Werle - Photopyrolysis of biomass: an experimental study	W. Kubiński - Application of the artificial neural network for determining the parameters of the PWR reactor
16:00-16:15	Małgorzata Sikora - Modelling the condensation process of low-pressure refrigerants in mini-channels	Aleksandra Dzido - Analysis of Dry-Ice Blasting Cleaning Speed – CFD Modelling and Batch Tests
16:20-16:35	Agata Mlonka-Mędrala - Silica gel impregnated with metal salts composites as potential adsorbents in sorption cooling devices – a comparative study	Adam Ruciński - The experimental characteristics of current generation in Peltier thermoelectric modules
16:40-16:55	Krzysztof Dutkowski - Experimental studies of the effect of microencapsulated PCM slurry on the efficiency of a liquid solar collector	Andrzej Grzebielec - The use of silicagel-water heat storage devices in large scale district heating system
19:00-23:00	<b>Gala dinner</b>	

<b>Thursday, 2 December 2021</b>																					
<b>Keynote/Invited Speaker Session</b>																					
9:00-9:30	Prof. Henrik Lund, Aalborg University																				
9:30-10:00	Prof. Soteris Kalogirou, Cyprus University of Technology																				
10:00-10:20	<b>Coffee break</b>																				
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;"><b>A4 Session</b></th> <th style="width: 50%; text-align: center;"><b>B4 Session</b></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">10:20-10:35 Bertrand STEPNIK, Framatome - Fuel elements for experimental reactors</td> <td style="text-align: center;">Dariusz Mikielewicz - An improved Müller-Steinhagen and Heck model for two-phase pressure drop in relation to flows at high reduced pressures</td> </tr> <tr> <td style="text-align: center;">10:40-10:55 Piotr Darnowski - MELCOR 2.2 Simulations for the Gen-II NPP Severe Accident Management Studies</td> <td style="text-align: center;">Robert Wejkowski - Numerical research on the new kind of convective tube banks with intensification of heat transfer and/or cleaning of tubes from ash depositions</td> </tr> <tr> <td style="text-align: center;">11:00-11:15 Marek Migdal - ISHTAR thermostatic irradiation device for advanced nuclear technologies research in the MARIA reactor</td> <td style="text-align: center;">Katarzyna Węglarz - A new calculation method for tube cross-flow heat exchangers</td> </tr> <tr> <td style="text-align: center;">11:20-11:35 Szymon Suchcicki - Neutronic calculations of the AP1000 reactor core with the POLARIS and PARCS codes</td> <td style="text-align: center;">Marek Cichocki - Direct and indirect methods of GT exhaust gas flow measurement</td> </tr> <tr> <td colspan="2" style="text-align: center;">11:40-12:00 <b>Coffee break</b></td> </tr> <tr> <td style="text-align: center;">12:00-12:15 Tomasz Bury - Analysis of energy and environmental effects of replacing a coal boiler by a specially designed and a generic high temperature nuclear reactor in a CHP plant</td> <td style="text-align: center;">Emad Hasani Malekshah - Influence of dissolved air on the dynamic of cavitating Venturi flow- Experimental observation</td> </tr> <tr> <td style="text-align: center;">12:20-12:35 Janusz Malesa - Cogeneration with HTGR for industry and district heating in Poland</td> <td style="text-align: center;">Paweł Domitr - Comparison of inverse uncertainty quantification methods for critical flow test</td> </tr> <tr> <td style="text-align: center;">12:40-13:00 Maciej Skrzypek - The thermal-hydraulic and neutronic design of High Temperature Gas Reactor for non-electrical applications</td> <td style="text-align: center;">Piotr Wiśniewski - Methodology of mathematical modelling of flow through a real filter material geometry</td> </tr> <tr> <td colspan="2" style="text-align: center;">13:00-14:00 <b>Lunch break</b></td> </tr> </tbody> </table>	<b>A4 Session</b>	<b>B4 Session</b>	10:20-10:35 Bertrand STEPNIK, Framatome - Fuel elements for experimental reactors	Dariusz Mikielewicz - An improved Müller-Steinhagen and Heck model for two-phase pressure drop in relation to flows at high reduced pressures	10:40-10:55 Piotr Darnowski - MELCOR 2.2 Simulations for the Gen-II NPP Severe Accident Management Studies	Robert Wejkowski - Numerical research on the new kind of convective tube banks with intensification of heat transfer and/or cleaning of tubes from ash depositions	11:00-11:15 Marek Migdal - ISHTAR thermostatic irradiation device for advanced nuclear technologies research in the MARIA reactor	Katarzyna Węglarz - A new calculation method for tube cross-flow heat exchangers	11:20-11:35 Szymon Suchcicki - Neutronic calculations of the AP1000 reactor core with the POLARIS and PARCS codes	Marek Cichocki - Direct and indirect methods of GT exhaust gas flow measurement	11:40-12:00 <b>Coffee break</b>		12:00-12:15 Tomasz Bury - Analysis of energy and environmental effects of replacing a coal boiler by a specially designed and a generic high temperature nuclear reactor in a CHP plant	Emad Hasani Malekshah - Influence of dissolved air on the dynamic of cavitating Venturi flow- Experimental observation	12:20-12:35 Janusz Malesa - Cogeneration with HTGR for industry and district heating in Poland	Paweł Domitr - Comparison of inverse uncertainty quantification methods for critical flow test	12:40-13:00 Maciej Skrzypek - The thermal-hydraulic and neutronic design of High Temperature Gas Reactor for non-electrical applications	Piotr Wiśniewski - Methodology of mathematical modelling of flow through a real filter material geometry	13:00-14:00 <b>Lunch break</b>	
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	<b>A5 Session</b>	<b>B5 Session</b>
14:00-14:15	Ferdinand Uilhoorn - Transportation of hydrogen blended natural gas in existing high pressure pipeline network	Serhii Denysiuk - Development of methods for energy efficiency management in hybrid energy supply systems based on dynamic tariffication
14:20-14:35	Michał Jurczyk - Possibilities of using metal-hydrides tanks to hydrogen storage	Bartłomiej Hernik - Numerical research of flue gas denitrification using the SNCR method in a OP 650 boiler.
14:40-14:55	Jimena Incer Valverde - Evaluation of a liquid hydrogen regasification cogeneration system	Robert Zarzycki - Erosion in CFB boilers fired with biomass and coal – analysis of some chosen cases
15:00-15:20	Daria Katla - Experimental study involving methanation reactor for conversion of H <sub>2</sub> and CO <sub>2</sub> into synthetic natural gas (SNG)	Piotr Józwiak - Petroleum coke and refuse-derived fuel co-firing enhanced with hydrogen in an industrial cement kiln – a CFD study
15:20-15:40	<b>Coffee break</b>	
15:40-15:55	Krystian Machaj - Electrochemical and thermodynamic analysis of a solid oxide fuel cell powered by ammonia	Artur Błaszczuk - Heat transfer characteristics of a fluidized bed heat exchanger with horizontal tube bundle
16:00-16:15	Pavel Shuhayeu - Theoretical investigation and implementation of PEM fuel cell into UAV	Aneta Magdziarz - Analysis of corrosion resistance of boiler steel and alloy coatings under ash deposit
16:20-16:35	Aliaksandr Martsinchyk - Application of artificial neural network for Molten Carbonate Electrolysis modeling and optimization	Rafał Wyczółkowski - Correlations for the thermal conductivity of selected steel grades as a function of temperature in the range of 20-800C
16:40-16:55	Jakub Kupecki - System-level analysis of degradation of solid oxide electrolyzers operated in off-design conditions	Natalia Mikos-Nuszkiewicz - A mathematical model of charging and discharging processes in a thermochemical energy storage reactor using the hydrated potassium carbonate as a thermochemical material
17:00-17:15	Katsiaryna Razumkova - Techno-economic assessment of Power-to-Gas (PtG) systems based on solid oxide electrolyzers (SOE)	Waldemar Kuczynski - A regressive model for periodic dynamic instabilities during condensation R1234yf and R1234ze refrigerants
17:20-17:35	Jarosław Milewski - A concept of SOE-MCFC hybrid system for supporting power-to-gas installation	Mateusz Brzęczek - Methanol production in Brayton Cycle
17:40-17:55	Artur Harutyunyan - Analyzing of different repowering methods on the example of 300 MW existing steam cycle power plant using Gatecycle™ software	Mateusz Brzęczek - Analysis of methanol production from biomass gasification in oxygen
19:00-21:00	<b>Illusion show/dinner</b>	

<b>Friday, 3 December 2021</b>	
<b>Keynote/Invited Speaker Session</b>	
9:00-9:30	Prof. Piotr Lampart - Overview of turbine flow losses and efficiency
9:30-10:00	Prof. Jarosław Milewski, Warsaw University of Technology - Numerical simulation of Seasonal Thermal Energy Multi-Storage
10:00-10:20	<b>Coffee break</b>
	<b>A6 Session</b>
	<b>B6 Session</b>
10:20-10:35	Grzegorz Bzymek - Zagadnienia poprawy bezpieczeństwa eksploatacji turbin parowych 18K370
10:40-10:55	Tadeusz Skoczkowski - Energy Management in the decarbonisation of the EU energy-intensive industries
11:00-11:15	Janusz Badur -Development of wind farms in Poland in the context of climate change
11:20-11:35	Albert Sobala - Mathematical modeling and analysis of possible utilization of renewable energy resources in the fourth-generation thermal network in polish climate conditions.
11:40-12:00	<b>Coffee break</b>
12:00-12:15	Artur Bieniek - Experimental investigations of intermediate pyrolysis of brewers' spent grain
12:20-12:35	Julia Valeeva - Tariff system for energy resources of the Republic of Tatarstan in comparison with the CIS countries in order to stimulate an increase in the share of electricity in the energy supply balance of buildings
<b>Coffee break</b>	
KPE PAN - closed session	

12:40-13:00	Valeeva Julia Sergeevna - Models of formation of tariffs for heat energy and features of heat supply systems in the largest cities	KPE PAN - closed session
13:00-13:20	<b>Conference closing speech</b>	
13:20	<b>Lunch</b>	

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