

FINAL PROGRAM

"Alternative Energy Sources, Materials & Technologies (AESMT'24)", Sofia, Bulgaria

MONDAY (May 13, 2024):

1. **Sightseeing** of Sofia, Bulgaria: 14:00 - 18:00 h (on your own).
2. **Registration and Welcome party**: 19:00 - 21:00 h (venue in the hotel "Dom na uchenia"/ Hotel of Bulgarian Academy of Sciences, BAS - Address: 50 "Shipchenski prohod" blvd, 1113 Sofia): <http://www.domnaucheniya.com>.

TUESDAY (May 14, 2024):

1. **Registration (Large hall, hotel BAS)**: 8:00 - 8:25 h
2. **Plenary sessions (Large hall, hotel BAS)**:
 - 2.1. **Opening**: 8:25 - 8:30 h.
 - 2.2. **Plenary session 1**: 8:30 - 10:30 h (**Chair: Aleksandar Georgiev**)
8:30 - 9:00 h; Aleksandar Georgiev (Sofia, Bulgaria): A. G. Georgiev, R. K. Popov, N. D. Vassileva. Efficiency simulation of a hybrid thermal system in different climatic zones (**VIDEO**).
9:00 - 9:30 h; André Thess (Stuttgart, Germany): An Update on Carnot-Batteries.
9:30 - 10:00 h; Ming Jun Huang (Belfast, UK): Ming Jun Huang, Gerard Obasi, Neil J. Hewitt. Investigation of the PCM applications for buildings energy management with advanced heat transfer enhancement.
10:00 - 10:30 h; Bin Chen (Beijing, China): Bin Chen. Urban energy-water nexus.
 - 2.3. **Coffee break**: 10:30 - 11:00 h (in hotel BAS);
 - 2.4. **Plenary session 2**: 11:00 - 13:00 h (**Chair: Aleksandar Georgiev**)
11:00 - 11:30 h; Yanjun Dai (Shanghai, China): Yanjun Dai. Harvesting solar energy using heat pump with photovoltaic / thermal module.
11:30 - 12:00 h; Christos Markides (London, UK): Christos Markides. A review of renewable, sustainable and waste-heat utilisation technologies.
12:00 - 12:30 h; Yong Hao (Beijing, China): Yong Hao, Zhenyu Tian, Wenjia Li, Jiahui Lou, Yunyun Wu. Photovoltaic-thermochemical power generation for distributed energy supply.
12:30 - 13:00 h; Mikhail Sheremet (Tomsk, Russia): Darya S. Loenko, Mikhail A. Sheremet. Natural convection of a pseudoplastic nanofluid in a cavity with a local heat-generating element and solid/porous fins.
3. **Poster session 1 (Large hall, hotel BAS)**: 13:00 - 13:30 h
Mariya Aleksandrova (Sofia, Bulgaria): M. P. Aleksandrova, I. M. Pandiev. Synergistic integration of energy harvesters and supercapacitors for enhanced performance.
Petru Cotfas (Brasov, Romania): P. A. Cotfas, D. T. Cotfas, B. Y. León Ávila, C. A. García Vázquez. The effect of opto-thermal cycles on the triple junction photovoltaic cell.
Ilonka Lilyanova (Varna, Bulgaria): R. D. Stancheva, I. T. Lilyanova. Energy conversion causing an unexplored electromagnetic interaction.

4. Lunch: 13:30 - 14:30 h (on your own).

5. Afternoon session 1 (Large hall): 14:30 - 16:30 h; Phase Change Materials (PCM) Applications, Electrical Engineering, Mechanical Engineering and Technologies (**Chair: Ilonka Lilyanova**)

14:30 - 14:50 h; Yali Liu (Kunming, China): Yali Liu, Ming Li, Ying Zhang, Guoliang Li, Runsheng Tang, Shengmei Zhang, Xintian Yang, Xin Li. Novel water-based composite phase change materials for cold energy storage applications (**VIDEO**).

14:50 - 15:10 h; George Sava (Brasov, Romania): P. N. Borza, M. Machedon-Pisu, G. I. Sava, C. Pislaru, S. Vlase. Digital Twin System for the E-mobility Transformation of Urban Public Transportation in Brasov city, Romania.

15:10 - 15:30 h; Thierry Lemenand (Angers, France): R. Aridi, M. Aridi, M.-L. Pannier, T. Lemenand. Eco-environmental, and social impacts of producing electricity with various renewable energy sources (**VIDEO**).

15:30 - 15:50 h; Nikolaos Rogkas (Athens, Greece): N. Rogkas, E. Syngounas, E. Mita, N. Arapkoules, D. Rakopoulos, P. Zalimidis, M. Vrachopoulos, V. Spitas. Enhancing the Efficiency of Pumpless ORC-based CHP Systems through Integrated Scroll Expander Parametric Design and Coupled Thermomechanical-CFD Analysis (**VIDEO**).

15:50 - 16:10 h; Milos Đorđević (Belgrade, Serbia): M. D. Đorđević, N. Đ. Zrnic, M. M. Peric, M. S. Komatina. Simplified life cycle assessment of a short belt conveyor (**VIDEO**).

16:10 - 16:30 h; Tianchen Huang (Hefei, China): Bin Xu, Yangliang Wang, Tianchen Huang, Taohong Ye, Jianbin Jing, Chuanxia Zhang, Kang Li. Hypersonic aerodynamic heating of blunt cone at ground: Numerical simulation of the effects of flow parameters and analysis of pseudo-stagnation point (**VIDEO**).

6. Coffee break: 16:30 - 17:00 h (in hotel BAS)

7. Afternoon session 2 (Large hall): 17:00 - 19:10 h; Solar and Hybrid Thermal Systems (**Chair: Mariya Aleksandrova**)

17:00 - 17:20 h; Muchi Yao (Kunming, China): Muchi Yao, Ming Li, Yunfeng Wang, Guoliang Li, Ying Zhang, Tianyu Xing, Zhihan Deng, Zude Zhang, Wenxiang Zhang. Performance, energy and exergy analysis of Solar-Assisted Heat Pump drying system with heat recovery: a comprehensive experimental study (**VIDEO**).

17:20 - 17:40 h; Panteleimon Tzouganakis (Athens, Greece): P. Tzouganakis, E. Bellos, D. Rakopoulos, A. Skembris, N. Rogkas. Thermodynamic analysis of a solar-fed heat upgrade system using the reverse air Brayton cycle.

17:40 - 18:00 h; Bin Zhao (Hefei, China): Bin Zhao, Kegui Lu, Wenshuo Zhang, Qingdong Xuan, Gang Pei. Thermo-responsive hydrogel-based building envelopes for building energy-saving (**VIDEO**).

18:00 - 18:30 h; Soteris Kalogirou (Limassol, Cyprus): Soteris Kalogirou. Renewable Energy Systems: Current Status and Prospects (**PLENARY**).

18:30 - 18:50 h; Ken Chen (Hefei, China): Chen Ken, Kongfu Hu, Junjie Chen, Siyan Chan, Tianxiang Hu, Zhao Bin, Pei Gang. Performance analysis of a novel spectrally selective photovoltaic thermal collector for medium temperature applications.

18:50 - 19:10 h; Funda Demir (Karabük, Turkey): Mustafa Günes, Funda Demir. Modeling of a Hybrid Energy System Including PEM Fuel Cell and Optimization of Converter Parameters Using PSO, GWO and ABC Methods (**VIDEO**).

8. Official dinner: 19:30 - 22:30 h (in restaurant BAS)

WEDNESDAY (May 15, 2024):

1. Morning parallel session 1 (Large hall): 8:30 - 10:50 h; Geothermal Energy Applications, Wind Energy (Chair: Daniel Tudor Cotfas)

8:30 - 8:50 h; Miguel Mateo Pla (Valencia, Spain): Miguel A. Mateo Pla, Borja Badenes, Hossein Javadi, Bruno Armengot, Burkhard Sanner, Javier F. Urchueguía. Use of advanced pipe and grout materials in an experimental Single-U BHE: installation procedure assessment and thermal properties comparison using C2RLSM (VIDEO).

8:50 - 9:10 h; Peng Pei (Guiyang, China): S. Hu, P. Pei, C. Wang, L. Tang. Study on the Thermo-mechanical Coupling Behaviour of Phase Change Backfill Materials and Its Influence on the Borehole and Surrounding Ground (VIDEO).

9:10 - 9:30 h; Andrew Wright (Leicester, UK): A. J. Wright, S Khattak. Design of a ground source heat pump system with hybrid photovoltaic-thermal solar charging for a low energy house in England.

9:30 - 9:50 h; Mariana Panaitescu (Constanta, Romania): F. V. Panaitescu, M. Panaitescu, I. Voicu. An overview of the wind statistics for Metocean Analytics on Galata platform, Bulgaria (VIDEO).

9:50 - 10:10 h; Pandora Gkeka (Chania, Greece): P. Gkeka-Serpetsidaki, G. Skiniti, S. Tournaki, D. Poursanidis, T. Tsoutsos. Development of offshore wind farms from an environmental perspective (VIDEO).

10:10 - 10:30 h; Asem Baktybekova (Karaganda, Kazakhstan): N. K. Tanasheva, A. N. Dyusembayeva, Minkov L. L., A. R. Bakhtybekova, A. S. Tussybayeva, Burkov M. A., Shuyushbayeva N. N. Comparative analysis of aerodynamic forces of a wind power plant with a complex geometric shape of the blades (VIDEO).

10:30 - 10:50 h; Asem Baktybekova (Karaganda, Kazakhstan): A. N. Dyusembayeva, A. S. Tussybayeva, N. K. Tanasheva, A. Zh. Satybalidin, A. R. Bakhtybekova, I. O. Sarzhanova, Zh. B. Kutum, Sh. S. Kyzdarbekova. Numerical investigation of aerodynamic parameters of wind power plant with combined blades (VIDEO).

2. Coffee break: 10:50 - 11:20 h (in hotel BAS)

3. Morning parallel session 2 (Large hall): 11:20 - 13:40 h; Energy Materials Science (Chair: Silvia Cesari)

11:20 - 11:40 h; Anastasia Cherpakova (Novosibirsk, Russia): A. V. Cherpakova, A. D. Grekova, L. G. Gordeeva, Yu. I. Aristov. Mesoporous silica gels for waste heat recovery and adsorption cooling of Big Data Centres (VIDEO).

11:40 - 12:00 h; Marek Baraniak (Poznan, Poland): K. Tokarek, J. Wojciechowski, F. Walkiewicz, M. Baraniak, M. Pajak, K. Hubkowska, D. Monikowska, A. Czerwinski, G. Lota. Ionic liquids as anti-corrosive additives for electrolyte of nickel-metal hydride negative electrode.

12:00 - 12:20 h; Aleksandra Grekova (Novosibirsk, Russia): A. V. Cherpakova, A. D. Grekova, Gordeeva L.G. Lithium chloride in silica gel with large pore volume as an adsorbent for adsorption heat storage (VIDEO).

12:20 - 12:40 h; Bianfeng Yang (Kunming, China): Bianfeng Yang, Cong Wang, Xu Ji, Junyao Mao, Huichao Zhang. Interface evaporator combining $Ti_3C_2T_x$ /porous graphitic carbon nitride and hydrogel for solar-driven efficient seawater desalination (VIDEO).

12:40 - 13:00 h; Jaroslaw Wojciechowski (Poznan, Poland): J. Wojciechowski, S. Jasiński, G. Lota. Corrosion prevention in energy storage systems.

13:00 - 13:20 h; Cong Wang (Beijing, China): Ziyi Li, Cong Wang, Yingshu Liu, Xu Ji, Bianfeng Yang, Ningqi Sun, Xiong Yang. Efficient CO₂ adsorption capture with silica microspheres bridges by Polyethyleneimine through in-situ synthesis (VIDEO).

13:20 - 13:40 h; Yanfeng Huang (Hefei, China): Yanfeng Huang, Tao Wu, Bin Xu, Xing-ni Chen. Modeling of heterogeneous structure and particle-scale analysis of LiFePO₄ electrode (VIDEO).

4. Lunch: 13:40 - 14:40 h (on your own).

5. Afternoon parallel session 1 (Large hall): 14:40 - 17:00 h; Solar and Hybrid Thermal Systems (Chair: Jaroslaw Wojciechowski)

14:40 - 15:00 h; Tao Zhang (Shanghai, China): T. Zhang, Shijing Feng, Mengqi Peng, Zhengrong Shi, Gang Pei, Jie Ji. Experimental study on the switching logic of a photovoltaic solar-assisted loop-thermosiphon /heat-pump hybrid system in enthalpy difference laboratory (VIDEO).

15:00 - 15:20 h; Daniel Tudor Cotfas (Brasov, Romania): D. T. Cotfas, P. A. Cotfas, C. A. García Vázquez, O. Pérez Baluja, B. Y. León Ávila. Advancements in buildings integration of the photovoltaic cells and thermoelectric generators.

15:20 - 15:40 h; Emine Yagiz Gürbüz (Mugla, Turkey): E. Y. Gürbüz, I. Sahinkesen, A. D. Tuncer, O. V. Güler, A. Keçebas, A. G. Georgiev. Experimental investigation of a baffled photovoltaic-thermal air collector with SiC nano-embedded thermal paste: A comparative study (VIDEO).

15:40 - 16:00 h; Junyao Mao (Kunming, China): Junyao Mao, Xu Ji, Bianfeng Yang, Huichao Zhang. Solar driven adsorption atmospheric water harvesting system (VIDEO).

16:00 - 16:20 h; Jun-Jie Chen (Hefei, China): J.-J. Chen, K. Chen, Mao-Bin Hu, G. Pei. Numerical analysis of spectrally selective photovoltaic/thermal collectors for solar heating systems with pit thermal energy storage.

16:20 - 16:40 h; Mutlucan Bayat (Karabük, Turkey): Mutlucan Bayat, Mehmet Özalp, Muhammet Kayfeci. Performance assessment of 600 MW supercritical thermal power plant (STPP): A case study for different operating loads (VIDEO).

16:40 - 17:00 h; Mutlucan Bayat (Karabük, Turkey): Mutlucan Bayat, Muhammet Kayfeci. Exergy analysis of a novel multigeneration system integrated with parabolic trough solar thermal power plant (PTSTPP) and multi-stage flash desalination (MSF) system (VIDEO).

6. Coffee break: 17:00 - 17:30 h (in hotel BAS)

7. Poster session 2 (https://aesmt.lima-city.de/Poster_session'24.html): 17:30 - 18:30 h

David Bondartsev (Almaty, Kazakhstan): A. Genbach, D. Bondartsev, N. Genbach, E. Genbach. Cooling system with coatings.

Ilia Iliev (Ruse, Bulgaria): I. K. Iliev, A. V. Fedyukhin, Yu. V. Yavorovsky, H. I. Beloev. EROI application for analysis of city energy profile.

Gady Golan (Ariel, Israel): G. Golan, M. Azoulay. The effect of magnetic nanoparticles on the quality-factor of an oscillatory circuit.

Emine Yagiz Gürbüz (Mugla, Turkey): A. Keçebas, O. V. Güler, E. Y. Gürbüz, I. Sahinkesen, A. G. Georgiev, A. D. Tuncer. Photovoltaic efficiency through ethanol-based phase change material cooling: An experimental study on front surface passive cooling techniques.

Jasmina Skerlic (Kosovska Mitrovica, Serbia): J. Skerlic, I. Popovic, M. Djordjevic, D. Nikolic, B. Stojanovic, B. Sudimac. Analysis and Evaluation of Building Envelopes with Integrated Vegetation Modules using factorial design.

Saulesh Minzhova (Almaty, Kazakhstan): S. Minzhova, M. Kurrat, B. Ongar, A. Georgiev. Is Rooftop Solar Panel Effective in the Southern Regions of Kazakhstan? Data from Field Studies and Modelling.

Jingyu Cao (Changsha, China): Ling Zheng, Jingyu Cao, Jinqing Peng, Zaikang Lu, Mingke Hu, Qiliang Wang, Jie Ji, Gang Pei. Structural optimization of a flexible separate heat pipe used for the tracking-type photovoltaic/thermal system.

Jingyong Cai (Shanghai, China): R. Zhang, J. Cai, Z. Shi. Integrated Hydrogen Energy Storage with Thermoelectric Generation: Performance and Efficiency Analysis

Haiyang Xu (Kunming, China): Haiyang Xu, Le Zhang, Xu Ji. Design and performance study of a solar reactor of photocatalytic nitrate reduction for wastewater purification.

Dingcheng Sun (Kunming, China): Dingcheng Sun, Xu Ji, Le Zhang, Yue Yang, Haiyang Xu, Shengjie Wei. Performance study of solar thermal assisted photovoltaic driven electrocatalytic nitrate reduction.

Hazim Dirawi (Nottingham, UK): Hazim Dirawi, Qiliang Wang, Mingke Hu, Yuehong Su, Saffa Riffat. Comprehensive Performance Analysis of a Novel Closed-Loop Photovoltaic Cooling System with Controlled Intermittent Flow Strategy.

Ya Dan (Nottingham, UK): Ya Dan, Qiliang Wang, Mingke Hu, Dongliang Zhao, Saffa Riffat, Yuehong Su. A novel radiative cooling system integrated with an asymmetric material-based compound parabolic concentrator.

Shengyu Pei (Shanghai, China): Z. Fu, S. Pei, Y. Li, J. Li, Q. Zhu. Study on the dynamic performance of SOEC under the joint input of varying electric energy and thermal energy in PV/T system.

Bingqian Wu (Kunming, China): Bingqian Wu, Xiaoqiao Huang, Yonghang Tai. A multivariate hybrid model based on CPO-ICEEMDAN-MSGNet for solar irradiance prediction.

Leyang Zhu (Kunming, China): Leyang Zhu, Xiaoqiao Huang, Yonghang Tai. A hourly solar irradiance prediction method based on the UnetTSF model.

Zongbin Zhang (Kunming, China): Zongbin Zhang, Xiaoqiao Huang, Yonghang Tai. Hourly irradiance prediction based on Minusformer model with stepwise learning residuals.

Kun Liu (Kunming, China): Kun Liu, Liqun Shao, Wenfeng Gao, Qing Li. PIV Experimental Study on the Influence of Double-Diffusion Effect on Indoor Pollutant Dispersion in Buildings.

Yiyuan He (Kunming, China): Yiyuan He, Qiong Li, Zhaopeng Huang, Xiaoqiao Huang. Short-term photovoltaic power forecasting based on deep temporal-spatial multi-modal model.

Zhaopeng Huang (Kunming, China): Zhaopeng Huang, Qiong Li, Yiyuan He, Yonghang Tai. Investigations on the effects of dynamic personnel activities on indoor thermal comfort and air quality in office environments.

Changxin Lu (Xuzhou, China): Changxin Lu, Chengyun Xin, Tuo Zhou, Zhikang Yang, Tairan Fu. Thermal hydraulic performance of air preheaters with integrated double-sided spiral finned tubes.

Aizhana Nugymanova (Almaty, Kazakhstan): A.S. Askarova, A. G. Georgiev, S. A. Bolegenova, V. Yu. Maximov, S. A. Bolegenova, A. O. Nugymanova, D. Toktarov. The Influence of Highly Efficient Environmentally Friendly Plasma-chemical Technology on the Characteristics of Combustion Processes of Power Boilers.

Shynar Ospanova (Almaty, Kazakhstan): Askarova, S. Bolegenova, Sh. Ospanova, S. Bolegenova, Zh. Shortanbayeva, N. Adilbayev, A. Georgiev. Application of Computer Technologies to Study Biofuel Combustion with Harmful Emissions Assessment.

Kamar Aljundi (Lisboa, Portugal): Kamar Aljundi, A. Vieira, A. C. Dias, R. Cardoso, J. Lapa. Sustainability Analysis of Energy Systems: Utilizing TOPSIS and BWM Methods for benchmarking Shallow Geothermal systems to other Energy Alternatives.

Biao Li (Harbin, China): V. S. Olawoore, B. Li1, C. Lei, Y. Shuai. A numerical study on the aerodynamic influences of boundary layer from various PV canopy configurations.

Ali Keçebas (Mugla, Turkey): O. V. Güler, A. Keçebas, E. Y. Gürbüz, I. Sahinkesen, A. G. Georgiev, A. D. Tuncer. CFD analysis of erosion in compact plate heat exchangers: A material study.

Mingke Hu (Chengdu, China): Ya Dan, Mingke Hu, Qiliang Wang, Saffa Riffat, Yuehong Su. A comprehensive study on the cooling performance of the radiative cooling module with crossed compound parabolic concentrator.

Zhanibek Seidulla (Almaty, Kazakhstan): R. K. Manatbayev, M.S. Isataev, Zh. K. Seidulla, B. Zh. Bektibai, N. B. Kalassov. Problem investigation of starting wind-mill electric generating units equipped with vertical axis wind turbine

Lazaros Aresti (Lemesos, Cyprus): Lazaros Aresti, Paul Christodoulides. Environmental Impact of Ground Source Heat Pumps versus Air Source Heat Pumps in different climates.

8. Morning paralel session 1 (Small hall): 8:30 - 10:50 h; Energy storages (Chair: Andrew Wright)

8:30 - 8:50 h; Tao Wu (Hefei, China): Tao Wu, Yan-feng Huang, Bin Xu, Yue Fei. Effects of relative flow direction of electrolyte on mass transfer and electrochemical performance in vanadium redox flow batteries (VIDEO).

8:50 - 9:10 h; Bernardo Yaser León Ávila (Brasov, Romania): B. Y. León Ávila, P. A. Cofas, L. A. Quintero Domínguez, D. T. Cofas, C. A. García Vázquez, O. Pérez Baluja. Exploring the Potential of Supercapacitors in Solar Energy Harvesting Applications for Wireless Sensor Networks.

9:10 - 9:30 h; Zhuohao He (Nanjing, China): Zhuohao He, Xiuwei Li. Comparative analysis between chemical potential energy storage mode and supercapacitor energy storage mode in absorption air-conditioning system (VIDEO).

9:30 - 9:50 h; Giulia Lombardo (Padova, Italy): G. Lombardo, G. Zanetti, D. Menegazzo, L. Vallese, S. Bordignon, M. De Carli, M. Bottarelli, S. Bobbo, L. Fedele. Cold Storage Solutions for Sustainable Cooling: A CFD Approach to PCM-Enhanced TES within the ECHO Project Framework.

9:50 - 10:10 h; Laura Vallese (Padova, Italy): L. Vallese, G. Lombardo, D. Menegazzo, S. Bordignon, M. De Carli, S. Barison, F. Agresti, E. Baccega, S. Bobbo, L. Fedele, M. Bottarelli. Evaluating the behaviour of a composite of CaCl₂ and vermiculite for thermochemical adsorption energy storage: experimental tests during the charging and discharging phases.

10:10 - 10:30 h; Yanfeng Huang (Hefei, China): Yanfeng Huang, Bin Xu, Tao Wu, Xing-ni Chen. Influence of electrode structure on polarization effect in lithium-ion battery based on two-dimensional heterogeneous model (VIDEO).

10:30 - 10:50 h; Silvia Cesari (Ferrara, Italy): S. Cesari, L. Vallese, G. Emmi, M. Bottarelli. Dynamic modelling of a novel TES system using TCMs and PCMs for space heating, cooling and domestic hot water.

9. Coffee break: 10:50 - 11:20 h (in hotel BAS)

10. Morning parallel session 2 (Small hall): 11:20 - 13:40 h; Solar Photovoltaic Systems, Solar Radiation Measurement and Sun-tracking (**Chair: Petru Cotfas**)

11:20 - 11:40 h; Emine Yagiz Gürbüz (Mugla, Turkey): I. Sahinkesen, A.D. Tuncer, E. Y. Gürbüz, A. G. Georgiev, O. V. Güler, A. Keçebas. Improving the output power of a photovoltaic system using longitudinal fins with nano-embedded thermal paste: An experimental study. Mugla, Turkey (**VIDEO**).

11:40 - 12:00 h; Osmel Pérez Baluja (Brasov, Romania): O. Pérez Baluja, Bernardo Y. León Ávila, Carlos A. García Vázquez, D. T. Cotfas, P. A. Cotfas1, O. E. Torres Breffe. Lighting impulsive overvoltage surging from the ground can damage the DC/AC converter in PV systems.

12:00 - 12:20 h; Keqin Huang (Kunming, China): Keqin Huang, Xu Ji, Dingcheng Sun, Shan Lin, Yingxu Chen, Haiyang Xu. Design and performance characteristics of single-axis tracking dual confocal Low-magnification parabolic trough CPV system (**VIDEO**).

12:20 - 12:40 h; Yinlong Zhu (Kunming, China): Yinlong Zhu, Ming Li, Yunfeng Wang, Guoliang Li, Yali Liu. Predicting photovoltaic greenhouse irradiance at low latitudes of plateau based on ultra-short-term time series (**VIDEO**).

12:40 - 13:00 h; Xue Li (Hefei, China): Xue Li, Ken Chen, Shuyi Chen, Lin Tang, Bin Zhao, Gang Pei. Performance study of a vacuum photovoltaic/thermal collector with spectral selectivity.

13:00 - 13:20 h; Haoyi Yao (Kunming, China): Haoyi Yao, Yunfeng Wang, Ming Li, Xun Ma. A climate-based analysis of daylight in vertical-planting mushroom greenhouse with PV modules in Kunming, China (**VIDEO**).

13:20 - 13:40 h; Mutlucan Bayat (Karabük, Turkey): Mutlucan Bayat, Mehmet Özalp, Muhammet Kayfeci. The effect of wind speed on the performance of a solar photovoltaic module: An experimental study for active cooling (**VIDEO**).

11. Lunch: 13:40 - 14:40 h (on your own).

12. Afternoon parallel session 1 (Small hall): 14:40 - 17:00 h; Building Energy Performance, Energy Efficiency (**Chair: Marek Baraniak**)

14:40 - 15:00 h; Tomasz Schabek (Lodz, Poland): T. Schabek, B. Król. Heat recovery ventilation and thermal insulation – the economic decisions of individual households in Central Europe (**VIDEO**).

15:00 - 15:20 h; Carlos Alberto Garcia Vazquez (Brasov, Romania): C. A. García Vázquez, D. T. Cotfas, A. I. González Santos, P. A. Cotfas, B. Y. León Ávila, V. Pérez Garrido. Optimal tuning of PID controllers focused on energy efficiency in a multivariable and coupled system. Case study: an AHU in the biopharmaceutical industry.

15:20 - 15:40 h; Rosita Norvaisiene (Kaunas, Lithuania): Rosita Norvaisiene. Energy Consumption in Administrative Buildings in Lithuania: An Analysis Based on Energy Performance Certificates (**VIDEO**).

15:40 - 16:00 h; Huichao Zhang (Kunming, China): Huichao Zhang, Xu Ji, Bianfeng Yang, Bude Gao, Junyao Mao. Performance evaluation of a water-cooled co-generation air conditioning system for greenhouse (**VIDEO**).

16:00 - 16:20 h; Hong Zhang (Hefei, China): Hong Zhang, Bin Xu, Gang Pei. Mesoscale simulation of liquid-gas distribution and heat transfer performance of flat heat pipes with different wick geometries by lattice Boltzmann method (**VIDEO**).

16:20 - 16:40 h; Jaroslaw Krzywanski (Czestochowa, Poland): J. Krzywanski, T. Czakiert, W. Nowak, T. Shimizu, W. M. Ashraf, A. Zylka, K. Grabowska, M. Sosnowski, D. Skrobek, K. Sztekler, A. Kijo-Kleczkowska, I. Iliev. NO_x emissions from advanced CO₂ capture technologies - a comprehensive knowledge-based system (**VIDEO**).

16:40 - 17:00 h; Sultan Ybray (Astana, Kazakhstan): Arystan Dikhanbaev, Bayandy Dikhanbaev, Sultan Ybray, Kuat Baubekov, Almagul Mergalimova, Aleksandar Georgiev. Development of a methodology for calculating the productivity of a melting reactor (**VIDEO**).