

PROGRAMME



## **KLIMA-FORUM 2023.**

**9th Forum on Cooling, Air-conditioning and Ventilation**



**26th International Conference on Heating, Cooling and Air-conditioning**

**Zadar, The 'Kolovare' Hotel, 19, 20 and 21 April 2023**

Organizers:

ENERGETIKA MARKETING d.o.o.  
the HESO association

Media Coverage:

the EGE magazine  
the [www.energetika-net.com](http://www.energetika-net.com) portal



## Programme

Wednesday, 20 April 2023

- 15:00 - 16:00 furnishing and arranging exhibition spaces of co-organizers
- 16:00 opening of exhibition spaces
  - the exhibition spaces will be open for visits by professionals and the general public until Friday, 21 April at 15:00 h

## Programme

Thursday, 20 April 2023

- 8:00 - 9:00 gathering and registration of participants

**9:00 - 10:30**

### KLIMA-FORUM

#### 1st Thematic Section: GLOBALLY and LOCALLY

- introductory speech from the Organizer
- welcome speeches by representatives of patrons and co-organizers
- invited key-note lectures:

*prof. dr. sc. Damir DOVIĆ, dipl. ing., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia - DECARBONIZATION OF POWER AND ENERGY INDUSTRY AND ZERO EMISSION BUILDINGS (ZEB)*

*prof. dr. sc. Vladimir SOLDO, dipl. ing., dr. sc. Luka BOBAN, mag. ing. mech., Dino MIŠE, mag. ing. mech. and Stjepan HERCEG, mag. ing. mech., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia - EXAMPLES OF IMPLEMENTED SYSTEMS WITH HEAT PUMPS*

*Dinko UZELAC, ing., Emerson Process Management d.o.o., Zagreb, Croatia - THE NEW COOL - COPELANDTM CO<sub>2</sub> SCROLL COMPRESSION TECHNOLOGY FOR TRANSCRITICAL APPLICATION WITH CO<sub>2</sub> IN COMMERCIAL COOLING*

*Leon CIMERMAN, Engie Refrigeration GmbH / Zenteh d.o.o., Markovci, Slovenia - HIGH TEMPERATURE thermeco2 HEAT PUMPS WITH NATURAL REFRIGERANT R 744 (CO<sub>2</sub>)*

- a presentation of a new edition from EM literatura: Orest Fabris - HLAĐENJE I KLIMATIZACIJA (Cooling and Air-conditioning)
- discussion

#### Remark:

**Abstracts of presentations for KLIMA-FORUM were published in the Proceedings of the KLIMA-FORUM.**

- 10:30 - 10:45 coffee break

**10:45 - 12:30**

### INTER-KLIMA 2023 CONFERENCE FRAN BOŠNJAKOVIĆ DAY - 1st Part



*Prof. Jurij AVSEC, University of Maribor, Faculty of Energy Technology, Krško, Slovenia - DEVELOPMENT AND APPLICATION OF THERMODYNAMICS IN THE FIELD OF ENERGY TECHNOLOGY, FROM HISTORY TO THE FUTURE*

*Jakša SINČIĆ, mag. ing. mech., dr. sc. Ivan HORVAT, mag. ing. mech., prof. dr. sc. Damir DOVIĆ, dipl. ing. and Petar FILIPOVIĆ, mag. ing. mech., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia - ANALYSIS OF THE STRATIFIED STORAGE MODEL FROM THE NEW prEN 15 316-5 : 2023*

*dr. sc. Gordan LJEŠIĆ, University of Mostar, Faculty of Mechanical Engineering, Computing and Electrical Engineering, Mostar, Bosnia and Herzegovina and prof. dr. sc. Vladimir SOLDO, dipl. ing., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia - EXPERIMENTAL INVESTIGATION OF CONDENSATION PRESSURE DROP OF PROPANE IN HELICALLY COILED TUBE-IN-TUBE HEAT EXCHANGER*

*Mustafa CANER, Res. Asst. and Prof. Dr. Ertan BUYRUK, Sivas State University, Mechanical Engineering Department, Sivas, Türkiye and Prof. Dr.-Ing. Ahmet CAN, Istanbul Rumeli University, Faculty of Engineering and Natural Sciences, Istanbul, Türkiye - EXPERIMENTAL INVESTIGATION OF HEAT TRANSFER FROM HELICAL COILED TUBES IN A WATER TANK*

*dr. sc. Dušan STRUŠNIK, Energetika Ljubljana d.o.o., Ljubljana, Slovenia and Prof. Jurij AVSEC, University of Maribor, Faculty of Energy Technology, Krško, Slovenia - THERMAL ANALYSIS OF ABSORPTION COOLING SYSTEM BY MACHINE LEARNING METHOD*

*Petar FILIPOVIĆ, mag. ing. mech., dr. sc. Ivan HORVAT, mag. ing. mech. and prof. dr. sc. Damir DOVIĆ, dipl. ing., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia - EVALUATION OF THERMAL PERFORMANCES OF A NOVEL POLYMER SOLAR COLLECTOR DESIGN*

*Ivan MATAS, mag. ing. mech., prof. dr. sc. Lovorka GRGEC BERMANEC, dipl. ing. and doc. dr. sc. Danijel ŠESTAN, dipl. ing., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia - DEVELOPMENT OF IMPROVED MEASUREMENT SYSTEM FOR CHARACTERIZATION OF CLIMATIC CHAMBERS*

- discussion (after each presentation)

- 12:30 - 13:30 lunch



### 13:30 - 15:00 KLIMA-FORUM 2nd Thematic Section: SYSTEMS and REGULATION

*Toni GAČINA, ing., Oventrop GmbH & Co. KG, Technical Support for Croatia, Slovenia and Bosnia and Herzegovina, Split, Croatia - OVENTROP - SOLUTIONS FOR HYDRAULIC BALANCING IN HEATING, COOLING AND DHW PREPARATION*

*Samo ŠMID, univ. dipl. inž. stroj., BELIMO AG, Technical Office, Kranj, Slovenia - UNIQUE SOLUTION FOR HYDRAULIC BALANCING AND MONITORING OF ENERGY CONSUMPTION*

*Renato LASIĆ, mag. ing. mech., Alfa Therm d.o.o., Mostar, Bosnia and Herzegovina - HUMAN RESOURCES DEVELOPMENT AND/OR DIGITALIZATION (an one-on-one interview)*

*Bojan JURINJAK, mag. ing. mech., Danfoss d.o.o., Zagreb, Croatia - DANFOSS NOVOCON - HVAC ENGINEERING 4.0 FOR SMART BUILDINGS*

*David DOBRINIĆ, univ. bacc. ing. mech., Samsung Electronics Adriatic, Zagreb Branch Office, Zagreb, Croatia - SAMSUNG SmartThings - Wi-Fi DEVICE MANAGEMENT APPLICATION - SMART HOME SYSTEM*

*Dragan GRBA, ing., Rittal d.o.o., Zagreb, Croatia - INDUSTRIAL PRODUCTION WITH REDUCED CO<sub>2</sub> FOOTPRINT*

• discussion

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15:00 - 15:15 coffee break

### 15:15 - 17:00 INTER-KLIMA 2023 CONFERENCE FRAN BOŠNJAKOVIĆ DAY - 2nd Part



*Danijel ZADRAVEC, mag. ing. mech. and prof. dr. sc. Nenad FERDELJI, dipl. ing., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia - OPTIMAL TOTAL REFLUX PERIOD DURATION IN BATCH DISTILLATION*  
*dr. sc. Martina ODELJAN, mag. ing. mech. and prof. emer. Antun GALOVIĆ, dipl. ing., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia - DETERMINATION OF CRITERIA FOR ACHIEVING THE SAME OUTLET TEMPERATURES OF BOTH FLUID STREAMS IN COUNTERFLOW HEAT EXCHANGERS*

*Nikola BOROVIK, mag. ing. mech., doc. dr. sc. Saša MUDRINIĆ, dipl. ing. and prof. dr. sc. Nenad FERDELJI, dipl. ing., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia - MODELLING OF TRANSFORMER VACUUM DRYING PROCESS*

*Merima GADARA, Džemal Bijedić University of Mostar, Faculty of Mechanical Engineering, Mostar, Bosnia and Herzegovina and doc. dr. sc. Haris LULIĆ, University of Sarajevo, Faculty of Mechanical Engineering, Sarajevo, Bosnia and Herzegovina - DYNAMIC MODELING OF THE SOLAR SYSTEM DEPENDING ON THE CHANGE IN THE TILT ANGLE OF THE SOLAR COLLECTOR*

*M. Musab BAYAT, Res. Asst. and Prof. Dr. Ertan BUYRUK, Sivas State University, Mechanical Engineering Department, Sivas, Türkiye and Prof. Dr.-Ing. Ahmet CAN, Istanbul Rumeli University, Faculty of Engineering and Natural Sciences, Istanbul, Türkiye - USE OF PCM WITH ALUMINUM FINS TO IMPROVE SOLAR PANEL PERFORMANCE*

*Stephen MURPHY, Technological University of the Shannon: Midlands, Midwest, Thurles, Ireland, Dan STEFANICA, EHPA - European Heat Pump Association, Brussels, Belgium, Carlos DELGADO, FCTA - Fundación Corporación Tecnológica de Andalucía, Seville, Spain, Megan GIGNAC, ESV - OÖ Energiesparverband, Linz, Austria and Pdraic O'REILLY, Technological University of the Shannon: Midlands, Midwest, Thurles, Ireland - REPLICATING THE SUCCESS OF THE HP4ALL PROJECT: INCREASING HEAT PUMP SKILLS AND INCREASING THE DEMAND FOR THOSE SKILLS*

*dr. sc. Alen CUKROV and prof. emer. Antun GALOVIĆ, dipl. ing., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia, Dr. Yohei SATO, Paul Scherrer Institute, Villigen, Switzerland, prof. dr. sc. Ivanka BORAS, dipl. ing., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia and Dr. Bojan NIČENO, Paul Scherrer Institute, Villigen, Switzerland - NUMERICAL SIMULATION OF WATER-ICE FORMATION AROUND A PIPE*

• discussion (after each presentation)

19:30 social programme

- Pub Quiz
- DJ



### 9:00 - 11:00 KLIMA-FORUM 3rd Thematic Section: PROJECTS and SOLUTIONS

*Zvonimir STRAPAJEVIĆ, mag. ing. mech., Samsung Electronics Adriatic, Zagreb Branch Office, Zagreb, Croatia - SAMSUNG EHS HT MONO QUIET - A NEW HEAT PUMP*

*Carsten FEUERHAKE, Bioclimatic GmbH, Bad Nenndorf, Germany - THE FUTURE OF SAFE AND HEALTHY AIR IN INNER SPACES*  
*Krešimir MATKOVIĆ, mag. ing. mech., Clivet S.p.A., Clivet South-East Europe, Zagreb, Croatia - SOLUTIONS FOR HEATING AS WELL*

*Pavao JERKOVIĆ, mag. ing. mech., Frigo Plus d.o.o., Soblinec, Croatia - NEW HEAT PUMPS WITH R 290 FOR HEATING AND COOLING 'MADE IN CROATIA'*

*Stjepan MIKLEUŠEVIĆ, bacc. ing. techn., Viessmann d.o.o., Zagreb, Croatia - VISSMANN VITOCAL - ALL PURPOSES HEAT PUMPS*

*Alen SIPIĆ, ing., IMP termotehnika-regulacija d.o.o., Zagreb, Croatia - HOW TO ACHIEVE OPTIMAL CONDITIONS FOR THE HEAT PUMP OPERATION IN COMBINATION WITH SURFACE HEATING AND COOLING?*

*mr. sc. Davor LUČIN, dipl. ing., Detron d.o.o., Split, Croatia - MULTIFUNCTIONAL DELTRON SOLUTIONS AND HEAT PUMPS - REDUCTION OF OPERATIONAL COSTS AND CONSUMPTION OF NON-RENEWABLE RESOURCES*

*Damir BUTKOVIĆ, dipl. ing., IFMA Croatia Chapter, Zagreb, Croatia - IFMA MISSION - WITH STRATEGIC MANAGEMENT TOWARDS GREATER FUNCTIONALITY, EFFICIENCY, COMFORT AND SAFETY IN BUILT ENVIRONMENT*

• discussion

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11:00 - 11:15 coffee break

### 11:15 - 13:00 INTER-KLIMA 2023 CONFERENCE ENERGY EFFICIENCY AND RENEWABLES



*dr. sc. Luka BOBAN, mag. ing. mech., Dino MIŠE, mag. ing. mech., Stjepan HERCEG, mag. ing. mech. and prof. dr. sc. Vladimir SOLDO, dipl. ing., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia - LONG TERM PERFORMANCE OF HEAT PUMP SYSTEM UNDER INFLUENCE OF AGING EFFECTS*

*Franco KROG and Prof. Jurij AVSEC, University of Maribor, Faculty of Energy Technology, Krško, Slovenia - ENERGY ANALYSIS OF HYDROGEN USE IN ROAD TRANSPORT OF THE REPUBLIC OF CROATIA*

*dr. sc. Marko MIMICA and prof. dr. sc. Goran KRAJAČIĆ, dipl. ing., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia - DECARBONISATION OF COMMUNITIES AND GEOGRAPHICAL ISLANDS - EXPERIENCES FROM H2020 INSULAE AND HE COMMUNITAS*

*Dino MIŠE, mag. ing. mech., dr. sc. Luka BOBAN, mag. ing. mech. and prof. dr. sc. Vladimir SOLDO, dipl. ing., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia - INFLUENCE OF DIFFERENT DEFROST STRATEGIES ON HEAT PUMP EFFICIENCY*

*Urška NOVOSEL and Prof. Jurij AVSEC, University of Maribor, Faculty of Energy Technology, Krško, Slovenia, Prof. Matej MENCINGER, University of Maribor, Faculty of Civil Engineering, Transportation Engineering and Architecture, Maribor, Slovenia and doc. dr. Brigita FERČEC, University of Maribor, Faculty of Energy Technology, Krško, Slovenia - COMBINED USE OF HYDROGEN TECHNOLOGIES AND RENEWABLE SOURCES TO REDUCE THE CARBON FOOTPRINT IN THE SAŠA REGION*

*prof. dr. sc. Damir DOVIĆ, dipl. ing., dr. sc. Ivan HORVAT, mag. ing. mech. and Petar FILIPOVIĆ, mag. ing. mech., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia - INCREASING EFFICIENCY AND REDUCING POLLUTANTS EMISSIONS FROM THE RESIDENTIAL COOKER BURNING WOOD BIOMASS*

*Josip MIŠKIĆ, mag. ing. mech., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia, dr. sc. Hrvoje DROTIĆ, Hrvoje Požar Energy Institute, Zagreb, Croatia, prof. dr. sc. Tomislav PUKŠEC and prof. dr. sc. Neven DUIĆ, dipl. ing., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia - THE METHOD OF DETERMINING THE RADIUS OF TECHNO-ECONOMIC FEASIBILITY OF WASTE HEAT FOR THE PLANNING OF THE DISTRICT HEATING SYSTEM*

• discussion (after each presentation)

13:00 - 13:15 coffee break



### 13:15 - 15:00 KLIMA-FORUM 4th Thematic Section: EFFICIENCY and COMFORT

*Renato JAKUS, Klimaoprema d.d., Samobor, Croatia* - HIGHLY EFFICIENT PROFESSIONAL KITCHEN VENTILATION SYSTEM

*Vedran VUKASOVIĆ, Atrea d.o.o., Rijeka, Croatia* - SCHOOL VENTILATION - LET'S PROVIDE QUALITY LEARNING CONDITIONS FOR THE THE YOUNGEST

*Tomislav JURIČEV-SUDAC, ing. mech., KAN-therm Hungary kft., Biatorbágy, Hungary* - KAN-therm - RECOGNIZED AND INTERNATIONALLY WELL-KNOWN NAME

*Josip ZORKO, Testo Kft., Samobor, Croatia* - A SYNONYME FOR PRECISE AND RELIABLE INSTRUMENTS

*prof. dr. sc. Antonio PETOŠIĆ, Domagoj STOŠIĆ i Toni MARINKOVIĆ, University of Zagreb, Faculty of Electrical Engineering and Computing, Zagreb, Croatia* - OPTIMIZATION OF NOISE PROTECTION MEASURES IN THE AIR CONDITIONING DUCT

*Robert MARINIĆ, mag. ing. mech., Vodoprivreda Daruvar d.d., Daruvar, Croatia, prof. dr. sc. Davor LJUBAS, dipl. ing. i prof. dr.sc. Hrvoje JURETIĆ, dipl. ing., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia* - ZAŠTITA SUSTAVA ZA OBRADU ZRAKA I VODE OD ONEČIŠĆENJA BAKTERIJAMA RODA LEGIONELLA

*prof. dr. sc. Davor LJUBAS, dipl. ing., University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia, Dinko LJOLJO, mag. ing. mech., Opus Optimus d.o.o., Zagreb, Croatia i Robert MARINIĆ, mag. ing. mech., Vodoprivreda Daruvar d.d., Daruvar, Croatia* - UPCOMING LEGAL OBLIGATIONS RELATED TO HOME WATER SUPPLY NETWORK

*Damir DIGULA, dipl. ing., Siemens d.d., Zagreb, Croatia* - ENERGY EFFICIENCY CLASSIFICATION TOOL

- discussion
- final word from the Organizer

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15:00 closing of exhibition spaces

15:00 lunch

**Remark**

The Organizer reserves the right to amend the Programme up to the conferences and even during the conferences.