

**9th International Conference on  
"Energy, Sustainability and  
Climate Crisis"  
ESCC 2022**



**Paphos, Cyprus, August 29 - September 2, 2022**

### Conference Venue

The conference will take place at Attikon Multicultural Space, Paphos, Cyprus (**location 34.7766918,32.4225483**). The Attikon Multicultural Space is at the Center of Paphos city.

For more information please go to: <http://esc.uth.gr/venue/>

### Directors of the Conference:

Professor Panos Pardalos, Center for Applied Optimization, University of Florida (USA).

Associate Professor Georgios K.D. Saharidis, [www.GreenYourRoute.com](http://www.GreenYourRoute.com), University of Thessaly (Greece).

Professor and Chairman Mohsen A. Jafari, Industrial and Systems Engineering, School of Engineering, University of Rutgers (USA).

Professor and Chairman Soteris Kalogirou, Mechanical Engineering and Materials Science and Engineering, Cyprus University of Technology (Cyprus).

Associate Professor Vítězslav Máša, Faculty of Mechanical Engineering, Brno University of Technology (Czech Republic).

Associate Professor Esmat Zaidan, Policy, Planning, and Development at Qatar University (Qatar).

Assistant Professor Maria do Castelo Gouveia, Coimbra Business School | ISCAC (Portugal)

Professor Gabriel Dima, University Politehnica of Bucharest (Romania).

### Scientific Committee:

Professor Gülgün Kayakutlu, Faculty of Management, Istanbul Technical University (Turkey).

Associate Professor Mihalis M. Golias, University of Memphis (USA).

Lecturer Dimitris Zisis, Operations Management, Norwich Business School (UK).



## Sessions

Session 1: Operational Research I	(Monday, 29 August, 09:40-11:20)
Session 2: Decision Making I	(Monday, 29 August, 12:20-14:00)
Session 3: Energy, Sustainability and Climate Change	(Monday, 29 August, 14:40-16:20)
Session 4: Renewable Energy - Energy Mix	(Monday, 29 August, 16:20-18:00)
Session 5: Decision Making II	(Tuesday, 30 August, 09:40-11:20)
Session 6: Energy and Environment	(Tuesday, 30 August, 12:20-14:00)
Session 7: Decision Making III	(Tuesday, 30 August, 14:40-16:40)
Session 8: Operational Research II	(Wednesday, 31 August, 09:40-11:40)
Session 9: Energy	(Wednesday, 31 August, 12:40-14:00)
Session 10: Poster Demonstration	(Wednesday, 31 August, 15:00-17:00)



## Program Summary

### Monday, 29 August 2022

- 08:00-09:00 Registration
- 09:00-09:40 Plenary Talk: Professor Soteris Kalogirou  
**Renewable Energy Systems: Current status in the World and Prospects**
- 09:40-11:20 Session 1: Operational Research I
- 11:20-11:40 Coffee Break
- 11:40-12:20 Plenary Talk: Chairman, Cyprus Energy Regulatory Authority Dr. Andreas Poullikkas  
**Optimum Strategies for Hydrogen Economy**
- 12:20-14:00 Session 2: Decision Making I
- 14:00-14:40 Light Lunch (Take Away)
- 14:40-16:20 Session 3: Energy, Sustainability and Climate Change
- 16:20-18:00 Session 4: Renewable Energy - Energy Mix

### Tuesday, 30 August 2022

- 09:00-09:40 Plenary Talk: Assistant Professor Maria do Castelo Gouveia  
**Is the Cohesion Policy Efficient in supporting the Transition to a Low Carbon Economy?**
- 09:40-11:20 Session 5: Decision Making II
- 11:20-11:40 Coffee Break
- 11:40-12:20 Plenary Talk: Professor Dr. Panos Pardalos  
**Artificial Intelligent and Smart Energy Systems**
- 12:20-14:00 Session 6: Energy and Environment
- 14:00-14:40 Light Lunch (Take Away)
- 14:40-16:40 Session 7: Decision Making III
- 20:00 ESCC Dinner - Fettas Tavern, Paphos**  
**Location: 33, Ioanni Agroti Street 8010 Paphos, Cyprus**  
**Log/Lat: 34.77408830927276, 32.42164169375949**

### Wednesday, 31 August 2022

- 09:00-09:40 Plenary Talk: Associate Professor Constantinos Hadjistassou  
**Can Cyprus Embrace Carbon Neutral Electricity and Transport Sectors?**
- 09:40-11:40 Session 8: Operational Research II
- 11:40-12:00 Coffee Break
- 12:00-12:40 Plenary Talk: Professor Gülgün Kayakutlu  
**Challenges in Industrial Battle against the Climate Change**
- 12:40-14:00 Session 9: Energy
- 14:00-14:40 Light Lunch (Take Away)
- 14:40-15:00 **"Panos Pardalos" Best Student Award**
- 15:00-17:00 Session 10: Poster Demonstration

### Thursday, 1 September 2022 (Only for Invited Researchers)

- 09:00-10:40 Round table: Energy Systems (Chairman: V. Máša)
- 10:40-12:00 Round table: LIFE GreenYourRoute Project: Extended Presentation of the Platform (Chairman: Georgios K.D. Saharidis)
- 12:00-13:00 Light Lunch (Take Away)
- 13:00-15:00 Seminar in Benders Decomposition Methods: Theory (Tutor: A. Fragkogios)
- 15:00-15:15 Coffee Break
- 15:15-17:30 Seminar in CPLEX: Theory (Tutor: El. Zygouri)

### Friday, 2 September 2022 (Only for Invited Researchers)

- 09:00-10:40 Special Issue Organization for ESCC 2023 (Chairman: Georgios K.D. Saharidis)
- 10:40-12:00 Organization of ESCC 2023 (Chairman: Georgios K.D. Saharidis)
- 12:00-13:00 Light Lunch (Take Away)
- 13:00-15:00 Seminar in CPLEX: C++ Library (Tutor: El. Zygouri)

15:00-15:15 Coffee Break

15:15-17:30 Seminar in Benders Decomposition Methods: Applications in Energy Networks (Tutor: A. Fragkogios)

### Sessions – Regular Presentations

**Monday, 29 August 2022**

#### **Session 1: Operational Research I**

**Chairman: V. Nevrlý**

**(09:40-11:20)**

- (1) G. S. Georgiou, C. Rouvas, D. Nathanael & A. Avraam "Enhancing Expansion of Rooftop PV Systems through Mixed Integer Linear Programming and Public Tender Procedure".
- (2) F. Lazzari, J. Cipriano, G. Laguna & G. Mor "Genetic Algorithm Based Optimizations for Planning and Operation of Renewable Energy Communities".
- (3) J. Pluskal, R. Šomplák, L. Szásziová & M. Pavlas "Supporting Tool for Strategic Decisions in Plastic Waste Processing Infrastructure Planning".
- (4) M. Pernica & T. Létal "Estimating Temperature Distributions and Thermal Stresses in a Shell and Tube Heat Exchanger with Fixed Tubesheets for Improved Material Selection".

#### **Session 2: Decision Making I**

**Chairman: L. Aresti**

**(12:20-14:00)**

- (1) V. Nevrlý "Cost as the Barrier in Waste Collection Systems for Recyclable Fractions".
- (2) Th. Stamadianos, N. A. Kyriakakis, M. Marinaki & Y. Marinakis "A TOPSIS Solution Selection Strategy for the Vehicle Routing Problem with 3D Constraints in Urban Spaces".
- (3) A. Lekidis, A. G. Anastasiadis & K. Hrissagis "Formal Modeling of Industrial Wireless Applications".
- (4) A. G. Anastasiadis, St. A. Konstantinopoulos, A. Lekidis, K. Hrissagis & G. Vokas "Stochastic Multiobjective, Non-Convex CHPED, Incorporating Wind Power and V2G Under Environmental Constraints".

#### **Session 3: Energy, Sustainability and Climate Change**

**Chairman: R. Agathokleous**

**(14:40-16:20)**

- (1) Ch.-H. Li, J.-B. Jhang & W.-M. Yan "Study of Vacuum Membrane Dehumidifiers on Heat and Mass Transfer Effects with Nafion 212 Membrane".
- (2) N. Alamanis, P. Lokkas, N. Xafoulis, G. Papageorgiou, D. Christodoulou, E. Paschalis & D. Zachos "The Evaluation of Engineering Knowledge through an Interactive Escape Room Game".
- (3) C. Góis, M. Costa & C. Viseu "The Sustainability Reporting in the Municipalities: A Study in Portugal".
- (4) A. G. Anastasiadis, A. Lekidis, I. Oikonomou, K. Hrissagis & G. Vokas "Quantification of Smart Microgrid Benefits Using Sensitivity Analysis".
- (5) G. Saharidis, K. Ampountolas & K. Papadimitriou "Optimal Network Design for Air Quality Monitoring of Urban Regions: The case of Volos City, Greece".

#### **Session 4: Renewable Energy - Energy Mix**

**Chairman: A. Lekidis**

**(16:20-18:00)**

- (1) L. Aresti, G. Florides, C. Makarounas, A. Stasis & P. Christodoulides "Moving from Air Source Heat Pumps to Ground Source Heat pumps: An environmental investigation of different types Ground Heat Exchangers".



(2) R. Agathokleous & S. Kalogirou "Experimental Investigation of PV Cooling Methods with Focus on BIPV Applications".

(3) N. Papanotas, C. L.G. Oikonomou & O. A. Haralampous "A Methodology for Evaluating the Operation of Floating Solar Panels in the Aegean Sea".

(4) D. Zachos, S. Zaoutsos, G. Bakalis, K. Bakalis & K. Liakoulis "Comparative Study for Selecting the Optimal Mixture as Well as the Most Suitable Origin of Biodiesel, for its Use in Internal Combustion Diesel Engines of Direct Injection".

## Tuesday, 30 August 2022

### Session 5: Decision Making II (09:40-11:20)

Chairman: C. Hadjistassou

(1) A. Trigo, C. Henriques, M. Gouveia, C. Viseu & A. Amaro "vbDEA Web App Prototype".

(2) C. Henriques, C. Viseu, A. Trigo, M. Gouveia & A. Amaro "Evaluating the Efficiency of Implementation of ERDF Funds devoted to Research and Innovation in SMEs".

(3) C. Henriques, A. Amaro, C. Viseu, A. Trigo & M. Gouveia "Efficiency Analysis on the Implementation of European Structural Funds devoted to ICT Adoption in SMEs".

(4) C. Henriques, C. Viseu, A. Trigo, M. Gouveia & A. Amaro "Assessing the Implementation of Structural Funds Dedicated to a Low Carbon-Economy in SMEs".

### Session 6: Energy and Environment (12:20-14:00)

Chairman: C. Henriques

(1) O. Němček & S. Honus "Improvement of Alternative Fuel Pellet Processing by Means of Torrefaction, Nanoparticles and Subsequent Thermal Degradation for Higher CO<sub>2</sub> Capture".

(2) M. Frondel & S. Schubert "Carbon Pricing in Germany's Road Transport and Housing Sector: Options for Reimbursing Carbon Revenues".

(3) V. Angelou, E. Nikolaidou, P. Christoforidou, A. Hletsis, A. Liakata, A. Papakonstantinou & P. Samaras "Computer Simulation and Energy Optimization in Municipal Wastewater Treatment Plants: A Case Study of Larisa City WWTP".

(4) M. Procházková, M. Vondra & V. Máša "Recent Advances in Biogas Plants and Treatment of Liquid Digestate".

### Session 7: Decision Making III (14:40-16:40)

Chairman: M. Frondel

(1) B.-L. Chen, T.-F. Yang & W.-M. Yan "Novel Correlations of Saturated Flow Boiling Heat Transfer and Evaporating Flow Boiling Pressure Gradient".

(2) E. Paschalis, N. Xafoulis, G. Papageorgiou, N. Alamanis, D. Tselios, A. Zahidou & I. Boufikos "Reservoirs for Flood Control and Restraint. A Case Study for Larissa City, Greece".

(3) B. Myradov "Decision Making on Integrated Hybrid Renewable Energy Systems Design".

(4) J. Góis, A. Santos, F. Baptista & M. Quina "Analysis of the Performance of an Industrial Dryer Developed for Dewatering Sewage Sludge".

(5) O. Blanas, D. Zisis & G. Ioannou "Demand Pooling, Optimal Pricing and Infrastructure Decisions in a Novel Electric Vehicle Business Model".

## Wednesday, 31 August 2022

### Session 8: Operational Research II (09:40-11:40)

Chairman: N. Alamanis



- (1) T. Chrysanidis, I. Tegos, N. Alamanis & G. Papageorgiou "A Method of Increasing the Ductility of Shear Walls Integrating Structural Steel Hollow Beams and their Sustainable Design".
- (2) B. Lin, B. Ghaddar & J. Nathwani "Electric Vehicle Routing for Sustainable Last-mile Delivery Services".
- (3) T. Chrysanidis, N. Alamanis & G. Papageorgiou "Experimental and Analytical Study on Out Of-Plane Buckling of R/C Structural Walls Due to Intense Seismic Action and Their Sustainable Design".
- (4) P. Broukos, N. Shah, A. Fragkogios & G.K.D. Saharidis "Solving the Non-Linear Waste Water Treatment Network Design Problem by Benders Decomposition".
- (5) J. Naoum-Sawaya "Blockchain based Supply Chain Network Design".

**Session 9: Energy**  
(12:40-14:00)

**Chairman: A. Fragkogios**

- (1) N. Xafoulis & E. Farsirotou "CFD Modelling of Water Flow Field in Open Channel".
- (2) A. V. Olympios & C. N. Markides "A Technology-to-System Approach to Compare Electrification and Hydrogen Heat Decarbonisation Pathways".
- (3) D. Diskin & L. Tartakovsky "A Hybrid Cycle Combining Fuel Cell, Internal Combustion Engine and Thermochemical Recuperation for Transportation Propulsion Systems".
- (4) G. Saharidis, K. Gourgoulianis & I. Pantazopoulos "One Year Air Quality Monitoring of PM2.5 and Emergency Admissions: A statistical Analysis for the Volos City, Greece".

**Session 10: Poster Demonstration**  
(15:00-17:00)

**Chairman: G.K.D Saharidis**

- (1) K. Bryszewski, A. Mielcarek, J. Rodziewicz & W. Janczukowicz "Treatment of Hydroponic Drainage in a Electrochemical Reactor".
- (2) D. Szwarc & A. Nowicka "Pulsed Electric Fields or Ultrasound - Comparison of Pretreatment Methods in Biogas Production from Rapeseed Straw".
- (3) D. Szwarc & A. Nowicka "Use of a Pulsed Electric Field in Methane Fermentation of Sida Hermaphrodita Silage".
- (4) A. Mielcarek, K. Bryszewski, A. Dobrowolski & T. Józwiak "Optimizing the Use of Electric Current to Support the Biological Treatment of Drainage Water from Soilless Tomato Cultivation in an Acidic Environment".
- (5) P. Ktistis, R. Agathokleous, C. Christodoulou, A. Kyriakou, L. Christou & S. Kalogirou "A Solar Simulator for Multidisciplinary Research on Solar Technologies".

**Emergency Telephone Numbers**

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