

**12th International Conference on
"Energy, Sustainability and
Climate Crisis"
ESCC 2025**



Rhodes, Greece, August 25 - 29, 2025

Conference Venue

The conference will take place at The Chamber of Commerce and Industry of the Dodecanese, Rhodes, Greece (**location 39.62103741177484, 19.923658014687827**). The Chamber of Commerce and Industry of the Dodecanese is in the town of Rhodes.

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

Directors of the Conference:

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

Associate Professor Georgios K.D. Saharidis, <https://greenyourfreight.eu>, University of Thessaly (Greece).

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).

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

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

Associate Professor Joe Naoum-Sawaya, Management Science, Ivey Business School (Canada).

Associate Professor Bissan Ghaddar, Management Science & Sustainability, Ivey Business School (Canada).

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

Research Director Vassilios Kappatos, Head of Constructural and Infrastructure Research in Maritime and Air Transport Lab, Hellenic Institute of Transport (HIT), Center for Research and Technology Hellas (CERTH) (Greece).

Professor Kyoshik Park, Soongsil University (South Korea).

Scientific Committee:

Chair of TC12 IFIP Eunika Mercier-Laurent, International Federation for Information Processing (France).

Assistant Professor Dimitris Zissis, Athens University of Economics and Business (Greece).

Antonios Fragkogios, University of Thessaly (Greece).

Assistant Professor Nuno A. S. Domingues, Department of Mechanical Engineering, Lisbon School of Engineering (Portugal).

Organizing Committee:

Eleousa Zygouri, University of Thessaly (Greece).

Anna-Maria Panagiotaki, University of Thessaly (Greece).



Program Summary

Monday, 25 August 2025

- 08:00-09:00 Registration
- 09:00-10:45 Session 1: Mathematical Programming and Energy, Sustainability & Climate Change I
- 10:45-11:30 Plenary Talk: Professor Dr. Panos Pardalos

Energy Systems

- 11:30-13:00 Session 2: Transportation and Energy Efficiency
- 13:00-13:45 Light Lunch
- 13:45-14:30 Plenary Talk: Dr. Vassilios Kappatos

The Critical Role of Predictive Maintenance in Renewable Energy Systems

- 14:30-16:00 Session 3: Di-Hydro Workshop
- 16:00-16:30 Poster Session
- 16:30-18:00 Session 4: Energy Efficiency I
- 18:00-19:30 Workshop: Dr. Antonios Fragkogios

CPLEX and C++ applied in Operational Research for Young Researcher

Tuesday, 26 August 2025

- 08:00-10:00 Session 5: Energy Systems & Energy and Environment
- 10:00-10:45 Plenary Talk: Professor Dr. Amela Ajanovic
- Future Prospects for Green Hydrogen in the European Energy System**
- 10:45-13:00 Session 6: Decision Making & Sustainability
- 13:00-13:45 Light Lunch
- 13:45-15:30 Session 7: Mathematical Programming and Energy, Sustainability & Climate Change
- 15:30-17:00 Session 8: Energy Efficiency II



17.00-19.00 Workshop: GreenYourRoute Company

GreenYourRoute Platform for Green Last Mile Deliveries

20:30

ESCC Dinner – Grand Beach, Rhodes

Location: 4 G. Papanikolaou Str., Elli Beach (Casino), Rhodes, Greece

Log/Lat: 36.45424082950082, 28.222925631481637

Wednesday, 27 August 2025

08:00-10:00 Session 9: Renewable & Sustainable Energy I

10:00-10:45 Plenary Talk: Professor Dr. Soteris Kalogirou

Renewable Energy Systems: Current Status in the World and Prospects

10:45-13:00 Session 10: Operational Research and Energy, Sustainability & Climate Change

13:00-13:45 Light Lunch

13:45-15:15 Session 11: Renewable & Sustainable Energy II

15:15-17:15 Workshop: Mr. Kostas Chrysagis

Applying for European Project – Challenges & Opportunities

17:15-17:30 "Panos Pardalos" Young Researcher Award

17:30-19:00 Seminar in Convex Analysis Applications (Tutors: P. Pardalos and R. Bakker)

Thursday, 28 August 2025

08:00-09:20 Seminar in Benders Decomposition Methods: Theory (Tutor: A. Fragkogios)

09:20-10:40 Round table: LIFE GreenYourFreight Project: Service and Green Logistics (Chairman: Georgios K.D. Saharidis)

10:40-12:40 Round table: Green Energy (Chairman: V. Máša)

12:40-13:20 Light Lunch



Friday, 29 August 2025

- 08:00-09:15 Seminar in Benders Decomposition Methods: Applications in Energy Networks (Tutor: A. Fragkogios)
- 09:15-10:30 Organization of ESCC 2026 (Chairman: Georgios K.D. Saharidis)

COFFEE, JUICE, WATER AND SNACKS
WILL BE OPEN AND FREE DURING THE SESSIONS

Sessions - Regular Presentations

Monday, 25 August 2025

Session 1: Mathematical Programming and Energy, Sustainability & Climate Change I (09:00-10:45)

Chairman: V. Máša

- (1) Y. Wu & L. Zhu "Developing a Sustainable Air Container Renting and Air Cargo Allocation Plan Under Dynamic Shipment Information".
- (2) A. Di Nardo, L. Palma, E. Creaco, M. Iervolino, A. Leopardi & G.F. Santonastaso "Advancing Water Distribution Network Management Through the Software SWANP".
- (3) N. Xafoulis, E. Farsirotou, S. Kotsopoulos & N. Alamanis "An Integrated Approach to Flood Risk Mapping using Machine Learning, GIS and 2D Hydraulic Simulations with Open-Access Geospatial Data".
- (4) D. Rizopoulos & K. Gkiotsalitis "Integrated Strategic and Tactical Transport Planning via Mixed-Integer Linear Programming: A Focus on Scheduling and Synchronization".
- (5) S. Ioannidis, L. Doitsidis, A.S. Xanthopoulos & D.E. Koulouriotis "Optimizing Energy Efficiency and Order Admission in Single-Stage Production Systems for Two Customer Classes".
- (6) F. Liatsos & V. Kappatos "Prevent-DisCC: Cross-Border Actions for Prevention of Disasters & Climate Change".

Session 2: Transportation and Energy Efficiency (11:30-13:00)

Chairman: E.F. Fernández

- (1) E.D. Spyrou & V. Kappatos "Greedy Optimization for Power Allocation and Coverage in Electric Vehicle Charging Station Networks".
- (2) A. Ajanovic & R. Haas "The Evolution and Future of Incentives for Battery Electric Vehicles: A Comparative Analysis of the EU, China, and Norway".
- (3) M. Yildirim "Design and Integration of a Hydrogen Fuel-Based Power System for Electric Motor Applications".
- (4) G. Kalantzis & G. Saharidis "Vehicle Routing Problem applied in Real World for Green Logistic".

Session 3: Di-Hydro Workshop (14:30-16:00)

Chairman: V. Kappatos

- (1) A. Tromaras & V. Kappatos "Digital Transformation in the Hydropower Industry".



- (2) N. Papadakis & G. Bouloukakis "A Modular Data Exchange Framework for the Digital Modernization of Hydropower Infrastructure".
- (3) M. Iovea, T.-A. Netculescu & E. Hermann "Visualization Tool for Hydro Power Plant Operators: Interactive Data Monitoring & Surveillance on Large Screen with Voice Warning".
- (4) S. Rodríguez-Carro, A. Martín-Crespo, P. Hernampérez-Manso & B.-A. Onose "Smart Decision Support Tool for Hybrid Hydropower Plants".
- (5) P. Vairamakias "iAMP-Hydro Project".

POSTER Session

(16:00-16:30)

- (1) S. Avgousti & S. Kalogirou "Solar Photovoltaic Monitoring System using IOT".
- (2) K. Kogan, Y. Perlman & S. Shatz "Side-Stream Processing: Optimal Policy Thresholds and Sustainability".
- (3) K. Hrich & J. Malá "Behavior of Pesticides Metazachlor, Epoxiconazole, and Glyphosate in Denitrifying Woodchip Bioreactor".
- (4) B. Goma, P. Skryja, B. Vladimír & A. Drda "Comparative Life Cycle Assessment study of Selected Sanitization Processes".
- (5) W. Kowalik, W. Hubert & L. Gawlik "Just Transition in Practice: Insights from Rural Areas in Poland – Case Study of Krzywca Commune".
- (6) M. Peplowska, W. Kowalik, W. Hubert & L. Gawlik "Citizen Engagement in Just Energy Transition: A Case Study of Poland in the TANDEM Project".
- (7) M. Neagoe, R.G. Saulescu & A.F. Neagoe "Power Flow in a Vertical-axis Counter-rotating Differential Wind System with Differential Planetary Speed Increaser and Counter-rotating Generator".
- (8) R.G. Saulescu & M. Neagoe "Modeling and Simulation of Steady-state Power Flow in a Vertical-axis Counter-rotating Wind System with Monomobile Planetary Speed Increaser and Counter-rotating Electric Generator".
- (9) C. Barreneche, L. Betancor, A. Mihi & S. Dosta "Development of a 2D Materials Database for Applications in Renewable Energy and Sustainability".
- (10) S. Dosta, V. Ortega & C. Barreneche "Life Cycle Assessment of Renewable and Fossil-Based Energy Technologies for 1 MW Power Production."

Session 4: Energy Efficiency I

Chairman: A. Tromaras

(16:30-18:00)

- (1) E.F. Fernández, M.A. Ceballos, A. Valera, J. Montes-Romero, P.J. Pérez-Higueras & F. Almonacid "Wide-Acceptance-Angle Tracking-Integrated Micro-Concentrator Photovoltaic Module for Agrivoltaics (Wit - CPV): Final Results and Future Perspectives".
- (2) G. Akgül, R. Sharma & S.M. Andersen "Biomass Based Carbonized Material as Electrocatalyst Support".
- (3) I. Oikonomidis, A. Sakkas & D. Zisis "Dynamic Pricing in the Greek Energy Sector: Moving Beyond the Flat-Rate Model".
- (4) B. Alafi, H. Sözer & S. Toplak "Integrated Energy Management Strategies in a Campus Sports Complex: Istanbul Technical University Case Study".
- (5) T. Kaltis & G. Saharidis "Literature Review on Benders Cut Selection and a Multiple Cut Generation Scheme".



Tuesday, 26 August 2025

**Session 5: Energy Systems & Energy and Environment
(08:00-10:00)**

Chairman: P.A. Bibiloni-Mulet

- (1) F. Jamil, A.H. Al-Muhtaseb, L. Al-Haj, M.A. Al-Hinai, P. Hellier & U. Rashid "Sustainable Valorization of Waste Date Pits for Biodiesel Production via Optimized Extraction and Transesterification".
- (2) Ł. Bartela, D. Homa, J. Ochmann & W. Kosman "Potential of Coal-to-Nuclear Decarbonization Path in Poland – First Conclusions of DEsire Project".
- (3) O. Němček & S. Honus "Hydrogen - Production, Purity and Technical Challenges in its Sampling and Use. Ecologization of Processes and Increasing Rate of Recycling."
- (4) D. Homa, Ł. Bartela & P. Sokoła "Potential of Coal-to-Nuclear Decarbonization Path in Poland – Feasibility Study of a Chosen Location".
- (5) J. Kalina, M. Vondra, V. Miklas, M. Touš, D. Horňák & V. Máša "Low-Potential Thermal Energy Storage".
- (6) C. Andrade, A. Fonseca & J.A. Santos "Integrating Climate Projections into Water Resource Management in the Iberian Peninsula: Challenges and Strategies".
- (7) M. Zampilli, K. Słopiecka, T. Galmacci, A. Hassan & F. Fantozzi "WASYNG - Integrated Production of Bio-Methane and E-Methane via Anaerobic Digestion and Sabatier Methanation: A Techno-Economic Pathway for Energy Storage and Humid Waste Management".

**Session 6: Decision Making & Sustainability
(10:45-13:00)**

Chairman: C. Henriques

- (1) X. Shao "General Two-Stage Cross-Efficiency Evaluation Based on Prospect Theory".
- (2) A. Karadonta, A. Akriotis, I. Papadopoulos, M. Trigkas & G. Aspridis "Innovative Application of Mulching and Smart Environmental Monitoring in Fire-Affected Forest Areas in Greece: From Restoration to Administrative Integration".
- (3) S. Bukchin-Peles, K. Baker Lozneva, J.K. Tomberlin & D. Zilberman "Toward a Circular Bioeconomy: Investigating the Scale, Structure, and Potential of the Black Soldier Fly Industry".
- (4) M. Kumral "Advancements in Responsible and Sustainable Mining Standards and the Expansion of Mining Activities into Sensitive Regions of the World".
- (5) F. Lopes & A. Amaro "Towards Adaptive and Resilient Supply Chains: A Data Driven Optimization Approach".
- (6) A. Amaro "Reengineering Supply Chain Sustainability: A MILP-Based Decision-Support Framework".
- (7) N. Alamanis & P. Dakoulas "Designing Risk Levels and Risk Assessment as Slope Protection Measures against Landslides".
- (8) D. Hupková, L. Dobošová & E. Loučanová "Assessing the Role of Climate Change in Shaping Farm-Level Decision-Making".

**Session 7: Mathematical Programming and Energy, Sustainability &
Climate Change II
(13:45-15:30)**

Chairman: D. Zisis

- (1) P.A. Bibiloni-Mulet, A. Moià-Pol, J. Vidal-Noguera, I. Alonso, V. Martínez-Moll, Y. Díaz & V. Canals "Optimal Operation of a Low-Enthalpy Heat Pump-based DHC Network Using a MINLP Approach".
- (2) B.B. Ünal, M.O. Kayalica, G. Kayakutlu & C. Rehtanz "Multi-Stage Stochastic Microgrid Design Model".



- (3) C. Henriques, M. Gouveia & D. Matos "Dynamic Assessment of Energy Poverty in the European Union: A Window Value-Based Data Envelopment Analysis Approach"
- (4) M. Yörükoğlu & S.S. Gülerüz "Global Carbon Intensity and Decoupling Trends: A Data-Driven Analysis for Climate Policy".
- (5) İ. Düzdar, S. Huruzoğlu & G. Kayakutlu "Multi-Criteria Decision Making Approach in Evaluating Sustainability-Focused Artificial Intelligence Applications: Industry 4.0 Perspective in Turkish Industry".
- (6) M. Gouveia, C. Henriques & V. Moutinho "Analyzing Gender Differences in Quality of Life Across Europe: A Club Convergence Approach with Window-Based Value DEA".

Session 8: Energy Efficiency II

Chairman: J. Kalina

(15:30-17:00)

- (1) N.M. Silva, A.B. Pereira, J. Pinho, J.M. Dias, D.M. Silva, B. Mascate & A. Horovistiz "Heat Pumps: Driving Carbon Neutrality and Efficiency in Buildings".
- (2) A.B. Pereira, J. Afonso, D.M. Silva, C. Linhares, L. Félix & S.M.O. Tavares "Blue Laser Welding in Power Transformers for Industrial Buildings".
- (3) R. Haas "Heading Towards Democratic, Sustainable and Competitive Electricity Systems".
- (4) C. Henriques, C. Viseu, M. Gouveia, M. Correia & M. Antunes "A Dynamic Evaluation of Energy Security Performance in the EU: Integrating Window-Based Efficiency Analysis with Club Convergence".
- (5) P. Cramton, M. Ilic & N. Stevens "The Simple Economics and Engineering of Electricity Markets".

Wednesday, 27 August 2025

Session 9: Renewable & Sustainable Energy I

Chairman: M. Kollmann

(08:00-10:00)

- (1) D. Graikos, G. Constandinides, L. Aresti, T. Onoufriou & P. Christodoulides "Linear Fresnel Reflectors under Eastern Mediterranean Conditions: Optical and Thermal Performance".
- (2) B. Borowiec & A. Żelazna "The Influence of Design Parameters on the Energy, Economic and Environmental Efficiency Indicators of a Brine-to-Water Heat Pump".
- (3) K. Tsatsakis & T. Tsitsanis "Federated Data Spaces and Cloud-Edge Intelligence for Secure, Flexible, and Decentralized Energy Systems".
- (4) V. Máša, M. Pavlas, M. Houser & K. Myslivcová "Sustainability in Education and Everyday Life at Brno University of Technology".
- (5) S. Beçet, M. Doğmus, Z. Karataş & H. Sözer "The Future of Sport Facilities: 'The Bee-Sportive' Sustainable Concept".
- (6) Ö. Öngören & Y. Büyüktepe "Multifuture: A Modular and Sustainable Sports Complex Integrating Renewable Energy and Inclusive Urban Life on ITU Maslak Campus".

Session 10: Operational Research and Energy, Sustainability & Climate Change

Chairman: M. Gouveia

(10:45-13:00)

- (1) A. Peiró-Signes, M. Segarra-Oña, O. Trull-Domínguez & J. Sanchez-Planelles "Circular Economy Self-Assessment Tool for the Food Service Industry".
- (2) M. Kollmann "Reinforcement Learning Co-Design for Hybrid Building Energy Systems".



- (3) S. Eressiou, N. Xafoulis, N. Alamanis, E. Farsirotou & S. Kotsopoulos "Geospatial Analysis of Landslide Susceptibility using GIS and Remote Sensing. A Case Study in the Region of Thessaly."
- (4) I. Benekos, G. Ntanis, A. Aggelakakis, T. Griva, M. Boile & V. Kappatos "Adaptation of the Loss Distribution Approach in Climate Extreme Risk Analysis for Wind Farm Digital Twin Decision Support Systems"
- (5) A. Mouratidis "Risk Assessment of Flood-Prone Roads Using Digital Models".
- (6) A. M. Azmi "Incorporating Carbon Management into Energy Education: A Case Study from Malaysia's Elective Course for Sustainable Energy Transition".
- (7) S. Sousa, J. Ramos, M. Lacerda & F. Lobo "Understanding Consumer Behavior Regarding Air Travel: An Exploratory Study of Environmental Awareness, Price Sensitivity and Behavioral Gaps".
- (8) T. Chrysanidis, S. Kotsopoulos, E. Farsirotou & G. Papageorgiou "Experimental and Numerical Study of the Elongation Degree Effect on Medium-Reinforced Prisms and their Sustainable Design".

Session 11: Renewable & Sustainable Energy II

Chairman: G. Constandinides

(13:45-15:15)

- (1) A. Moià-Pol, J. Vidal Noguera, I. Alonso de Miguel, V. Martínez-Moll, Y. Díaz, P. A. Bibiloni Mulet, A. Saeedi & M. E. Foulaadvand "Hotels with Zero Impact of Energy and Water in Islands. Study Case Balearic Islands".
- (2) A. Ciccozzi, T. de Rubeis, D. Paoletti & D. Ambrosini "BIM-Based PV System for Energy Optimization: The Case Study of the 'Panepucci Refuge'".
- (3) G. Saharidis "GreenYourFreight Platform: Emission Calculation Models".
- (4) L. Mahjoub & M. Sebri "Geopolitical Risk and Energy Security in the European Union".
- (5) H. Özmüş & A. Alkaya "Single-Diode Model Approach for Parametric Analysis of Photovoltaic Cells".

Emergency Telephone Numbers

Police

100

Medical Emergency Department

166

Fire Department

199

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ESCC