

International Conference on Energy, Ecology and Environment



International Conference on Energy Storage and Intelligent Vehicles

Rome, Italy Aug 26-29, 2024



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Welcome to ICEEE&ICEIV 2024

On behalf of the Organizing Committee, it is my great pleasure to welcome you to the International Conference on Energy, Ecology, and Environment (ICEEE) 2024. Hosted by the University of Rome Tor Vergata, ICEEE 2024 will serve as a leading international platform to explore the latest advancements in the diverse fields of energy and environmental systems, paving the way for a greener future. The conference will span a broad range of topics, showcasing both numerical and experimental findings, alongside groundbreaking technologies in the realms of Engineering, Ecology, Environmental, and Energy Sciences.

Supported by the International Society for Energy and Environmental Science (ISEES)—a prominent organization in advancing energy and environmental excellence—ICEEE invites young scientists to join the society and contribute to its growth. This year is significant for Tor Vergata University, as our Rector, Prof. Nathan Levialdi Ghiron, has dedicated 2024 to sustainability during the Academic Year's opening ceremony. This makes hosting such a prestigious international event even more special for us.

We are equally thrilled to invite you to the 7th International Conference on Energy Storage and Intelligent Vehicles (ICEIV 2024) in Rome from August 26 to 29, 2024. This conference focuses on "Boosting Decarbonization via Innovation in Energy Storage and Intelligent Transportation."

Energy storage plays a crucial role in achieving carbon neutrality. The innovation and application of energy storage technologies are vital for accelerating renewable energy deployment. Decarbonizing the transport sector is also essential to achieving climate goals and ensuring sustainable societal evolution. ICEIV, held annually since 2017 in various global cities, is a high-impact conference providing an excellent forum for scientists, researchers, engineers, and government officials to present their latest findings.

We look forward to your participation in these pivotal conferences, helping to shape a sustainable future for all.

Conference Chairs

Prof. Eng. Giacomo Falcucci, The University of Rome "Tor Vergata", Italy Prof. Bin Chen, Beijing Normal University, China Prof. Fengchun Sun, Academician of the Chinese Academy of Engineering, China Prof. Xiaohui Shi, Chongqing University of Technology, China Prof. Rui Xiong, Beijing Institute of Technology, China

Organizers ORMAN Università di Roma BEI TITUTE OF 1902 Tor Vergata 難化 海岸之 大 . CHONGOING Ð (OLOGN STCHE AL + 1965 - 1965 **^{NEERING**} FIG UNIVERSITY 0



Impact Factor: 3.9 CiteScore: 9.8

The scientific committee will recommend high quality papers, which are presented at the conference, for further consideration of publication in the prestigious journals, including *Energy Ecology and Environment, Applied Energy, Journal of Industrial Ecology*.

http://www.springer.com/energy/journal/40974

International Society of Energy and Environmental Science (ISEES)

The International Society of Energy and Environmental Science (ISEES) is an independent, non-profit, global membership organization for business, government, academic and other professionals concerned with energy and environment science and related issues in the international community.

The purpose of ISEES is to provide for the mutual association of people interested in the shortages of energy and deterioration of the natural environment, to create a forum for professional, multinational, multi-disciplinary discussion and to provide a means of professional communication and constructive dialog.

Our Mission

The ISEES will facilitate worldwide information flow and exchange of ideas on energy and environmental science, promote high quality research and propel the development and education of students and professionals. The ISEES will conduct the following activities:

- Providing leading edge publications and electronic media;
- Organizing international and regional conferences;
- Building networks of energy and environmental science concerned professionals.
- Bridging the cooperation between clean technology inventors or environmental remediation technologies and their industry with the financial sector.

Focused Areas

- Energy engineering and innovation for sustainability
- Advanced energy storage and applications
- Environmental pollution and ecological remediation
- Climate dynamics, adaptation, and mitigation
- Climate change and public health
- Emission reduction, carbon captures and storage
- Smart management of natural resources
- Biodiversity and ecosystem services across energy transition
- Environmental, economic, and societal trade-offs
- Big data applications in multiple spheres
- Sustainable nanotechnology

Website http://iseesglobal.org/index.html



Committees for ICEEE 2024

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Prof. Eng. Giacomo Falcucci Prof. Bin Chen The University of Rome "Tor Vergata", Italy Beijing Normal University, China

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X. Ren, China X. Liao, China X. Sun, China X. Cao, US Y. Xie, China Y. Wei, China Y. Ui, China Y. Park, Korea Y. Hu, UK Y. Zhang, China Z. Zhang, China Z. Chen, China Z. Wu, China







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Keynote Speakers for ICEEE 2024



Efi Foufoula-Georgiou

Title: Precipitation in the Earth's system: Global Estimation, S2S Prediction and Climate Change

Bio: Efi Foufoula-Georgiou is an elected member of the European Academy of Sciences, the U.S. National Academy of Engineering (NAE) and the American Academy of Arts and Sciences. She is a Distinguished Professor in the Departments of Civil and Environmental Engineering and Earth System Science and the Henry Samueli Endowed Chair in Engineering at the University of California, Irvine. Her area of research is hydrology and geomorphology, with special interest on scaling theories, multiscale dynamics and space-time modeling of precipitation and landforms. She has served as Director of the NSF Science and Technology Center "National Center for Earth-surface Dynamics" (NCED) and Director of the St. Anthony Falls Laboratory at the University of Minnesota. Her elected positions include President of the Hydrology Section of AGU, chair of the Board of Directors for CUAHSI (Consortium of Universities for the Advancement of Hydrologic Sciences), a member of the Board of Trustees of UCAR (University Corporation for Atmospheric Research), and Councilor of the American Meteorological Society (AMS). Professor Foufoula-Georgiou's work has been recognized by several awards including the John Dalton Medal of the European Geophysical Society, the Hydrologic Sciences Medal of AMS, and the Horton Medal of AGU.

Abstract: Precipitation is the input to the hydrologic cycle and affects the water and energy balance at the local, regional and global scales. Precipitation extremes create hazards and endanger life, property and critical infrastructure. Under global warming, precipitation is expected to change in complex ways, including the mean annual precipitation, the duration of wet and dry spells, the seasonality, and the frequency and magnitude of extremes. In this talk, I will present recent results on two main aspects of precipitation: (1) global precipitation estimation from multi-satellite observations in places of the world that do not have ground measurements, with particular emphasis on preservation of extremes, and (2) assessment of the change of the space-time structure of storms under global warming. In global precipitation estimation, we propose a new conditional generative deep neural network diffusion model that combines the information from the instantaneous Passive Microwave (PMW) snapshots taken by Low Earth Orbit (LEO) satellites with the dynamical temporal information provided by GEO IR satellites before and after the time of the LEO overpass, and show a considerable improvement as well as the ability of the conditional generative diffusion model to capture extremes and provide uncertainty estimates. In assessing the change of precipitation extremes under climate change, we analyze the cold-season (October-March) precipitation over the western United States in long-term numerical simulations from the storm-resolving WRF model at 6 km and 1 h resolution in the historical period (1981-2020) and pseudo-future simulations for the 2041-2080 period, constrained by GCMs under the high emission RCP8.5 scenario. We demonstrate that global warming will induce a "sharpening" of storms both in time and space, meaning that a larger proportion of rain will fall over fewer we hours and over smaller areas, amplifying hazard potential for flooding and post-fire debris flows.



Petros Koumoutsakos

Title: Artificial Intelligence and Computational Science: There is Plenty of Room in the Middle

Bio: Petros Koumoutsakos is Herbert S. Winokur, Jr. Professor of Engineering and Applied Sciences, Faculty Director of the Institute for Applied Computational Science (IACS) and Area Chair of Applied Mathematics at Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS). He has served as the Chair of Computational Science at ETHZ Zurich (1997-2020) and has held visiting fellow positions at Caltech, the University of Tokyo, MIT, the Radcliffe Institute of Advanced Study at Harvard University and he is Distinguished Affiliated Professor at TU Munich. Petros is elected Fellow of the American Society of Mechanical Engineers (ASME), the American Physical Society (APS), the Society of Industrial and Applied Mathematics (SIAM) and the Collegium Helveticum. He is recipient of the Advanced Investigator Award by the European Research Council and the ACM Gordon Bell prize in Supercomputing. He is elected International Member to the US National Academy of Engineering (NAE). His research interests are on the fundamentals and applications of computing and artificial intelligence to understand, predict and optimize fluid flows in engineering, nanotechnology, and medicine.

Abstract: Unprecedented hardware capabilities and algorithmic innovations have enabled the acquisition and analysis of massive datasets and simulations of complex systems that were inconceivable only a decade ago. Computing is transforming our intellectual capacity to tackle complex problems and fueling the Artificial Intelligence (AI) revolution that is changing our world. Computational Science and AI have been drivers and benefactors of these advances, each in different ways, and originally, with different targets. I will juxtapose pattern recognition with Learning of Effective Dynamics, physics based flow control and controllers learned via multi-agent reinforcement learning, to argue and that the intellectual space between these two fields contains a wealth of opportunities for advancing human knowledge and scientific discovery.



Fengqi You

Title: Environmental Sustainability Analytics for Trending Issues on Virtual Engagement, Digital Assets, and Transportation Electrification

Bio: Fengqi You is the Roxanne E. and Michael J. Zak Professor in Energy Systems Engineering at Cornell University. Within Cornell, he serves as the Chair of Ph.D. Studies in Systems Engineering, Co-Director of the Cornell University AI for Science Institute (CUAISci), Co-Lead of the Schmidt AI in Science Program, and Co-Director of the Cornell Institute for Digital Agriculture (CIDA). His research focuses on fundamental theory and methods of systems engineering and artificial intelligence, with applications spanning materials informatics, smart manufacturing, digital agriculture, quantum computing, energy systems, and sustainability. Fengqi has an h-index of 80 and authored over 250 refereed articles in journals such as Science, Nature Sustainability, Nature Communications, Science Advances, and PNAS.

Abstract: In an era where energy and environmental sustainability are paramount, exemplified by the recent COP 28 Agreement and widespread "net zero" commitments, the role of sustainability analytics is increasingly significant. This presentation explores its applications in addressing key societal and industrial challenges. We will examine the climate impacts of recent shifts to virtual and hybrid conferences, the rising trend of remote and hybrid work models, and the metaverse industry's expansion. Subsequently, we will explore strategies for climate-neutral bitcoin mining and its potential to support renewable energy projects, along with the environmental aspects of non-fungible tokens and the Ethereum merge. The final part will discuss the critical metal requirements and environmental impacts of automotive batteries in transportation electrification, covering battery chemistry, recycling technologies, and global supply chain dynamics. Through these examples, we demonstrate the breadth of sustainability analytics, encompassing mathematical programming, data analytics, life cycle assessment, techno-economic analysis, integrated assessment models, systems design and integration, and model-based design of experiments, highlighting its critical role in advancing sustainability across various sectors.

Keynote Speakers for ICEIV 2024



Liz Varga

Title: Automation and electrification innovation in transport: systemic consequences and dependencies

Bio: Professor Liz Varga CBE has a chair in Complex Systems in the Civil, Environmental, and Geomatics Engineering Department of University College London (UCL). She leads the Infrastructure Systems Institute. She teaches, writes, and advises globally on energy, transport, digital communications, water, and waste systems. Her key research themes are infrastructure resilience, sustainable innovation, circular engineering, and decarbonisation, using digital and mixed (quantitative and qualitative) approaches including digital twins, computational ontologies and epistemologies, artificial intelligence, and hybrid models. She is a commissioner with the National Preparedness Commission, an Executive member of the UK Collaboratorium for Research in Infrastructure and Cities (UKCRIC) (https://www.ukcric.com/), director of UKCRIC Limited, and a governor on the Strategy Board for the Data and Analytics Facility for National Infrastructure (https://dafni.ac.uk/). She developed UCL's Infrastructure Systems MSc https://www.ucl.ac.uk/prospective-students/graduate/taughtdegrees/infrastructure-systems-msc and is project manager for a new international standard ISO 22372 on infrastructure resilience building on work with United Nations Office for Disaster Risk Reduction.

Abstract: The twin objectives of combating negative environmental consequences and improving productivity are driving innovation in transport infrastructure and solutions. This talk examines two specific innovations: automation and electrification, which are often combined. These innovations are delivering desirable systemic consequences, such as greater inclusion and resilience. However, to be effective at scale, various adaptations are needed to grid/energy infrastructure, telecommunications systems, data infrastructures, standards, etc. It follows that the quality of systemic consequences of transport innovation depend on adaptations in other systems. Thus, other adaptations must be driven by the twin objectives driving innovation in transport.



Zheng Chen

Title: Collaborative Energy-Saving Control for Connected Autonomous New Energy Vehicle Platoon

Bio: Zheng Chen received the B.S. and M.S. degrees in electrical engineering and the Ph.D. degree in control science engineering from Northwestern Polytechnical University, Xi'an, China, in 2004, 2007 and 2012, respectively. He is currently a Professor with the Faculty of Transportation Engineering, Kunming University of Science and Technology, Kunming, Yunnan, China. He was a Post-Doctoral Fellow and a Research Scholar with the University of Michigan, Dearborn, MI, USA from 2008 to 2014, and a Marie-Curie Research Fellow with Queen Mary University of London, London, U.K. from 2019 to 2021. He has conducted over 30 projects and has published over 200 peer-reviewed journal papers and conference proceedings. His research interests include battery management system, and energy control of intelligent electric vehicles. He is a Fellow of the Institution of Engineering and Technology.

Abstract: The advancement of new energy and connected autonomous technologies facilitates the implementation of collaborative energy-saving control for vehicle platoon, and the collaborative energy-saving control for connected autonomous new energy vehicle platoon showcases the potential in enhancing safety, efficiency and economic viability of traffic management. Nevertheless, implementation of collaborative energy-saving control in complex traffic scenarios, such as extensive traffic networks and combination of human-driven and autonomous vehicles, presents significant challenges. In view of the aforementioned considerations, a collaborative energy-saving control system in complex traffic scenarios is introduced. The optimization of single-vehicle energy-saving operations, with a particular focus on the single-vehicle energy management is firstly

introduced. Then, an efficient modelling method for connected autonomous vehicle platoon based on graph structure is presented to address the challenges posed by the high-dimensional state and action space. Subsequently, a vehicle platoon safety warning scheme is introduced based on the established model, thereby laying the foundation for safe operation of collaborative energy-saving control. Finally, an end-to-end intelligent traffic decision-making model based on hybrid deep reinforcement learning is deployed based on the macro "vehicle-road-cloud" architecture, thus enabling energy-saving control for connected autonomous new energy vehicle platoons.



Giacomo Falcucci

Title: Hydrogen Storage through Metal Hydrides: a viable solution for the Green Transition?

Bio: Giacomo Falcucci is Associate Professor of Fluid Machinery, Energy and Environmental Systems at the University of Rome Tor Vergata. He has been appointed as the Referee for the Quality Assurance of his Department and as the Responsible for the Research Quality. He got his Masters Degree in Mechanical Engineering and PhD in Mechanical Engineering at the University of Rome "Roma Tre". He became Post-Doc Researcher and then Assistant Professor at the University of Naples "Parthneope", then he completed his Tenur-Track at Tor Vergata. He has been Visiting Professor of "Heat Transfer" at the Tandon School of Engineering of the New York University and Visiting Professor of "Computational Physics" at the John A. Paulson School of Engineering and Applied Sciences of Harvard University. He is currently Associate to the Department of Physics of Harvard University. He is Principal Investigator of many National and International Research Grants and he is author of more than 150 papers on Scientific Journals, and is first author of 2 publications in Nature.

Abstract: Hydrogen is increasingly viewed as a critical component of the global green energy transition due to its potential to significantly reduce greenhouse gas emissions and serve as a clean, sustainable energy source across various sectors, including transportation, industry, and power generation. However, despite its potential, the widespread adoption of hydrogen is hampered by significant challenges associated with its production, storage, and distribution. Solid-state hydrogen storage through metal hydrides is emerging as one of the most promising solutions to these challenges. Metal hydrides offer several advantages over traditional high-pressure gas or cryogenic liquid hydrogen storage methods. They provide a much higher volumetric density of hydrogen, allowing more hydrogen to be stored in a given volume. Moreover, metal hydride storage operates at more practical and safer temperatures and pressures, making it suitable for a wide range of applications, from small-scale mobile systems to large-scale stationary storage. The fundamental process behind metal hydride storage involves a reversible reaction between hydrogen gas and metals or alloys to form metal hydrides. This reaction allows hydrogen to be absorbed into the metal lattice at relatively low pressures and released by applying heat. However, the success of metal hydride storage hinges on improving the thermodynamic efficiency of the hydrides. Researchers are working to enhance hydrogen absorption and desorption kinetics, increase power performance, and optimize operating conditions. This keynote will explore the current state of metal hydride hydrogen storage technology, with a special focus on recent advancements aimed at enhancing thermodynamic efficiency. Improving these aspects is crucial for making metal hydride storage a key enabler in the broader adoption of hydrogen as a clean energy carrier, supporting the global shift towards a sustainable energy future.





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GREEN ENERGY AND INTELLIGENT TRANSPORTATION

Editor-IN-CHIEF Fengchun Sun Executive Editors-IN-CHIEF Zhenpo Wang • Rui Xiong







Topics include but are not limited to:

- Advanced energy storage
- Electrification of transportation
- Interaction of electric transportation with power grids
- Power electronics for traction
- Intelligent infrastructure for green transportation
- Intelligent and sustainable transportation system
- New materials and lightweight technology in transportation



- Sustainability of green transportation (including carbon neutrality)
- Al, new materials and technologies in energy and transportation

Special Issue Call for Papers

- 1. Safety Technologies for New Energy Vehicles
- 2. Approaches to green, smart and resilient rail transportation systems
- 3. Advances on hydrogen and hybrid propulsion
- 4. Learning-based intelligent transportation systems: theories, technologies and applications



^{*}The Article Publishing Charge (APC) fee of USD 2340 will be covered by Beijing Institute of Technology Press Co., Ltd for articles submitted by 31st December 2024.

For more information or to submit your paper, go to: elsevier.com/locate/geits

Practical Guide

Location



It is directly connected with the A-line metro terminus (bus 20): Aline is the subway that connects all the major monuments in Rome, including the Colosseum and the Vatican Museums.

From A-subway terminus "Anagnina" to the location of the ICEEE2024, take Bus "20" to the stop "CAMBRIDGE/COLUMBIA" + little walk to the Conference Rooms at the Department of Enterprise Engineering "Mario Lucertini".



Speaker's Guide

- Authors should give a 15-minitues presentation.
- Question and answer for each presentation would last 5 minutes.
- The recommended aspect ratio of the projector screen is 16:9.
- There is no template for the presentation.

Program at a Glance

| August 26, 2024 | | | | | |
|-------------------|-----------------------------|----------------------|-------------------|--|--|
| Registration: Mai | Registration: Main Entrance | | | | |
| 14:00-16:00 | | Registration | | | |
| | | Augu | st 27, 2024 | | |
| Conference Roon | n: Aula Convegni | | | | |
| | | | Opening of ICI | EEE 2024 | |
| 09:00-09:15 | | Welcome | from ICEEE 202 | 4 Conference Chair | |
| | | | Prof. Bin (| Chen | |
| | Keynote: Prec | ipitation in the Ea | rth system: Glo | bal Estimation, Precipitation Extremes & | |
| 09:15-09:55 | | | Climate Ch | ange | |
| | | P | rof. Efi Foufoula | a-Georgiou | |
| 09:55-10:30 | | | Coffee br | eak and a second s | |
| | Keynote: Artifi | cial Intelligence an | nd Computation | nal Science: There is Plenty of Room in the | |
| 10:30-11:10 | | | Middle | e | |
| | Kaunaha | | rof. Petros Kou | moutsakos | |
| 11.10 11.50 | Keynote: | Environmental Su | Stainability An | alytics for Trending Issues on Virtual | |
| 11:10-11:50 | | ngagement, Digita | Drof Eenge | | |
| 11.50-13.30 | | | Lunch | | |
| Paral | lel session of ICEEE | 2024 | | | |
| | Energy and | | | | |
| | Energy | Ecology and | | Opening of ICEIV 2014 | |
| | Economics | Environment | | | |
| | Session Room: | Session Room: | | | |
| | Archimede | Leonardo | Conference R | oom: Aula Convegni | |
| 13:30-13:50 | #22 | #83 | 14:00-14:10 | Opening of ICEIV 2024 | |
| 13:50-14:10 | #25 | #79 | | Keynote: Automation and electrification | |
| 14:10-14:30 | #55 | #23 | 14:10-14:55 | innovation in transport: systemic consequences and dependencies | |
| 14:30-14:50 | #96 | #99 | | Prof. Liz Varga | |
| 14:50-15:30 | | | Coffee br | eak | |
| 15:30-15:50 | #42 | #69 | | Keynote: Collaborative Energy-Saving Control for Connected Autonomous New | |
| | | | 15:30-16:15 | Energy Vehicle Platoon | |
| 15:50-16:10 | #6 | #88 | | Prof. Zheng Chen | |
| 16:10-16:30 | #82 | #34 | | Keynote: Hydrogen Storage through Metal | |
| | | | 16:15-17:00 | Hydrides: a viable solution for the Green | |
| 16:30-16:50 #75 | | #8 | | I ransition ? Prof. Giacomo Falcucci | |
| | August 28. 2024 | | | | |

| Parallel session of ICEEE 2024 & ICEIV 2024 | | | | |
|---|-----------------------------|-------------------------|-----------------------|--|
| | Energy and Energy Economics | Ecology and Environment | ICEIV | |
| | Session Room: Archimede | Session Room: Leonardo | Session Room: Galileo | |
| 08:30-08:50 | #38 | #10 | N2603 | |
| 08:50-09:10 | #95 | #4 | N2616 | |
| 09:10-09:30 | #98 | #29 | N2606 | |
| 09:30-09:50 | #92 | #94 | N2405 | |
| 09:50-10:30 | | Coffee break | | |
| 10:30-10:50 | #31 | #21 | N2604 | |
| 10:50-11:10 | #44 | #61 | #50 | |
| 11:10-11:30 | #13 | #97 | N2611 | |
| 11:30-11:50 | #87 | | N2629 | |
| 11:50-13:30 | Lunch | | | |
| 13:30-13:50 | #2 | #54 | N2624 | |
| 13:50-14:10 | #72 | #80 | #48 | |
| 14:10-14:30 | #28 | #24 | #19 | |
| 14:30-14:50 | #100 | #93 | N2628 | |
| 14:50-15:20 | | Coffee break | | |
| 15:20-15:40 | #59 | #43 | #15 | |
| 15:40-16:00 | #41 | #53 | N2605 | |
| 16:00-16:20 | #91 | #16 | N2630 | |
| 16:20-16:40 | #36 | #101 | #81 | |
| 16:40-17:00 | | #30 | N2621 | |
| 19:30-20:00 | | Banquet | | |

Oral Presentations (27 August)

| Session Room: Archimede | | | | |
|--|----------|--|--|--|
| Chair: Hailong Li | | | | |
| Time | Paper ID | Author | Paper Title | |
| 13:30-13:50 | 22 | Ruoqing Yin and Liz Varga | Physics Informed Neural Networks (PINNs) for Capturing the Dynamics of Power Systems: A Case Study of IEEE BUS 9 | |
| 13:50-14:10 | 25 | Maoquan Huang, Wei Wang, Xiaohan Ren, Qie Sun and Mu Du | Dust Accumulation Effects on the PV Cells with a Transparent Radiative Cooling Cover | |
| 14:10-14:30 | 55 | Mario Petrollese, Giorgio Cau, Daniele Cocco, Vittorio Tola and Mostafa Esmaeili Shayan | Sustainable off-grid energy solutions: pumped thermal energy storage modeling and its role in optimizing renewable energy utilization | |
| 14:30-14:50 | 96 | Ran Tao, Liang Wang, Long Lin, Gang Xin and Øyvind Skreiberg | Production and characterization of biocarbon from woody biomasses | |
| 14:50-15:30 | | | TEA/COFFEE BREAK | |
| Chair: Yigang Wei | i | | | |
| 15:30-15:50 | 42 | Fei Teng, Qi Zhang, Xiwen Liu, Siyuan Chen and Lu Wang | Hydrogen Supply System Optimization Toward Carbon Neutrality in China: Life Cycle Analysis and Techno-Economic Assessment | |
| 15:50-16:10 | 6 | Tiantian Feng | Grappling with the Trade-offs of Carbon Emission Trading and Green Certificate: Achieving Carbon Neutrality in China | |
| 16:10-16:30 | 82 | Weize Song, Zheng Li and Boda Sun | Policy Incentives of CCUS development under China's Carbon Neutrality Goal | |
| 16:30-16:50 | 75 | Yigang Wei and Entong Gao | Identifying Development Trends and Technological Innovations in the CCUS Sector: Building Patent Knowledge Graphs and Time- Series Analysis Based on LLM | |
| Session Room: Leonardo | | | | |
| Session Title: Ecology and Environment | | | | |
| | | | | |
| 13:30-13:50 | 83 | Weize Song and Zheng Li | Typology of low-carbon development pathways under future uncertainty | |
| 13:50-14:10 | 79 | Jin Yang and Song Chai | Can Transition from Pollution Fees to Environmental Tax Reduce Carbon Emission in the Electricity Sector: The Tax Rate Matters | |

| 14:10-14:30 | 23 | Lijuan Si, Yao Li, Chaoqun Wang and Pinyue Wang | Promoting large-scale development of renewable energy really promote carbon emission reduction? |
|-----------------|----|---|--|
| 14:30-14:50 | 99 | Dan Song | Indicators on Energy Conservation and Emission Mitigation for Life Cycle of Cement Production Process |
| 14:50-15:30 | | | TEA/COFFEE BREAK |
| Chair: Dan Song | | | |
| 15:30-15:50 | 69 | Stefano Mazzoni, Simone Orazzini, Daniele Mioni, Michela Vellini and Marco Gambini | Hydrogen Production and Utilization in the Hard-to-Abate Sectors Decarbonization pathways |
| 15:50-16:10 | 88 | Ling Shao and Zi Wu | Life-cycle carbon emissions from pilot zero-waste technologies in China |
| 16:10-16:30 | 34 | Ying Zhang, Wenjie Gang, Xiuxia Hao and Keqi Chen | An assessment and ranking method of building flexibility for sustainable cities |
| 16:30-16:50 | 8 | Mengyao Han | Deploying Renewables: Trends, Overlaps and Impacts |

Oral Presentations (28 August)

| Session Room: Archimede Session Title: Energy and Energy Economics | | | |
|---|-------------|---|--|
| Chair: Liz Varg | а | | |
| Time | Paper ID | Author | Paper Title |
| 08:30-08:50 | 38 | Tianrun Yang and Qie Sun | The impact of large-scale implementation of seasonal thermal energy storage on the regional energy system |
| 08:50-09:10 | 95 | Zekai Wang and Sun Qie | Enhancing HVAC Demand Response by PMV-based Control method |
| 09:10-09:30 | 98 | Liang Wang, Hao Wu, Peter Arendt Jensen, Øyvind Skreiberg, Kim Dam-Johansen and Johan Einar Hustad | Ash Transformation and Deposition Behavior during Co-firing of Biomass Fuels with Sewage Sludge |
| 09:30-09:50 | 92 | Fuwen Yu, Yingying Zheng and Shijie Guan | Assessment of the Resistance of Integrated Energy Systems against Cold Wave Compound Disasters |
| 09:50-10:30 | | | TEA/COFFEE BREAK |
| Chair: Tianrun | Yang, Beib | bei Dong | |
| 10:30-10:50 | 31 | Raza Ayyaz and Liz Varga | Blockchain Technology in Electricity Systems |
| 10:50-11:10 | 44 | Xiurong Hu | Synergistic Cost-Benefit Analysis of Emission Trading and Renewable Portfolio Standards in China |
| 11:10-11:30 | 13 | Li Liu and Jichuan Sheng | Energy quota trading and energy vulnerability: China's energy quota trading pilot |
| 11:30-11:50 | 87 | Chenyu Su, Xiaodan Shi, Anders Avelin and Hailong Li | Dynamic modelling Thermal Energy Storage Using Long Short- Term Memory (LSTM) Networks |
| 11:50-13:30 | LUNCH | | |
| Chair: Vittorio | Villani, Be | ibei Dong | |
| 13:30-13:50 | 2 | Mei Song, Zisha Wang, Mingming Zhu and Rui Wang | Study on short-term natural gas system resilience under import shortage shocks |
| 13:50-14:10 | 72 | Mingzhe Wang and Xuesong Li | Effects of Tip Clearance on Economy and Safety in a Compressor Cascade |
| 14:10-14:30 | 28 | Lijuan Si, Kexin Shi, Yaru Xin, Yao Li and Haoyu Cao | How do renewable energy policies affect regional energy economic resilience? Evidence from 237 prefecture-level cities in China |
| 14:30-14:50 | 100 | Mingquan Shao, Zhen Ye, Hichem Hakka and Yukun Hu | A Financial Model for Hydrogen Energy Ocean Shipping: Modelling Uncertainties and Risks across Supply Chain and Technological Pathways |
| 14:50-15:20 | | | TEA/COFFEE BREAK |
| Chair: Wei Wang, Chenyu Su | | | |
| 15:20-15:40 | 59 | Beibei Dong, Shuo Wang, Qie Sun, Eva Thorin and Hailong Li | Marginal cost of CO ₂ capture |
| 15:40-16:00 | 41 | Yang Li, Gemma Cremen and Liz | Autonomous Grid: Opportunities and Challenges of Al |

| | | Varga | Empowerment and Telecom Integration |
|----------------|----|---------------------------------|---|
| 16:00-16:20 91 | 04 | Mahuizi Lu, Kelin Jia and Yukun | Adaptive reinforcement learning self-tuning electromagnetic |
| | 91 | Hu | inference cancellation via active filters |
| 16:20-16:40 | 36 | Lihong Su, Wenjie Gang, Shukun | An optimal sizing method of battery energy storage system for |
| | | Dong and Xiuxia Hao | buildings considering monthly demand shaving |

Oral Presentations (28 August)

Session Room: Leonardo

Session Title: Ecology and Environment

| Chair: Lijuan Si | | | | |
|---------------------------------|---------------------------|--|--|--|
| Time | Paper ID | Author | Paper Title | |
| 09.20 09.50 10 | Zhihui Zhang and Shaoqing | Assessing the habit-formation related lock-in effects in co- | | |
| 08.30-08.30 | 10 | Chen | reducing CO2 and air pollutants in China | |
| | | MeiSong liaZhang Mengyueli | The influence of population aging on living carbon emissions | |
| 08:50-09:10 | 4 | and Yujin Gao | in the Yellow River Basin: a comparative analysis of urban and | |
| | | | rural areas | |
| | | Tiantian Gu. Muhan Xie and | Classifying and Quantifying Residents' Engagement in the | |
| 09:10-09:30 | 29 | Envang Hao | Sponge-Style Old Community Renewal of China: An Analysis | |
| | | | Using the ANP-PROMETHEE II Approach | |
| 09:30-09:50 | 94 | Sichale Abdissa Bayissa, Cuncun | Enhancing Urban Resilience in Addis Ababa: Energy Efficiency | |
| | 5. | Duan, Bin Chen | and Sustainability through the Corridor Initiative | |
| 09:50-10:30 | | 1 | EA/COFFEE BREAK | |
| Chair: Weize S | ong | | | |
| 10:30-10:50 | 21 | Lijuan Si, Pinyue Wang, | Can low-carbon city pilot policy improve energy efficiency? | |
| 10100 10100 | | Chaoqun Wang and Kexin Shi | empirical evidence from China's low-carbon city pilots | |
| 10.20-11.10 | 61 | Kaipeng Ren, Xu Tang, Jakob | Revealing global energy security from the perspectives of | |
| 10.00 11.10 | 01 | Willerström and Mikael Höök | fossil and metal resource supply | |
| 11.10-11.30 | 97 | Rui Huang and Wei Li | Managing China's renewable energy poverty in advancing | |
| 11110 11100 | 57 | | green hydrogen economy | |
| 11:30-13:30 | | | LUNCH | |
| Chair: Tiantian | Chair: Tiantian Gu | | | |
| | 54 | Qianqian Sheng, Yaou Ji, Ying | Spatial-temporal variation characteristics and key driving | |
| 13:30-13:50 | | Chen, Zhengwei Huang and | factors of atmospheric pollutants in the Oinghai-Tibet Plateau | |
| | | Zunling Zhu | | |
| 13.20-14.10 | 80 | Chenxing Wang, Yan Yan and | Pathways for Ecological Restoration of Territorial Space Based | |
| | | Zetong Wang | on Ecosystem Integrity | |
| 14:10-14:30 | 24 | Yuhan Liang | Quantification of food waste and its impacts on energy-water- | |
| | | | carbon in China from the trans-regional perspective | |
| | | Xuan Yang Dan Song Cuncun | Does stricter sewage treatment policy exacerbate the | |
| 14:30-14:50 | 93 | Duan. Bin Chen | contradiction between effluent water quality improvement | |
| | | | and carbon emissions mitigation? Evidence from China | |
| 14:50-15:20 TEA/COFFEE BREAK | | | | |
| Chair: Andrea Facci, Xiurong Hu | | | | |
| 15:20-15:40 | 43 | Tong Luo, Yongjia Wang, | Nano-sized spherical CaO-based CO2 sorbents prepared by | |
| | | Honghui Chen and Cong Luo | spray combustion synthesis | |
| 15.40-16.00 | 53 | 3 Wei Zhang and Yiqi Geng | The rheology behavior of copper tailing suspensions with | |
| | | | polyethyleneimine | |
| 16.00-16.20 | 16 | Chong Zhang, Xianning Li and | Sulfamethoxazole degradation in a tri-electrode microbial | |
| | _• | Xintong Gao | electrochemical system operating in organically polluted | |

| | | | waters: Metabolomic and metagenomic approaches |
|-------------|-----|--|--|
| 16:20-16:40 | 101 | Xueqiang Li, Xiaohan Zhao, Zhongyao Zhang, Shengchun Liu and Chengming Zhang | Time series forecasting based on the LSTM of the heat pipe performance on motor cooling |
| 16:40-17:00 | 30 | Zetian Tang | Thermal analysis and fuel allocation optimization for improved ICE-PEMFC ammonia-based system efficiency |

Oral Presentations (28 August)

| Session Room: Galileo | | | | |
|-----------------------|-----------------------------|---------------------------------|--|--|
| Session Title: ICEIV | | | | |
| Chair: Zeyu Ch | en, Hui Pang | Į | | |
| Time | Paper ID | Author | Paper Title | |
| 08.20 08.50 | Nacoa | Xiaoran Yu, Ruiming Zhang, | Model-data-fusion based long-term degradation prediction | |
| 08:30-08:50 | N2603 | Wenchao Zhu, Changjun Xie | for proton exchange membrane fuel cell | |
| | | Hongqian Zhao, Zheng Chen, | Fast State of Health Prediction of Lithium-ion Batteries Based | |
| 08:50-09:10 | N2616 | Xing Shu, Jiangwei Shen, | on Least Squares Support Vector Machine with Adaptive | |
| | | Yonggang Liu | Learning Particle Swarm Optimization | |
| | | Hui Pang, Fengbin Wang, | A state-of-health estimation method for lithium-ion batteries | |
| 09:10-09:30 | N2606 | Kaiqiang Chen, Wenzhi Nan | using BiLSTM and attention mechanism | |
| | | Zeyu Chen, Yanshen Chi, | Low temperature heating of lithium-ion battery pack based | |
| 09:30-09:50 | N2405 | Mingguang Hu, Huachen Zhang | on a sequential pulse method | |
| 10:10-10:40 | | ۔ ۱ | EA/COFFEE BREAK | |
| Chair: Kui Chei | n, Xiaopeng | Tang | | |
| | | Xiaopeng Tang, Yuan Liu, | A Data-Matching Framework for Battery State-of-Charge | |
| 10:40-11:00 | N2604 | Jiahuan Lu, Xin Lai | Estimation | |
| | | Abigail Holmes, Dylan Jethwa, | | |
| 11:00-11:20 | 50 | Joseph Baker. Cynthia Liu and | System Dynamic Modelling of UK Electromobility | |
| | | Yukun Hu | Infrastructure | |
| | | | A Fusion Estimation Method of Remaining Useful Life for | |
| 11:20-11:40 | N2611 | Xing Shu, Hao Yang, Jiangwei | Lithium-ion Batteries Based on Multi Machine Learning | |
| | | Shen, Zheng Chen, Aihua Tang | Algorithms | |
| | | Kui Chen, Yang Luo, Zhou Long, | A health state estimation method for lithium-ion batteries | |
| 11:40-12:00 | N2629 | Yang Li, Kai Liu, Guoqiang Gao, | based on multi-stage, multi-scale features and convolutional | |
| | | Guangning Wu | neural networks | |
| 12:00-13:30 | | | LUNCH | |
| Chair: Chuang | Qi, Chunjing | ; Lin | | |
| | | Chunjing Lin, Qingsong Zhang, | Research on Active and Passive Coupled Thermal | |
| 13:30-13:50 | N2624 | Yuemeng Zhang, Sichuan Xu, | Management System for Lithium ion Battery Based on Phase | |
| | | Chuang Qi | Change Materials and Liquid Cooling | |
| | | | An Assessment of High Voltage Connection Technologies Over | |
| 13:50-14:10 | 48 | Abigail Holmes and Liz Varga | Life | |
| | | | An improved LSTM transfer learning method based SOC | |
| 14:10-14:30 | 19 | Yujing Cai and Yuan Chen | estimate of lithium-ion batteries for small sample real | |
| | | | vehicles datasets | |
| | | | Structural design of the refrigerant direct cooling thermal | |
| 14:30-14:50 | N2628 | Chuang Qi | management system for lithium-ion batteries | |
| 14:50-15:20 | 20 TEA/COFFEE BREAK | | | |
| Chair: Aihua Ta | Chair: Aihua Tang, Xing Shu | | | |
| | | Zhipeng Zhu, Guangzhong | Charging Optimization for Lithium-Ion Battery Based on Robust | |
| 15:20-15:40 | 15 | Dong, Xiaojia Luo, Jincheng Yu | Deep Reinforcement Learning | |

| | | and Jingwen Wei | |
|-------------|-------|---|--|
| 15:40-16:00 | N2605 | Aihua Tang, Yuchen Xu, Xin Yang, Lei Peng, Quanqing Yu | Unsupervised autocoder enabling for machine learning-based battery health monitoring |
| 16:00-16:20 | N2630 | Boyu Chen, Jiwei Cao, Bin Chen | Reliability Analysis of High-Power Density Motors with New Cooling Methods |
| 16:20-16:40 | 81 | Chun Wang, Yuqin Shen, Jing Chen, Xinmei Gao, Hao Jin and Maosheng Tian | Hierarchical predictive energy management strategy for electric vehicles |
| 16:40-17:00 | N2621 | Yong Chen, Qinhong Zhong, Yuecheng Li | Unmanned Vehicle Path Planning with P-RRT Based on Steering Angle Constraints |













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