

i°ca e

International Conference on Applied Energy

Nov 29 - Dec 5, 2021

Virtual/Bangkok



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Welcome to ICAE2021

icae
International Conference on Applied Energy

Virtual/Thailand

13th
International Conference
on Applied Energy
Nov 29 - Dec 5, 2021

Welcome to ICAE2021-13th International Conference on Applied Energy

Due to the COVID-19 pandemic, the ICAE2021 will be held in the form of a virtual conference on Nov. 29-Dec. 5, 2021. The theme of ICAE2021 is “Sustainable Energy Solutions for a Post-COVID Recovery towards a Better Future”. ICAE2021 will include keynotes and invited speeches, plenary sessions, dedicated workshops, and oral and poster presentations on various topics (but not limited to):

- » Renewable Energy
- » Clean Energy Conversion Technologies
- » Mitigation Technologies
- » Intelligent Energy Systems
- » Energy Storage
- » Energy Sciences
- » Energy Management, Policy, Economics & Sustainability
- » Geoenery

For more information, please visit www.applied-energy.org, or contact: icae2021@applied-energy.org

Please contact us if you would like to propose and organize a session, a panel, a workshop, or a special forum in the Conference.

All papers will be peer-reviewed, and accepted papers are required to be presented orally at the Conference. Selected papers from ICAE2021 will be recommended by the Scientific Committee for further consideration of publication in prestigious journals including Applied Energy, Advances in Applied Energy and other journals.

I look forward to meeting you at ICAE2021 online!

Prof. J. Yan

Chair of ICAE2021 and Editor in Chief of Applied Energy, Advances in Applied Energy

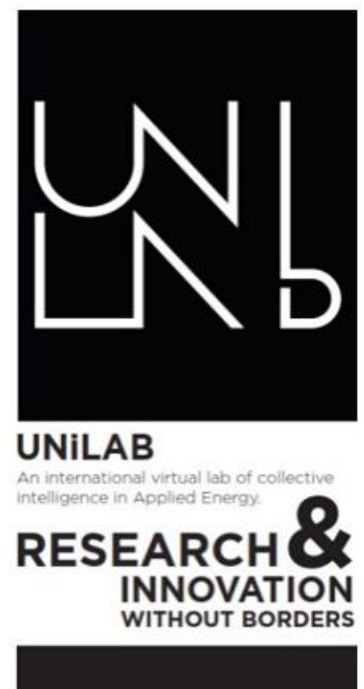
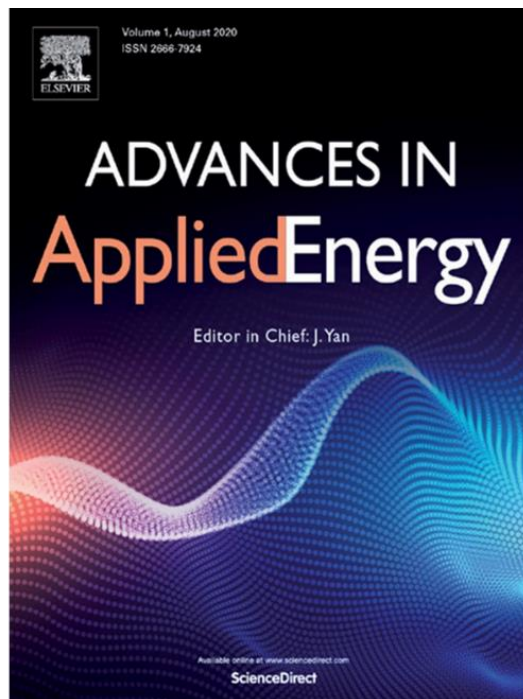
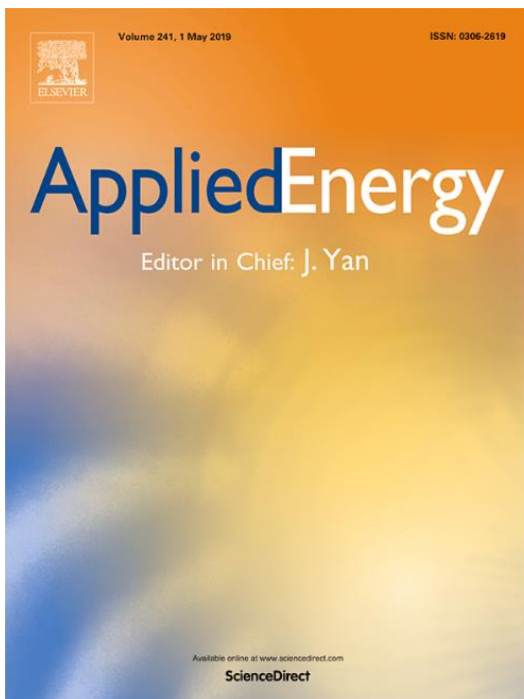
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International Conference on Applied Energy



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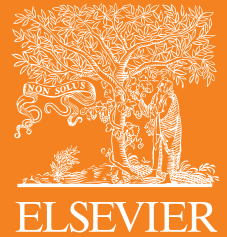
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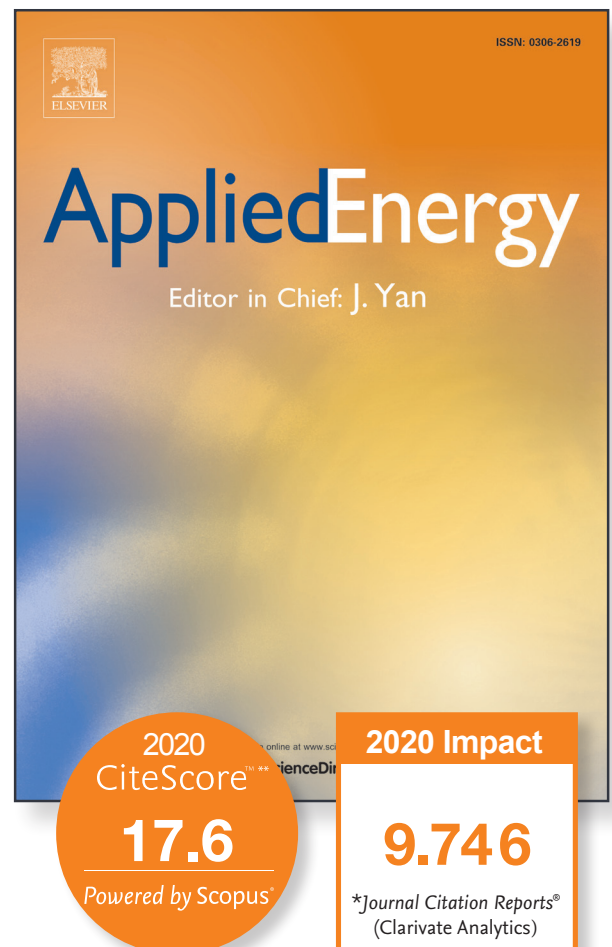
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Applied Energy Editors & Editorial Board Meetings: Virtual Meeting at ICAE2021

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Speaker's Guide

Presentation

As ICAE2021 will be a virtual conference, the poster session has been cancelled and all papers will be oral presentations.

You are required to connect to the Zoom meeting room 15mins before your session starts. It is recommended to download the app of Zoom (<https://zoom.us/>);

Change your user name to your full name and add your paper ID;

Prepare a short bio, around 50words, and share it in chat of Zoom

Your presentation should be in accordance with your allocated time. It is 10mins for each paper, including Q&A. Please always refer to the latest conference program, which can be downloaded from the conference website www.applied-energy.org, for actual presentation time.

The links of Zoom will be sent before the opening of the conference. If you need any help, please do not hesitate to contact us via icae2021@applied-energy.org.

If you have any trouble with using Zoom, please see: <https://support.zoom.us/hc/en-us>

Zoom ID and Password

Room S ID: 849 7830 8334 PW: 424575 (OPEN FOR PUBLIC)

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Room A ID: 852 7952 7876 PW: 146991

Room B ID: 810 8384 8230 PW: 130237

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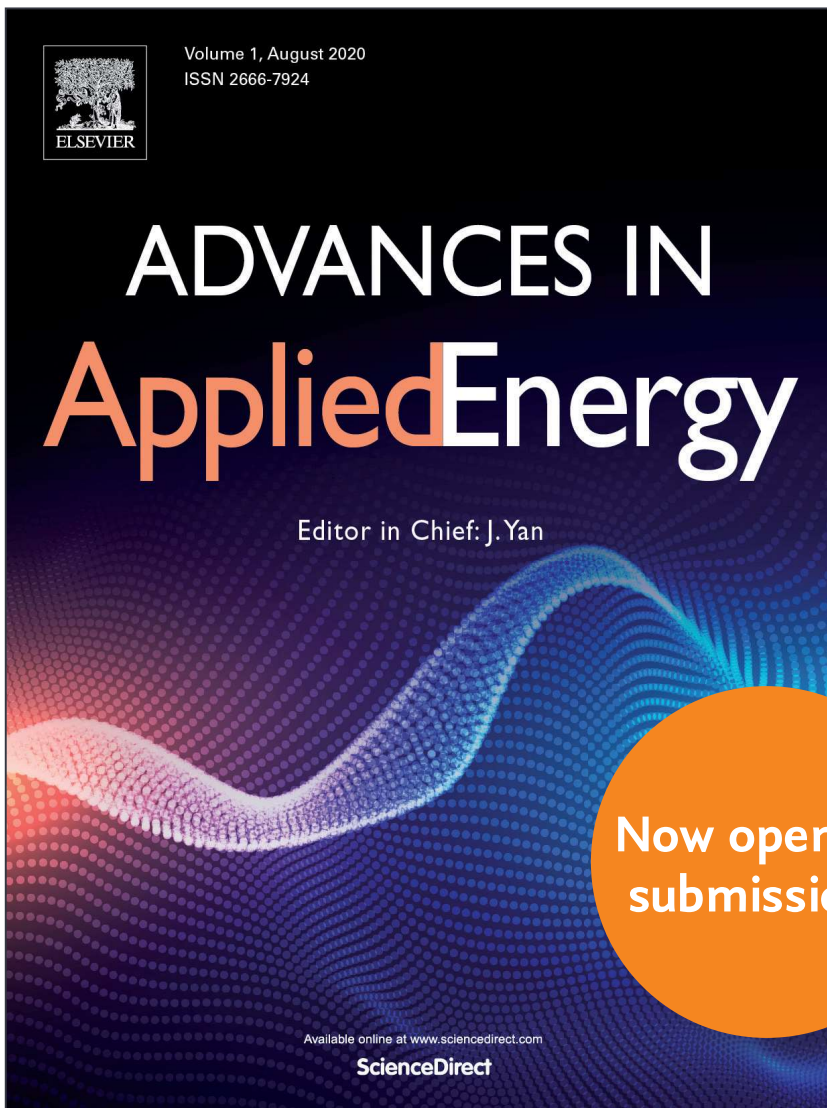
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Speaker's Guide

Time Zone Converter

City Location & Time Zone	Time				
Stockholm, GMT+1, Conf. Time	12:00	13:00	14:00	15:00	16:00
London, GMT+0	11:00	12:00	13:00	14:00	15:00
Johannesburg, GMT+2	13:00	14:00	15:00	16:00	17:00
New Delhi, GMT+5:30	16:30	17:30	18:30	19:30	20:30
Beijing, GMT+8	19:00	20:00	21:00	22:00	23:00
Tokyo, GMT+9	20:00	21:00	22:00	23:00	0:00
San Paulo, GMT-3	8:00	9:00	10:00	11:00	12:00
New York, Toronto, GMT-5	6:00	7:00	8:00	9:00	10:00
San Francisco, GMT-8	3:00	4:00	5:00	6:00	7:00

Advances in Applied Energy



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Advances in Applied Energy

Advances in Applied Energy is a new, open access journal for publishing cutting-edge research in the field of applied energy. This new, fully peer-reviewed journal is a companion journal to the highly regarded journal *Applied Energy*.

With an expert editorial team, led by Editor-in-Chief Professor Jinyue Yan (Royal Institute of Technology and Mälardalen University, Sweden) this exciting new journal aims to provide authors and the community with a quality open access outlet for significant and impactful research.

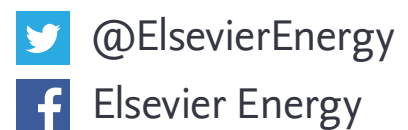
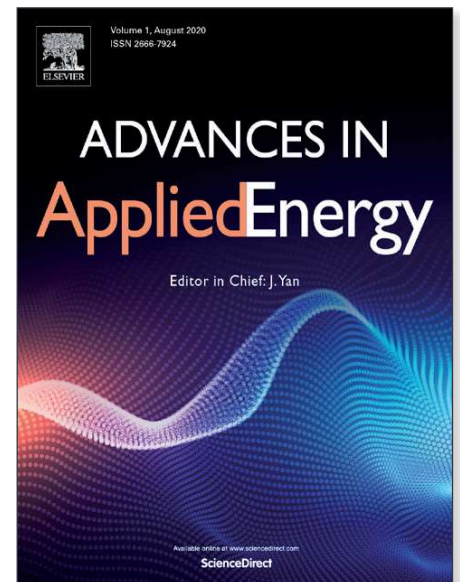
Covering a broad scope of topics, *Advances in Applied Energy* will publish applied research on all aspects of energy innovation that bridge the gaps between research, development, and implementation. Topics include, but are not limited to:

- New development trends: advances in cutting-edge applied energy areas, including renewable energy, clean energy conversion and utilization, smart and flexible system integration and optimization, energy storage, climate change mitigation, and energy sustainability;
- Systems characteristics: integrated energy systems such as industry, transport, and buildings; renewable energy; advanced conversion technologies; energy storage; emission mitigations; smart grids and mini/micro grids; distributed energy systems; e-mobility; and sustainability of energy systems;
- Energy nexus and synergy with other critical global issues: energy-water, energy-emissions, power-to-x, waste-to-energy, flexibility of renewable energy systems.

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Prof. Peter D. Lund

Aalto University

Can Europe become the first carbon-neutral continent in the world?

A systemic approach to the energy transition in Europe

November 29th 12:15-13:00 (GMT+1)

[The Zoom details](#)

[Room ID: 849 7830 8334](#)

[Room PW: 424575](#)

Abstract:

The European Union launched the Green Deal package to reach carbon-neutrality by 2050. The Fit-for-55% policy frame lays the necessary steps till 2030 with 55% emission cuts. The European Academies were invited by the Commission to provide advice on a systemic approach to this transition, considering technical, economic, regulatory, and social aspects simultaneously, including the particularities of member states. There are several possible pathways to carbon-neutrality and achieving it by 2050 is possible, but this requires urgent action. Any successful policy must involve a carbon pricing mechanism (but socially just). Electrification and strong system integration form an important technical pathway. Policy must also stimulate behavioural change alongside technology.

Short Bio:

Peter D. Lund is Professor in Advanced Energy Systems at Aalto University, Finland. He is Honorary Professor at Southeast University (Nanjing). He has >40 years of experience in clean energy technologies, systems, and policies. He has led Finland's R&D on new energy technologies. Dr. Lund is active in senior roles with European energy initiatives: he chaired Advisory Group Energy of European Commission 2002-2006 and Energy Steering Panel of European Academies Science Advisory Council 2013-2017, Co-Chair of European Academies' Science Advice for Policy on the energy transition 2019-2021. He is vice-chair of Finnish Climate Panel, Editor-in-Chief of Oxford Open Energy, member of Applied Energy EB, etc. He is D.Sc. from Helsinki University of Technology (1984); London Business School Alumni (1989). Jiangsu Friendship Award and Medal (2020).



Prof. Robert Gross

Imperial College London

The role of policy in de-risking investment in renewable energy – a balancing act?

November 29th 13:10-14:00 (GMT+1)

[The Zoom details](#)

[Room ID: 849 7830 8334](#)

[Room PW: 424575](#)

Abstract:

Around the world prices of renewable energy have fallen dramatically. In the UK for example, government auctioned contracts known as Contracts for Difference, or CfDs, have proved very attractive to investors and bid prices have fallen from over £100/MWh to under £40/MWh.

Some commentators ask whether renewables still need government support through long term contracts like CfDs. The logic is that long run contracts make investment less risky, but they largely remove incentives for renewable generators to respond to changes in the wholesale market price of electricity.

Others argue we have only just started to deliver the massive shift in power infrastructure needed for decarbonisation of the electricity system. They argue that we need to keep the costs of capital as low as possible to help afford huge new investments needed in low carbon power.

The talk lays out the key issues and provides analysis of the impact of risk on the cost of capital.

Short Bio:

Robert Gross is the Director of the UK Energy Research Centre (UKERC) and Professor of Energy Policy and Technology at Imperial College London. He has published extensively on a wide range of issues related to energy policy. A particular focus has been on electricity market design and incentives for renewable and low carbon energy.

Robert is a Fellow and Council member of the Energy Institute, former Chair of the British Institute of Energy Economists (BIEE), and member of the Academic Advisory Panel for Ofgem. He has extensive experience with UK policymaking and of engagement with international bodies such as the IEA.



Prof. Chao-Yang Wang

Pennsylvania State
University

Fast Charging Batteries for Mass-Market Electric Vehicles

November 29th 16:00-16:45 (GMT+1)

[The Zoom details](#)

[Room ID: 849 7830 8334](#)

[Room PW: 424575](#)

Abstract:

Electric vehicles (EVs) should allow drivers to recharge quickly anywhere in any weather, like refueling gasoline cars. However, none of today's EVs allow fast charging due to the risk of lithium plating, the formation of metallic lithium that drastically reduces battery life and even results in safety hazards. In this talk, we present a new approach enabling 10-minute fast charging of energy-dense Li-ion batteries in any temperatures (even at -50°C) while still preserving remarkable cycle life. We further show that fast rechargeability is an economical answer to mass-market EVs, making possible a vehicle battery costing only \$3,500 while eliminating range anxiety.

Short Bio:

Prof. Chao-Yang Wang, Academician of National Academy of Inventors, is William E. Diefenderfer Chair Professor of Mechanical, Chemical, and Materials Science & Engineering at Pennsylvania State University. He has 220+ publications, 36,000+ citations, an H-index of 104. He holds 140 patents and has published two books, "Battery Systems Engineering" by Wiley and "Modeling and Diagnostics of Polymer Electrolyte Fuel Cells" by Springer. His work on all-temperature battery (ACB) was selected by 2022 Winter Olympic Games to power electric vehicles serving the Games, as well as adopted by several carmakers. Dr. Wang's expertise covers the transport, materials, manufacturing and modeling of batteries and fuel cells.



Prof. Kunio Yoshikawa

Tokyo Institute of
Technology

Waste-to-Energy: High-Quality Solid Fuel Production from Biomass and Wastes

November 30th 12:00-12:45 (GMT+1)

[The Zoom details](#)

[Room ID: 849 7830 8334](#)

[Room PW: 424575](#)

Abstract:

In the Waste-to-Energy processes, the conversion of waste and biomass resources into high-quality solid fuels is a critical pre-treatment step. We have developed an innovative hydrothermal treatment technology (HTT) that can perform this conversion utilizing high-pressure (around 2-3MPa) saturated steam. Any kind of burnable materials can be converted into coal-like granular products and only 10-15% of the products are enough as fuel for steam production in a boiler. In this presentation, commercial experiences of HTT will be introduced focusing on the treatment of municipal solid waste, sewage sludge, and empty fruit bunch (EFB).

Short Bio:

Dr. Kunio Yoshikawa is a professor emeritus and a researcher at the Tokyo Institute of Technology, Japan. His major research areas are energy conversion, thermal engineering, combustion, gasification, waste treatment technologies, and atmospheric environmental engineering. He published more than 200 papers and supervised 57 Ph.D. students. He is an associate editor of Applied Energy. His main awards are AIAA Best Paper Award in 1999, ASME James Harry Potter Gold Medal in 2001, JSME Environmental Technology Achievement Award in 2006, Best Educator Award of Tokyo Institute of Technology in 2014, and Best Editor Award of Applied Energy in 2020.



Prof. Eric Loth

University of Virginia

“Why we must move beyond LCOE for Renewable Energy Design”

November 30th 16:00-16:45 (GMT+1)

The Zoom details

Room ID: 849 7830 8334

Room PW: 424575

Abstract:

The design of renewable energy systems such as wind turbines or solar panels has ubiquitously employed the Levelized Cost of Energy (LCOE). However, LCOE fails to account for time-varying factors of energy prices and energy reserve requirements, which are becoming increasingly important as energy grids become more dynamic and as renewable energy penetration rises. If we consider these factors, renewable energy systems (especially those with energy storage) may perform poorly if designed with LCOE. This is particularly true when considering dispatchability, which LCOE fails to consider entirely. Therefore, new metrics are urgently needed to design future renewable energy systems. To better value energy based on time-dependent generation and grid demand, the Cost of Valued Energy (COVE) has been developed based on a fundamental price-demand relationship for the grid. Case studies for new energy systems show the benefit of COVE compared to LCOE as a design metric.

Short Bio:

Eric Loth is the Rolls Royce Professor and Chair of Mechanical and Aerospace Engineering at the University of Virginia. He is a Fellow of the ASME, the AIAA, and was named a Yip Visiting Fellow of the Magdalene College at Cambridge University (U.K.). Dr. Loth has given invited talks at several universities (Harvard, MIT, Oxford, Penn, Princeton), several national labs (NETL, NREL, NRL, SNL), and the several conference and events (ARPA-E Congressional Showcase, MIT A+B, World Energy Storage Conference), with research covered by American Scientist, Popular Science, USA Today, MIT Technology Review, CNBC, and several other media outlets.



Prof. Shan-Tung Tu

East China University of
Science and Technology

Challenges and technology enablers for the safe utilization of hydrogen energy

December 1st 12:00-12:45 (GMT+1)

[The Zoom details](#)

[Room ID: 849 7830 8334](#)

[Room PW: 424575](#)

Abstract:

Hydrogen (H), the most abundant element in the Universe, offers a charming sustainable energy solution that can potentially substitute carbon-based fuels and thus reduce carbon dioxide emissions. The challenges of the safe utilization of H energy lie in many aspects covering different industry fields. Firstly, an intrinsic safe process for storage and transportation in mild condition should be very desirable. Secondly, the development of hydrogen equipment requires affordable and mass-produced high-strength and sustainable materials that are H resistant. The antagonism between strength and resistance to H embrittlement in metallic materials provides a fundamental challenge to the field of materials science, metal forming and welding. Thirdly, H possesses a wide range of flammable concentrations in air and lower ignition energy than gasoline or natural gas. These features make it ignite quite easily, which frequently causes explosion accidents even nowadays. This means particular care has to be taken on the design and maintenance of the whole H systems to prevent H leakage and ignition. These would essentially require the development of codes and standards for H systems including infrastructures, interface technologies, detectors, operating procedures, etc.

This lecture will start with a review of the use of steam power and the followed development of safe design theory and technology. To facilitate the application of H energy one has to prioritize the safety technology. Opportunities and challenges of its utilization and critical technology development towards its safe use will then be focused. Some of the recent research in this field, particularly in East China University of Science and Technology (ECUST) will be covered.

Short Bio:

Shan-Tung Tu received his B.Eng degree in 1982 and Ph.D degree in 1988 from Nanjing Tech University. He is a Chair professor of mechanical and power engineering, East China University of Science and Technology. Prior to this, he has worked in Nanjing Tech University and East China University of Science and Technology as a professor and vice present, and a guest scientist to Royal Institute of Technology, Sweden. He was elected as an academician of Chinese Academy of Engineering in 2019.

Driven by the safety concern of the process and energy equipment, Professor Tu has long devoted to developing knowledge related to design of high temperature equipment. He is an author of more than 400 papers and received a number of distinguished awards, including China National Science and Technology Progress Award, National Technology Invention Award, China Youth Science and Technology Award, ASME Best Paper Award and so on. He has been the honorary president of Chinese Pressure Vessel Institution (since 2010) and the honorary president of Chinese Materials Institution (since 2015) of China Mechanical Engineering Society, Chairman of Asian Oceanic Regional Committee of International Council for Pressure Vessel Technology. He is currently an honorary professor of the University of Nottingham. He is also serving a number of journals as an associate editor or editorial board member, including Applied Energy, Int J Pres Ves and Piping, J of Materials Science and Technology and so on.



Dr. Yong Chen

International Renewable
Energy Agency

Sector Coupling in Facilitating Integration of Variable Renewable Energy in Cities

December 2nd 12:00-12:45 (GMT+1)

[The Zoom details](#)

[Room ID: 849 7830 8334](#)

[Room PW: 424575](#)

Abstract:

To accommodate high shares of variable renewables in an effort to address global climate change, the future power system would require significant enhancement in grid flexibility. This presentation highlights the importance of sector coupling as a key source of flexibility that cities can explore to stabilise grid operations. However, quantifying sector coupling opportunities requires an integrated approach to model increasing complexity and interconnectedness of energy systems. Cross-sectoral synergies through sector coupling technologies should be measured against optimisation objectives in different scenarios. The study aims to help cities understand the great potential they hold to accelerate the race to net zero.

Short Bio:

Prof. Yong Chen has been working on energy related issues for more than 20 years. He is now leading the sustainable urban energy program at the International Renewable Energy Agency's (IRENA) Innovation and Technology Centre (IITC). Prior to this role, Mr. Chen had functioned as Regional Program officer for Asia and the Pacific, representing the Agency at various forums and advising IRENA's Member States in the region to accelerate renewable energy deployment. Before joining IRENA in 2012, Mr. Chen had been with Stockholm Environment Institute, conducting research and providing consultancy on renewable energy.



Prof. Peter Crossley

University of Exeter

Future of Low-carbon Transmission Network

December 3rd 15:40-16:30 (GMT+1)

[The Zoom details](#)

[Room ID: 849 7830 8334](#)

[Room PW: 424575](#)

Abstract:

Modern society is dependent on flexible electrical energy, available on demand, at an affordable social and environmental cost. Today, most of our electrical energy is produced by converting the carbon stored in coal or natural gas into heat energy and then via turbines and synchronous generators into electrical energy.

To address the challenges of global warming, Exeter University is discussing and exploring methods to reduce our reliance on 'pre-historic' solar energy stored in fossil fuels, and exploiting 'real time' solar energy available via wind, waves, photovoltaic, solar thermal, bio-mass and hydro. To incorporate these green, but often intermittent energy resources, electricity networks will have to become 'smarter'. Real time information will have to be communicated between the producers and consumers of electricity, the local and national energy stores, and the operators of the transmission and distribution grids. A "low-carbon smart-grid" refers to the balancing of supply and demand without resorting to the conventional burning of coal and gas.

To fully utilise our national renewable energy resources, we need to recharge energy stores when supply exceeds demand and recover the energy when the balance reverses. A financially astute consumer or community will buy and store electricity when the price is low, and sell stored electricity when the price is high. However, storage is only part of the solution and energy management systems will be required to ensure energy use is sensitive to supply availability and real-time pricing. For example, 'smart homes' will receive information, informing appliances that energy costs are about to go high and unless absolutely necessary they should not operate. This reduces demand by automatically shifting the use of white-goods, EV charging or storage based heating systems to periods when the wind is blowing, the sun is shining, the transmission and distribution network infrastructure has spare capacity and energy demand is relatively low.

Short Bio:

Peter Crossley is Honorary Professor at the University of Exeter. Immediately prior to joining the Exeter Smart Grid Centre in 2021, he was Director of the EPSRC Centre for Doctoral Training in Power Networks at the University of Manchester. He is a named author on 105 Journal and over 250 conference papers in subjects related to smart-grids, power system protection and control, and the impact of low carbon technologies on transmission and distribution networks. He is also a Fellow of the Chinese Society of Electrical Engineers, a Senior Member of the IEEE and a Chartered Engineer in the UK.



Future Energy Center

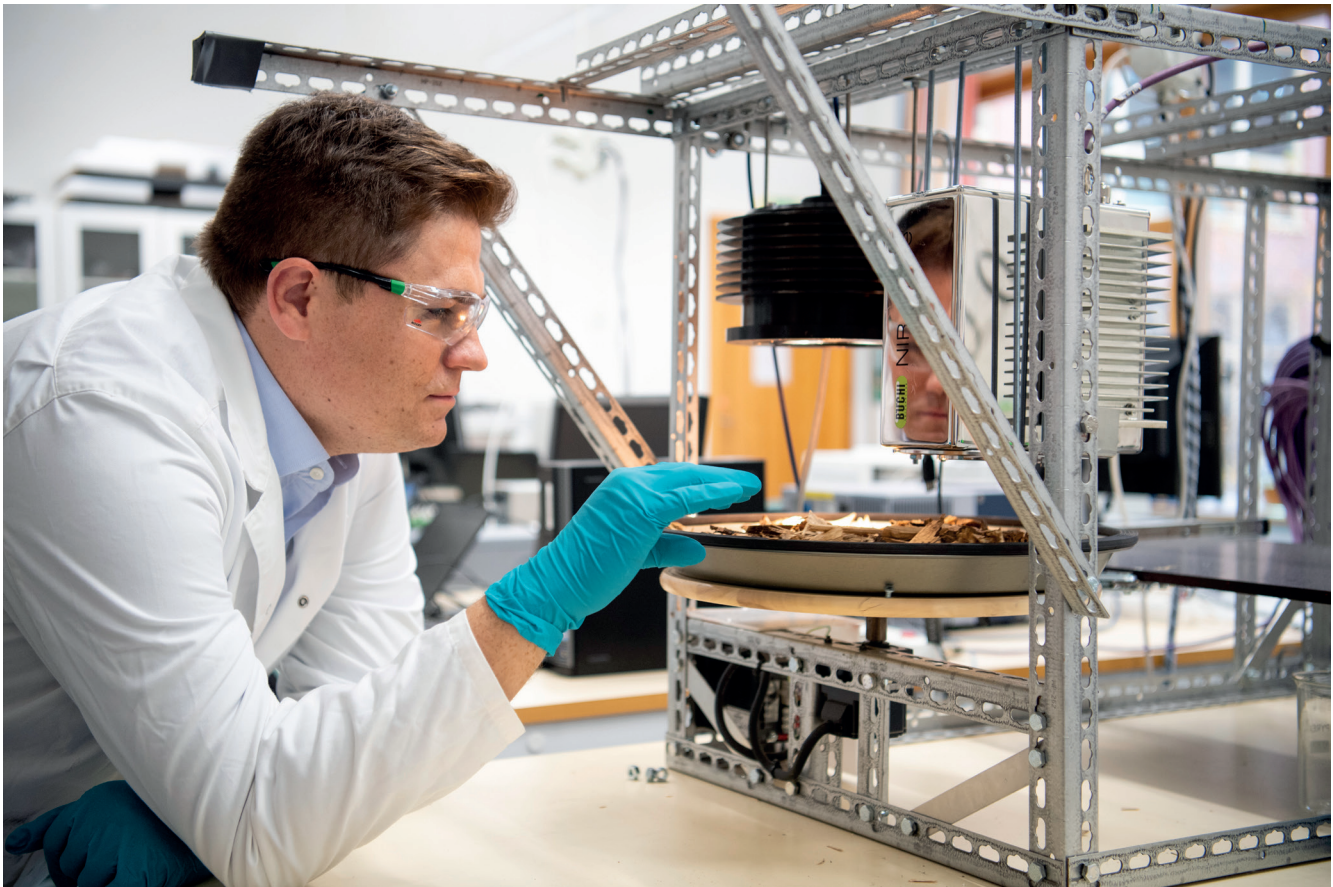
The Future Energy Center (FEC) is an internationally competitive research environment at Mälardalen University (MDH), Sweden. FEC focus on renewable energy, resource efficiency and digitalisation – towards a sustainable future, in co-production with industry and society.

FEC meets the future challenges in energy and environmental systems by investigating and developing processes and systems for increased resource efficiency and digitalisation in the transition towards a renewable energy system. A core area is enhancing the flexibility, to accommodate intermittent renewable energies such as solar and wind, and to meet the growing need of capacity. Resource efficiency includes utilizing bioenergy sources and at the same time enabling recovery of other resources, as for example nutrients. Another important area is investigating possible process integrations for both increased flexibility and resource efficiency. Further, digitalisation concerns developing new mathematical methods for model based diagnostics, decision support, optimization and control. Different simulation tools and soft sensors built on e.g. spectral measurement techniques are

used in combination to develop new systems for optimization and control. Interdisciplinary work and the integration of research approaches from engineering and natural sciences with those in social sciences and humanities perspectives, as for example markets, big data handling and behaviour, are important to consider.

FEC conducts education within energy, building and environmental engineering at bachelor, master and postgraduate levels. Strategic collaboration with industry is an important part of the education. On-going activities include development of modern web-based education, which extends to the international market. Moreover, FEC participates in several research schools in collaboration with industry and the public sector.

THE FUTURE ENERGY CENTER PRODUCES OVER 100 publications per year, including in the top ranked journals Nature Energy and Nature Climate Change. FEC Professors are active in leading international communities and organises several international conferences together with other partners. FEC has 40+ ongoing projects, of which most are carried out in collaboration with industry and the public sector.



Today, the center comprises 8 professors, 20 senior researchers and about 30 graduate students. The research environment is characterised by a high level of cross-collaboration and communication that drives synergies in interdisciplinary work. International exchange including visiting professors and other researchers at FEC has been highly active over the past 10 years, with visiting professors from Canada, South Africa, Norway, India, and China etc. The Future Energy Center has an annual research budget of about 40 million SEK of which around 70% is external funding.

FEC HAS STRONG RELATIONSHIPS WITH INDUSTRY as well as with recognized national and international centers, including universities across the world. The collaborations with other international partners are carried out through international platforms, where activities connected to the ICAE conference is one important part. The research within FEC is an important part of the development of MDH's strategic collaboration with both private and public sector, partly based on strategic agreements with for example ABB and Bombardier Transportation. In addition, cooperation is carried out with several regional small and medium sized companies. There is also a strong development of energy related interests in industry in the Mälardalen region as for example the establishment of Northvolt Labs and Hitachi ABB Power Grids.



Panel Discussion

Women in Applied Energy



Time: Nov. 29th 14:10–16:00 (GMT+1) ROOM SA

“Women in Applied Energy” was established in 2019. It’s a platform with added value for women lean in and the missions include: empower women researchers in the Applied Energy’s community to obtain career achievements; create a supportive platform for addressing gender-related issues with mentorship; advance gender equality and “Women Power” in energy science, technology, and engineering.

The panel is organized by “Women in Applied Energy” and panelists from different areas will share valuable experience about women development and further discussion is also arranged.

Moderator



Dr. Yanli Liu
Tianjin University

Short Bio

She is the associate professor of the school of electrical and information engineering, head of the department of electrical engineering and executive deputy director of integrated energy power system intellectual center in Tianjin University.

Her research area includes power system stability and security, cyber physical power system, and data-driven method applications in Smart Grid. She is now the “Smart Grid and Energy Internet” Subject Associate Editor of the journal Engineering (published by Chinese Academy of Engineering) and Associate Editor of the journal International Journal of Electrical Power & Energy Systems. She is vice-chair of the IEEE Task Force “Application of Big Data Analytic on Transmission System Dynamic Security Assessment” and secretary of the IEEE Task Force “Cyber-Physical Interdependence for Power System Operation and Control”.

Speakers



Dr. Zhu Li
Tianjin University

GMT+1 14:10-14:25

On the Trans-Disciplinary Way: Technology+Art+Management Short Bio

Dr. Zhu Li is the professor and doctoral supervisor at the School of Architecture, Tianjin University, and the first President of APEC Sustainable Energy Center (APSEC). Dr. Zhu is specialized in Low Carbon Building Design and Technology Integration & Energy Planning and Key Technology of Low-carbon Towns. Dr. Zhu has chaired 41 research projects, the amount of which exceeds 14 million Yuan, and has published 181 papers totally, as the first or corresponding author, 31 papers have been indexed by SCI and 23 papers have been indexed by EI. She has written 2 books and was granted 30 patents.



Dr. Zhaohong Bie
Xi'an Jiaotong
University

GMT+1 14:25-14:40

Resilience for Power System and Women in Power Short Bio

Dr. Zhaohong Bie is with Xi'an Jiaotong University (XJTU), where she is currently a Professor and Doctoral Supervisor, Member of XJTU Committee, Director of XJTU Office of Discipline Planning and Construction, and Dean of School of Electrical Engineering. She is also the Director of Shaanxi Key Laboratory of Smart Grid and serves on the board of Chinese Society for Electrical Engineering (CSEE).

Her research interests include power system resilience, planning and reliability evaluation. She developed a series of planning and reliability evaluation techniques for power system with high penetration of renewable energy. She has served as the leader to make the first international technical specification for microgrid -- IEC TS 62898-1, Microgrids - Part 1: Guidelines for microgrid projects planning and specification. In 2017 she was then awarded with the IEC 1906 Award for her contribution to the IEC working group. She also received provincial and ministerial level scientific research award of China 7 times.



Dr. Aleksandra
TU Delft

GMT+1 14:40-14:55

Power Systems Research during Covid-19 Short Bio

Aleksandra received the B.S., M.S., and Ph.D. degrees in electrical engineering from the School of Electrical Engineering, University of Belgrade, Belgrade, Serbia, in 2012, 2013, and 2017, respectively. Between 2012 and 2018 she has been a Teaching Assistant with the School of Electrical Engineering, University of Belgrade, and an Assistant Professor from 2018 to 2019. In 2019 she worked as a Postdoctoral Researcher at the Department of Electrical Engineering ESAT – ELECTA, KU Leuven and in the Institute Energy Ville, Genk, Belgium. From January 2020, Aleksandra works as an Assistant Professor at TU Delft, Faculty of Electrical Engineering, Mathematics and Computer Science.



Dr. Yan Li

The Pennsylvania
State University

GMT+1 14:55-15:10

Developing Career in Renewable Energy

Short Bio

Yan Li received her Ph.D. degree from Tianjin University, Tianjin, China, in 2013. She also received a second Ph.D. degree from University of Connecticut, Storrs, CT, U.S., in 2019. Both are in Electrical Engineering. She is currently an assistant professor at the School of Electrical Engineering and Computer Science in The Pennsylvania State University, University Park, PA, U.S. Her research interests include cyber-physical power systems, quantum algorithms, data-driven modeling and control, resilience analysis, cybersecurity, software-defined networking, etc. Dr. Li is a Senior Member of IEEE, and a member of IEEE PES, Women in Power, and American Association of University Women. She has won IEEE-PES Outstanding Engineer Award and Connecticut Women of Innovation Award. She has also been interviewed by WTNH News 8, an ABC-affiliated television station, to share her research experiences and model opportunities for the next generation, especially for people from underrepresented groups.



**Dr. Sandra
Venghaus**

Aachen University

GMT+1 15:10-15:25

It's a Matter of Energy – Charge and Discharge between being a 'Successful' Scientist and a 'Good' Mother

Short Bio

Sandra Venghaus is currently assistant professor for decision analysis and socio-economic assessment at RWTH Aachen University in Germany and head of the research group "Ethics, Sustainability, and the Resource Nexus" at the Institute of Energy and Climate Research – Systems Analysis and Technology Evaluation at Forschungszentrum Jülich.

After studying environmental science and public policy at Harvard University, she received her PhD in economics from Leibniz University Hannover, Germany, focusing on complex system innovations, and then worked at the Potsdam Institute for Climate Impact Research as a post-doc. She currently also coordinates the BioSC Competence Platform "Transform2Bio: Integrated Transformation Processes and their Regional Implementations: Structural Change from Fossil Economy to Bioeconomy".

Her research focuses on the quantitative modeling of complex socio-ecological systems, with a special interest in the impacts of political regulation and decision dynamics on social, economic, and ecological parameters.



Dr. Xiaonan Wang

Tsinghua University

GMT+1 15:25-15:40

Girls Can: In Pursuit of Women Power and Energy in Academia

Short Bio

Dr Xiaonan Wang is currently an associate professor in the Department of Chemical Engineering at Tsinghua University, funded by the national overseas talent program. She received her BEng from Tsinghua University in 2011 and PhD from University of California, Davis in 2015. After working as a postdoctoral research associate at Imperial College London, she joined the National University of Singapore (NUS) as an assistant professor since 2017 and later became adjunct associate professor. She is leading a Smart Systems Engineering research group at NUS and Tsinghua of more than 20 team members as PI and also a program lead of the Association of Pacific Rim Universities (APRU). She has published more than 100 peer-reviewed papers, organized and chaired several international conferences, and delivered more than 50 invited talks at conferences and universities on five continents. She is an editorial board member of 10 SCI journals e.g. Applied Energy, ACS ES&T Engineering. She was recognized as an AIChE-SLS Outstanding Young Principal Investigator, Young

Researcher Award for Engineering Sustainable Development, IChemE Global Awards Young Researcher finalist and selected for Royal Society International Exchanges Award, as well several best paper awards at IEEE and Applied Energy conferences and journals.

Discussion

GMT+1 15:40-16:00

Panel Discussion

Big Data Analytics for Smart Energy Systems

Time: Nov. 30th 13:00–15:20 (GMT+1) ROOM SA

The comprehensive digitization, informatization, and intelligence of the energy system have made the amount of relevant data increase exponentially, and it has the remarkable characteristics of massive, multi-source, heterogeneous, and so on. By combining massive data with collected information from different links of the energy system, various entities, such as power utilities, customers, energy investment, society, etc., can use big data analytics technology to deepen the understanding of the energy system and its relevant links and create new value. This panel will discuss big data analytics application in the smart energy systems.

Moderator



Dr. Yanli Liu
Tianjin University

Short Bio

She is the associate professor of the school of electrical and information engineering, head of the department of electrical engineering and executive deputy director of integrated energy power system intellectual center in Tianjin University.

Her research area includes power system stability and security, cyber physical power system, and data-driven method applications in Smart Grid. She is now the “Smart Grid and Energy Internet” Subject Associate Editor of the journal Engineering (published by Chinese Academy of Engineering) and Associate Editor of the journal International Journal of Electrical Power & Energy Systems. She is vice-chair of the IEEE Task Force “Application of Big Data Analytic on Transmission System Dynamic Security Assessment” and secretary of the IEEE Task Force “Cyber-Physical Interdependence for Power System Operation and Control”.

Speakers



**Prof. Nikos
Hatziargyriou**
National Technical
University of Athens
GMT+1 13:00-13:20

Topic: The role of data in intelligent distribution grids

Abstract

The role of Intelligent Distribution Networks, as the backbone of future integrated energy systems, will be first discussed. In order to operate efficiently the complex future integrated systems wide application of ICT technologies is required. For this reason, large investments are planned by distribution system operators in grids digitalization. In distribution system operation and planning in particular, the benefits provided by the organization and exploitation of the large amount of data, available by the wide deployment of smart meters, sensors, smart substations, intelligent devices, etc. are very significant. The key functionalities that can strongly benefit from the proper use of data and the way they can lead to a more secure and efficient operation of the system will be described. Indicative results of data applications in distribution systems and other power system areas will be briefly reported.

Short Bio

Nikos D. Hatziargyriou is professor in Power Systems at the National Technical University of Athens. He has over 10 years industrial experience as Chairman and CEO of the Hellenic Distribution Network Operator and as executive Vice-Chair of the Public Power Corporation. He was chair and vice-chair of the EU Technology and Innovation Platform on Smart Networks for Energy Transition (ETIP-SNET). He is honorary member of CIGRE and Life Fellow of IEEE, currently Editor in Chief of the IEEE Trans on Power Systems. He is the 2017 recipient of the IEEE/PES Prabha S. Kundur Power System Dynamics and Control Award. He is author and of more than 250 journal and 500 conference papers and he is included in the 2016, 2017 and 2019 Thomson Reuters lists of top 1% most cited researchers. He is Globe Energy Prize laureate 2020.



**Prof. Vladimir
Terzija**
Humboldt Fellow
IEEE Fellow
GMT+1 13:20-13:40

Topic: On infrastructure and methods for model-free monitoring of voltage-instability in modern power systems

Abstract

As a result of high penetration of Converter Interfaced Generation (CIG), also called nonsynchronous generation, converter connected demand and mixed ac-dc transmission and even distribution networks, the nature of operation of modern electrical power systems became a challenge. The nature of the entire system became more complex, expressed in quite a new dynamic, requesting new approaches for monitoring, protection and control. On the other hand, availability of modern sensor and ICT technology opened new paradigms for coping with previously described challenges. The presentation is aiming at addressing new approaches of monitoring of future electrical power systems, focused on voltage instability detection and monitoring. In this context, a novel model-free and data driven approach based on Maximum Lyapunov Exponent calculation, will be discussed and presented. Experience gathered from 3 flagship and large-scale projects funded by Ofgem (UK) Network Innovation Competition, VISOR, EFCC and FITNESS projects, will be summarized and also discussed from the perspective of their extension to another level: integration of different energy systems and approaches for their operation, fostering flexibility and resilience of a particular integrated energy system. Approaches used in the AMPaC Megagrant project (<https://ampac.skoltech.ru/>), will be discussed, too.

Short Bio

Vladimir Terzija was born in Donji Baraci (former Yugoslavia). He received the Dipl.-Ing., M.Sc., and Ph.D. degrees in electrical engineering from the University of Belgrade, Belgrade, Serbia, in 1988, 1993, and 1997, respectively. He is a Full Professor at Skoltech, Moscow, Russian Federation. He is also a Distinguished Professor at the Shandong University, Jinan, China, where he has been since 2013. From 1997 to 1999, he was an Assistant Professor at the University of Belgrade, Belgrade, Serbia. From 2000 to 2006, he was a senior specialist for switchgear and distribution automation with ABB, Ratingen, Germany. From 2006 to 2020 he was the EPSRC Chair Professor in Power System Engineering with the School of Electrical and Electronic Engineering, The University of Manchester, Manchester, U.K. His current research interests include smart grid applications; wide-area monitoring, protection, and control; multi-energy systems; switchgear and transient processes; ICT, data analytics and digital signal processing applications in power systems. Prof. Terzija is Editor in Chief of the International Journal of Electrical Power and Energy Systems, Alexander von Humboldt Fellow, Fellow of IEEE, as well as a DAAD and Taishan Scholar. He is the recipient of the National Friendship Award, China (2019).



Prof. Z.Y. Dong

University of NSW

GMT+1 13:40-14:00

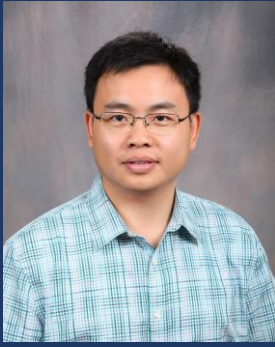
Topic: Data driven electric vehicle and charging infrastructure modelling and optimization

Abstract

Shared mobility business is a key driving force for the diffusion of electric vehicles aiming at better social, environmental and mobility benefits in the city. Optimal mobility planning requires a wholistic approach to consider siting and sizing of charging facilities in power distribution networks while trying to maintain system stability and reliability with high EV penetrations. In this talk a framework for EV infrastructure planning considering economic benefit together with maximizing mobility demands will be presented with case studies. Modelling of the uncertainties associated with EVs is included in this framework. The planning problem is formatted as a multi-objective optimization problem which can be solved effectively with mixed integer nonlinear programming optimization and stochastic dynamic discrete simulations.

Short Bio

Professor Z.Y. Dong obtained Ph.D. from the University of Sydney, Australia. He is a SHARP Professor of Energy Systems at the University of NSW, Sydney, Australia. He is also serving as Director of the University of NSW's Digital Grid Futures Institute; and Director of Australian Research Council Research Hub for Integrated Energy Storage Solutions. His immediate role is Professor and Head of the School of Electrical and Information Engineering, The University of Sydney. He was Ausgrid Chair and Director of the Ausgrid Centre for Intelligent Electricity Networks (CIEN) providing R&D support for the Smart Grid, Smart City national demonstration project of Australia. He also worked as manager of a state transmission network service provider in Australia responsible for transmission system planning. His research interest includes smart grid and smart cities, power system planning, power system dynamics and stability, load modeling, renewable energy systems, and electricity market. He has also been working as editor/associate editor for a number of IEEE transactions and IET journals. He is Fellow of IEEE and a Web of Science Highly Cited Researcher.



Prof. Le Xie

Texas A&M University

GMT+1 14:00-14:20

Topic: An open-access cross-domain approach to analyzing the impact of extreme events on the electricity sector: what we learned from COVID-19 and 2021 Texas winter outage

Abstract

Extreme events such as COVID-19 and the 2021 Texas power outage are placing increasing amount of operational challenges to the resiliency of the electricity sector. We illustrate an open-access and cross-domain approach to analyzing the short-run impact and corrective measures of these extreme events on the electricity sector. We release a first-of-its-kind cross-domain open-access data hub, integrating data from across all existing U.S. wholesale electricity markets with COVID-19 case, weather, mobile device location, and satellite imaging data. Leveraging cross-domain insights from public health and mobility data, we rigorously uncover a significant reduction in electricity consumption that is strongly correlated with the number of COVID-19 cases, degree of social distancing, and level of commercial activity. For the 2021 Texas power outage, we collaboratively release an open-source extendable model that is synthetic but nevertheless provides a realistic representation of the actual energy grid, accompanied by open-source cross-domain data sets. This simplified synthetic model is calibrated to the best of our knowledge based on published data resources. Building upon this open-source synthetic grid model, researchers could quantitatively assess the impact of various policies on mitigating the impact of such extreme events. This approach and methodology are generalizable for other regions experiencing significant energy portfolio transitions.

Short Bio

Dr. Le Xie is a Professor, Chancellor EDGES Fellow, and Presidential Impact Fellow in the Department of Electrical and Computer Engineering at Texas A&M University, and the Assistant Director-Energy Digitization at Texas A&M Energy Institute. He received B.E. in Electrical Engineering from Tsinghua University in 2004, S.M. in Engineering Sciences from Harvard in 2005, and Ph.D. in Electrical and Computer Engineering from Carnegie Mellon in 2009. His industry experience includes ISO-New England and Edison Mission Energy Marketing and Trading. His research interest includes modeling and control in data-rich large-scale systems, grid integration of clean energy resources, and electricity markets. Dr. Xie received the U.S. National Science Foundation CAREER Award, and DOE Oak Ridge Ralph E. Powe Junior Faculty Enhancement Award. He was awarded the 2021 IEEE Technical Committee on Cyber-Physical Systems Mid-career Award, and 2017 IEEE PES Outstanding Young Engineer Award. He is a Fellow of the IEEE (Class 2022). He was recipient of Texas A&M Dean of Engineering Excellence Award, ECE Outstanding Professor Award, and TEES Select Young Fellow. He serves or have served on the Editorial Board of IEEE Transactions on Smart Grid, IET Transaction on Smart Grid, and Foundations and Trends in Electric Energy Systems. He is the founding chair of IEEE PES Subcommittee on Big Data & Analytics for Grid Operations. His team received the Best Paper awards at North American Power Symposium 2012, IEEE SmartGridComm 2013, HICSS 2019 and 2021, IEEE Sustainable Power & Energy Conference 2019, and IEEE PES General Meeting 2020.



Prof. Junhua Zhao
The Chinese University
of Hong Kong,
Shenzhen
Director of Energy
Markets and Finance
Lab

GMT+1 14:20-14:40

Topic: Cyber physical social system for supporting low carbon energy transition

Abstract

In the context of the "dual carbon" strategy, China's power system will undergo a low-carbon transition from thermal power to new energy in the next 30-40 years. The low-carbon power system can theoretically be represented as a complex network system containing the triple elements of information-physics-society. This lecture discusses how to utilize AI and big data analytics to build a low-carbon power system model from three levels: micro modeling (user behavior), meso modeling (corporate behavior), and macro modeling (policy formulation), and introduces several practical applications.

Short Bio

Professor Zhao is a National Youth Expert at the Chinese University of Hong Kong, Shenzhen. The director of the Energy Market and Finance Lab, the Shenzhen Finance Institute, and an invited energy industry expert at China Merchants Bank. He has long been engaged in research on smart grid, energy economy, low-carbon transition, and artificial intelligence. In 2020, he was named "Top 2% Scientists in the World" by Stanford University and Mendeley Data. In 2017, he was awarded the Young Scientist of the Future by the ADC Forum in Australia. In 2017, he won the "China's 100 Most Influential Chinese Sci-tech Journal Papers" award from the Ministry of Science and Technology. He won the Hunan Science and Technology Progress Award twice, and the Zhejiang Natural Science Award once. His research have had important impacts in the industry. Has participated in the rule design for multiple domestic power markets. A number of software products he developed have been applied to large energy companies such as New York Edison, Hongkong Electric, Guangdong Energy Group, CNOOC, and Datang Power Generation.



Dr. Yan Xu
Associate Professor
and Cluster Director at
Energy Research
Institute
Nanyang
Technological
University (NTU),
Singapore

GMT+1 14:40-15:00

Topic: Data-driven frequency control of stochastic power systems

Abstract

Load frequency control (LFC) of a power system aims to restore system frequency and eliminate unscheduled tie-line power interchange among different control areas. Intermittent renewable energy sources (RES) such as wind and solar power have introduced significant challenges for LFC due to more complex cross-area power balancing between generation and demand. This seminar will present a series of deep reinforcement learning (DRL) based data-driven methods for more effective LFC of the stochastic power systems with large-scale RES. The principle of DRL will be explained at first. Then, a value-based DRL model will be introduced for single-area LFC, followed by a multi-agent DRL model for coordinated LFC of multi-area power systems. After that, a data-driven controller for energy storage system is introduced to provide LFC support to the power grid.

Short Bio

Dr Yan Xu obtained his B.E. and M.E. degrees from South China University of Technology, Guangzhou, China, and PhD degree from University of Newcastle, Australia. He did postdoctoral research with University of Sydney Postdoctoral Fellowship and then joined Nanyang Technological University (NTU) with the Nanyang Assistant Professorship. He is now an Associate Professor at School of EEE and a Cluster Director at Energy Research Institute @ NTU (ERI@N).

Dr Xu is now leading the SODA (Stability, Optimization & Data-Analytics) research group which consists of 14 PhD students and 6 Post-doctoral Fellows, focusing on power system stability, microgrid, and smart grid data-analytics. His research is funded by Singapore National Research Foundation (NRF), Ministry of Education (MOE), Energy Market Authority (EMA), Housing & Development Board (HDB), Rolls-Royce, Singtel, Infineon, Singapore Power (SP) Group, Lite-On, and technology start-up companies. Many of his research outcomes have been practically applied/licensed to the industry.

As the first/corresponding author, Dr Xu has published 1 book, 93 IEEE Transactions papers and 30 IET journal papers. He has 13 "Web-of-Science highly cited papers" and received 11 IEEE/IET paper contest and conference best paper awards. Dr Xu is serving as an Editor for IEEE Transactions (TSG and TPWRS), IET journals (GTD and ECE), and China's international power engineering journals (CSEE JPES and MPCE). He is also serving as the Chairman for IEEE Power & Energy Society (PES) Singapore Chapter.

Discussion

GMT+1 15:00-15:20

Panel Discussion

Open Data for Urban Energy Systems

Time: 14:40–16:00 Nov 30 (GMT+1)

Cities are home to half of the world's population and are responsible for more than two-thirds of global energy use. Open Data can be a powerful tool to reduce information asymmetry in markets, increase transparency and help achieve local economic development goals. Several sectors like transport, public sector management and agriculture have started to benefit from Open Data practices. However, challenges for open data exist such as lack of access, legal, licensing and privacy concerns, technological and infrastructure challenges, socio-cultural and economic barriers.

In the field of urban energy, access to real granular energy data is further challenging, despite the urgent need for an energy transition based on effective policies towards sustainable cities. Several research groups around the world have attempted to be granted access to urban data and make it public. Many of them have been successful but are still constrained by extensive challenges.

This panel aims at:

1. Gaining better insight in the process of gaining access to urban energy data and opening it, as sought by various research groups worldwide
2. Identifying particular challenges each research group faced, and how they were overcome
3. Discussing what potentials of the real data are anticipated and what role of data openness and sharing on enhancing the data impact.

Panel Discussion

Moderator



Short Bio

Fredrik Wallin is senior lecturer at Mälardalen University, Sweden. he received the M.Sc., Tech. Lic. and Ph.D. degree in Energy and Environmental Technology from Mälardalen University, Västerås, Sweden, in 2001, 2005 and 2010, respectively. He is now working as a project leader and researcher at the School of Sustainable Development of Society and Technology at Mälardalen University. Dr. Wallin has mainly been working with automatic meter reading systems, electricity end-use, load forecasting and load pricing. Wallin has also been involved in developing web-based applications with the purpose of analyzing energy consumption patterns. Wallin has commercialized parts of the research activities and the company participates in the Swedish incubator program via CREATE Business Incubator and Västerås Science Park.

Speakers



Tianzhen Hong
Building Technology
& Urban Systems
Division
Lawrence Berkeley
National Laboratory
GMT+1 14:40-14:50

Open data for creating urban building energy models

Abstract

Urban building energy models (UBEM) is a powerful computational tool to model and analyze city's building stocks to provide insights into prioritization of strategies to reduce energy use, decarbonize buildings, and improve their climate resilience. Open data from diverse sources are needed to develop interoperable UBEMs. Data sources, integration techniques, data standards and models will be discussed.

Short Bio

Dr. Tianzhen Hong is a Senior Scientist and Deputy Head of the Building Technologies Department of Lawrence Berkeley National Laboratory. He leads the Urban Systems Group. He is an IBPSA Fellow and ASHRAE Fellow. He published more than 150 journal articles. He received B.Eng. and Ph.D. in HVACR, and B.Sc. in Applied Mathematics from Tsinghua University, China.



Stephanie Pincetl
The Center for
Sustainable
Communities at the
UCLA Institute of the

Data Stasis: Obdurate Utilities and Utility Obscurancy; Examples from California

Abstract

Urban energy data is critically important in developing strategies for energy decarbonization, especially in buildings. But with scant consumption data, electricity and natural gas building infrastructure information, and grid data, it becomes very difficult to plan for decarbonization of energy supplies, especially in a just and equitable manner, including for renters. I show the power of such data, when its can be obtained and argue data should be widely available for analysis using the example of California.

Short Bio

Stephanie Pincetl conducts research on environmental policies and governance is expert in bringing together interdisciplinary teams of researchers across the biophysical and engineering sciences with the social sciences to address problems of complex urban systems and environmental management. Her

Environment

GMT+1 14:50-15:00

commitment is to science in the public interest and to conducting science that advances social and environmental justice.



Clayton Miller

National University of
Singapore

GMT+1 15:00-15:10

The Role of Open Data, Machine Learning Skills and Crowdsourced Models for the Built Environment

Abstract

In this talk, Dr. Miller will cover efforts to improve basic programming skills of professionals in Architecture, Construction, and Engineering through the lens of an edX Massive Open Online Course (MOOC) and open data sets. He will also discuss innovative ways to create crowd-sourced machine learning workflows and innovation using methods like the ASHRAE Great Energy Predictor III competition.

Short Bio

Clayton Miller is an Assistant Professor at the National University of Singapore in the Building and Urban Data Science (BUDS) Lab. He is the Co-Leader of Theme D - Data Analytics at the University of California, Berkeley SinBerBEST2 Lab and the Co-Leader of Subtask 4 of the IEA Annex 79 Occupant-Centric Building Design and Operation (ResearchGate). He holds a Dr. sc. from the ETH Zürich, an MSc. (Building) from the National University of Singapore, and a BSc./Masters of Architectural Engineering (MAE) from the University of Nebraska - Lincoln. He is the former CTO of Optiras Pte. Ltd, a Singapore NRF-funded startup, a former Fulbright Scholar to Singapore at NUS, and a Walter Scott Jr.Scholar at UNL.



Polly Hudson

Senior Research
Fellow at Turing and
at The Centre for
Advanced Spatial
Analysis, UCL

GMT+1 15:10-15:20

The Colouring Cities Research Programme

Abstract

The Colouring Cities Research Programme has been set up at the Alan Turing Institute to develop open source software for open databases/knowledge exchange platforms able to collect, collate, visualise and share open data on building stocks. The aim is to provide free tools and resources to aid sustainable development, and to support scientific analysis of the stock as a dynamic system. Using the Colouring London live prototype, diverse methods of data capture are tested, relating to stock composition, operation/performance, and dynamics. These include computational approaches using inference and crowdsourcing. Interface features are developed in discussion with diverse stakeholders to produce a model for sustainable platforms, relevant to multiple disciplines and sectors, able to be collaboratively maintained at low cost. Collaborative work on prototype reproduction, on data ethics, and on ways of accelerating access to high quality, comprehensive building attribute data at building level, is also being undertaken with academic partners in Lebanon, Bahrain, Australia, Greece, Germany, Switzerland, Indonesia and China.

Short Bio

Polly Hudson is a Senior Research Fellow at The Alan Turing Institute and project lead for the Colouring Cities Research Programme. She is also a senior research fellow at the Centre for Advanced Spatial Analysis, UCL where she developed the Colouring Cities concept as part of her PhD. Polly trained as an architectural historian and cabinet maker, working initially in historic building restoration, slide library design and community planning. In 1991 she directed and designed the Building of Bath Museum and in 1996 set up The Building Exploratory charitable trust in London as a prototype for free, hand-on centres providing joined-up information about the local building stock, built by and for local communities. Here she also began to test designs for public facing GIS

platforms able to collate and visualise current, and historical, building attribute data. Since this time she has continued to develop physical and digital educational tools to increase public information about the building stock, and to promote multisector collaboration across the humanities, science, and the arts. Polly has held public appointments at the Department of Culture, Media and Sport, English Heritage, The Royal Institute of British Architects, and The National Lottery.



Elaina Present

A Member of the Residential Buildings Research Group at the National Renewable Energy Laboratory

GMT+1 15:20-15:30

A Retrospective on Data Access

Abstract

The National Renewable Energy Laboratory recently completed the End Use Load Profiles project which used data about buildings and their energy consumption to calibrate and validate physics-based end use load profiles of the U.S. building stock with high geographic resolution. The data used for this project included 2.3 million meters of AMI data along with other datasets such as load research data, sub-metered end-use load data, building characteristics data from the U.S. Census, and building characteristics and sector energy consumption data from the U.S. EIA. This presentation covers the various datasets used in support of the End Use Load Profiles project, how those datasets were obtained, how they were used, and which of them are available to the public.

Short Bio

Elaina Present is a member of the Residential Buildings Research Group at the National Renewable Energy Laboratory. Her work focuses on better understanding today's domestic energy consumption patterns, how they may change in the future, and the impacts they will have on the evolving electric grid. Elaina and her team recently completed a multi-year collaborative project creating end use load profiles for the U.S. building.

Elaina holds degrees in mechanical engineering, civil and environmental engineering, and architecture.



Alaa Krayem

Mälardalen University

GMT+1 15:30-15:40

Open Urban Data Portal for Collaborative Research and Innovation

Abstract

Despite the importance of urban energy data for urban studies and strategies, its access and availability remain challenging. During this panel, I present “NRGYHUB”, an urban energy portal for open data for the city of Västerås, Sweden. Granular electricity, district heating and water consumption data were collected and matched to their corresponding buildings. The data are stored into a database and will be available for public through a GIS-driven interface.

Short Bio

Dr. Alaa Krayem is a Postdoc at Mälardalen University, in the Future Energy Center. Her research interests focus on urban energy modeling to improve sustainability and climate resilience of cities. She completed her PhD in 2019 from a joint program between the Lebanese University and Paul-Sabatier University in France, with co-supervision from the National Center for Remote Sensing in Lebanon. She also holds a MSc in Renewable Energy and a BSc./Masters in Mechanical engineering from the Lebanese University. Prior to her current position, she worked as an information management officer, data curator, at UNHCR, and a research assistant at the American University of Beirut.

Discussion

GMT+1 15:40-16:00

Panel Discussion

Smart District Heating Networks

Time: Dec. 1st 9:30–11:30 (GMT+1)

Integration of the heating sector into the future smart energy systems constitutes a priority towards decarbonizing the energy sector. Higher share of renewables and sectorial integration can leverage the transition to coherent energy systems. This shift demonstrates substantial potential in terms of environmental and economic benefits. However, more effort is required for alleviating the social barriers, handling the legal implications, and realizing the technical implementation at large scale.

Real-time process data, advanced modelling and digitalization are some of the envisaged tools for addressing the technical challenges. Smart district heating networks promise to reduce operating temperatures, optimize the management of multi-energy sources, and provide increased flexibility to the grid and the end-users.

This panel aims at:

1. Evaluating the role of artificial intelligence, data management and digitalization towards increasing the efficiency of district heating networks.
2. Discussing the potential and limitations of enhanced flexibility, integration of renewables and sector coupling.
3. Shedding light into the future layout of district heating networks.

Speakers



Prof. Erik Dahlquist
Mälardalen University
GMT+1 9:30-9:45

On the use of artificial intelligence for smarter district heating networks

Short Bio

Erik Dahlquist holds PhD in Chemical engineering from KTH in 1991. Has served as adjunct professor at KTH, 1997-2000. He is a full professor at Mälardalen University since 2000. Worked as an engineer in nuclear power (1975-1980), control engineer for wastewater treatment (1980-1992), and technical project manager for development of crossflow membrane filter (1985-1989). Erik has been the project leader for ABBs Black Liquor Gasification project, Department Manager for Combustion and Process Industry Technology at ABB Corporate Research, and a member of the board of directors for ABB Corporate Research in Västerås. From 1996 to 2000 Erik has been the General Manager for the Product Responsible Unit "Pulp Applications" worldwide within ABB Automation Systems. He has been the director of research for the Future Energy Centre since 2000. He is also a member of Royal academy of Engineering since 2011. He has been the Chairman of the international program committee for EUROSIM, Chairman of SIMS, Scandinavian Simulation Society, member of editorial board for Applied energy journal. Holds more than 25 patents and more than 280 publications.



Prof. Peter Lund
Aalto University
GMT+1 9:45-10:00

District heating part of the sector-coupling to enable energy transition

Short Bio

Peter D. Lund is Professor in Advanced Energy Systems at Aalto University, Finland. He is Honorary Professor at Southeast University (Nanjing). He has >40 years of experience in clean energy technologies, systems, and policies. He has led Finland's R&D on new energy technologies. Dr. Lund is active in senior roles with European energy initiatives: he chaired Advisory Group Energy of European Commission 2002-2006 and Energy Steering Panel of European Academies Science Advisory Council 2013-2017, Co-Chair of European Academies' Science Advice for Policy on the energy transition 2019-2021. He is vice-chair of Finnish Climate Panel, Editor-in-Chief of Oxford Open Energy, member of Applied Energy EB, etc. He is D.Sc. from Helsinki University of Technology (1984); London Business School Alumni (1989). Jiangsu Friendship Award and Medal (2020). He is member of the Finnish Academy of Science and Letters and Swedish Engineering Academy in Finland.



Prof. Natasa Nord
Norwegian University of Science and Technology

Design, analysis, and integrated control of the district heating integrating distributed heat sources

Short Bio

Natasa Nord is Professor at the Department of Energy and Process Engineering at the Norwegian University of Science and Technology in Trondheim, Norway. She has strong background in district heating, energy planning, building energy monitoring, building simulation, optimization, and fault detection. She is a member of the Outstanding Academic Fellowship Programme at NTNU that focuses to qualify some of our foremost young research talents for internationally leading research careers. She has been a project leader for two research projects, one Horizon 2020 MSCA-IF, several collaboration and industry related projects, and a project on innovative teaching. Some of her projects were focusing on performance and control analysis of heat pump and energy supply systems for buildings. In the laboratory, the entire CO2 heat pump plant and the heated room has been developed by her and the

GMT+1 10:00-10:15

laboratory engineers. She is the main or co-author of more than 40 journal papers and has Scopus h-index 19.



Dr. Stefan

Wennerström

Energy & Recycling at
Eskilstuna Energi &
Miljö

GMT+1 10:15-10:30

Volatile electricity prices - challenges and possibilities for CHPs networks

Short Bio

Mr Wennerström (Business Unit Manager Energy & Recycling, Eskilstuna Strängnäs Energi och Miljö) has a broad experience from energy and recycling business, and about eight years with specific experience from CHP networks as manager for among others analyst and investment teams, as well as operational experience from O&M and fuel supply on an international basis.



Dr. Anna Nilsson

Swedish Environmental
Research Institute

GMT+1 10:30-10:45

Making use of flexibility in district heating networks

Short Bio

Anna Nilsson holds a M.Sc. in Energy System Engineering and is currently working as a project manager at IVL Swedish Environmental Research Institute. She is the project coordinator of the ERA-Net SES project Flexi-Sync which focuses on co-optimization of district energy flexibility. Anna has previous experience from working with innovation projects and strategic investments in power distribution at one of Sweden's largest DSOs.



A/Prof. Mirko

Morini

University of Parma

GMT+1 10:45-11:00

Optimal management of smart district heating networks

Short Bio

Mirko Morini graduated with a Bachelor of Science in Material Engineering in 2003, with a Master of Science in Material Engineering in 2004, and with a PhD in Industrial Engineering at the University of Ferrara in 2008. During his PhD, he had an internship at Alstom (now Ansaldo Energia) in Baden (CH). He is currently Associate Professor in Energy Systems and Fluid Machinery at the Department of Engineering and Architecture of the University of Parma. His main research activities have focused on (i) smart district energy, (ii) energy and economic analyses of energy chains based on biomass and biofuels, (iii) micro-CHP systems analysis, (iv) dynamic models for the simulation of turbomachines, (v) experimental investigation of turbomachine instabilities, (vi) analysis of the effect of blade deterioration on turbomachine performance, and (vii) analysis of start-up transients of heavy-duty gas turbines for cost-killing and reliability enhancement. This activity is documented by more than a hundred papers. He is currently coordinator of the ERANET Smart Energy Systems funded project "DISTRHEAT – Digital Intelligent and Scalable Control for Renewables in Heating Networks".

Discussion

GMT+1 11:00-11:30

Panel Discussion

Decarbonising heating and cooling sector: a whole-system perspective

Time: Dec. 1st 13:00–14:40 (GMT+1)

Many countries around the world have pledged to achieve the net-zero emission target in the next three decades. Decarbonising heating and cooling sector is a crucial step toward reaching carbon neutrality. Given the interdependent nature of the energy system, any major programme for rolling out low-carbon technologies and fuels for heating and cooling will have substantial impacts on other energy vectors such as electricity and hydrogen/gas. The aim of this panel session is to provide an overview of various options for decarbonising heating and cooling, and explore their potential impacts on the whole energy system.

Session chair



**Dr. Meysam
Qardan**
Cardiff University

GMT+1 13:00-13:10

Introduction to the panel and setting the scene

Short Bio

Dr. Meysam Qardan is an EPSRC-UKRI Innovation Fellow and a Reader in Energy Networks and Systems at Cardiff University. His research area covers expansion and operational planning of interdependent energy networks at different scales from community to national level. Two key projects that he is currently leading are on Cross-sectoral flexibility to support the operation of low carbon power systems, and Whole-system impacts of heat decarbonisation pathways. Meysam Qardan is an Associate Editor of IET Energy Systems Integration journal.

Speakers



Mr. Mikael
Jakobsson
CEO at NXITY

GMT+1 13:10-13:25

System Dynamics and Benefits of Pool Operated Multi-fueled District Energy systems

Short Bio

Mr. Mikael Jakobsson is the CEO of NXITY, a district energy business consulting company originated from Sweden. In 2017, Mr. Jakobsson initiated the establishment of the Asia Pacific Urban Energy Association (APUEA), a sector association governed by the International Institute for Energy Conservation (IIEC). Mr. Jakobsson acts as the Executive Director of APUEA.

Mr. Jakobsson is a graduate civil engineer with a master's degree in HVAC/Energy from the Royal Institute of Technology, Sweden. Mr. Jakobsson has more than 20 years of experience within Project Management and Energy Engineering, with specialist knowledge in Design- and Operation optimization of Multi-energy systems including thermal and hydraulic steady-state and transient-state analysis of complex thermal energy systems.

In the past 10 years, Mr. Jakobsson has developed and optimized some 50 District Energy projects in Asia Pacific, whereof the majority in China. Mr. Jakobsson started his career working as an analyst, for the Finnish state-owned energy enterpri



Dr. Graeme
Hawkers
University of
Strathclyde

GMT+1 13:25-13:40

Resiliency in future low-carbon heating and cooling systems: learning from recent events

Short Bio

Dr. Graeme Hawker is a Lecturer in Future Energy Systems at the Department of Electronic and Electrical Engineering at the University of Strathclyde in Scotland. With an industry background in the development of wind energy projects and local energy systems, his current research looks at resiliency and security for future scenarios with decarbonised gas and electricity networks operating in tandem. He is a member of the UK Energy Research Centre and the Energy Institute.



Dr. Patrick
Lauenburg
District Heating Expert
at E.ON

GMT+1 13:40-13:55

The decarbonisation of heat supply in Sweden

Short Bio

Dr. Patrick Lauenburg is a specialist in district heating systems. Since 2018, he is working with optimisation and development in E.ON's largest district heating system in Malmö, Sweden. Before that, he worked at Lund University, Sweden, with district heating research and education in the field of energy systems, with focus on heat supply. He got a PhD in heat and power engineering in 2009.



Dr. David Parra
University of Geneva
GMT+1 13:55-14:10

Making the most of flexibility for renewable energy integration: learnings from an energy system analysis for Switzerland

Short Bio

Dr. David Parra is a senior researcher and teaching fellow at the University of Geneva, where he coordinates the energy storage and hydrogen research since 2016. His research is interdisciplinary in nature and integrates technical, economic, environmental and social dimensions, the latter being currently being expanded. He has proven his ability to lead collaborations on projects and publications in Switzerland and abroad. He is PI of the project Consumer-driven impacts on the grid: Peer effects on the diffusion of technologies and strategies to manage PV electricity and demand (Peer-to-Grid), funded by the Swiss National Science Foundation.

Discussion

GMT+1 14:10-14:40

Panel Discussion

Challenges in the commercialization of biomass renewable energy technologies

Time: 14:50 pm–16:30 pm Dec. 1st CET, central Europe time (GMT+1)

Panel introduction

As the world marks the fifth anniversary for the adoption of the Paris Agreement on climate change, promising steps towards carbon neutrality are taking shape. In a response to deal with the climate crisis and environmental pollutions, many countries have revised their energy schemes, where renewable energy plays an important role. Among the different forms of renewable energy, biomass has been considered as an imperative resource that can be used to provide a variety of energy needs, including generating electricity, fueling vehicles, and providing heat. According to some estimations, biomass is considered as the fourth largest energy source in the world after coal, petroleum, and natural gas, which is accounted for 14% of the world's primary energy consumption. The main advantage of biomass, as the only renewable carbon source, over all other renewable resources is the possibility to be converted into solid, liquid, and gaseous fuels through different conversion routes.

However, the commercialization of biomass renewable energy technologies has been facing with challenges due to the natural characters of biomass including low bulk density, low energy density, high moisture content, high oxygen content, feeding issues, soot and tar generation and fouling problems during thermal conversion. The topics of this panel discussion mainly include the development space and technical challenges of biomass based bulk chemicals/high value-added chemicals/power generation/fuel cell etc. We hope that this panel will provide researchers some inspiration and facilitate the development of advanced techniques for exploring efficient biomass utilization systems in the future.

Panel Discussion

Moderator



Lu Ding, East China
University of Science
and Technology
dinglu@ecust.edu.cn

Short Bio

Lu Ding is an Associate Professor from Institute of Clean Coal Technology, East China University of Science and Technology, China. He is long-term commitment to basic research and related engineering technology development of coal/biomass gasification and resource utilization of organic solid wastes. He has coauthored over 70 peer-reviewed scientific papers, including *Appl. Energ.*, *Fuel*, etc.

He is now serving as the Managing Guest Editor of VSI: Biomass-Energy2021 in *Applied Energy*, Guest Editor of VSI: Green to Blue Economy in *Energy*, Editorial Board Member of *The International Journal of Coal Science and Technology*, Scientific Editor of *Journal of Fuel Chemistry and Technology*, etc.

Speakers



Ashwani K. Gupta
University of
Maryland, USA

GMT+1 15:00-15:10

Topic: Gasification and Pyrolysis of Biomass and Wastes

Abstract:

Short Bio: Dr. Ashwani K. Gupta is a Distinguished University Professor at the University of Maryland, College Park. He obtained his PhD and higher doctorate (DSc) from the University of Sheffield, UK, and also DSc from the University of Southampton, UK. He received Honorary Doctorates from the University of Wisconsin Milwaukee, the University of Derby, UK, and KMUTNB, Thailand. His research interests include swirl flows, combustion, air pollution, sprays, high intensity distributed combustion, fuel reforming, waste and biomass to clean fuels, pyrolysis and gasification, and laser diagnostics for high speed flows. He is Honorary Fellow of American Society of Mechanical Engineers (ASME) and Royal Aeronautical Society (RAeS) UK, and Fellow of American Institute of Aeronautics and Astronautics (AIAA) and Society of Automotive Engineers (SAE), American Association for the Advancement of Science (AAAS). He has co-authored over 290 journal papers, over 500 conference papers, 3 books, and 18 edited books.



Manosh Paul
University of
Glasgow, UK

GMT+1 15:10-15:20

Topic: BioH₂ and BECCUS: Challenges and Opportunities

Abstract: Potential opportunities with challenges in the production of carbon neutral/net-negative emission bio-syn hydrogen from biomass and other waste will be presented and discussed in this talk.

Short Bio: Professor of Thermofluids, Energy and Sustainability Group, Systems, Power & Energy (SPE) Research Division of the James Watt School of Engineering, University of Glasgow, UK.



Wan Azlina Wan Ab
Karim Ghani
Universiti Putra
Malaysia

GMT+1 15:20-15:30

Topic: Biochar as Potential Renewable Solid Fuel Power Generation

Abstract: In Malaysia, the primary agricultural business is oil palm, from which about 90 million metric tons of biomass has been harvested, with 12.4 million tonnes/year of EFB have been generated. Previous research has investigated a variety of biomass conversion, including hydrothermal, carbonization, and pyrolysis. Therefore, herein, the proximate, ultimate and ash compositional analyses of EFB biochar generated by conventional and microwave-assisted pyrolysis, as well as their combustion performance as prospective solid fuel candidates for power generation, were performed in this study.

Short Bio: Prof. Ir. Dr. Wan Azlina currently a Head of Sustainable Process Engineering Research Centre (SPERC) at the Universiti Putra Malaysia. Her research background focusing on the sustainable chemical valorisation of biomass and wastes valorisations to bioenergy, biofuel and biomaterials. As YSM members, her active commitments in the review and formulation of several National Policy in Science, Technology & Innovation (NPSTI) enriches her knowledge and skills in dissecting key contemporary international and regional science policy issues related to future studies, waste management, while intimating how science, technology, and innovation contribute to policy developments, global governance and sustainable development of communities around the world.



Yun Hang Hu
Charles & Carroll
McArthur Endowed
Chair Professor,
Michigan
Technological
University, USA

GMT+1 15:30-15:40

Topic: Hydrogen Production from Biomass

Abstract: The technologies of hydrogen production from biomass will be highlighted and the challenges of their commercial applications will be discussed.

Short Bio: Dr. Hu is Charles & Carroll McArthur Endowed Chair Professor, Michigan Technological University. He is a fellow of American Association for the Advancement of Science (AAAS), American Chemical Society (ACS), American Physical Society (APS), American Institute of Chemical Engineers (AIChE), American Society of Metals (ASM International), and Royal Society of Chemistry (RSC). He was the chair of the ACS Energy and Fuels Division. He is the editor-in-chief of "Energy Science & Engineering" (Wiley journal) and an editorial board member for 8 international journals. His main research interests range from energy materials, clean fuels, solar energy, batteries, supercapacitors, fuel cells, photocatalysis, and hydrogen storage to CO₂ conversion with about 300 papers published in prestigious journals.



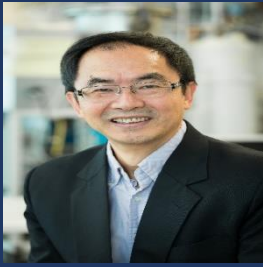
Weihong Yang
KTH-Royal Institute
of Technology

GMT+1 15:40-15:50

Topic: Pyrolysis of Biomass for add-value products: Opportunities and Challenges

Abstract: Biomass is not only the renewable energy, but also one of two renewable carbon materials. Pyrolysis of biomass can produce both energy and carbon materials, which leads to a resource efficient application. Commercial challenges from technology, markets and policy shall be identified and discussed.

Short Bio: Weihong Yang is a researcher at KTH. Mainly R&D activities are thermal conversion of biomass and waste for high added value products including syngas, biooil, biochar and hydrogen. He has more than 120 refereed papers and 4 chapters of books, and 5 PCT patents including pending. He has been coordinating and involved many research projects in the field of biomass/waste thermal conversion.



Xiaotao (Tony) Bi
The University of
British Columbia,
Canada

GMT+1 15:50-16:00

Topic: Novel thermochemical conversion technologies for biomass residues
Abstract: This talk will give an overview on the development of novel thermochemical conversion technologies for converting biomass residues to gas, liquid and solids biofuels. The economic and environmental impacts and benefits of those bioenergy conversion pathways will be discussed based on life cycle analysis and techno-economic analysis.

Short Bio: Dr. Xiaotao (Tony) Bi is the Methanex Professor in Clean Energy Systems in the Department of Chemical and Biological Engineering at the University of British Columbia and the director of UBC's Clean Energy Research Centre and Biorefining Research and Innovation Centre. Dr. Bi's research focuses on particle technology, fluidized bed reactors, biomass thermo-catalytic conversion, and life cycle analysis and integrated assessments of clean energy systems. A Fellow of the Canadian Academy of Engineering and Engineers Canada, he is the recipient of a UBC Killam Senior Research Fellowship, the American Institute of Chemical Engineers Particle Technology Forum Lectureship Award, and the Canadian Society for Chemical Engineering Industrial Design and Practice Award.



Chinnathan
Areeprasert
Kasetsart University,
Thailand

GMT+1 16:00-16:10

Topic: Example of solid biofuel production in pulp and paper industry: From laboratory to commercialization.

Abstract: Since pulp and paper mill consumes large amount of energy produced by a large-scale solid fuel boiler, conversion of paper sludge into solid biofuel using hydrothermal treatment is a sound strategy. Therefore, our goal is to produce the solid biofuel from paper sludge and utilize within the mill to reduce the consumption of conventional fossil fuel. Keeping this goal in mind, a series of experiment has been conducted. This presentation shows the research and development experiences from laboratory to commercialization of the hydrothermal technology.

Short Bio: Dr. Chinnathan Areeprasert is an associate professor at Kasetsart University, Thailand. His major research areas are waste and biomass thermochemical conversion technologies.

Discussion: Scientific strategies to overcome challenges in the commercialization
of biomass renewable energy technologies

GMT+1 16:10-16:30

Panel Discussion

Challenges in the commercialization of biomass renewable energy technologies

Time: 10:00 am–12:00 pm Dec. 3rd CET, central Europe time (GMT+1)

Panel introduction

As the world marks the fifth anniversary for the adoption of the Paris Agreement on climate change, promising steps towards carbon neutrality are taking shape. In a response to deal with the climate crisis and environmental pollutions, many countries have revised their energy schemes, where renewable energy plays an important role. Among the different forms of renewable energy, biomass has been considered as an imperative resource that can be used to provide a variety of energy needs, including generating electricity, fueling vehicles, and providing heat. According to some estimations, biomass is considered as the fourth largest energy source in the world after coal, petroleum, and natural gas, which is accounted for 14% of the world's primary energy consumption. The main advantage of biomass, as the only renewable carbon source, over all other renewable resources is the possibility to be converted into solid, liquid, and gaseous fuels through different conversion routes.

However, the commercialization of biomass renewable energy technologies has been facing with challenges due to the natural characters of biomass including low bulk density, low energy density, high moisture content, high oxygen content, feeding issues, soot and tar generation and fouling problems during thermal conversion. The topics of this panel discussion mainly include the development space and technical challenges of biomass based bulk chemicals/high value-added chemicals/power generation/fuel cell etc. We hope that this panel will provide researchers some inspiration and facilitate the development of advanced techniques for exploring efficient biomass utilization systems in the future.

Panel Discussion

Moderator



Lu Ding, East China University of Science and Technology, dinglu@ecust.edu.cn

Short Bio

Dr. Lu Ding is an Associate Professor from Institute of Clean Coal Technology, East China University of Science and Technology. He is long-term commitment to basic research and related engineering technology development of coal/biomass gasification and resource utilization of organic solid wastes. He has coauthored over 70 peer-reviewed scientific papers, including Appl. Energ., Fuel, etc.

He is now serving as the Managing Guest Editor of VSI: Biomass-Energy2021 in Applied Energy, Guest Editor of VSI: Green to Blue Economy in Energy, Editorial Board Member of The International Journal of Coal Science and Technology, Scientific Editor of Journal of Fuel Chemistry and Technology, etc.

Speakers



Kunio Yoshikawa
Tokyo Institute of Technology, Japan
GMT+1 10:10-10:20

Topic: How to phase out coal usage by replacing it with biomass?

Abstract: Production of coal alternative fuel from biomass is challenging due to non-uniformity, high moisture content, low bulk density, low heating value, and high alkaline content of biomass. We have developed an innovative hydrothermal treatment technology (HTT) for upgrading biomass to be co-fired with coal. In this presentation, commercial-scale experiences of HTT will be introduced.

Short Bio: Dr. Kunio Yoshikawa is a professor emeritus and a researcher at the Tokyo Institute of Technology, Japan, and an associate editor of Applied Energy. His major research areas are energy conversion, thermal engineering, combustion, gasification, and waste treatment technologies. His main awards are AIAA Best Paper Award in 1999, ASME Harry Potter Gold Medal in 2001, JSME Environmental Technology Achievement Award in 2006, Best Educator Award of Tokyo Institute of Technology in 2014, and Best Editor Award of Applied Energy, 2020.



Xun Hu
University of Jinan, China
GMT+1 10:20-10:30

Topic: Carbon materials from bio-oil

Abstract: High-strength carbon materials can be produced from polymerization of bio-oil and bio-char with aid of a polymerisation agent such as furfural at 170–280°C. The strength of the material originates from the cross-linking structure formed via the cross-polymerisation between bio-oil, furfural and biochar. In this process, furfural played an essential role in “bonding” together of bio-oil and biochar. The components in bio-oil is also very reactive towards polymerisation while biochar could also cross-polymerize with furfural or bio-oil. The resulting carbon material has low ash yield, sulfur content and nitrogen content, while its potential use needs to be further explored.

Short Bio: Dr Xun Hu is currently a full professor in University of Jinan. He obtained his PhD degree from the Chinese Academy of Sciences in 2010. From 2010 to 2016, he worked in Fuels and Energy Technology Institute, Curtin University (Australia) as a Postdoctoral Research Fellow under the supervision of Professor Chun-Zhu Li and later hold a position of Curtin Research Fellow in Curtin University. Since October 2016, he joined University of Jinan (China) and

established a research group. His major research interest includes the pyrolysis/hydrolysis of biomass and the conversion of biomass to biofuels, value-added chemicals and carbon materials. His research activities can be found in the link below: <https://orcid.org/0000-0003-4329-2050>; https://scholar.google.com/citations?hl=zh-CN&user=_08hJZYAAAAJ



Guoqing Guan
IRI, Hirosaki
University, Japan

GMT+1 10:30-10:40

Topic: Development of small-scale biomass gasifiers

Abstract: Biomass gasification to provide gas fuels for power generation is considered as one of the best ways for substituting fossil fuels. Large scale unit of biomass gasification with capacity over 2 MW is preferably chosen due to its efficiency to investment ratio even though collecting large amount of biomass takes high cost. To effectively utilize the biomass resource in local and regional areas, it is expected to apply more small-scale biomass gasifiers with a capacity less than 200 kW for a small community or even a family. This will help to let bioenergy become more popular in our daily life. In this talk, I will introduce our endeavors on development of a separated-type small-scale biomass gasification system, and discuss the challenges and prospects of it in the future

Short Bio: Dr. Guoqing Guan is a full professor of Hirosaki University, Japan. He received his B.S., M.S. and PhD degrees in Chemical Engineering from Sichuan University, China and Kyushu University, Japan, in 1990, 1993, 1995 and 2004. He had ever worked at Kyushu University (10/1999-9/2001), National Institute of Advanced Industrial Science and Technology, Japan (10/2001-3/2005), IMM, Germany (4/2005-7/2006), Fukuoka Women`s University, Japan (8/2006-2/2009), and The University of Tokyo (3/2009-9/2010) His main research interests include biomass energy conversion, biorefinery and energy-related materials. He has published over 360 international journal papers, 40 patents and 10 book chapters From 2018, he is also the editorial board member of “Fuel Processing Technology”, an associate editor of “Carbon Resources Conversions”, and a guest editor of “Molecular Catalysis”.

HP: Guan Group (google.com)



Xiangzhou Yuan,
Korea University,
Korea

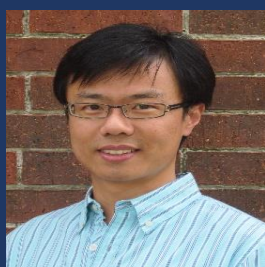
GMT+1 10:40-10:50

Topic: Applied Machine Learning for Prediction of CO₂ Adsorption on Biomass Waste-Derived Porous Carbons

Abstract: Biomass waste-derived porous carbons are a class of complex materials that are widely used in sustainable waste management and carbon capture. However, their diverse textural properties, the presence of various functional groups, and the varied temperatures and pressures to which they are subjected during CO₂ adsorption make it challenging to understand the underlying mechanism of CO₂ adsorption. Thus, this talk will introduce our latest research output on machine learning-guided CO₂ capture performance using biomass waste-derived porous carbons.

Short Bio: Dr. Yuan is a Research Professor at Korea University in Seoul, South Korea. His academic background covers greenhouse gas adsorption and separation, low carbon technology, waste management, engineered biochar, life-cycle sustainable assessment. He has published over 40 refereed journal articles including *Nat. Rev. Earth Environ.*, *Matter*, *Small*, *Renew. Sustain. Energy Rev.*, *Environ. Sci. Technol.*, etc. He is active in servicing as the Outside Director

of Sun Brand Industrial Inc. from 2020 and the Key Academic Committee of International Cooperation Research Centre of Carbon Capture in Ultra-low Energy-consumption, Tianjin, China from 2018. In addition, he is servicing as managing guest editor of VSI: *Zero-plastic* in *Environmental Pollution*, Guest Editor of VSI: *Bio-Sustain* in *Biomass & Bioenergy*, etc.



Jiahua Jack Zhu
Associate Dean,
College of Chemical
Engineering,
Nanjing Tech
University, China

GMT+1 10:50-11:00

Topic: Improving techno-economy of biomass conversion by integrating biomass-skeleton products

Abstract: The first part will introduce a scalable and sustainable top-down method to “peel-off” hierarchical porous structure from natural biomass and use it for water purification and environmental catalysis. The production of such unique-structured materials was then integrated into a biomass conversion system to improve the techno-economy of the entire process. The integration of advanced material development into biomass conversion has been demonstrated promising in supporting the commercialization of biomass energy.

Short Bio: Dr. Jiahua Zhu, professor of Chemical Engineering at Nanjing Tech University. His research interest covers the biomass processing, biomass-based advanced materials and bio-energy conversion by using chemical technologies. Dr. Zhu has coauthored more than 150 peer-reviewed journal articles. Dr. Zhu received Young Leader Development Award from Functional Material Division of The Minerals, Metals & Materials Society, Early Career Award from Polymer Processing Society and Early Career Investigator Award from ECS Electrodeposition Division.



Taufiq Yap Yun Hin
Vice Chancellor of
Universiti Malaysia
Sabah (UMS)

GMT+1 11:00-11:10

Topic: High value-added chemicals from biomass catalytic conversion

Short Bio: Prof. Taufiq is the Vice Chancellor of Universiti Malaysia Sabah (UMS), and he obtained his Bachelor's Degree in Chemistry from Universiti Pertanian Malaysia in 1992 before furthering his studies at the same university in 1994. In 1997, Taufiq received his doctorate degree in the field of Heterogeneous Catalysis from the University of Manchester Institute of Science and Technology, United Kingdom. He was also active in academic journal writing, conferences and proceedings. He was appointed as The Royal Society of Chemistry Fellow in the United Kingdom in 2008. His main research interests cover catalysis, biomass conversion, and biofuels.



Abd El-Fatah
Abomohra
(Chengdu University,
China)
Tanta University,

Topic: Challenges and opportunities towards environmental sustainability

Abstract: Microalgae cultivated in wastewater have attracted much interest in the last decades for dual purpose of phycoremediation and biofuel production. Microalgae biorefinery is nowadays a widely used statement for efficient utilization of microalgae, which is getting much attention. Therefore, recent advances in microalgae cultivation to achieve a circular economy is a timely topic that deserves in-depth discussion. This speech aims to addresses the historical and potential use of microalgae for enhancing the human health and preventing diseases. In addition, integrated approaches for microalgae cultivation, waste recycling, and biofuel production will be evaluated in order to introduce all the latest novel technologies for a circular bioeconomy.

Short Bio: Abd El-Fatah Abomohra, PhD, is a Professor of Environmental Engineering at the Department of Environmental Engineering, School of

Egypt

GMT+1 11:10-11:20

Architecture and Civil Engineering (SACE), Chengdu University (China). He received his PhD in “Phycology” through a cooperation program between Tanta University (Egypt) and Hamburg University (Germany) funded by Deutscher Akademischer Austauschdienst (DAAD). He has stupendous research experiences and finite vision in the field of biofuel production. According to Web of Science, he published more than 100 SCI papers, most of them are in Q1 journals with 4 papers as “Highly Cited Paper”. His research group is primarily working on bioenergy production from different biomass feedstocks and wastes.



Muhammad Aziz
Assoc. Prof./Lab Head,
Institute of Industrial
Science, The University
of Tokyo, Japan

GMT+1 11:20-11:30

Topic: Empowering Biomass Utilization and Integration in Future Energy System
Abstract: Biomass as primary energy source has a long history in the human civilization. However, its utilization is still limited due to some barriers in technology, economy, and social acceptance. Biomass has characteristics which are not owned by other renewables; therefore, optimal utilization of biomass based on its peculiar characteristics is crucial toward broader utilization. Optimal operation based on these characteristics is expected able to reform the energy market. In addition, integration of biomass with other renewables is also encouraged to solve both technological and economic problems faced today.

Short Bio: Dr. Aziz is currently an associate professor at Institute of Industrial Science, The University of Tokyo. He manages Energy and Process Integration laboratory, focusing on advanced energy conversion, production and utilization of carbon-free secondary energy sources, energy storage, and future energy systems. He has published more than 150 scientific journals, as well as numerous proceedings, books, chapters, and other.



Beibei Yan
Professor
Tianjin University
Tianjin, China

GMT+1 11:30-11:40

Topic: Microwave catalytic reforming: A potential approach for treatment of biomass gasification tar

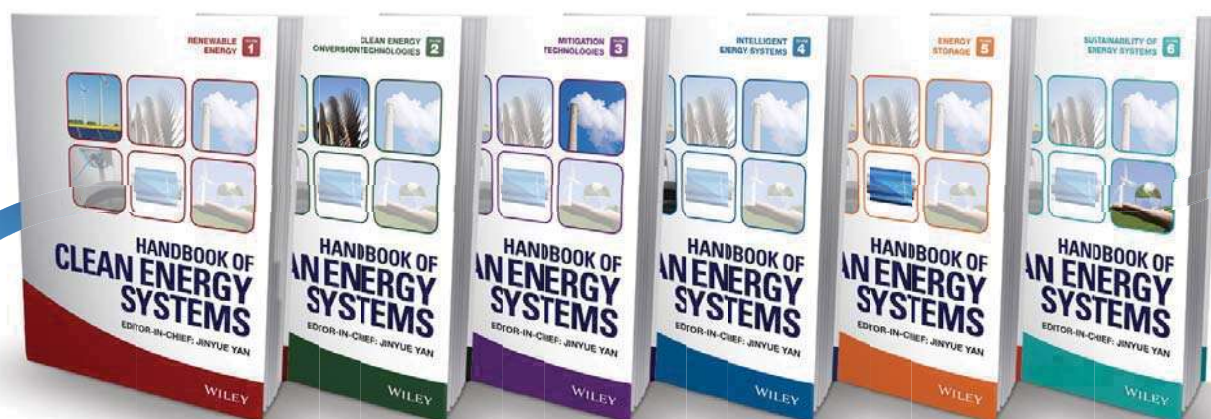
Abstract: Tar is the bottleneck of biomass gasification development. In this study, microwave was innovatively applied for tar treatment. Firstly, the microwave applicable catalyst was prepared for catalytic cracking of toluene. Then the developed catalyst was prepared for toluene reforming in the gasification atmosphere. Based on the comparison between conventional heating cracking, it was proved microwave irradiation could efficiently eliminate the coke deposition, especially for the filamentous coke. Finally, the energy feasibility of microwave catalytic reforming was investigated by net energy analysis method. It is hoped that this study could provide the insights for the mechanisms of microwave, catalysis and tar reforming process, and pave a way for the industrial application of microwave based tar treatment.

Short Bio: Beibei Yan is a professor of Tianjin University. Supported by the Outstanding Youth Fund of The National Natural Science Foundation of China and the Outstanding Youth Fund of Tianjin, Prof. Yan is mainly engaged in thermochemical conversion of organic solid wastes and pollutant control. The total amount of personal project funds has exceeded 10 million RMB. As the first or corresponding author, she has published more than 50 SCI papers and obtained more than 30 authorized invention patents.

Discussion: Scientific strategies to overcome challenges in the commercialization
of biomass renewable energy technologies

GMT+1 11:40-12:00

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Panel Discussion

Design and operation optimization of aggregate energy systems

Time: Dec. 2nd 13:00–14:40 (GMT+1)

Speakers



Prof. Emanuele
Martelli

Politecnico di Milano

GMT+1 13:00-13:15

Design and operation optimization of aggregate energy systems Short Bio

Emanuele Martelli (1982) is tenured Associate Professor of Energy Systems and Power plants at Politecnico di Milano. He received the master degree in mechanical engineering (2006) and the PhD in Energy Engineering from Politecnico di Milano (2010). His main research interest is the development of models and algorithms for the optimization of energy systems and power plants. His research in the area of aggregate energy systems (energy districts, microgrids and virtual power plants) focuses on the development of efficient methods to optimize their design and operation under uncertainty. He is co-author of over 100 international publications and principal investigator of several projects funded by leading energy companies and public institutes.



Prof. Jianzhong
Wu

Cardiff University

GMT+1 13:15-13:30

Integrated Energy Networks Enabling a Carbon Neutral Future Short Bio

Prof Jianzhong Wu is Professor of Multi-Vector Energy Systems and Head of School of Engineering at Cardiff University. He researches on Smart Grid and Multi-Vector Energy Systems. He has contributed to more than 60 EC, EPSRC and industry funded projects and has published more than 260 peer-reviewed papers and is a co-author of books “Smart Grid: Technology and Applications” (2012, Wiley), “Smart Electricity Distribution Networks” (2017, CRC) and “The Future of Gas Networks” (2019, Springer). He is Co-Director of the UK Energy Research Centre, Associate Editor of Applied Energy, and Fellow of Energy Institute and the Learned Society of Wales.



Dr. Sara Walker
National Centre for
Energy Systems
Integration

GMT+1 13:30-13:45

Building as a Power Plant

Short Bio

Dr Sara Walker has BSc (Hons) Physics, PGCE, MSc Environmental Science and a PhD in energy policy. She has 5 years of experience in industry and over 20 years of experience in academia. Dr Walker is Director of the Centre for Energy Systems Integration (CESI), Deputy Director of the Supergen Energy Networks Hub and Academic Deputy Director of the Active Building Centre, with a portfolio of research projects of total value £68m. She has numerous journal and conference papers covering topics of renewables, building energy performance, impact of buildings/renewables on energy networks and energy policy.



Prof. Fernando de Cuadra
Universidad Pontificia
Comillas

GMT+1 13:45-14:00

The role of microgrids in electrification planning: an integrated distribution approach from the Universal Energy Access group”

Short Bio

Prof. Fernando de Cuadra was born in Madrid, Spain, in 1961. He received the B.S.+M.S. (1985), and Ph.D. (1990) degrees in Industrial Engineering, and an Executive MBA (2010) degree at Universidad Pontificia Comillas, Madrid (Spain). At Comillas he is Full Professor, and from 2001 to 2010 he was the Dean of the ICAI School of Engineering. His research includes simulation and direct-search optimization applied to aerospace, railways, and power systems. In 2016, he joined the Universal Energy Access Lab, a MIT-Comillas joint research group, working in the design and specification of general models, methods, and tools for large-scale electrification planning.



Prof. Geert Deconinck
KU Leuven university

GMT+1 14:00-14:15

Grid-constrained distributed optimization for frequency control with low-voltage flexibility

Short Bio

Prof.dr.ir. Geert Deconinck is full professor at KU Leuven university (Belgium). His research focuses on robust distributed coordination and control, specifically in the context of smart electric distribution networks. In this field, he has authored and co-authored over 500 publications in international journals and conference proceedings. Since April 2012, he is head of the research group ELECTA (Electrical Energy Systems and Applications) at the Department of Electrical Engineering (ESAT), and is CSO of the Energy Ville, the research centre on energy for sustainable cities.

Discussion

GMT+1 14:15-14:40

Panel Discussion

PV systems for agricultural applications

Time: Dec. 2nd 14:50–16:30 (GMT+1)

Agriculture is one of the most water- and energy-intensive sectors of the economy, consuming about 70% of global freshwater withdrawals. On a global scale, the agri-food chain consumes about the 30% of the total energy supply. Given the projections on population growth and related food demand, and the potential negative impacts that climate changes might have on the agri-food system, it is of paramount importance to provide access to clean and affordable energy for food, water, and social security. This will allow to attain the United Nations Sustainable Development Goals (SDGs), especially, SDGs 2 (Zero Hunger), 6 (Clean Water and Sanitation), 7 (Affordable and Clean Energy), and 13 (Climate Action), decarbonize an energy-intensive sector, and improve incomes and living standards especially in developing countries and remote areas.

In this context, renewable energies and especially PV systems can play a key role in the water-food-energy nexus of the agricultural and in general of the agri-food sector. The integration of PV systems with agricultural or aquaculture activities in the form of photovoltaic water-pumping systems, agrivoltaics, and floating photovoltaic systems, to cite some, allows to maximise land and water use efficiency without creating conflicts among the SDGs. PV systems allow not only to produce clean electricity combating climate changes but also offer a solution for climate adaptation by reducing evaporation losses from water bodies (i.e., floating PV systems), reducing crop water and temperature stresses (i.e., agrivoltaic systems), and maintaining the match between water consumption and production (i.e., water pumping systems). PV systems also offer an important solution for the decarbonization of the most cutting-edge technologies introduced in the agricultural sector, by way of example agricultural robots and electric tractors.

This panel session will present and discuss some of the recent results and advancement on the integration of PV systems in agriculture during the recent years. It includes panellists from Belgium, China, Italy, Iran, Japan, and Sweden. There will be five presentations, of which three are connected to papers submitted to the conference, by researchers from different regions including Belgium, Iran, Italy, and Japan.

Moderator



A/Prof. Pietro Elia
Campana

Mälardalen University

GMT+1 14:50-15:00

Short Bio

Dr. Pietro Elia Campana is currently an Associate Professor (Senior Lecturer) at Mälardalen University, where he received his PhD in Energy and Environmental engineering in 2015. Dr. Campana's research fields include distributed renewable energy systems, solar radiation assessment, water-food-energy nexus, and artificial intelligence for energy issues. Up to now, he has more than 90 publications among peer-reviewed international journals (including one paper in Nature Energy), conferences, books/monographs, and book chapters. He is currently an Assistant Editor of the Elsevier journal Applied Energy and also an editor in the newly launched Elsevier journal Energy Nexus. Since 2020, he has been also appointed as co-chair of the Community of Practice on the water-food-energy nexus under the Group on Earth Observations (GEO).



Dr. Bengt Stridh

Mälardalen University

GMT+1 15:00-15:10

Short Bio

Dr. Bengt Stridh has been working for more than 15 years with photovoltaics (PV) systems at ABB Corporate Research until 2018. Since 2012 part time as researcher and since October 2018 full time as senior lecturer at Mälardalen University, performing research and education in solar energy. The research has been focused on operation, simulation, and evaluation of PV systems, including economy, regulations and support systems for PV.

He is one of the Swedish representatives in IEA PVPS Task 13 on Performance and Reliability of Photovoltaic Systems since 2011 and since 2015 also in IEA PVPS Task 15 on Enabling Framework for the Acceleration of BIPV.

Speakers



Assistant Professor
Shiva Gorjian

Tarbiat Modares
University

GMT+1 15:10-15:20

Transition Towards Sustainable Agriculture and Food Systems Relying on Advanced Solar Energy Technologies

Abstract

The world's population growth is expected to reach over 9 billion people by 2050, threatening food security as the major facet of sustainability. Population and economic growth along with climate change have affected the agriculture sector by putting strain on food security with an unprecedented increase in food demand by 60%, energy demand by 80%, and water demand by 50%. According to the statistics released by the Food and Agriculture Organization (FAO), the agri-food supply chain (AFSC) is responsible for 24% of total global greenhouse gas (GHG) emissions due to the heavy reliance of its several associated activities on fossil fuels. Different approaches have been employed till now to address this issue that among them investing in the 'energy-smart' food systems with increased energy efficiency and reduced CO₂ emission has received much recent attention. The employment of solar energy with fast-growing associated technologies, nascent market, and the highest adaptability with a wide range of agricultural activities offers a solution to achieve sustainability in this sector. With the flexibility and sustainability added by solar systems to AFSCs, it is expected that both mitigation and adaptation strategies will be met in coping with climate change impacts. However, the in-depth analysis of interventions between solar energy and agriculture especially in terms of global markets, economy, and implemented policies is crucial. It is expected that solar energy

could open new doors to agricultural technologies, giving birth to new and novel systems that form future activities.

On the Advent of Solar Concentrating Photovoltaic Modules in Crop Cultivation Environments

Abstract

Energy is a crucial component of the agri-food sector since almost 30% of the world's energy is consumed by this sector. Under such circumstances, the employment of renewable energies can be a sustainable solution to mitigate the adverse environmental impacts as consequences of the greenhouse gas (GHG) emissions from the agri-food supply chain. Generation of electricity using photovoltaic (PV) technology to supply the power demand of the agriculture and food production sectors requires large areas of land. To solve this problem, the co-generation of solar PV electricity and crop production (agrivoltaic concept) is expected to relieve this restriction. An emerging agrivoltaic technology is the installation of concentrating PV (CPV) systems in crop cultivation environments to both provide the power demand and produce food on the same land. This study presents an overview of agrivoltaic systems and CPV technology with a special focus on the advent of CPV modules in agricultural environments. In this case, the main benefits and challenges of this technology are presented and discussed.

Short Bio

Dr. Shiva Gorjian is Assistant Professor in Biosystems Engineering Department (Faculty of Agriculture), and Renewable Energy Department (Faculty of Interdisciplinary Science and Technology) at Tarbiat Modares University (TMU), Tehran, Iran. She received her Ph.D. in Mechanics of Biosystems Engineering, from TMU with the first ranked graduation in 2014. She is the editor of the book entitled "Photovoltaic Solar Energy Conversion: Technologies, Applications, and Environmental Impacts" which was published by Elsevier in 2020. Her main field of study is applications of renewable energies in agriculture and food production systems. She has been the Managing Guest Editor (MGE) of a Special Issue on "Feasibility, Efficiency and Sustainability of Renewable Energy Applications in Agriculture" hosted in the Journal of Sustainable Energy Technologies and Assessments published by Elsevier. Her other fields of interest are solar desalination technologies, hybrid PVT systems, renewable-based power generation systems, energy and exergy analysis, and modeling and simulation of energy systems. She has published several papers in reputational journals and has been invited to speak in several national and international credible conferences.



**Prof. Stefano
Amaducci**

How different agrivoltaic plants affects the radiation environment and crop performances? A simulation study to explore crop response across agrivoltaic design solutions, latitudes and layouts

Abstract

Agri-voltaic solutions (agriPV) are increasingly considered as key technologies to produce renewable energy on land without negative impacts on agricultural activities and food production.

In the last years, a variety of agrivoltaic solutions, characterized by different heights of the panels from the ground, dimensions of the panels, sun-tracking systems, etc., have been installed and tested in almost every continent.

A key aspect in the design and management of sustainable agriPV solutions is the dynamic effect of the shade, which the PV panels cast on the ground, on the growth, yield and quality of crops.

The objective of this work is to identify, through an extensive simulation work, how different agriPV solutions influence spatially and temporally the energy available to crops. Simulations were carried out at different latitudes to investigate what agriPV solution is preferable in a given latitude or how the layout of a certain design solution should be modified in order to maximize the synergy between energy and crop production.

For this purpose, four plant solutions (two stilt mounted and two ground mounted) representing a large proportion of actual agriPV systems were compared using a modelling platform, where a crop model (Gecros) with a high level of physiological detail, is coupled to algorithms for the estimation and spatialization of shading and radiation. The same panel ratio (PV area/soil area = 0.4) was used for all plants. The simulations covered nine Italian locations with latitudes between 35° and 50° and three different plant layouts (0° N, -45° N and 90° N). The simulated crop for all Agrivoltaic systems was industrial tomato.

The results of the simulations showed that the radiation available for crops (mean ground radiation between April and August) is strongly influenced by the latitude for all types of plants with progressively decreasing values from the lowest to the highest latitudes. Average radiation ranged between 450 and 300 W m⁻². Plant layout also had a notable effect on radiation. The highest and lowest radiation values were obtained for the West-West (90°N) and North-South oriented plants (0°N), respectively. Yield results for the tomato crop were slightly influenced by the latitude (and by the radiation values) and the highest yields were obtained at the higher latitudes. The Agrivoltaic system influenced tomato yield, and on average, best results were obtained with the stilt-mounted plants.

Short Bio

Prof. Stefano Amaducci is Full professor of Agronomy and field crops at the Department of Sustainable crop productions, Università Cattolica del Sacro Cuore. Most of his past research was focussed on the agronomic evaluation of industrial crops, particularly for fibre and biomass production. More recently the focus of his research has broadened, studying and developing management strategies to increase sustainability of agricultural systems. Experimental activities are carried out at the interface of crop ecophysiology, applied agronomy and soil science. Recently he is working on the development of the Agrovoltaico technology to combine electric energy to food production on the same land.



Makoto Tajima
Institute for

Factors affected the notable development of agrivoltaics in Japan and its potential

Abstract

Solar power is expected to become a key power source among the renewable energies essential for decarbonization. However, various environmental and socio-economic problems associated with its development have become apparent. Agrivoltaics, which is attracting attention as a solution to these problems, is currently being implemented or planned in 24 countries worldwide, and large-scale commercial facilities are also emerging. Agrivoltaics is a “rational and integrated land use technology that simultaneously provides various environmental and socio-economic services.” It is rapidly evolving through

Sustainable Energy
Policies (ISEP)

GMT+1 15:30-15:40

research and demonstration in various fields, including crop cultivation, aquaculture, and livestock. Currently, Japan has the most extensive installation base of agrivoltaic farms in the world. How has this development been made possible? I will report on the updated situation of agrivoltaics in Japan and identify the factors that have made this development possible. I will also discuss the potential for future expansion to encourage agrivoltaic communities in other countries.

Short Bio

Makoto Tajima has over 25 years of experience in international development work and research working overseas for NGOs and Japan International Cooperation Agency (JICA) as an expert/advisor. He currently acts as director / senior research fellow of the Institute for Sustainable Energy Policies (ISEP), advisor on Disaster Risk Reduction and Response of Japan NGO Center for International Cooperation (JANIC), director of CWS Japan, and director of Women's Eye. His professional background is in natural resources management. MSc in agronomy and soil science specialized in agroforestry, the University of Hawaii.



Brecht Willockx
KU Leuven

GMT+1 15:40-15:50

Development of a quick-scan webtool to facilitate an agrivoltaic system design

Abstract

Interest in agrivoltaic systems (the combination of agriculture and photovoltaics (PV)) is growing. Many small-scale installations show the possible benefits for both the agricultural and energy sector. However, this multidisciplinary technology also results in a complex design process for the various stakeholders (farmers, PV installers, policy makers). This work proposes the first, easy to use, "quick-scan" webtool incorporating several performance indicators on crop and energy level. The webtool provides insights in the relationship of the performance indicators and important cost-determining design parameters, and therefore seriously reduce the design phase. It is concluded that crop impact information is still the missing key in the further development of the tool and this technology.

Short Bio

Brecht Willockx obtained a Master's degree in industrial engineering from the University of Leuven (KUL) with a focus on automation in 2017. He later obtained his second Master's degree in the field of electromechanical engineering, with a specialisation in Energy at the Brussels Faculty of Engineering (BRUFACE) in 2019. In his current study as a PhD student, back at University of Leuven, he investigates the potential of agri-PV. To accomplish this, he mainly focuses on the PV design modelling and practical implementation aspects.



A/Prof. Qie Sun

Short Bio

Dr. Qie Sun received his Ph.D. degree from Royal Institute of Technology (KTH), Stockholm, Sweden. He is now an associated professor at Shandong University, Jinan, China. He is the Head of the Institute of Thermal Science and Technology and Deputy Dean of the Institute for Advanced Technology, Shandong University; the Team Leader of the AMS Thermal at CERN, Geneva; a member of the IEEE PES; and a member of the Innovation Committee of KTH. He is a co-founder of the International Conference on Energy, Ecology and Environment (ICEEE), and was a co-organizer of ICAE, CUE and CPS. He is working as an Associate Editor of E-Prime and was a Guest Editor for special issues in Energy,

Shandong University

GMT+1 15:50-16:00

Applied Energy and Journal of Cleaner Production. He was awarded an Outstanding Reviewer by WoS in 2018 and 2019. His research interests include, sustainable energy systems, evaluation of uncertainty and flexibility, data analysis and system optimization, building energy consumption and demand response, electric energy storage and compressed gas energy storage, heat transfer and thermal management for electronics and renewable energy, especially floating photovoltaics and agrivoltaic systems.

Discussion

GMT+1 16:00-16:30

Panel Discussion

Accelerated climate change and the Food-Energy-Water- Nexus

Time: Dec. 3rd 12:00–13:40 (GMT+1)

The dramatic events of 2021 reveal that in the Anthropocene, climate change can affect everyone, rich and poor around the globe. This year illustrates the importance of the transformation of the fossil fuel-based societies into net-zero-emission societies to avoid severe damages through climate change. The food-energy-water nexus (FEW-Nexus) is at the centre of this transformation process to enable a net-zero emission resilient future. We will discuss the socio-economic transformation options presenting examples from Africa, China and Europe.

We will discuss industrialization of countries to enhance economic growth and inclusiveness by preserving their effectiveness in fighting climate change. The job creation potential of developing countries for a decarbonized economic development is another topic of debate. Furthermore, the technology transfer option to support developing countries in their transformation process will be presented. Thereby a focus will be set on the biogas potential especially for Africa and Europe.

Moderator



Dr. Holger Schlör
Forschungszentrum
Jülich, Jülich, Germany

Short Bio

Holger Schlör studied economics at the University of Heidelberg and went on to complete his PhD in economics in Berlin. He received a scholarship from the German Marshall Fund and the Alfred Krupp von Bohlen und Halbach Foundation. He has conducted research at several scientific institutions and the German Parliament. He is currently working at Forschungszentrum Jülich in the Institute of Energy and Climate Research – Systems Analysis and Technology Evaluation (IEK-STE). His research here focuses on the fields of Sustainable Development, Food-Energy-Water-Nexus, Energy and Resource Economics and Energy Systems Analysis. The “Applied Energy 2017 Outstanding ICAE Paper” price was awarded to his paper: “The energy mineral society nexus – A social LCA model.” He is subject assistant editor of the Journal Applied Energy.

Co-Moderator



Dr. Nicola Cantore
United Nations
Industrial
Development
Organization (UNIDO)

Short Bio

Nicola Cantore holds a Ph.D in environmental economics and management at the University of York and a Ph.D in economics at the Università Cattolica del Sacro Cuore in Milan. He worked as a junior researcher at the FEEM (Fondazione ENI Enrico Mattei) in Milan, as a senior researcher at the Department of Agricultural Economics and Engineering of the University of Bologna and as a research fellow at the Overseas Development Institute in London. He is currently a research and industrial policy officer at the Department of Policy Research and Statistics of UNIDO. His work covers research, capacity building activities and policy advice. His research interests include environment, development and structural change.



**Dr. Wilhelm
Kuckshinrichs**
Forschungszentrum
Jülich, Jülich, Germany

Short Bio

Dr. Wilhelm Kuckshinrichs studied economics at the Universities of Dortmund and Oldenburg. From 1986-1991 he worked also for AGEP, a study group on energy and systems planning, Oldenburg. In 1991, he joined the team of IEK-STE at Forschungszentrum Jülich as an energy economist, and in 2019, he was appointed to the acting head of IEK-STE. He is working in the area of assessment of strategies for systems transformation, primarily for energy systems, but recently also for bio-economic systems. He became speaker of topic3 ‘Energy Systems – Issues of Energy Efficiency and Energy Security’ in the Helmholtz program ‘Technology, Innovation, Society’. He is also appointed as Head of Core Group for ‘Economy and Society’ of the Bioeconomy Centre.

Speakers



Dr. Lea Eggemann
Forschungszentrum
Jülich, Jülich, Germany
GMT+1 12:10-12:20

The Contribution of Manure Utilisation in Biogas Plants in Terms of Climate Change

Abstract

The main source of global CO₂ is heat and electricity production, which requires an increase in renewables that cover fluctuating sources. Biogas plants are one possibility, which are already commonly used in the European energy system. This study focuses on the utilisation of unused manure to reduce direct emissions of methane within an advanced and expensive, and a simplified and less expensive plant. Therefore, the environmental impact in terms of CO₂ eq emissions of a biogas plant with either subsequent combustion in a combined heat and power plant or the direct use of the biogas in a simplified burner are investigated. The analysis shows that the more advanced system yields 493 t CO₂ eq, while the simplified one causes 42 t CO₂ eq per year. Nevertheless, increasing average annual temperatures generate higher manure credits and thus reduce emissions of both plant options to 726 and -178 t CO₂ eq per year, respectively, making the direct biogas usage become more interesting. Thus, both systems hold the potential for savings in terms of improved manure management against the background of climate change.

Short Bio

I graduated in agricultural economics and started working in sustainability management at the research centre Jülich in 2016. In the beginning of 2018, I started my PhD about a novel Power-to-Fuel system, producing methanol from CO₂ in biogas. I am currently a postdoc at the Institute of Energy and Climate Research in Jülich, where I deal with biomass-related topics in energy systems analysis.



Dr. Daphne Keilmann-Gondhalekar
Technical University of Munich TUM, School of Engineering and Design
GMT+1 12:20-12:30

Feasibility of energy generation with biogas at the household level: assessing the impact of anaerobic co-digestion of waste activated sludge and food waste taking a Water-Energy-Food (WEF) Nexus approach, and implications for Europe and Africa

Abstract

The effects of anaerobic co-digestion at a household level with waste activated sludge and food waste as co-substrates were studied in a GD-BMP test with mix ratio volatile solids basis of 20:80, 30:70, 50:50, 70:30 and 80:20 (WAS/OW) respectively. The results obtained were used to assess the feasibility of energy generation and the volume of each waste that can be treated. The highest specific methane yield calculated was of $431.31 \text{ mL}_{\text{CH}_4} / \text{g}_{\text{VS added}}$ from the 30:70 mix ratio sample with an RSD of 4.68%. It was hypothesized that the benefits of adding food waste will shift the C/N ratio leading to a potential coverage to reduce the energy demand from households by 50%. In addition, the benefits from a house scale SBR with microbubble aeration followed by SCSTR anaerobic co-digester. Using the 30:70 mix ratio analyzed, a calculation to obtain the electrical energy that can be recovered from a single household resulted in a 30% reduction of energy coming from the grid. This paper reflects that biogas can be used as a replacement of fossil fuels, reducing the carbon dioxide footprint and the strong link to the WEF Nexus cycle, and discusses the implications for Europe and Africa.

Short Bio

Dr. Daphne Gondhalekar is an urban planner and research scientist at the Chair of Urban Water Systems Engineering, Technical University of Munich, Germany.

Her research focus is integrated urban planning, Water-Energy-Food Nexus, and multi-stakeholder processes in India, Niger, Ghana and Germany. She heads the urban Water-Energy-Food Nexus research group and co-coordinates the TUM Water-Energy-Food Nexus field of study in the Environmental Engineering Masters Programme. She holds a Ph.D. in Urban Planning from The University of Tokyo and a Masters and Bachelor in Architecture and Urban Design, has worked as Postdoctoral Associate at Department of Urban Studies and Planning at Massachusetts Institute of Technology (MIT), USA and Center for Development Research (ZEF), University of Bonn, Germany.



Prof Xing Fan
Institute of
Environment and
Ecology, Shandong
Normal University,
Ji'nan, Shandong,
250358

Food-energy-water nexus in context of planting and breeding coupling mode-a case study in China

Abstract

Towards the goal of sustainable agricultural development, China has issued a series of practical policies promoting the coupling of crop planting and livestock breeding, where crop straws are collected and used as animal green feeds and animal manure are treated and recycled in croplands to provide nutrients. In this study, the trade-offs and synergies among food, energy and water resources were quantified for the planting and breeding coupling mode of Chinese agriculture. Taking a typical project as the case, the energy and water resource consumption along the cycling process of planting and breeding coupling system was calculated considering the specified food yields. The saving potential of such food-energy-water nexus incorporating technical and managerial innovation was also simulated in context of SDG goals of UN and carbon neutrality of China. Finally, a range of policy suggestions were proposed for the promotion of circular agriculture in China.

Short Bio

Xing Fan is an associate professor in Institute of Environment and Ecology of Shandong Normal University. She obtained Ph.D. degree in environmental science from Zhejiang University. Her research focuses on ecological engineering. She has published more than 10 papers in journals including Nature Communications, Environmental Science and Technology, Applied Energy, Ecological Engineering, etc.



Prof. Bin Chen,
State Key Joint
Laboratory of
Environmental
Simulation and
Pollution Control,
School of
Environment, Beijing
Normal University,
Beijing 100875, China

Bin Chen is a full professor at Beijing Normal University in the School of Environment as well as the State Key Joint Laboratory of Environmental Simulation and Pollution Control. He obtained B.E. degree in electrical engineering from Zhejiang University, and Ph.D. degree in environmental science from Peking University. His background is environmental system modelling studies. He has authored more than 200 academic publications in peer-reviewed journals including Science Advances, Nature Communications, Nature Climate Change and Proceedings of the National Academy of Sciences (PNAS). He is serving as Editor-in-Chief of Energy, Ecology and Environment, Executive Editor of Journal of Cleaner Production, Associate Editor of Frontiers of Earth Science, Subject Editor of Applied Energy, Ecosystem Health and Sustainability, and an editorial board member of Energy, Ecological Modelling, Journal of Environmental Management, Journal of Hydrodynamics, Ecological Informatics, Fundamental Research, Environmental and Sustainability Indicators, Current Research in Environmental Sustainability, etc.

GMT+1 12:30-12:40



Dr. Wen Zhang

Institute of
Environment and
Ecology, Shandong
Normal University,
Ji'nan, Shandong,
250358



Prof Bin Chen

State Key Joint
Laboratory of
Environmental
Simulation and
Pollution Control,
School of
Environment, Beijing
Normal University,
Beijing 100875, China

GMT+1 12:40-12:50

Energy-water nexus stress driven by food trading in China

Abstract

Food production has consumed considerable energy and water resources in China. In this study, an energy-water nexus stress evaluation framework was proposed considering local food scarcity. The energy and water transfer embedded in the food trading activities was also assessed using multiple regional input-output method according to the food supply and demand in China. The spillover effects and saving potential were then simulated considering the current food trading pattern. The results showed that the spatial heterogeneity of energy-water nexus stress in China was notable, of which Beijing and three coastal provinces, Zhejiang, Fujian and Guangdong, were of higher resource stress. It was concluded that the hidden transfer of energy and water in food trade should be highlighted to promote the collaborative resource utilization on the national scale.

Short Bio

Wen Zhang is an associate professor in Institute of Environment and Ecology of Shandong Normal University. She obtained Ph.D. degree in environmental science from Northwest Agriculture & Forestry University. Her research focuses on sustainable agriculture. She has published more than 10 papers in journals including Journal of Environmental Management, Plant Cell and Environment, Journal of Agro-Environment Science and Transactions of the Chinese Society for Agricultural Machinery, etc.

Prof Bin Chen is a distinguished professor of environmental system modelling at Beijing Normal University. Dr. Chen has published over 200 peer-reviewed papers in international journals such as Science Advances, Nature Communications, Nature Climate Change, PNAS, etc. He is serving as Editor-in-Chief of Energy, Ecology and Environment, Executive Editor of Journal of Cleaner Production, Associate Editor of Frontiers of Earth Science, Subject Editor of Applied Energy, etc.



Mr. Abu Saieed
United Nations
Industrial
Development
Organization (UNIDO)
GMT+1 12:50-13:00

Are Energy Efficiency Improvements Always the Most Cost-Effective Investments?

Abstract

The United Nations Industrial Development Organization (UNIDO) implemented the Mediterranean Transfer of Environmentally Sound Technology (MED/TEST) Phase II in the Southern Mediterranean Region between 2016 and 2018. This paper reports the findings of resource efficiency demonstrations with 58 companies in three North African countries (Algeria, Morocco, and Tunisia). The paper draws on the findings of Material Flow Cost Accounting that estimates the full costs of energy, water, and raw materials used in production processes, and of Resource Efficiency and Cleaner Production Assessments that identify feasible and cost-effective interventions. The combination of these two tools allows for a comparison of the payback periods of a full range of potential resource efficiency measures. Not surprisingly, there are several water and raw materials measures that have returns on investment similar to those for energy measures.

Short Bio

Abu Saieed is working as an International Expert on Green Industry at the Department of Environment of the United Nations Industrial Development Organization (UNIDO) based in Vienna, Austria. As a technical expert, he is responsible for the UNIDO's portfolio under Partnership for Action on Green Economy (PAGE) in Asian and African countries. Before joining UNIDO, Mr. Saieed worked for the International Atomic Energy Agency in Austria, United Nations Development Programme in Bangladesh, and several research institutes. He is an economics and public policy graduate of Central European University, Hungary, and the National Graduate Institute for Policy Studies, Japan



Dr. Stelios Grafakos
European Office of the
Global Green Growth
Institute (GGGI)
GMT+1 13:00-13:10

Assessment of jobs creation potential of NDC Renewable Energy targets in selected African countries

Abstract

This study assessed the employment co-benefits of implementing targets related to renewable energy (RE) set in the Nationally Determined Contributions (NDCs) under the Paris Agreement in five GGGI Member developing countries in Africa. Quantitative NDC targets related to RE were found for five African countries related to five RE technologies, namely 1) solar photovoltaic, 2) onshore wind, 3) biomass, 4) geo-thermal, and 5) hydropower. The study used employment factors (EFs) to estimate the number of direct job-years generated as a result of investments in RE to achieve the NDCs. EFs, particularly in the RE sectors, were obtained from an extensive literature review and subsequently adjusted for each country under study to account for national labor market conditions and changes over time. RE job-years are estimated separately for four stages in the value chain: 1) construction and installation, 2) manufacturing, 3) operation and maintenance, and 4) fuel production.

Short Bio

Dr Stelios Grafakos is the Head of the European Office of the Global Green Growth Institute (GGGI) and Global Lead of GGGI's work on Long Term – Low Emission Development Strategies (LT-LEDS). In his current role, he is leading GGGI's technical work on supporting member and partner countries to develop their Long-Term Low Emission and Climate Resilient Development Strategies. Under this workstream, Stelios is providing strategic direction and leadership on conducting low emission pathway analysis and modelling, assessing socio-

economic impacts of low carbon development policies, and incorporating climate resilience in LT-LEDS. In addition, Stelios is also responsible for GGGI's work on the (macro)-economic analysis of green and low carbon growth plans and strategies, with main focus on the assessment of green jobs. Stelios has led several green jobs related studies in Fiji, Mexico, Indonesia and Rwanda and currently in Mongolia. Prior to GGGI, Stelios was the Head of Environment and Climate Change unit at the Institute for Housing and Urban Development Studies (IHS) at Erasmus University Rotterdam (EUR) in the Netherlands. In his career Stelios has led a number of research, advisory and capacity building projects on climate policy, supporting national and sub-national governments in low- and middle-income countries to develop their low carbon and climate-resilient strategies.

Stelios holds a PhD in integrated assessment of climate actions and decision support from the Erasmus University Rotterdam, a Master's Degree in Environmental Management and Policy from the University of Amsterdam and a Bachelor's degree in Economics from the Athens University of Economics and Business. In addition, Stelios has published many peer-reviewed articles in academic journals, books, and international conferences, while he has led and contributed to several GGGI flagship publications.

Discussion

GMT+1 13:10-13:40

Panel Discussion

Demand Response in Smart Energy Systems

Time: Dec. 4th 15:00–17:00 (GMT+1)

Panel introduction

Faced with the twin challenge of increasing demand and environmental concerns, energy systems are undergoing a pivotal transition, especially towards increased interdependence among different energy suppliers, carriers, and consumers. This transition is accelerated by the widespread utilization of coupled energy components such as combined heat and power units and power-to-gas facilities, and a range of market incentive mechanisms for facilitating a wide spread of demand flexibility programs. Despite the high efficiency and sustainability of smart energy systems in energy generation, transmission, storage, and use, the interplay between suppliers and consumers can bring about diverse emerging risk control issues. As the scale of energy systems expands, the external disturbances originating from extreme weather, cyber failures, intentional attacks, and policy uncertainties can increase significantly. The interaction among market participants is also prone to increase system uncertainties, in some cases affecting the balance between energy supply and demand. The participation of demand-side flexible sources in turn affects the reliability or risk associated with smart energy systems. Considering the impacts of various external disturbances and failure propagation as well as complicated demand response participation, it is essential to develop risk control measures for smart energy systems featuring in demand response. Such risk management calls for a comprehensive understanding of multiple aspects, including the modelling of energy system's physics and reliabilities, coordinated demand response strategies, robust optimization under multiple uncertainties, fast risk assessment techniques considering the interdependencies and failure propagations, advanced applications and detailed case studies.

Panel Discussion

Moderators



Prof. Yi Ding
Deputy Dean in the
College of Electrical
Engineering, Zhejiang
University, China

Short Bio

Yi Ding is a Professor in the College of Electrical Engineering, Zhejiang University (ZJU). Before he joined in ZJU, he was an Associate Professor (permeant position) in Technical University of Denmark (DTU), Denmark. He also held academic positions in University of Alberta, Canada and Nanyang Technological University, Singapore. He was also a Consultant as Energy Economist for Asian Development Bank in 2010. He is the executive director of the Applied Energy UNiLAB (Smart Grid Market Mechanism, SGM2). He is an editorial member of 5 international journals including Applied Energy, Electric Power System Research, Journal of Modern Power Systems and Clean Energy, Intelligent Industrial Systems, Protection and Control of Modern Power Systems. He is also a guest editor for the special sections of IEEE Trans. on Power Systems and IEEE Trans. on Industrial Electronics. Dr. Ding is a member of IEC working groups for micro-grid standards. His research areas include power system planning and reliability evaluation, smart grid and complex system risk assessment.



Dr.

Hongxun Hui
Post-doctoral, State
Key Laboratory of
Internet of Things for
Smart City, University
of Macau, China

Dr. Hongxun Hui is a Post-doctoral Fellow with the State Key Laboratory of Internet of Things for Smart City, University of Macau. Previously, he received the B.S. and Ph.D. degrees both from the College of Electrical Engineering, Zhejiang University in 2015 and 2020, respectively. From 2018 to 2019, he was a visiting scholar at the Advanced Research Institute in Virginia Tech and the CURENT at University of Tennessee. He was elected in the 1st batch of the Academic Rising Star Program for Ph.D. students in Zhejiang University in 2018. He has authored or coauthored 1 international book, 40 journal papers and 15 issued patents. He serves as the Vice President of IEEE Industry Applications Society Student Branch Chapter from 2018 to 2020 in Zhejiang University, and the Director of IEEE PES Electric Vehicle Satellite Committee-China, Energy and Transportation Nexus Subcommittee.

Speakers



Prof. Tao Jiang
Department of

Topic: Optimal Operation of TSO-DSO Coordination Considering Uncertainty of Demand Response

Abstract: With the large integration of non-dispatchable renewable energy generation (REG), Active distribution networks (ADNs) with distributed generators (DGs) can provide flexibility for the upstream grid by participating in energy and flexibility markets, while demand response (DR) has gained much attention due to its flexibility in mitigating power imbalances. To achieve the minimum cost of purchasing power and flexibility, a novel market-clearing model is proposed to facilitate energy and flexibility transactions through coordinating the flexibility providers in both transmission and

Electrical
Engineering,
Northeast Electric
Power University,
China

GMT+1 15:00-15:10

distribution networks. The energy and flexibility market-clearing problem is formulated as a bi-level optimization model. The upper-level models the transmission-level joint energy and flexibility market clearings while the lower-level represents the distribution-level ADN market clearings. Moreover, as the uncertainty of demand response caused by customers' temporary refusal to respond may affect the optimal schedule determined by the transmission system operators (TSO) and distribution system operators (DSOs), a stochastic programming-based risk-averse distributed optimal scheduling model is proposed to minimize the generation scheduling cost and the potential risk cost. The conditional value at risk (CVaR) is used to measure the potential risk cost caused by the uncertainties of DR and renewable energy. Case studies verify the rationality of the proposed models.

Short Bio: Tao Jiang received the B.S. and M.S. degrees in electrical engineering from Northeast Electric Power University, Jilin, China, in 2006 and 2011, respectively, and the Ph.D. degree in electrical engineering from Tianjin University, Tianjin, China, in 2015. He is currently a Professor with the Department of Electrical Engineering, Northeast Electric Power University. From 2014 to 2015, he was a visiting scholar with the Department of Electrical and Computer Engineering, North Carolina State University, Raleigh, NC, USA. From Oct 2018 to Oct 2019, he was a visiting scholar with the Department of Electrical Engineering and Computer Science, The University of Tennessee, Knoxville, TN, USA. His research interests include power system stability analysis and control, renewable energy integration, demand response, and smart grid. He is an Associated Editor of IEEE Transactions on Power Systems, IEEE Power Engineering Letters, Alexandria Engineering Journal and IET Energy Systems Integration.



Prof. Fei Teng
Imperial College
London, United
Kingdom

GMT+1 15:20-15:30

Topic: Role of Demand Management in Supporting the Efficient and Resilient Operation of Low Inertia Grids

Abstract: Decarbonization of electricity system is expected to be achieved by the integration of large share of RES. However, the variability, uncertainty, limited inertia and short circuit current capability associated with inverter-based RES impose significant challenges on the secure and efficient operation of future power systems. This talk will introduce the development and incorporation of pseudo-dynamic frequency stability and short circuit current level constraints into system scheduling problem to quantify their impact on the system operation and demonstrate how demand management can mitigate such challenge.

Short Bio: Dr. Fei Teng is a lecturer in the Department of Electrical and Electronic Engineering, Imperial College London. He is currently serving as the education director of Energy Futures Lab and the deputy director of Imperial - Tsinghua Joint Research Centre for Intelligent Power and Energy Systems. He also holds a visiting position at MINES ParisTech, France. Dr Teng graduated with a BEng from Beihang University, China in 2009 and obtained

Ph.D. from Imperial College London in 2015. He worked as a Research Associate at Imperial from 2015 to 2017 and as an Assistant Professor in Smart Grids at PERSEE, MINES ParisTech, France in 2017.

His research focuses on the efficient and resilient operation of future high IBG-penetrated cyber-physical energy systems. He has authored more than 80 scientific publications in leading power system journals and conferences. His research has been funded by EPSRC, ESRC, Innovate UK, Royal Society, Research England, EDF Energy, and National Grid ESO.



Prof. Menglian Zheng
College of Energy
Engineering, Zhejiang
University, China

GMT+1 15:30-15:40

Topic: Demand Response in Distributed CCHP Systems: Role of Energy Storage

Abstract: Combined cooling, heating, and, power (CCHP) systems have been regarded as ones of the key solutions for the distributed energy production in the future energy systems as they recover otherwise wasted thermal energy. However, the current dispatch strategies for combined CCHP systems are challenging to meet weakly temporal-correlated cooling, heating, and power demands of end users. In spired by the success in the electric energy systems, energy storage in the form of heat, cold, or electrochemical energy is expected to play essential roles in the CCHP systems by decoupling energy generation and consumption. Furthermore, the benefits of CCHP systems with respect to the overall efficiency and economics are expected to be further increased when energy storage is deployed to enable demand response of CCHP systems in response to a time-of-use electric tariff. Nevertheless, the underlying mechanisms played by different kinds of energy storage for the performance improvement, as well as the implications of the uncertainties in the essential parameters such as consumers' demands and fuel prices, are yet fully understood for energy-storage-integrated CCHP systems. In this talk, these two issues will be addressed through a case study conducted for a an office building in Shanghai, China.

Short Bio: Menglian Zheng is an Associate Professor in the College of Energy Engineering at Zhejiang University. She earned a B.S. degree in Energy & Environment Systems Engineering from Zhejiang University, China in 2007. She then came to the U.S. in 2011 and earned M.S. and Ph.D. degrees from Columbia University in 2015. She is the a member of the Applied Energy UNiLAB (Smart Grid Market Mechanism, SGM2). Her research focuses on three different aspects of flow batteries and energy systems, including (1) storage dispatch strategies to enable intelligent energy systems and demand response; (2) flow field design and mass transfer enhancement of redox flow batteries; (3) structure and system optimizations redox flow batteries.

Topic: Grid-interactive Building Control Via Deep Reinforcement Learning

Abstract: Mainstream grid-interactive building optimal controllers are mostly based on model predictive control (MPC). Though it is able to provide satisfactory performance, MPC's requirements for on-demand computation and a simplified yet accurate differentiable building model can lead to higher implementation costs. In our works, we investigate using deep reinforcement



Dr. Xiangyu Zhang
Researcher of
Computational Science
Center, National
Renewable Energy
Laboratory (NREL),
USA

GMT+1 15:40-15:50

learning (RL) as an alternative to achieve similar control performance but with less implementation costs, based on a cloud computing and edge execution paradigm. However, RL controller training/policy search is nontrivial as it typically amounts to solving a non-convex optimization problem with large search space. To ameliorate this, we propose a global-local policy search method that combines the complementary advantages of a zero-order gradient estimation approach and a policy gradient algorithm to achieve a better policy convergence during controller training. Using the most complex single building control problem in the literature (i.e., grid-interactive, multi-zone, continuous low-level control), we demonstrate the efficacy of the proposed method and show that better performance can be achieved when compared with a linear MPC baseline.

Short Bio: Dr. Xiangyu Zhang is a researcher from the Computational Science Center at the National Renewable Energy Laboratory (NREL) in Golden, Colorado, USA. He received his B.S., M.S. and Ph.D. degrees in Electrical Engineering from Wuhan University, Tsinghua University and Virginia Tech in 2012, 2014 and 2018, respectively. From 2016 to 2017, he is an award recipient of the Building-Grid Integration Research and Development Innovators Program from the U.S. Department of Energy (DOE). Currently at NREL, he is the leading contributor of multiple lab-funded or DOE-funded research projects related to building or grid control. He is interested in the applications of scalable deep reinforcement learning and high-performance computing to solve optimal control problems in energy systems.



Dr. Hongxun Hui
Post-doctoral, State
Key Laboratory of
Internet of Things for
Smart City, University
of Macau, China

GMT+1 15:50-16:00

Topic: Real-time Local Electricity Market Considering High-Penetration Distributed Energy Resources

Abstract: The rapidly increasing distributed energy resources (DERs) bring more fluctuating output power to the distribution network and put forward a higher requirement on local regulation resources for maintaining the network's balance. Heating, ventilation, and air conditioning (HVAC) loads account for more than 40% of power consumption in modern cities and have huge regulation potential. However, HVACs equipped with inverter devices have rarely been studied for providing regulation services in the local electricity market (LEM), even though they have exceeded regular fixed speed HVACs. To address this issue, a real-time LEM and a distribution network's optimization framework are proposed to exploit the regulation potential of inverter-based HVACs and multiple DERs. This LEM avoids iterations in real-time and significantly decreases the difficulty related to the participation of small end-users. Moreover, a transactive capacity evaluation method is developed to assist end-users in deciding their inverter-based HVACs' regulation capacities in the real-time LEM, which considers buildings' thermal features, dynamic ambient temperature, and users' multiple comfort requirements. On this basis, a multi-level bidding strategy is developed for inverter-based HVACs to decrease energy cost, increase fluctuating DERs'

local utilization rate, and alleviate the distribution network's congestion.

Short Bio: Dr. Hongxun Hui is a Post-doctoral Fellow with the State Key Laboratory of Internet of Things for Smart City, University of Macau. Previously, he received the B.S. and Ph.D. degrees both from the College of Electrical Engineering, Zhejiang University in 2015 and 2020, respectively. From 2018 to 2019, he was a visiting scholar at the Advanced Research Institute in Virginia Tech and the CURENT at University of Tennessee. He was elected in the 1st batch of the Academic Rising Star Program for Ph.D. students in Zhejiang University in 2018.

Discussion: Demand Response in Smart Energy Systems Around the World

15 min

Panel Discussion

Future Hydrogen Society

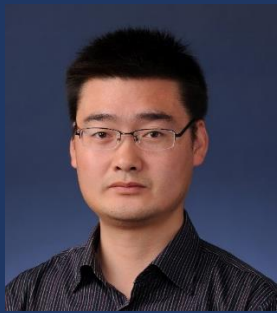
Time: 10:00–11:30 AM Dec 5 (GMT+1)

Hydrogen and energy have a long shared history – powering the first internal combustion engines over 200 years ago to becoming an integral part of the modern refining industry. It is light, storable, energy-dense, and produces no direct emissions of pollutants or greenhouse gases. But for hydrogen to make a significant contribution to clean energy transitions, it needs to be adopted in sectors where it is almost completely absent, such as transport, buildings and power generation.

The panel discussion focuses on the ways in which hydrogen can help to achieve a clean, secure and affordable energy future; and how we can go about realizing its potential.

Panel Discussion

Moderator



Chuang Wen
University of Exeter

Short Bio

Dr Chuang Wen is an Assistant Professor at the University of Exeter, United Kingdom. His research interests are clean and smart energies to tackle climate challenges including advanced clean technologies for fossil energy, hydrogen energy, solar energy, energy storage, heat transfer, fluid mechanics, thermodynamics, etc. To date, He has published 1 book (Springer), 43 high-quality journal papers and more than 40 conference papers with an h-index of 22 and over 1280 citations (Google Scholar). Dr Wen was awarded several prestigious fellowships to support his innovative research including Marie Skłodowska-Curie Fellowship, H.C. Ørsted Fellowship and SPE Star Fellowship.

Speakers



Mi Tian
Assistant Professor,
University of Exeter,
UK

GMT+1 10:10-10:20

Hydrogen storage and distribution for Green H₂ production Abstract

Hydrogen is experiencing a promising wave of enthusiasm across the world. Future energy scenarios in the UK are being produced with a reliance on hydrogen, and the growth of the industry. However, the climate challenge and UK decarbonisation targets require hydrogen's carbon-intensive history to be re-written. As decarbonisation has not historically been the focus of hydrogen use, there is relatively little research concerning sustainable hydrogen economies. This study examines the feasibility of a green hydrogen economy for the Southwest of England, using data collection and expert elicitations to produce an optimal design. The cost, emissions, and social impacts of this design are calculated and considered in the evaluation of its feasibility. The designed green hydrogen economy consists of wind powered electrolysis, salt cavern storage, and distribution via pipelines to decarbonise heating in Southwest England. Various recommendations for further research are given to ensure the growth of the hydrogen industry and its contribution to a sustainable energy system.

Short Bio

Dr Mi Tian is an Assistant Professor in the Department of Engineering, University of Exeter, UK. Dr Tian expertise in hydrogen energy and significantly contributes to the development of porous polymer composite for on-board hydrogen systems, which has a direct impact on light-weighted vehicles and low carbon economy. She has been leading the research on neutron scattering techniques for hydrogen energy materials. Mi received the Ede & Ravenscroft Prize in 2019. She was recognised as one of the Top 50 Women in Engineering (WE50) in 2020.



Awais Salman
Mälardalen University
GMT+1 10:20-10:30

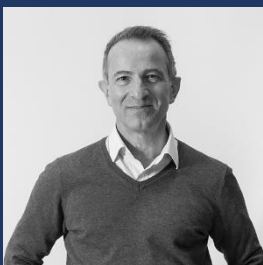
Feasibility of Onsite hydrogen production for the upgradation of bio-oil and Fischer-Tropsch fuels to drop-in biofuels.

ABSTRACT

Drop-in biofuels — biofuels that have similar properties to conventional petrol and diesel – are produced from waste by a thermochemical process in two steps. The first step converts the waste biomass to intermediate liquid fuels such as Fischer–Tropsch (FT) fuels by gasification or bio-oil using pyrolysis. The second step includes the upgrading of these intermediate liquid fuels to drop-in biofuels via hydrocracking, hydroprocessing and distillation of FT-fuels or bio-oil. Upgrading of bio-oil from pyrolysis and FT fuels from gasification through cracking and hydroprocessing requires a significant amount of hydrogen. About 4–5 wt% of hydrogen is required for bio-oil conversion to drop-in biofuels, while approximately 17 wt% of hydrogen is required for FT fuels upgradation. WE compared the onsite hydrogen production for the upgradation of bio-oil and FT fuels. Hydrogen can be produced onsite to upgrade intermediate FT fuels and bio-oil to drop-in biofuels. But hydrogen from SOEC decreased the overall system efficiency and limited the capacity of the overall integrated process compared with hydrogen from WGS. However, hydrogen production from the WGS reactor was a more expensive option.

Short Bio

He is a researcher and process engineer with several years of experience. He has a natural aptitude to create solutions and process improvements in the renewable energy sector - not only in the technical and research field but also towards project managing and energy innovation. During his Ph.D. in Energy Engineering, he designed and analyzed bioenergy processes such as gasification, pyrolysis, anaerobic digestion, and combustion. As a postdoctoral researcher, he has been working to improve the flexibility of multi-energy systems. His professional focal points include modeling and simulations of multi-energy systems, circular economy, renewable energy, quality professional, and project management.



Laurence Marzell
Innovation Lead, Serco
UK & Europe, Serco
Group Plc
GMT+1 10:30-10:40

TerraMare: Fuelling the Green & Blue Economies for a Digital & Green Future

Abstract

TerraMare poses the question. What does the Maritime Ecosystem in the SW of England look like from 2030 onwards? TerraMare will directly support the decarbonisation of the SW maritime sector and thus, supporting the green and blue economies, using a set of scenarios focussed on the operational tasks and requirements of SW end-user organisations who together, have a critical need for operational assurance. These organisations, with their activities touching multiple aspects and varied supply chains across the entire region, form the basis of the SW Marine Economic Journey. Through such scenarios, a comprehensive picture can be painted of the operational activities and

needs and thus the Operational Assurance requirements that will, in the future, require renewable energy, decarbonisation and associated circular economy aspects related to the management, maintenance and operation of different types, sizes and function of marine vessels.

Short Bio

Laurence Marzell leads on research and innovation activity within the UK & Europe division of Serco Group. This includes participation in multiple projects within the EU's Horizon 2020 and Horizon Europe programmes in thematic areas such as: EU Green Deal; Copernicus Earth Observation; Nature Based Solutions; Resilient and Sustainable Infrastructure; Data Driven Decision-Making. In the UK, Laurence is active in projects and concepts supporting the UK's changing societal needs in areas such as: The Clean Maritime Plan; Digital & Green Skills; Social Value; Societal & Community Sustainability and Resilience. Together with the Royal United Services Institute (RUSI), Laurence developed the white paper: Combined Effect: A New Approach to Resilience, and leads on its strategic and operational development and adaptation into areas outside of resilience, to meet current challenges and needs such as sustainability, decarbonisation and complex ecosystems. He is a keen advocate of its adoption to underpin research and innovation projects for organisational transformation programmes. He has a particular interest in aligning governance and operational delivery at the intersection and boundaries between organisations whether public, private, voluntary and community, saying that they need to come together to understand, manage and meet their shared safety, security, resilience and sustainability needs. Laurence is an accomplished public speaker and has numerous published works to his name.



Dina Azhgaliyeva
Asian Development
Bank Institute

GMT+1 10:40-10:50

Energy Storage and Renewable Energy Deployment: Empirical Evidence from OECD countries

Abstract

Renewable energy can reduce pollution by providing renewable electricity, heating, cooling and transportation. The main disadvantage of renewable energy deployment, is that once it reached a high share in electricity generation, the intermittency caused by renewable energy sources makes balancing of an energy system challenging. Most energy storage technologies are immature and require investments in R&D in order to improve performance, safety and reduce cost. Empirical literature studying investments in renewable energy is abundant, however empirical literature studying investments in energy storage is highly limited due to data availability. Using panel data from all OECD countries over the period 1985-2016 this study the determinants of investments in R&D of energy storage technologies. The results of fixed effects and random effects estimations provide an empirical evidence that energy storage policy and environmental patents increase investments in R&D of energy storage.

Short Bio

Dr. Dina Azhgaliyeva is a Research Fellow at the Asian Development Bank

Institute (ADBI). Before joining ADBI in July 2019, she worked as a Research Fellow in the energy economics division of the Energy Studies Institute, National University of Singapore. She was also a Research Fellow at the Henley Business School, University of Reading (UK) where she was involved in empirical analysis of the impact of local content policy on extractive industries. She worked as Economics Teaching Fellow at the University College London. She also worked as a leading and chief specialist for the Tax Committee at the Ministry of Finance of Kazakhstan. She holds a PhD, Master's, and Graduate Diploma in economics, all from the University of Essex (UK). She also holds an internationally recognized teaching qualification from the Fellow of Higher Education Academy and a qualification in research career management from the Staff Educational and Development Association. Her research interests include energy policy, particularly renewable energy, energy efficiency, and energy storage. She is currently a guest editor for the Applied Energy's special issue "Integration of Renewable Energy in Energy Systems, Perspectives on Investment, Technology, and Policy". More information is available here: <https://www.adb.org/adbi/about/staff-profiles/dina-azhgaliyeva>



John Williams
Head of Hydrogen
Expertise Cluster
AFRY Management
Consulting
GMT+1 10:50-11:00

Hydrogen: Opportunities and Challenges

Abstract

Hydrogen will play an essential role in a decarbonised future in key sectors of industry, heat, power and transport. Electrification cannot be relied on to fully decarbonise these sectors. But for hydrogen to play a significant role it will face challenges which will be both economic and technical. This presentation will provide AFRY's view on the key sectors for hydrogen use, the costs and the requirements for investment.

Short Bio

John Williams has over 25 years' experience in competitive energy markets. He is head of AFRY's hydrogen team that has delivered over 60 projects since the start of 2020. Working across the entire value chain, AFRY offers a one-stop shop service for any clients interested in the opportunities of hydrogen and power-to-X, whether they are interested in high-level strategy or developing projects.



Daofan Cao
Director of Methanol
Hydrogen Energy
Project,
Southern University of
Science and

Options for Carbon Neutrality in China — Green Methanol & Hydrogen Energy System

Abstract

China has announced the target of carbon neutrality before 2060 to address climate changes. Solar energy and wind energy as well as hydrogen energy, are regarded as the important parts of the action. With rising energy demand in China, although the installed energy has been increased these years, the curtailment of intermittent renewable energy is also growing. In a short time, it will be hard to cut out coal energy in China soon, and coal still will dominate the energy structure. But how to utilise coal in a cleaner way under the transiting period. SUSTech has been developing a series of technologies for cheaply producing high-quality coal with soil amendment materials as by-products, upgrading

Technology

GMT+1 11:00-11:10

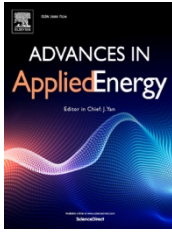
conventional coal industries to produce green methanol and the applications of methanol hydrogen energy for distributed energy. The commercial and commercial-ready projects will be introduced and discussed.

Short Bio

Daofan Cao is the Director of Methanol Hydrogen Energy Project, in the School of Innovation and Entrepreneurship of Southern University of Science and Technology (SUSTech) as well as the Managing Director of Shenzhen Neutral Clean Energy Technology Co., Ltd, which is shared by the SUSTech. In Birmingham Centre for Energy Storage and University of Birmingham, he has been working on the design and optimisation of the hybrid energy system.

**Discussion: Enlightenments for Hydrogen Society development in Asian
Developing Countries**

GMT+1 11:10-11:30



Call for Young Editorial Board Member

Advances in Applied Energy (ADAPEN) is an open access journal for publishing cutting-edge applied research on all aspects of energy innovation that bridge the gaps between research, development, and implementation with significant impact and broad readership. The journal is a companion journal to the highly regarded journal Applied Energy. In order to provide a platform for active academic exchange for young scientists engaging, ADAPEN is constructing an editorial board specifically for young editorial members. This board would be an excellent venue for young scientists to practice their editorial management skills, comment on peer work, exchange ideas, and find collaboration opportunities.

Application Information

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- Be familiar with academic paper writing and publishing. Experience in peer review is preferred.
- Published research articles in Applied Energy OR Advances in Applied Energy as first and/or corresponding author in the past 3 years.
- Fluent in English language.

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- Provide consultation on manuscripts with the journal editors at their requests.
- Attend editorial board meetings and participate in activities organized by the journal.
- Additional editorial tasks or special projects as requested by the editors.

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- An official appointment certificate from the EiC of ADAPEN.
- The articles from youth members or recommended by youth members are preferably considered for faster review in ADAPEN.
- Exceptional youth members will be awarded the "Excellent Young Board Member" and will be elevated to be an ADAPEN editorial board member.
- The initial term of service is one year with potential of renewal for a second term.

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Please send an email and an attached CV to Prof. Jinyue Yan (jinyue.yan@mdh.se), Editor in Chief of Advances in Applied Energy, with an email subject "ADAPEN Young Editorial Board Application + Name + Research Area". The deadline for the application is Dec. 31, 2021.

ROOM S

12:00-12:15

OPENING

12:15-13:00

KEYNOTE 1 (PETER D. LUND)

13:10-14:00

KEYNOTE 2 (ROB GROSS)

14:00-14:10

TEA/COFFEE BREAK**ROOM A****SESSION 1-A1 CLEAN ENERGY CONVERSION TECHNOLOGY****SESSION CHAIR: KUI JIAO**

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:10-14:30	297	ZHIFENG XIA, TONG ZHANG, WANCHAO SHAN, HUI CUI CHEN	BEHAVIOR OF CURRENT DENSITY REDISTRIBUTION AND VOLTAGE DROP UNDER HYDROGEN STARVATION CONDITIONS FOR A POLYMER ELECTROLYTE MEMBRANE FUEL CELL
14:30-14:40	76	ZHENPO WANG, PENG LIU, LI DA, ZHAOSHENG ZHANG	MULTI-PARAMETER AND MULTI-TIME-STEP PREDICTION FOR REAL-WORLD PROTON EXCHANGE MEMBRANE FUEL CELL VEHICLES BASED ON NEURAL NETWORKS
14:40-14:50	78	JIAN LI, ZHE CHENG, HONGCHUAN QIN, BINGTAO ZHANG, RENJIE ZHOU, JIANHUA JIANG	PERFORMANCE OPTIMIZATION ANALYSIS OF MULTI-STACK SOFC SYSTEM
14:50-15:00	128	HANKWON LIM, MUKESH UPADHYAY, SALAISARGUNAN S PARAMANANTHAM	IMPLEMENTATION OF NOVEL 4X4 MATRIX BUNDLE CELL STACK WITH CYLINDER-SHAPED FUEL CELL
15:00-15:10	158	ZAOXIAO ZHANG, ZHEN WU, ZHU PENGFEI, JING YAO, LEILEI GUO, HUAN WANG	THERMOCHEMICAL MODELING OF SOFC FUELED BY BIOMASS SYNGAS: CARBON DEPOSITION STUDY
15:10-15:20	234	YONGSHANG YU	A GAS STARVATION DIAGNOSIS METHOD OF PEM FUEL CELLS BASED ON ADAPTIVE NETWORK-BASED FUZZY INFERENCE SYSTEM (ANFIS)
15:20-15:30	244	L.-W. WEI, H. PAUL WANG, P.-C. CHANG, Y.-H. LIU, S.-H. LIU	SIMULTANEOUSLY SOLAR-DRIVEN H ₂ O-TO-H ₂ O ₂ AND TREATMENTS OF ORGANIC WASTEWATER IN A SINGLE-COMPARTMENT FUEL CELL
15:30-15:40	280	JUNFENG ZHANG, YAN YIN, MENGYUAN LI, XIN LIU, HAOTIAN LIU, NA XIE	PROTON EXCHANGE MEMBRANES DOPED WITH PRUSSIAN BLUE ANALOGUE FOR PERFORMANCE ENHANCEMENT UNDER LOW HUMIDITY CONDITIONS
15:40-15:50	75	LIQUN SONG, KUI JIAO, SHAOQING HE, ZIRONG YANG, BOWEN WANG, ZHIJUN PENG, GUOBIN ZHANG	A COMPREHENSIVE PROTON EXCHANGE MEMBRANE FUEL CELL SYSTEM MODEL INCORPORATING MULTIPLE BOP COMPONENTS
15:50-16:00	343	KAI CHEN, ZIXUAN WANG, BOWEN WANG, ZHIJUN PENG, QING DU, KUI JIAO	EXPERIMENTAL INVESTIGATION OF OPERATING CONDITION AND MEMBRANE EFFECTS ON ANION EXCHANGE MEMBRANE FUEL CELLS

ROOM B**SESSION 1-B1 CLEAN ENERGY CONVERSION TECHNOLOGY****SESSION CHAIR: JUN LI, LI CHEN**

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:10-14:30	484	QIBIN LIU, BUCHU LU, XIANGYU YAN	SOLAR HYDROGEN PRODUCTION WITH COMBINED EFFECT OF SOLAR LIGHT AND HEAT AT MID-AND-LOW TEMPERATURE –EXPERIMENTAL AND THERMODYNAMIC ANALYSIS
14:30-14:40	254	WEI-HSIN CHEN, YI-KAI CHIH	REACTION CHARACTERIZATION OF HYDROGEN PRODUCTION FROM STEAM REFORMING OF METHANOL SPRAYS OVER NI-CU/AL ₂ O ₃ CATALYSTS
14:40-14:50	262	HANKWON LIM, MANHEE BYUN, SEOJOUNG PARK, DONGHYUK KIM	FEASIBILITY PREDICTION MODEL FOR HYDROGEN PRODUCTION SYSTEM OF METHANOL STEAM REFORMING WITH MEMBRANE FILTERS BY MACHINE LEARNING REGRESSION ALGORITHM
14:50-15:00	277	MOONYONG LEE, MUHAMMAD ABDUL QYYUM, AMJAD RIAZ, GWANGSIK KIM	HARNESSING LIQUID AIR COLD ENERGY FOR PERFORMANCE ENHANCEMENT OF HYDROGEN LIQUEFACTION PROCESS
15:00-15:10	359	SHIYE ZHANG, KUI JIAO, BINGFENG ZU, LINHAO FAN	INFLUENCE OF DIFFERENT LIQUID/GAS DIFFUSION LAYER ON THE PERFORMANCE OF PROTON EXCHANGE MEMBRANE WATER ELECTROLYSIS
15:10-15:20	363	LI SUN, RUILIN YIN	CONTROL-ORIENTED MODELING AND SIMULATION OF SOLID OXIDE ELECTROLYSIS SYSTEM
15:20-15:30	375	RONG MA	FULL-SPECTRUM SUNLIGHT-DRIVEN SYNERGISTIC PHOTO-THERMO-CATALYSIS AND PHOTOVOLTAIC-POWERED SONO-CATALYSIS FOR ENHANCED HYDROGEN EVOLUTION
15:30-15:40	477	SHURONG WANG, LINGJUN ZHU, HONGCAI SU, TIAN LI	HYDROGEN PRODUCTION FROM HYDROTHERMAL TREATMENT OF WASTE PLASTIC AT LOW OPERATING TEMPERATURE

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15:40-15:50	241	MOONYONG LEE, HANKWON LIM, MUHAMMAD ABDUL QYYUM, AHMAD NAQUASH, AMJAD RIAZ, SEONGWOONG MIN, YUS DONALD CHANIAGO, NOMAN RAZA SIAL, MUHAMMAD ISLAM	MEMBRANE-AND-CRYOGENIC-ASSISTED HYDROGEN SEPARATION AND PURIFICATION PROCESS
15:50-16:00	659	XIAOHUI SHE, WU YUE, LIU BIN, SUN QIAOYANG, TENG LIN, LI XIGUI, KANG XI, WANG LAN	STUDY ON HYDROGEN DECOMPRESSION PERFORMANCE OF AN ORIFICE PLATE STRUCTURE WITH PARALLEL TESLA-TYPE CHANNELS
ROOM C SESSION 1-C1 MITIGATION TECHNOLOGY AND ENERGY STORAGE SESSION CHAIR: QIYUAN XIE, SHOULIANG YI			
TIME	PAPER ID	AUTHOR	PAPER TITLE
14:10-14:30	273	ZAOXIAO ZHANG, GUANGXIN LIU, HUIFENG FAN, XIAOMEI WU, MAIMOONA SHARIF	PERFORMANCE COMPARATION OF MEA AND EDA IN ELECTROCHEMICALLY-MEDIATED AMINE REGENERATION CO2 CAPTURE
14:30-14:40	82	OCEAN CHEUNG, RIBOOGA CHANG	NOVEL HAFNIUM BASED OXIDE SORBENT FOR HIGH TEMPERATURE CO2 CAPTURE
14:40-14:50	44	ZAOXIAO ZHANG, YUNSONG YU, XIAOMEI WU, MAIMOONA SHARIF, TINGTING ZHANG, HONGXIA WANG	ASSESSMENT OF MASS TRANSFER COEFFICIENT AND INTERMOLECULAR INTERACTIONS OF SECONDARY AND TERTIARY AMINES FOR CO2 ABSORPTION
14:50-15:00	432	ZAOXIAO ZHANG, YUNSONG YU, CHENYANG ZHOU, CHEN ZHANG, JINGFENG ZHANG, JIAFENG WANG	ATOM SOLUTION CHANGES THE PATTERN FOR CARBON DIOXIDE CAPTURE
15:00-15:10	520	WARD DE PAEPE, LAURENT BRICTEUX, ANTOINE VERHAEGHE, LIONEL DUBOIS, DIANE THOMAS	FIRST STEP TOWARDS A MORE EFFICIENT CARBON-CLEAN MICRO GAS TURBINE: SOLVENT SELECTION AND PROCESS PARAMETERS OPTIMIZATION
15:10-15:20	526	LIANG SUN, KAI LI, ZHIYU TIAN, XIAOHUA ZHOU	CARBON EMISSIONS OF CIVIL AIRPORTS IN CHINA MAINLAND AND PRIMARY MATCHING WITH CARBON STORAGE SINKS
15:20-15:30	548	GAURAV PANDEY, TEJASWA POOTHIA, DIPTI MEHRA, JYOTI SINGH, PRERNA B.S RAWAT	ROLE OF CO2 CAPTURE AND SEQUESTRATION (CCS) USING GAS HYDRATE BASED TECHNOLOGY FOR SUSTAINABLE ENERGY
15:30-15:40	890	YAN YANG, HAOPING PENG, HONGBING DING, CHUANG WEN	ENERGY STORAGE PERFORMANCE ENHANCEMENT IN TRIPLEX-TUBE HEAT EXCHANGERS INTEGRATING PHASE CHANGE MATERIALS, NANOPARTICLES AND COPPER FINS
15:40-15:50	656	RUILONG WANG, MINGJIA LI, DONG LI	THE OPTIMIZED STUDY OF A NOVEL ATTACHED MEMBRANE PHOTOBIOREACTOR ON ADVANCED CARBON SEQUESTRATION OF MICROALGAE
15:50-16:00	739	XUDONG SHEN, HUIQING LIU, MINGZHE GUO, LIANGYU MA	A MODIFIED PRESSURE TRANSIENT ANALYSIS MODEL FOR ESTIMATING CARBON SEQUESTRATION CAPACITY OF A SHALE RESERVOIR
ROOM D SESSION 1-D1 ENERGY SCIENCES SESSION CHAIR: REBEI BEL FDHILA			
TIME	PAPER ID	AUTHOR	PAPER TITLE
14:10-14:30	846	DANIEL MIRA, XI JIANG, CHENG CHEN	EFFECTS OF POLY (OXYMETHYLENE) DIMETHYL ETHER ADDITION ON SUPERCRITICAL N-DODECANE DROPLET EVAPORATION - A MOLECULAR DYNAMICS STUDY
14:30-14:40	227	T.B DUC, W PANG, G CHENG, MENGZHEN LIU	3D NUMERICAL ANALYSIS OF DESICCANT-COATED HEAT EXCHANGER FOR AIR DEHUMIDIFICATION
14:40-14:50	239	XUELING LIU, JIANSHEG WANG, SHUTING YAO	THE INFLUENCING MECHANISM OF SURFACE WETTABILITY ON CONVECTIVE HEAT TRANSFER IN COPPER NANOCHANNEL
14:50-15:00	248	LIWEN JIN, CHARLES CHUN YANG, XIANGZHAO MENG, SIYU QIN, RUIYANG JI, CHENGYU MIAO, YE WANG	EXPERIMENTAL STUDY ON COUPLING THERMAL PERFORMANCE OF AIR-COOLING AND PHASE-CHANGE HEAT TRANSFER FOR 3D THERMOSYPHON
15:00-15:10	251	LIWEN JIN, CHARLES CHUN YANG, SIYU QIN, RUIYANG JI, ZHAO LU, ZIXIANG TONG	EFFECT OF SURFACE WETTABILITY ON BOILING HEAT TRANSFER IN A CONFINED SPACE
15:10-15:20	252	LIWEN JIN, SIYU QIN, RUIYANG JI, CHENGYU MIAO, ZHAO LU, JOHN C. CHAI, LICHUAN WEI	EXPERIMENTAL INVESTIGATION OF VAPOR CHAMBERS WITH DIFFERENT WICK STRUCTURES FOR THE THERMAL MANAGEMENT
15:20-15:30	408	YULONG ZHAO, YANZHE LI, MINGHUI GE, LIKE YUE, MINGJIE LU, GUOYIN ZHANG	PERFORMANCE OF EXHAUST THERMOELECTRIC GENERATOR WITH POROUS PLATE
15:30-15:40	414	KUNIO YOSHIKAWA, FUMITAKE TAKAHASHI, TAMER ISMAIL, TAKAHIRO KOBORI, KIRYU KANAZAWA, TASYA MUHAMAD YASSER, ABRAHAM CASTRO GARCÍA	PYROLYSISEFFECT OF ELECTRON INJECTION ON TAR PROFILES GENERATED FROM OXIDATIVE PYROLYSIS OF BIOMASS AND PLASTIC
15:40-15:50	493	WEI HE, CHENCHEN PEI	HEAT DISSIPATION AND FLOW RESISTANCE PERFORMANCE OF WATER HEAT SINK USED IN DATA CENTER COOLING SYSTEM

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15:50-16:00	513	YOU-RONG LI, CHUNMEI WU, JUNFENG SHEN	KINETICS AND INTERFACIAL ENERGY TRANSPORT OF DROPLET EVAPORATION ON THE SURFACE WITH NON-UNIFORM WETTABILITY
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ROOM E
SESSION 1-E1 ENERGY SCIENCES
SESSION CHAIR: ROLAND SPAN

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:10-14:30	224	ROLAND SPAN, TOBIAS NEUMANN	THE ADVANTAGES OF EQUATIONS OF STATE IN FORM OF THE HELMHOLTZ ENERGY FOR THE DESIGN OF CCS-RELEVANT PROCESSES
14:30-14:40	222	LI ZHAO, XIANHUA NIE, JUAN XUE, JIAJUN WANG, YADI BAI, ZEQING WU	MOLECULAR DYNAMICS INVESTIGATED ON VISCOSITY COEFFICIENT OF THE WORKING MIXTURES FOR SUPERCRITICAL CO ₂ BRAYTON CYCLE
14:40-14:50	455	ROLAND SPAN, NILS VON PREETZMANN, REINER KLEINRAHM	EXPERIMENTAL EVALUATION OF DIFFERENT PROCEDURES FOR LIQUEFACTION OF GAS MIXTURES AND THE RESULTING CHANGES IN COMPOSITION
14:50-15:00	506	YOU-RONG LI, CHUNMEI WU, XIANG WEI	STUDY ON THE PHASE TRANSITION AND CLUSTERS EVOLUTIONS FROM ADSORPTION TO CONDENSATION AT SOLID-VAPOR INTERFACE
15:00-15:10	614	JULIAN WANG	EXPERIMENTAL STUDY FOR FILMWISE CONDENSATION HEAT TRANSFER OF BUILDING GLAZING SYSTEMS
15:10-15:20	703	TINGTING DU, SHAOBO HAN	TEMPERATURE-DRIVEN SWITCHING AND DEFLECTION OF BISTABLE FLOW CROSSING SIDE-BY-SIDE TUBES-ABSTRACT
15:20-15:30	737	QINGZHONG YANG, XIANG LI, MIAO QUAN, YUKUN LANG	STATIC FLASH EVAPORATION OF HIGH CONCENTRATION AQUEOUS NA ₂ CO ₃ SOLUTION AT DIFFERENT FLASH SPEEDS
15:30-15:40	785	ZHIHAN DENG	THE EFFECTIVE MOISTURE DIFFUSIVITY AND DRYING SIMULATION OF MUXIANG UNDER THE ACTION OF VARIABLE TEMPERATURE
15:40-15:50	829	CHUNSHENG JIA, CHAOWEN WANG, XIAO-LONG PENG, RUI JIANG, JIAN-YI LIU, JI LI	PREDICTION OF GIBBS FREE ENERGY FOR HYDROGEN
15:50-16:00	913	KIM CHOON NG, SAGAR SAREN, KYAW THU, TAKIHIKO MIYAZAKI, SOURAV MITRA	PERFORMANCE CHARACTERISTICS OF HYBRID ADSORPTION HEAT TRANSFORMER-MULTI EFFECT DISTILLATION (AHT+MED) SYSTEM USING DIFFERENT SILICA GEL ADSORBENT

ROOM F
SESSION 1-F1 INTELLIGENT ENERGY SYSTEM
SESSION CHAIR: HAO YU, YING CHEN

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:10-14:20	223	QI ZHANG, SHENG XIE, DATAO SHI	A MINLP SCHEDULING MODEL BASED ON THE COUPLING OF THE BYPRODUCT GASES, STEAM AND POWER IN IRON AND STEEL INDUSTRY
14:20-14:30	245	QUN CHEN, HUAN MA, QINGHAN SUN	SPATIO-TEMPORAL COORDINATION OF FLEXIBILITY SUPPLY IN DISTRIBUTED ENERGY SYSTEMS BASED ON AN EXERGY-BASED FLEXIBILITY COST INDICATOR
14:30-14:40	287	YUZHANG WANG, KANRU CHENG, QING ZHANG, JIAO LI, DAOMING HU	CONFIGURATION OPTIMIZATION AND NOVEL OPERATION STRATEGIES FOR COMBINED COOLING HEATING AND POWER SYSTEM BASED ON MICRO GAS TURBINE
14:40-14:50	300	TOMISLAV CAPUDER, MIRNA GRŽANIĆ	COLLABORATION MODELS BETWEEN DISTRIBUTION SYSTEM OPERATORS AND FLEXIBLE PROSUMERS
14:50-15:00	309	MINGLIANG BAI, WENJIANG YANG, DONGBIN SONG, MAREK KOSUDA, MIROSLAV KELEMEN	EQUIVALENT CONSUMPTION MINIMIZATION STRATEGY BASED ON FUZZY LOGIC CONTROL FOR THE ENERGY MANAGEMENT OF HYBRID UNMANNED AERIAL VEHICLE
15:00-15:10	594	GU CHENGHONG, XUYANG WANG	OPTIMAL BRANCH UPGRADE TO ENHANCE DISTRIBUTION NETWORK RESILIENCE
15:10-15:20	610	XINGCHEN LIU, ZIQI CHEN, JIACHUN WANG, XUNCHAO ZHANG, SIYANG WANG, XIANKE LIN, ZHIBIN BAO, SABIR HOSSAIN, STEPHEN LUU	ENERGY EFFICIENCY ENHANCEMENT OF FUSED DEPOSITION MODELING MANUFACTURING THROUGH DEVELOPMENT OF A COMPUTER VISION-BASED FAILURE DETECTION SYSTEM
15:20-15:30	674	HANQI ZHOU	A NEW MANAGEMENT STRATEGY OF MICROGRIDS VIA THE COMBINATION OF ROBUST OPTIMAL CONTROL AND MODEL PREDICTIVE CONTROL
15:30-15:40	730	YUZHANG WANG, KANRU CHENG, JIAO LI, DAOMING HU, XIAODONG DU	CARBON EMISSION AND ECONOMIC ANALYSIS OF HYDROGEN INTEGRATED ENERGY SYSTEM FOR CARBON NEUTRALITY
15:40-15:50	906	HAORAN ZHANG, XIUCHENG DONG, KANGYIN DONG, JIAMAN LI, GUIXIAN LIU	LNG GASIFICATION STATION POINT SUPPLY OF VILLAGES AND TOWNS IN RURAL CHINA: A CASE OF SHANDONG PROVINCE
15:50-16:00	873	JULIAN WANG, YANXIAO FENG	WEARABLE DEVICE-BASED PERSONALIZED THERMAL COMFORT PREDICTION FOR SMART BUILDINGS

ROOM SA

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Day 1: Nov 29

Oral Presentations

14:10-16:00	PANEL: Women in Applied Energy
ROOM S	
16:00-16:45	KEYNOTE 3 (CHAO-YANG WANG)

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ROOM S

12:00-12:45

KEYNOTE 1 (KUNIO YOSHIKAWA)**ROOM A****SESSION 2-A1 RENEWABLE ENERGY
SESSION CHAIR: KUNIO YOSHIKAWA**

TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	450	ALEXANDER KOZLOV, VLADISLAV SHAKIROV	MULTI-CRITERIA COMPARISON OF BIOMASS GASIFICATION-BASED AND DIESEL-BASED HYBRID ENERGY SYSTEMS FOR POWER SUPPLY OF REMOTE REAS
13:10-13:20	604	JUN LI, MORGEN MUKAMWI, TOSIN SOMORIN, XIAOLEI ZHANG	DESIGN, SYNTHESIS AND CHARACTERIZATION OF A NOVEL CATALYST NICO _{0.25} CE _{1.25} O _{3.75} FOR IN-SITU STEAM REFORMING OF SYNGAS HYDROCARBONS TO MAXIMISE HYDROGEN PRODUCTION
13:20-13:30	607	QUAN (SOPHIA) HE, JIE YANG, NIMA NASIRIAN	INFLUENCE OF SODIUM CHLORIDE AND SODIUM CARBONATE ON HYDROTHERMAL LIQUEFACTION OF LIPID-RICH, PROTEIN-RICH, CARBOHYDRATE-RICH FEEDSTOCK
13:30-13:40	667	FENG TANG, YUQI JIN, YONG CHI, JIAYU MA, ZHONGXU ZHU, JINHUA GONG	THE HOMOGENEOUS CONVERSION MECHANISM OF CELLULOSE PYROLYSIS TAR UNDER THE EFFECT OF STEAM
13:40-13:50	738	BEIBEI YAN, ZIBIAO LIU	MN-DOPED CA ₂ FE ₂ O ₅ OXYGEN CARRIER FOR CHEMICAL LOOPING GASIFICATION OF BIOGAS RESIDUE: EFFECT OF OXYGEN UNCOUPLING
13:50-14:00	755	XUN ZHU, QIANG LIAO, JUN LI, YUN HUANG, AO XIA, XIANQING ZHU, CHUANCHANG XU, YIMING LAI	SIMULATION OF CO-GASIFICATION OF SAWDUST AND POLYETHYLENE IN AN UPDRAFT FIXED BED FOR PRODUCTION OF HYDROGEN-RICH SYNGAS
14:00-14:10	803	ZHIQIANG WU, BO ZHANG, JIANXUAN SHANG, BOLUN YANG, YUN CHANG LI	CHEMICAL LOOPING PARTIAL OXIDATION OF BIOMASS PYROLYSIS VOLATILE: THERMOMECHANICAL ANALYSIS AND PRODUCT DISTRIBUTION ON METHANE
14:10-14:20	897	DONG-HA LIM, JAE HYUNG CHOI, HEE CHUL WOO	CATALYTIC ACTIVITY OF PALLADIUM AND COPPER BASED CATALYSTS FOR MACROALGAL BIO-OIL HYDROTREATMENT
14:20-14:30	736	NIANLING KUANG, ZHENGXING ZUO, WEI WANG, ZHENGYANG ZHAO	A CATALYTIC COMBUSTION BASED FLEXIBLE THIN-FILM THERMOELECTRIC POWER GENERATOR WITH FUELS OF METHANOL AND ETHANOL
14:30-14:40	TEA/COFFEE BREAK		

ROOM B**SESSION 2-B1 CLEAN ENERGY CONVERSION TECHNOLOGY
SESSION CHAIR: ERIK DAHLQUIST**

TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	39	HAIPING YANG, LIANG WANG, QING YANG, PIETRO BARTOCCI, ALBERTO ABAD, ARTURO CABELLO, MARGARITA DE LAS OBRAS LOSCERTALES NAVARRO, MATTERO PELUCCHI, ANDREA TAIANA, WANG LU, HAIBO ZHAO, TERO JORONEN, JUKKA KONTTINEN, FRANCESCO FANTOZZI	INTEGRATION OF MULTIPHASE CFD MODELS WITH DETAILED KINETICS TO UNDERSTAND THE BEHAVIOR OF OXYGEN CARRIERS UNDER PRESSURIZED CONDITIONS
13:10-13:20	51	ZAOXIAO ZHANG, MAIMOONA SHARIF, WANYI XU, HONGXIA WANG, GUANGXU CHENG, XIAOMI CUI	CARBON-CALCIUM COMPOSITE CONVERSION CALCIUM CARBIDE ACETYLENE SYSTEM: MATERIAL AND ENERGY TRANSFORMATION, EXERGY EVALUATIONS
13:20-13:30	102	CHANGAN WANG, DEFU CHE, QISEN MAO, LEI ZHOU, LIYAN JIN, XING NING, FU YANG	EVALUATION ON PYROLYSIS AND MILD OXIDATION CHARACTERISTICS OF TAR-RICH COAL
13:30-13:40	103	JINGYU RAN, ZIQI WANG, ZHONGQING YANG, RUIMING FANG, YUAN TIAN, YUNFEI YAN	KINETIC CHARACTERISTICS OF LOW-CONCENTRATION METHANE CATALYTIC COMBUSTION OVER MN-CE-CU CATALYST UNDER PRESSURE
13:40-13:50	164	H. PAUL WANG, TZU-EN WU, HSIN-LIANG HUANG, YEU-JUIN TUAN, TING-CHUN WANG	HIGH-TEMPERATURE DESULFURIZATION BY ZNO/RANEY CUO ABSORBENTS

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13:50-14:00	194	ZUO ZHENGXING, ZHENGYANG ZHAO, WEI WANG, NIANLING KUANG, PEIYUN XU	THERMAL PERFORMANCE OF THERMOELECTRIC SYSTEM WITH THE PROPANE/AIR OPPOSED-FLOW MICRO POROUS COMBUSTOR
14:00-14:10	357	YANSONG SHEN, YIRAN LIU, HUIMING ZHANG	A DATA-DRIVEN APPROACH FOR THE QUICK PREDICTION OF IN-FURNACE PHENOMENA OF PULVERIZED COAL COMBUSTION IN AN IRONMAKING BLAST FURNACE
14:10-14:20	358	YANSONG SHEN, SHUYUE LI, YUTING ZHUO	MODELLING OF MULTIPHASE REACTIVE FLOWS IN A FULL-LOOP COAL-DIRECT CHEMICAL LOOPING COMBUSTOR
14:20-14:30	395	CHANGAN WANG, DEFU CHE, LEI DENG, TAO ZHU, XING NING, XIANGYU XUE	PREDICTION OF THERMAL CONDUCTIVITY OF UNDERGROUND TAR-RICH COAL SEAM BASED ON SUPPORT VECTOR MACHINE
14:30-14:40	TEA/COFFEE BREAK		
ROOM C			
SESSION 2-C1 CLEAN ENERGY CONVERSION TECHNOLOGY			
SESSION CHAIR: XIAOHUI SHE, ZAOXIAO ZHANG			
TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	5	MARCO SORRENTINO, CESARE PIANESE, MARCO CALIFANO, MARC ROSEN	HEAT AND POWER MANAGEMENT AND ECONOMIC ASSESSMENT OF A GREEN HYDROGEN-BASED MICROGRID EMPLOYING A REVERSIBLE SOLID OXIDE FUEL CELL
13:10-13:20	7	AGUSTIN VALERA-MEDINA, SYED MASHRUK, MARINA KOVALEVA, SEIF-EDDINE ZITOUNI,	AMMONIA/HYDROGEN/METHANE CHARACTERISTIC PROFILES FOR ATMOSPHERIC COMBUSTION APPLICATIONS
13:20-13:30	33	MUHAMMAD AZIZ, DU WEN, KYOHSUKE MIYAHIRA	A NOVEL INTEGRATED RENEWABLE MULTI-GENERATION SYSTEM BASED ON BIOMASS-BASED HYDROGEN/AMMONIA PRODUCTION
13:30-13:40	34	BOWEN WANG, SHIYE ZHANG, MENG NI, KUI JIAO	INTELLIGENT PARAMETER ESTIMATION AND OPERATIONAL CHARACTERISTICS OF PROTON EXCHANGE MEMBRANE ELECTROLYZER FOR HYDROGEN PRODUCTION
13:40-13:50	101	ZAOXIAO ZHANG, ZHEN WU, ZHU PENGFEI, JING YAO, LEILEI GUO, HONGLI YAN, HUAN WANG	A NOVEL DESALINATION SYSTEM WITH POLY GENERATION BASED ON THE HYDROLYSIS REACTION OF HYDRIDE
13:50-14:00	107	BERND EPPEL, DARIA BELLOTTI, PASCAL KOSCHWITZ, CHENG LIANG	A NEW SMALL SCALE TIME-FLEXIBLE CONTAINERIZED POWER TO AMMONIA SOLUTION
14:00-14:10	117	CHONG PENG	RENEWABLE ANTHRAQUINONE WORKING SOLUTION DESIGN AND APPLICATION IN HYDROGEN PEROXIDE SYNTHESIS BY AUTO-OXIDATION PROCESS
14:10-14:20	132	MEYSAM QADRAN, NICHOLAS JENKINS, AMIRREZA AZIMIPOOR	INVESTIGATING THE OPERATIONAL IMPLICATIONS OF TRANSPORTING HYDROGEN VIA EXISTING NATURAL GAS INFRASTRUCTURE IN SOUTH WALES
14:20-14:30	201	XUN ZHU, QIANG LIAO, YANG YANG, JUN LI, QIAN FU, LIANG ZHANG, RUN LIU	PORE ENGINEERING IN NON-PRECIOUS BIMETALLIC PHOSPHIDE ELECTRODE FOR EFFICIENT HYDROGEN EVOLUTION
14:30-14:40	TEA/COFFEE BREAK		
ROOM D			
SESSION 2-D1 MITIGATION TECHNOLOGY AND ENERGY STORAGE			
SESSION CHAIR: CLEMENTE CAPASSO, OTTORINO VENERI			
TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	36	DEBANJAN MUKHERJEE, KARUNA KALITA	TECHNO-ECONOMIC FEASIBILITY OF GRID-SCALE SOLAR PHOTO-VOLTAIC ENERGY STORAGE SYSTEM (GSPV-ESS) HYBRIDS FOR DAILY PEAK POWER SHAVING IN ASSAM, INDIA
13:10-13:20	48	DANIEL KUCEVIC, REBECCA MEIßNER, ANDREAS JOSSEN, HOLGER HESSE	BATTERY ENERGY STORAGE SYSTEMS AS AN ALTERNATIVE TO CONVENTIONAL GRID REINFORCEMENT
13:20-13:30	177	DENNIS Y.C. LEUNG, WENDING PAN, YIFEI WANG, KEE WAH LEONG	ALL-PRINTED AQUEOUS AL ION BATTERY, A PRELIMINARY STUDY
13:30-13:40	187	WENWEN DU	THERMODYNAMIC STUDY OF LIQUID AIR ENERGY STORAGE WITH LOW BOIL-OFF RATES FOR SEASONAL ENERGY STORAGE

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13:40-13:50	188	SHIXUE WANG, PENGFEI SUN, YU ZHU, XIAONING ZHANG	MECHANISMS OF LI (Ni _{0.5} Co _{0.2} Mn _{0.3}) O ₂ /GRAPHITE BATTERY DEGRADATION CAUSED BY OVERCHARGING CYCLING AT LOW TEMPERATURES
13:50-14:00	202	ZHANG XI, YIZHAO GAO, MAYAN LI	DETERMINATION OF HALF-CELL OPEN-CIRCUIT POTENTIAL IN PHYSICAL-BASED MODEL FOR A SILICON-ANODE LI-ION BATTERY CELL
14:00-14:10	225	H RENUKA, PAVAR SAI KUMAR, AWASTHI HIMANSHI, GOEL SANKET	EVALUATION OF LASER ABLATED GRAPHENE BASED ELECTRODES FOR FLEXIBLE SUPERCAPACITORS
14:10-14:20	292	WEILIANG WANG, CHANG HUANG, YUQIAN WANG	DESIGN AND OPTIMIZATION OF A HIGH-TEMPERATURE RANKINE CARNOT BATTERY
14:20-14:30	324	H. PAUL WANG, PO-AN CHEN	ENERGY STORAGE IN A PSEUDOCAPACITIVE CAPACITIVE DEIONIZATION PROCESS

TEA/COFFEE BREAK

ROOM E
SESSION 2-E1 ENERGY SCIENCES
SESSION CHAIR: XIAOHU YANG, LIANG ZHANG

TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:20	541	YUNTING GE, XINYU ZHANG	PERFORMANCE ANALYSIS OF SHELL-AND-TUBE SUPERCRITICAL CO ₂ GAS HEATER IN A CO ₂ POWER GENERATION SYSTEM
13:20-13:30	319	MANOSH PAUL, MENG WANG, PHILLIP DOBSON	INFLUENCE OF BROWNIAN MOTION ON NANOPARTICLE DEPOSITION IN A MICROCHANNEL HEAT SINK
13:30-13:40	716	HUIQING LIU, SHUN WANG, JING WANG	FORCED IMBIBITION TO ENHANCED TIGHT/SHALE OIL RECOVERY: A MOLECULAR DYNAMICS SIMULATION STUDY
13:40-13:50	444	LIWEN JIN, ZHENDI MA, ZHENHUA XIA, GUOSHENG JIA, JIAWEI WANG, YUPING ZHANG	EXPERIMENTAL INVESTIGATION OF FLUID FLOW AND HEAT TRANSFER IN A COAXIAL HEAT EXCHANGER WITH CONSTANT HEAT FLUX
13:50-14:00	445	XIANGLONG LUO, YING CHEN, JIANYONG CHEN, YINGZONG LIANG, ZHI YANG, JIACHENG XU	PINCH ANALYSIS-BASED APPROACH FOR ENERGY TARGETING AND MASS EXCHANGER NETWORK DESIGN OF MULTI-STREAM PRESSURE-RETARDED OSMOSIS SYSTEMS
14:00-14:10	876	QIANG LIU, YAJING XU	STUDY ON HEAT TRANSFER PERFORMANCE OF SINGLE WELL COAXIAL CASING HEAT EXCHANGER
14:10-14:20	307	JUN ZHAO, YANG LI, MINXIA LI, WENJIE XU, QI YAN, CHENGJUAN YANG, KUAN YANG, WEIRAN CAO	EXPERIMENTAL INVESTIGATION ON WETTING CHARACTERISTICS OF R134A ON LASER-PROCESSED SURFACES
14:20-14:30	510	QUN CHEN, XIA LI	FREQUENCY-DOMAIN TRANSFER FUNCTION MODELLING METHOD FOR DYNAMIC NATURAL GAS FLOW AND APPLICATION IN PIPELINE LEAKAGE LOCATION

TEA/COFFEE BREAK

ROOM F
SESSION 2-F1 ENERGY MANAGEMENT, POLICY AND ECONOMICS
SESSION CHAIR: YINGRU ZHAO, FREDRIK WALLIN

TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:20	551	YINGRU ZHAO, JIAN LIN, XUETAO BAI, YUAN HUANG, SHAN XIE	INTEGRATED ENERGY SUPPLY AND DEMAND COORDINATION OPTIMIZATION MODEL FOR URBAN AREAS
13:20-13:30	27	PHILIP SHINE, MICHAEL D. MURPHY	PREDICTING MILK COOLING, MILK HARVESTING AND WATER HEATING ELECTRICITY USE ON DAIRY FARMS USING ARTIFICIAL NEURAL NETWORKS
13:30-13:40	55	GABRIELE CASCIARO, ANDREA LIRA-LOARCA, ANDREA MAZZINO	INCREASING THE SKILL OF SHORT-TERM WIND SPEED ENSEMBLE FORECASTS COMBINING FORECASTS AND OBSERVATIONS VIA EMOS
13:40-13:50	57	JAVAD KHAZAEI, FAEGHEH MOAZENI	DEEP LEARNING-BASED DETECTION OF LINE CONGESTION CYBERATTACKS IN CYBER-PHYSICAL POWER SYSTEMS
13:50-14:00	215	QU FENG, SHIHAO ZHOU	ENERGY MARKET LIBERALIZATION AND EFFICIENCY: EVIDENCE FROM SINGAPORE
14:00-14:10	471	JIANING LIN	SENSITIVITY ANALYSIS BETWEEN INFLUENCING FACTORS AND CLEARING PRICE IN ELECTRICITY SPOT MARKET
14:10-14:20	479	DEYU HUANG	RESEARCH ON THE CLEARING STRATEGY FOR ENERGY RETAIL MARKET IN INTERCONNECTED REGIONS CONSIDERING MULTI-SOURCE ENERGY STORAGE

14:20-14:30	951	XINYUAN LI, QI CHEN, ZHENGJIA ZHANG, QINGHUA XIE, QINGXIANG WANG, ZHILING GUO, HAORAN ZHANG	TOWARDS SMARTER INFRASTRUCTURE PLANNING AND MANAGEMENT FOR RENEWABLE ENERGY: A REVIEW OF REMOTE SENSING TECHNOLOGIES
14:30-14:40	TEA/COFFEE BREAK		
ROOM SA			
13:00-14:30	PANAL: Big Data Analytics for Smart Energy Systems		
14:30-14:40	TEA/COFFEE BREAK		
ROOM A SESSION 2-A2 RENEWABLE ENERGY SESSION CHAIR: LU DING, AWAIS SALMAN			
TIME	PAPER ID	AUTHOR	PAPER TITLE
14:40-14:50	286	WEI-HSIN CHEN, RIA ANIZA, HSIU-JU LO	APPLICATION OF MULTIVARIATE ADAPTIVE REGRESSION SPLINES AND ARTIFICIAL NEURAL NETWORK ON PREDICTING BIOMASS TORREFACTION SEVERITY INDEX
14:50-15:00	306	NORAZANA IBRAHIM, RUZINAH ISHA, NADHILAH AQILAH SHAHDAN, VEKES BALASUNDRAM, KAMYAR SHAMELI, ROSHAFIMA RASIT ALI	CO-PYROLYSIS OF EMPTY FRUIT BUNCH AND HIGH-DENSITY POLYETHYLENE OVER HZSM-5: THERMOGRAVIMETRIC, KINETIC AND THERMODYNAMIC ANALYSIS
15:00-15:10	339	KUNIO YOSHIKAWA, FUMITAKE TAKAHASHI, BASKORO LOKAHITA, HAO XU, DOUGLAS HUNGWE, SHUO CHENG	CO-PYROLYSIS OF OIL SLUDGE AND TORREFIED RICE STRAW FOR HYDROCARBON PRODUCTION
15:10-15:20	350	XIAONAN WANG, LANYU LI, YEN WAH TONG, JIE LI	COMPARISON OF ENERGY PROFILE OF WASTE VALORIZATION TECHNOLOGIES BASED ON DATA-DRIVEN OPTIMIZATION
15:20-15:30	412	KUNIO YOSHIKAWA, FUMITAKE TAKAHASHI, BASKORO LOKAHITA, HAO XU, DOUGLAS HUNGWE, KAWAI KAZUHIRO, SRIKANDI NOVIANTI	IMPROVING DRYING PERFORMANCE OF SPENT COFFEE GROUND VIA HYDROTHERMAL PRETREATMENT
15:30-15:40	521	XUN ZHU, QIANG LIAO, JUN LI, QIAN FU, LIANG ZHANG, YU SHI, ZHIQIANG LU, YAN LI	AN AMMONIA-BREATHING THERMALLY REGENERATIVE BATTERY FOR LOW-GRADE WASTE HEAT RECOVERY
15:40-15:50	704	BEIBEI YAN, GUANYI CHEN, JIAN LI, ZHI WANG, FAN YU	A COMPREHENSIVE EVALUATION ON THE INTEGRATED PROCESS OF ANAEROBIC DIGESTION AND PYROLYSIS
15:50-16:00	332	JAEWON BYUN, JEEHOON HAN, HOYOUNG PARK, JEONGKEUN LEE	TECHNO-ECONOMIC ANALYSIS OF OLEFINS PRODUCTION FROM BIO-BASED METHANOL
ROOM B SESSION 2-B2 MITIGATION TECHNOLOGY AND ENERGY STORAGE SESSION CHAIR: XIAOYAN JI, SHOULIANG YI			
TIME	PAPER ID	AUTHOR	PAPER TITLE
14:40-14:50	4	ZAOXIAO ZHANG, SIMIN WANG, CHEN SONG, WEIXIANG LIN	OPTIMIZATION INVESTIGATION ON THE STRUCTURAL PARAMETERS OF A NOVEL CYCLONE SEPARATOR USING GENETIC ALGORITHM
14:50-15:00	14	FARID AKHTAR, ZHEJIAN CAO, RAFAEL ACOSTA LAISEQUILLA	3D-PRINTED ZEOLITE NAX-MAGNESIUM CHLORIDE UNITS AS AMMONIA CARRIERS
15:00-15:10	264	CONG CHEN, CHAOKUI QIN	RESEARCH ON POLLUTANT EMISSIONS OF GAS FULL PREMIXED WATER-COOLED COMBUSTION TECHNOLOGY

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15:10-15:20	404	JEEHOON HAN, HOYOUNG PARK, MYUNGHO CHOI	GLOBAL WARMING POTENTIAL ASSESSMENT OF ADIPIC ACID PRODUCTION FROM GAMMA-VALEROLACTONE
15:20-15:30	647	XINGXING CHENG, SHEN CHENG, XINGYU ZHANG, LUYUAN WANG, CHENGBO XUAN, ZHIQIANG WANG, CHUNYUAN MA, RONGFENG SUN	SO ₂ TOLERANCE MECHANISM OF CE-MODIFIED CU/FE ₂ O ₃ CATALYSTS FOR THE NO + CO REACTION: IN SITU DRIFTS STUDY
15:30-15:40	723	FU WANG, LEI XUANMIAO	AN AMMONIA CARBON CAPTURE SYSTEM COUPLED WITH AMMONIA WATER ABSORPTION REFRIGERATION
15:40-15:50	68	ZHENKUN WU, YUHAO WU, XINYU NING, BO ZHU, XIAO GUO, WEN TANG, WENLONG YAN, SONGSHAN LI, WEIDONG GU, XIANG HUANG, LEI DENG	ANALYSIS OF FACTORS ON NO _x EMISSION OF A 600 MW BOILER UNDER DIFFERENT CONDITIONS
15:50-16:00	56	CAI YONGTIE, ZHENG ZHIMIN, ZHOU ANQI, LI ZHENWEI, YANG WENMING	CHEMICAL AND MINERALOGICAL ANALYSIS OF ASH DEPOSITS IN A MOVING GRATE BOILER

ROOM C

SESSION 2-C2 MITIGATION TECHNOLOGY AND ENERGY STORAGE

SESSION CHAIR: XIAOHUI SHE, CHUANG WEN

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:40-14:50	52	WU JIANBANG, SHENGLAI YANG, BOWEN GAN	A NEW IMBIBITION SCALE MODEL FOR TIGHT RESERVOIRS CONSIDERING DIFFUSION AND WATER SENSITIVITY
14:50-15:00	151	DEBO LI, NING ZHAO, YONGXIN FENG, YONG LIANG, ZHIWEN XIE	STUDY ON EVAPORATION CHARACTERISTICS OF FGD WASTEWATER IN THE SPRAY DRYING TOWER USING NUMERICAL SIMULATION AND RESPONSE
15:00-15:10	152	DEBO LI, NING ZHAO, YONGXIN FENG, XIAOLE HUANG, ZHIWEN XIE	EXPERIMENTAL STUDY ON CHLORINE MIGRATION OF DESULFURIZATION WASTEWATER IN HOT FLUE GAS ENVIRONMENT
15:10-15:20	250	BIN LIU, JIE WU, YING YANG, JUNZE JIANG, DEQI CHEN, XIAOMIN GUO	STUDY ON MODIFICATION OF NH ₄ AL(SO ₄) ₂ ·12H ₂ O AND MGCL ₂ ·6H ₂ O COMPOSITE PHASE CHANGE ENERGY STORAGE MATERIALS
15:20-15:30	281	BIYU JING	THERMAL ENERGY STORAGE OF HFO-1336-MZZ(Z)/MOF-200 AND MM/MOF-200 NANOFLUIDS: A MOLECULAR SIMULATION STUDY
15:30-15:40	754	LINGSHI WANG, XIAOBING LIU, XINZHANG ZHOU, AMIT NASKAR	EXPERIMENTAL AND NUMERICAL STUDY ON THE IMPACTS OF VARIOUS LONG CARBON FIBER INSERTS ON THE THERMAL PERFORMANCE OF PHASE CHANGE MATERIALS
15:40-15:50	838	LINGSHI WANG, XIAOBING LIU, MING QU, LIANG SHI, XINZHANG ZHOU	EXPERIMENTAL STUDY ON CHARGING AND DISCHARGING PERFORMANCE OF A DUAL-PURPOSE UNDERGROUND THERMAL BATTERY
15:50-16:00	869	XUN ZHU, QIANG LIAO, JUN LI, QIAN FU, PENGTAO YUE, LIANG ZHANG, YUHANG XIE	ACTIVATED CARBONS SUPPORTED NI-N-C CATALYSTS FOR ENHANCED FARADAIC EFFICIENCY OF ELECTROLYTIC BICARBONATE TO CO

ROOM D

SESSION 2-D2 MITIGATION TECHNOLOGY AND ENERGY STORAGE

SESSION CHAIR: ALESSIO TAFONE

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:40-14:50	697	XIAOHUI SHE, YULONG DING, TONGTONG ZHANG	INTEGRATION OF LIQUID AIR ENERGY STORAGE WITH AMMONIA SYNTHESIS PROCESS
14:50-15:00	714	XIAOSONG ZHANG, XIAOHUI SHE, CHEN WANG	ENHANCED COLD RECOVERY OF LIQUID AIR ENERGY STORAGE WITH PACKED BED COLD AND HEAT STORAGE
15:00-15:10	808	ANDREW C, ELOKA-EBOKA, TEMILOLUWA OLATUNJI SCOTT, DANIEL R.E. EWIM	AN OVERVIEW OF NATURAL CONVECTION OF HYBRID-WATER NANOFLUIDS IN CAVITY FLOWS
15:10-15:20	868	MAHA HAJI, MATTHEW HAEFNER	INTEGRATED PUMPED HYDRO REVERSE OSMOSIS SYSTEM OPTIMIZATION WITH ENHANCED REVERSE OSMOSIS MODELING

Day 2: Nov 30

Oral Presentations

15:20-15:30	817	JINLING HU	ENERGY STORAGE MATERIALS MGO-HITEC MOLTEN SALT COMPOSITE BY ELECTROMAGNETIC HEATING IN-SITU PREPARATION
15:30-15:40	176	CHENGBIN YU, YOUNG SEOK SONG	SMART CONTROL OF PYROELECTRIC ENERGY HARVESTING SYSTEM USING FORM-STABLE PHASE CHANGE MATERIAL (PCM)
15:40-15:50	111	GANG PEI, DATONG GAO	DIFFERENT ENERGY MANAGEMENT STRATEGIES EVALUATION FOR SOLAR ENERGY EFFICIENT YEAR-ROUND UTILIZATION
15:50-16:00	47	XIANGLEI LIU, HAICHEN YAO	EXPERIMENTAL AND NUMERICAL STUDY ON SOLAR-THERMAL ENERGY STORAGE AT PORE-SCALE BASED ON VOLUMETRIC ABSORPTION

ROOM E
SESSION 2-E2 ENERGY SCIENCES
SESSION CHAIR: XUN ZHU

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:40-14:50	42	DEFU CHE, LEI DENG, BING BAI, NAIFENG ZHANG, JUN CHEN, GANG XIAO, YUE ZHANG	A STUDY ON THE CORROSION BEHAVIOR OF 15CRM0 IN STEAM-INJECTION BOILER WITH LOW-QUALITY FEED WATER
14:50-15:00	211	JIA WANG, JUAN WANG, WEIHENG LI, QIU-AN HUANG, JIUJUN ZHANG, RUI ZHAO, NAN WANG	A NOVEL PREPROCESSING APPROACH OF ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY FOR DISTRIBUTION OF RELAXATION TIMES
15:00-15:10	157	KE SUN, HUIQING LIU, LIANGYU MA, RENJIE LIU, YABIN FENG, ZHIJIANG KANG, YUN ZHANG	A PRACTICAL METHOD FOR PRODUCTION DECLINE ANALYSIS OF THE SINGLE WELL DURING NATURAL DEPLETION IN TIGHT RESERVOIRS AFTER FRACTURING
15:10-15:20	123	ZIYE LING, ZHENGGUO ZHANG, XIAOMING FANG, XUEMIN LIN	NOVEL CONDUCTIVE FLEXIBLE PARAFFIN/SEBS/EG/SILICON OIL COMPOSITE PHASE CHANGE MATERIAL FOR THERMOTHERAPY
15:20-15:30	757	SHUAI LI, SHENGLAI YANG, XINYUAN GAO, WENGANG DONG, LEI JIN, BEIDONG WANG	INFLUENCING FACTORS AND CONSTRUCTION PARAMETER OPTIMIZATION DESIGN OF HOT WATER HUFF AND PUFF IN TIGHT VOLCANIC RESERVOIR
15:30-15:40	175	WEI-HSIN CHEN, TZU-HSUAN HUANG	DESIGN AND SIMULATION OF A UNILEG THERMOELECTRIC GENERATOR
15:40-15:50	547	LINGYANG LI, HAORAN ZHANG, XIAOCONG SUN	SHORT-TERM LOAD FORECASTING MODEL USING SUPPORT VECTOR MACHINE BASED ON WAVELET DECOMPOSITION
15:50-16:00	370	ZHIGUO QU , JIAN-FEI ZHANG , HUANGYI ZHU , QINLONG REN	DIMENSIONLESS ANALYSIS AND PARAMETER SENSIBILITY ANALYSIS OF IONIC THERMOELECTRICAL ENERGY CONVERSION IN NANOCANNELS BASED ON SORET EFFECT

ROOM F
SESSION 2-F2 ENERGY MANAGEMENT, POLICY AND ECONOMICS
SESSION CHAIR: BIYING YU, YING YANG

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:40-14:50	861	KARLIS MENDZINS , AIGA BARISA , VLADIMIRS KIRSANOVS	EXTERNAL COSTS OF PASSENGER CARS IN LATVIA
14:50-15:00	858	AIGA BARISA	RENEWABLE TRANSPORT CHALLENGE: A COMPREHENSIVE POLICY ASSESSMENT MODEL
15:00-15:10	418	NICOLA CANTORE , CHARLES FANG CHIN CHENG	THE INCLUSIVE AND SUSTAINABLE COMPETITIVE INDUSTRIAL PERFORMANCE INDEX (ISCIPI): IMPLICATIONS FOR AFRICA
15:10-15:20	888	DAGNIJA BLUMBERGA , ANDRA BLUMBERGA , AIGA BARISA , RUTA VANAGA , IEVA PAKERE , RITVARIS FREIMANIS , ĢIRTS BOHVALOVŠ	SYSTEM DYNAMICS MODELING FOR THE TRANSITION FROM TRADITIONAL HISTORIC URBAN BLOCK TO A POSITIVE ENERGY BLOCK
15:20-15:30	220	PREDRAG SPASOJEVIC	CLIMATE CHANGES INFLUENCE TO RENEWABLE ENERGIES AND PROPOSAL FOR ITS REVERSAL WITH THE DIRECT RENEWABLE ENERGY APPLICATION
15:30-15:40	720	DAGNIJA BLUMBERGA , KRISTIANA DOLGE	COMPOSITE TRANSPORT SUSTAINABILITY INDEX: CROSS-COUNTRY ASSESSMENT TOWARDS CLIMATE NEUTRALITY IN THE CONTEXT OF THE EUROPEAN GREEN DEAL TARGETS
15:40-15:50	892	DAGNIJA BLUMBERGA , ANDRA BLUMBERGA , KRISTIANA DOLGE , ANRIJS TUKULIS	ENERGY EFFICIENCY IMPROVEMENT FROM VIEWPOINT OF ENTERPRISES
15:50-16:00	196	AFSHIN AFSHARI	URBAN DESIGN/RETROFIT OPTIMIZATION USING A COMPUTATIONALLY LIGHT STANDALONE URBAN CANOPY MODEL FORCED BY ERA5 DATA

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Day 2: Nov 30

Oral Presentations

ROOM 5

14:40-16:00

PANEL: Open data for urban energy systems

16:00-16:45

KEYNOTE 2 (ERIC LOTH)

ROOM S

9:00-11:30

PANEL: Smart district heating networks

12:00-12:45

KEYNOTE 1 (SHAN-TUNG TU)**ROOM A****SESSION 3-A1 RENEWABLE ENERGY
SESSION CHAIR: LU DING, AWAIS SALMAN**

TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	20	ARIF DARMAWAN, MUHAMMAD HUDA, HARIANA HARIANA, FAIRUZ MILKIY KUSWA	STUDY ON ASH CHARACTERISTICS OF COFIRING SAWDUST WITH COAL FOR SUPERCRITICAL POWER PLANTS IN INDONESIA
13:10-13:20	62	LEI DENG, YUAN TIE, KAI ZHANG, XIAOLE HUANG, YANG BAI, PEIQING CAO, YONGGANG ZHAO	EFFECTS OF WET SLUDGE AMOUNT ON SLUDGE-COAL BLENDING COMBUSTION FOR POWER GENERATION
13:20-13:30	97	HENRIK STROM, TAO CHEN, JONAS SJÖBLOM	INVESTIGATION OF THE SOOT FORMATION DURING WOOD LOG COMBUSTION
13:30-13:40	398	TIANYU LIU, CHANG WEN, CHANGKANG LI, KAI YAN, RUI LI, ZHENQI JING	THERMAL UPGRADES OF TYPICAL BIOMASS: COMBUSTION BEHAVIOR, PARTICULATE MATTER EMISSION AND TECHNO-ECONOMIC ANALYSIS
13:40-13:50	3	ANIL KUMAR SAKHIYA, PARAMJEET BAGHEL, ABHIJEET ANAND, AKSHIT TRADA, VIRENDRA KUMAR VIJAY, PRIYANKA KAUSHAL	ENERGY POTENTIAL FROM WALNUT SHELL DERIVED BIOCHAR: A CLEAN ENERGY APPROACH IN INDIA
13:50-14:00	79	YUAN TIE, YUHAO WU, KAI ZHANG, XIAOLE HUANG, LEI DENG, DEFU CHE	RELEASE AND TRANSFORMATION OF POTASSIUM DURING BIOMASS GASIFICATION IN A FIXED BED REACTOR WITH STEAM-OXYGEN MIXTURES
14:00-14:10	153	LEI ZHANG, LINGXIAO DONG, YUHAO WU, JIANGJIA HAO, LEI DENG	PB2+ ADSORPTION PROPERTIES OF PINE BIOCHAR AND SOYBEAN STRAW BIOCHAR
14:10-14:20	213	YONG-SEONG JEONG, TAE-YOUNG MUN, JOO-SIK KIM	PRODUCTION OF PRODUCT GAS WITH LOW LEVELS OF TAR AND NH3 FROM DRIED SEWAGE SLUDGE GASIFICATION USING A TWO-STAGE GASIFIER
14:20-14:30	282	LU DING	HYDROTHERMAL CARBONIZATION OF RAPE STRAW: EFFECT OF REACTION PARAMETERS ON HYDROCHAR AND MIGRATION OF AAEMS
14:30-14:40	294	TIM EISENBACH	A FIRST PARAMETERIZATION OF THE PORE-STRUCTURE DEPENDENT KINETIC ADSORPTION MODEL FOR O2 ADSORPTION IN BIOMASS CONVERSION MODELING
14:40-14:50	TEA/COFFEE BREAK		

ROOM B**SESSION 3-B1 CLEAN ENERGY CONVERSION TECHNOLOGY
SESSION CHAIR: HU ZHANG, LIANG WANG**

TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	425	WEI HAN, CHANGCHUN LIU, XIAODONG XUE	THE PERFORMANCE IMPROVEMENT MECHANISM OF A NOVEL CHEMICAL RECUPERATIVE POWER PLANT BASED ON SUPERCRITICAL WATER COAL GASIFICATION
13:10-13:20	718	JINGYU RAN, ZIQI WANG, ZHONGQING YANG, YUAN TIAN, YUNFEI YAN, ZHISHUAI DOU	STUDY ON THE EFFECT OF MN-CE BIMETAL MODIFICATION ON CU-BASED CATALYSTS ON THE CATALYTIC COMBUSTION CHARACTERISTICS OF METHANE
13:20-13:30	800	ZHIQIANG WU, WEI GUO, RONGJIANG ZHANG, JIANXUAN SHANG, BOLUN YANG	KINETICS ANALYSIS FROM LIQUID CHEMICAL LOOPING GASIFICATION OF MCT WITH ANTIMONY-BASED OXYGEN CARRIER
13:30-13:40	827	P MUTHUKUMAR, SUNITA DEB, SHV SATISH	NUMERICAL STUDY OF COMBUSTION MODES IN A CLUSTERED POROUS RADIANT BURNER
13:40-13:50	833	BOLUN YANG, ZHIQIANG WU, PANXI YANG, JIANXUAN SHANG, YUYUAN LIU, JIANHUA LIU	PRESSURE PROFILE INSIDE THE COAL PARTICLE DURING THE PROCESS OF PULVERIZED COAL RAPID PYROLYSIS FOR UPGRADING PROCESS
13:50-14:00	862	ROBERTO SCACCABAROZZI, MANUELE GATTI, DAMIANO GELMINI	DECARBONIZED HYDROGEN PRODUCTION FROM COMBINED BIOMASS GASIFICATION AND NATURAL GAS REFORMING WITH CO2 CAPTURE
14:00-14:10	780	BOLUN YANG, ZHIQIANG WU, WEI GUO, RONGJIANG ZHANG, JIANXUAN SHANG	EFFECT OF TORREFACTION ON LIQUID CHEMICAL LOOPING GASIFICATION (LCLG) OF BIOMASS
14:10-14:20	823	LI ZHANG, ZHONGQING YANG, YUNFEI YAN, JINGXIANG YOU, TAO JIA, HAOJIE LI, ZIQIANG HE	PROGRESS IN HYDROGEN PRODUCTION FROM AMMONIA BORANE HYDROLYSIS
14:20-14:30	41	QIUWANG WANG, JIAN YANG, ZHIHONG WU	PERFORMANCE OF METHANE STEAM REFORMING IN INTERNAL SPIRAL FINNED TUBE

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14:30-14:40	916	KYAW THU, RELEBOHILE MOKETE, FRANTISEK MIKSIK, NOBUO TAKATA, TAKIHIKO MIYAZAKI	A PRECURSOR STUDY FOR MODIFICATION OF HYDROGEN PRODUCTION BY ELECTROLYSIS
14:40-14:50	TEA/COFFEE BREAK		
ROOM C			
SESSION 3-C1 CLEAN ENERGY CONVERSION TECHNOLOGY			
SESSION CHAIR: YUKUN HU, TAO ZHANG			
TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	528	JIANWEI LI, ZHONGHAO TIAN, WEITAO ZOU	CONCENTRATION MEASUREMENTS IN A LOW-PRESSURE HYDROGEN JET USING SCHLIEREN METHOD
13:10-13:20	535	JAEWON BYUN, JEEHOON HAN	ECONOMIC FEASIBLE PRODUCTION OF GREEN HYDROGEN FROM CEREAL-RICH FOOD WASTE
13:20-13:30	542	YUN LI, ZEKUN LIU, KANG XIANG, GAO XIUFENG	NUMERICAL SIMULATION OF TWO-PHASE FLOW IN LIQUID PISTON COMPRESSOR FOR HYDROGEN REFUELING STATION
13:30-13:40	545	CHANGLONG WANG, STUART WALSH	EVALUATING THE ECONOMIC POTENTIAL FOR GREEN AMMONIA PRODUCTION IN AUSTRALIA
13:40-13:50	661	XIAOHUI SHE, YANHONG ZHANG, LIU BIN, LUO YONG, SUN QIAOYANG, TENG LIN	NUMERICAL SIMULATION STUDY OF MULTISTAGE HIGH-PRESSURE HYDROGEN PRESSURE-REDUCING VALVE
13:50-14:00	663	XIAOHUI SHE, LIU BIN, MO FAN, TENG LIN, KANG XI, WANG HUIRU, HAN PENG	STUDY ON HYDROGEN DISPERSION OF COMPLEX AIR SUPPLY AND EXHAUST SYSTEM IN LARGE UNDERGROUND GARAGE
14:00-14:10	760	NAZMIYE BALTA-OZKAN, JOEL GORDON, SEYED ALI NABA VI	HYDROGEN HOPES FOR UK HOMES? A THEORETICAL APPROACH TO BREAKDOWN SOCIOTECHNICAL BARRIERS
14:10-14:20	764	CHUAN WANG, YUKUN HU, XIYAO SUN	UNDERSTANDING THE HYDROGEN/AMMONIA COMBUSTION BEHAVIOURS UNDER AIR AND OXYGEN ENVIRONMENTS IN A COMBUSTION CHAMBER
14:20-14:30	831	LU LI	OPERATING CHARACTERISTICS OF METAL HYDRIDE HYDROGEN STORAGE WITH PRESSURE REGULATION
14:30-14:40	405	HANKWON LIM, BOREUM LEE, HYUNJUN LEE, HEEHYANG KIM, JIWON GU	GREEN H ₂ PRODUCTION BY SOLAR ENERGY AND ALKALINE WATER ELECTROLYSIS: ECONOMIC FEASIBILITY STUDY FOR FUTURE H ₂ SOCIETY
14:40-14:50	TEA/COFFEE BREAK		
ROOM D			
SESSION 3-D1 MITIGATION TECHNOLOGY AND ENERGY STORAGE			
SESSION CHAIR: CLEMENTE CAPASSO, OTTORINO VENERI			
TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	516	LI WANG, XIUFEN HE, YUNONG LIU	PROCESS PROGRESS AND PERFORMANCE COMPARISON OF AN INTEGRATED SYSTEM OF AIR SEPARATION AND LIQUID AIR ENERGY STORAGE TECHNOLOGIES
13:10-13:20	641	AMIT KUMAR, ESKINDER GEMECHU, ABAYOMI OLUFEMI ONI, MD. MUSTAFIZUR RAHMAN	ASSESSMENT OF ENVIRONMENTAL AND ENERGY FOOTPRINTS OF UTILITY-SCALE FLYWHEEL ENERGY STORAGE SYSTEMS
13:20-13:30	655	JINGWEI NI, MINGJIA LI, TENG MA	THE STUDY OF DYNAMIC RESPONSE MODEL AND ENERGY OPTIMIZATION MANAGEMENT PROCESS FOR THE APPLICATION OF VANADIUM REDOX FLOW BATTERY IN MICROGRID
13:30-13:40	688	SHENRUN ZHANG	DEEP LEARNING-BASED ENSEMBLE METHOD FOR LI-ION BATTERY STATE-OF-CHARGE ESTIMATION
13:40-13:50	701	SUITAO QI, XIAOYAN ZHANG, LAN ZHANG	PHENYL VINYL SULFONE AS AN EFFICIENT ADDITIVE FOR ENHANCED CYCLABILITY OF NCM811 BATTERIES
13:50-14:00	741	BYEONG WAN KWON	ANTRAQUINONE DERIVATIVES AND HYDROQUINONE REDOX COUPLES IN AQUEOUS ORGANIC REDOX FLOW BATTERY
14:00-14:10	797	RUI WANG, YINSHI LI, CHAO HE, ZHILONG ZHAO, XIANHUA WU	HIGH-PERFORMANCE CARBON-BASED POROUS ELECTRODE WITH ENHANCED DESIGN TOWARDS MASS TRANSPORT AND REDOX REACTION FOR FLOW BATTERIES
14:10-14:20	799	S. JAYANTI, PAVAN KUMAR VUDISI, RAGHURAM CHETTY	CONSTANT-POWER CHARACTERIZATION OF A 5 KW VANADIUM REDOX FLOW BATTERY STACK

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Day 3: Dec 1

Oral Presentations

14:20-14:30	807	S. JAYANTI, PRAPHULLA RAO	TEMPERATURE-SENSITIVE ELECTROCHEMICAL MODEL OF VANADIUM REDOX FLOW BATTERY CELL
14:30-14:40	356	XING YAO, SHAO-CHAO MA, YING FAN, LEI ZHU, BIN SU	AN INVESTIGATION OF BATTERY STORAGE OPERATING STRATEGIES IN POWER SYSTEMS
14:40-14:50	TEA/COFFEE BREAK		
ROOM E			
SESSION 3-E1 ENERGY SCIENCES			
SESSION CHAIR: XIAOSEN LI, YI WANG			
TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	37	TIANBIAO HE, JIBAO ZHANG, XIALIAN XING	EXPERIMENTAL STUDY OF THE ENHANCEMENT OF CO ₂ /C ₃ H ₈ HYDRATE KINETICS WITH CYCLOPENTANE FOR DESALINATION
13:10-13:20	58	QINGYUN LIAO, BOHUI SHI, SHANGFEI SONG, XU DUAN, JUNAO WANG, HAIYUAN YAO, ZIYUAN FENG, JING GONG	MOLECULAR DYNAMICS SIMULATION OF METHANE HYDRATE GROWTH IN WATER-WAXY OIL SYSTEM
13:20-13:30	124	JIAFEI ZHAO, YU LIU, LANLAN JIANG, XIAOFAN WANG, CHEN LANG	EXPERIMENTAL STUDY FOR EFFECTS OF KINETIC INHIBITORS ON STRUCTURE II HYDRATES USING A ROCKING CELL
13:30-13:40	216	DONGLIANG ZHONG, HU SI, ZILI YANG	DYNAMIC ENERGY EFFICIENCY OPTIMIZATION RESEARCH OF GAS HYDRATE DISSOCIATION BY COMBINED METHOD OF THERMAL STIMULATION AND DEPRESSURIZATION
13:40-13:50	335	ZHENYUAN YIN, MENGYA NIU, JUNJIE REN	EFFECT OF NA-MONTMORILLONITE CLAY ON THE KINETICS OF CH ₄ HYDRATE FORMATION AND DISSOCIATION: IMPLICATION FOR ENERGY RECOVERY FROM CH ₄ HYDRATE
13:50-14:00	665	YIFEI SUN, GUANGJIN CHEN, JINRONG ZHONG, YUE-FEI ZHANG	CO ₂ HYDRATE DISSOLUTION RATES IN UNSATURATED WATER QUANTIFIED WITH LABORATORY EXPERIMENTS
14:00-14:10	715	JINRONG ZHONG, GUANGJIN CHEN, CHANGYU SUN, YAN XIE, YUJIE ZHU, JING-CHUN FENG, TAO ZHENG	PECULIARITY OF CO ₂ /H ₂ HYDRATE DECOMPOSITION: THE EQUILIBRIUM DECOMPOSITION TEMPERATURE SEEMS TO BE AFFECTED BY DIFFERENT H ₂ MOLECULE OCCUPATION
14:10-14:20	798	SI ZHANG, JING-CHUN FENG, MINGRUI ZHANG, LIWEI SUN, YANYAN HUANG, ZHIFENG YANG, PIAN LI	PHASE EQUILIBRIUM CHARACTERISTICS OF METHANE HYDRATE FORMATION IN THE DEEP SEA
14:20-14:30	848	RAJNISH KUMAR, BHAVIKKUMAR MAHANT, OMKAR SINGH KUSHWAHA	GAS HYDRATE BASED ENERGY STORAGE BY USING EDIBLE OIL DERIVED SURFACTANT
14:30-14:40	849	RAJNISH KUMAR, BHAVIKKUMAR MAHANT, OMKAR SINGH KUSHWAHA	EXPERIMENTAL INVESTIGATIONS AND MODELLING OF METHANE STORAGE AND FLOW ASSURANCE USING MODIFIED-PVP
14:40-14:50	TEA/COFFEE BREAK		
ROOM F			
SESSION 3-F1 INTELLIGENT ENERGY SYSTEM			
SESSION CHAIR: ZHENG ZHUANG, JINQING PENG			
TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	154	JIA LIU, YUEKUAN ZHOU, YINGDONG HE, GUOQIANG ZHANG	ENERGY COMPLEMENTARITY BETWEEN RENEWABLE-ABUNDANT AND REMAND-SHORTAGE REGIONS THROUGH ENHANCED TRANSPORTATION-BASED ENERGY MIGRATION
13:10-13:20	314	XIAONAN WANG, MUNSIK PARK, ZHIYUAN WANG	MULTI-OBJECTIVE BUILDING ENERGY SYSTEM OPTIMIZATION CONSIDERING EV INFRASTRUCTURE
13:20-13:30	446	MA CHENGJUN	EXPLORATION OF RURAL SOLAR HOUSE RENOVATION DESIGN IN CENTRAL INNER MONGOLIA IN THE PROCESS OF LOW-CARBON ECONOMIC TRANSFORMATION
13:30-13:40	469	SAYANTHAN RAMAKRISHNAN, JAY SANJAYAN	BUILDINGS INTEGRATED WITH PHASE CHANGE MATERIALS AND FLOOR HEATING FOR PEAK LOAD SHIFTING VIA THERMAL ENERGY STORAGE: A POST-COVID GREEN RECOVERY APPROACH
13:40-13:50	712	YUPENG WU, JOHN CALAUTIT, PAIGE WENBIN TIEN, SHUANGYU WEI, ZHICHEN WEI	AN OVERVIEW OF CLOTHING INSULATION MEASUREMENT FOR USE IN PMV-BASED HVAC CONTROL STRATEGY AND VISION-BASED APPROACH FOR CLOTHING INSULATION PREDICTION
13:50-14:00	749	HUANXIN CHEN, ZHENXIN ZHOU	VARIABLE REFRIGERATION FLOW SYSTEM SIMULTANEOUS FAULT DIAGNOSIS BASED ON DEEP CONVOLUTIONAL NETWORK

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Day 3: Dec 1

Oral Presentations

14:00-14:10	840	YUPENG WU, JOHN KAISER CALAUTIT, FANGLIANG ZHONG	EVALUATION OF HVAC SYSTEM OPERATIONAL FAULT IMPACTS UNDER CLIMATE CHANGE SCENARIOS
14:10-14:20	863	YUPENG WU, YANYI SUN, YANG MING	CFD AND RAY-TRACING MODELLING FOR SOLAR HEAT GAIN COEFFICIENT CALCULATION FOR AN ADAPTIVE SMART WINDOW SYSTEM
14:20-14:30	805	HONGXING YANG, WENCHAO SHI, XIAOCHEN MA	STUDY ON WATER SPRAYING DISTRIBUTION FOR IMPROVEMENT OF INDIRECT EVAPORATIVE COOLERS WITH NOZZLE ARRANGEMENT OPTIMIZATION
14:30-14:40	467	MARKUS KRAFT, SEBASTIAN MOSBACH, MARKUS HOFMEISTER, AMIT BHAVE, JÖRG HAMMACHER, MARTIN BLUM, GERD RÖHRIG, CHRISTOPH DÖRR, VOLKER FLEGEL	RESOURCE-OPTIMISED GENERATION DISPATCH STRATEGY FOR DISTRICT HEATING SYSTEMS USING DYNAMIC HIERARCHICAL OPTIMISATION
14:40-14:50	TEA/COFFEE BREAK		
ROOM S			
13:00-14:40	PANEL: Decarbonising heating and cooling sector: a whole-system perspective		
14:40-14:50	TEA/COFFEE BREAK		
ROOM A			
SESSION 3-A2 RENEWABLE ENERGY			
SESSION CHAIR: PIETRO CAMPANA, BENGT STRIDH			
TIME	PAPER ID	AUTHOR	PAPER TITLE
14:50-15:00	65	TAKURO KOBASHI, UCOK SIAGIAN, RETNO GUMILANG DEWI, BRIANTAMA ASMARA, SYAHIRINA ANGGRAINI, JUN ICHIHARA	POTENTIALS OF ROOFTOP PHOTOVOLTAICS PLUS ELECTRIC VEHICLES FOR DEEP DECARBONIZATION OF JAKARTA CITY, INDONESIA
15:00-15:10	85	HUIMING YIN	NONLINEAR DEFORMATION OF LARGE BUILDING INTEGRATED PHOTOVOLTAIC PANELS UNDER STATIC TRANSVERSE LOADING
15:10-15:20	92	SOOWON CHANG, JUNYOUNG CHO, JUNSUK KANG, TAKURO KOBASHI	POTENTIALS OF ROOFTOP PHOTOVOLTAICS COMBINED WITH ELECTRIC VEHICLES FOR DECARBONIZATION IN KOREAN CITIES
15:20-15:30	272	LI ZHU, YIFAN JING, BAOQUAN YIN, FANGFANG LI	UPGRADING OF PHOTOVOLTAIC SYSTEM IN AN EXISTING INTEGRATED ENERGY PARK
15:30-15:40	301	TAKURO KOBASHI, LIYA XUE, JUNLING LIU, MENG YUE LI	TECHNO-ECONOMIC ANALYSIS OF ROOFTOP PV PLUS EV SYSTEM TOWARD CARBON NEUTRALITY IN SHENZHEN CITY
15:40-15:50	308	PEIPEI JIANG, CHENG CHENG	APPLICATION OF RENEWABLE ENERGY IN RENOVATION OF EXISTING BUILDINGS
15:50-16:00	313	ZHENGHAO LIU, HENG ZHANG, NA WANG, HAIPING CHEN	EXPERIMENTAL PERFORMANCE EVALUATION OF VACUUM MEMBRANE DISTILLATION SEAWATER DESALINATION SYSTEM COMBINED WITH LCPV/T MODULE
16:00-16:10	331	GANG PEI, LIANG GONG, XIAO REN, DATONG GAO, CHUANYONG ZHU, BINGHUAN HUANG	A NOVEL PHOTOVOLTAICTHERMAL SYSTEM USING SILICON HETEROJUNCTION CELLS FOR INTERMEDIATE TEMPERATURE APPLICATIONS
16:10-16:20	369	KAI ZHANG	ASSESS SOLAR ENERGY POTENTIAL OF PHOTOVOLTAIC NOISE BARRIERS (PVNB) BASED ON ENSEMBLE CLASSIFICATION MODEL AND STREET VIEW IMAGES
16:20-16:30	498	GUIYU ZHAO	COMPARATIVE ANALYSIS OF THE DEVELOPMENT OF WIND POWER AND PHOTOVOLTAIC POWER GENERATION
ROOM B			
SESSION 3-B2 RENEWABLE ENERGY			
SESSION CHAIR: LIANG WANG, JAN SKVARIL			
TIME	PAPER ID	AUTHOR	PAPER TITLE
14:50-15:00	243	LEI DENG, XIAOLE HUANG, ZHENKUN WU, XINYU NING, BO ZHU, WEN TANG, WEIDONG GU, HAOXUAN DING, YUHAO WU, YU LEI, JUN YIN, DENG YU LIAO, KAI ZHANG	NUMERICAL SIMULATION ON COMBUSTION CHARACTERISTICS OF CO-FIRING BIOMASS SYNGAS AND COAL IN A 660 MW UTILITY TOWER BOILER

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Day 3: Dec 1

Oral Presentations

15:00-15:10	290	JENNY RIZKIANA, AGHIETAS CHOIRUN AZ ZAHRA	MICRO AND MACRO PARTICLE MODELLING APPROACH OF CO-TORREFACTION OF LOW-RANK COAL AND BIOMASS
15:10-15:20	305	YIN LONG, YI WU, XI LIANG, PEIPEI CHEN	EFFECT MEASUREMENT OF PV ADOPTION ON HOUSEHOLD ELECTRICITY CONSUMPTION: EVIDENCE FROM JAPAN BASED ON A PSM-DID APPROACH
15:20-15:30	341	HAODONG HUANG, MENG LIN	MULTI-SCALE DYNAMIC BEHAVIOR OF SOLAR THERMOCHEMICAL REACTOR FOR FUEL GENERATION: MODELING AND CONTROL STRATEGY
15:30-15:40	352	HARIANA, ARIF DARMAWAN, HANAFI PRIDA PUTRA, FAIRUZ MILKY KUSWA, M. SHOLEH, MUHAMMAD AZIZ	COMBUSTION CHARACTERISTICS DURING COFIRING OF PALM EMPTY FRUIT BUNCH, PALM FROND WITH BITUMINOUS COAL
15:40-15:50	925	HAILONG LI, JAN SKVARIL, EVA THORIN, ALI AHMAD SHAHNAWAZI, KAJSA EDLUND	APPLICATION OF NEAR-INFRARED SPECTROSCOPY AND MACHINE LEARNING ALGORITHMS FOR REAL-TIME MEASUREMENT OF ELEMENTAL COMPOSITION AND OTHER SOLID BIOFUEL PROPERTIES
15:50-16:00	944	LIANG WANG, LORENZO RIVA, ØYVIND SKREIBERG, ZSUZSANNA CZÉGÉNY, PIETRO BARTOCCI, HENRIK KOFOED NIELSEN	STUDY ON DENSIFICATION OF BIOCARBON FOR METAL PRODUCTION APPLICATION
16:00-16:10	772	JUN LI, XIAOLEI ZHANG, ASUQUO JACKSON ASUQUO	WASTE CARICA PAPAYA OIL SEED EXTRACTION: A POTENTIAL FEED STOCK FOR BIODIESEL PRODUCTION TO ACHIEVE NET-ZERO
16:10-16:20	895	HAILONG LI, EVA THORIN, LIANG WANG, YINGYING SUN, BEIBEI DONG	CAPTURING CO ₂ FROM WOOD FAST PYROLYSIS

ROOM C

SESSION 3-C2 CLEAN ENERGY CONVERSION TECHNOLOGY

SESSION CHAIR: ERIK DAHLQUIST

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:50-15:00	70	BO ZHU, YUAN TIE, ZHENKUN WU, XINYU NING, HAOXUAN DING, SONGSHAN LI, WENLONG YAN, JIAN HUANG, XIANG HUANG, LEI DENG	THE INFLUENCE OF FLUE GAS RECIRCULATION ON HEAT TRANSFER CHARACTERISTICS BASED ON A DOUBLE-REHEAT BOILER
15:00-15:10	208	ZHANG BAI, YU YUAN, BO ZHENG, WENXIN HU	THE OFF-DESIGN PERFORMANCES OF THE EMPLOYED THERMOCHEMICAL RECUPERATION FOR COORDINATING THE DISTRIBUTED ENERGY PRODUCTION
15:10-15:20	435	XUN ZHU, QIANG LIAO, JUN LI, JILI ZHENG, JUN ZHANG, SHUAI LV, YANAN ZOU	BUBBLING FLUIDIZED CATHODE PHOTOCATALYTIC FUEL CELL SYSTEM FOR BOOSTING THE REDUCTION EFFICIENCY OF CARBON DIOXIDE: DUAL FUNCTION OF TITANIUM CARBIDE
15:20-15:30	437	XIULAN HUAI, LI WANG, YA-NAN LI, PING WU, SHIPING ZHANG, JINGUANG YANG	EFFECT OF CARBON NANOTUBE DOPING ON THERMAL CONDUCTIVITY OF CA ₃ CO ₄ O ₉ CERAMICS
15:30-15:40	459	HAITAO ZHAO, PENG JIANG, WEI MENG, GUANG YANG, LIN ZHU, JIANTING YU, XU GUAN, LIANG QIAO, LULING LI	PERFORMANCE ASSESSMENT OF GAS-ELECTRIC HYBRID SYSTEM FOR EFFICIENT COOLING PRODUCTION
15:40-15:50	524	XIANGFENG WU	DEVELOPMENT AND APPLICATION ON THE DISTRIBUTED SIGNAL AMPLIFICATION SENSOR OF POLYMER ELECTROLYTE MEMBRANE FUEL CELL
15:50-16:00	540	XIAOYAN JI, ZHIBO ZHANG	DEVELOPING ARTIFICIAL IONIC COFACTORS FOR EFFICIENT ELECTRO-ENZYMATIC CONVERSION OF CO ₂ TO FORMIC ACID
16:00-16:10	571	NILOFAR NAAZ	INFLUENCE OF WATER TURBIDITY UPON THE SOLAR RADIATION AND PHOTOVOLTAIC RESPONSE OF AMORPHOUS SILICON BASED UNDERWATER SOLAR CELLS
16:10-16:20	575	YULEI LIU, HAITAO YU, YAO WANG, QIANGFANG ZHANG	DESIGN AND OPTIMIZATION OF A NOVEL MAGNETIC SCREW INTEGRATED GENERATOR FOR WAVE POWER GENERATION
16:20-16:30	169	PRAVEEN LINGA, YE ZHANG, GAURAV BHATTACHARJEE	KINETIC STUDY OF MIXED HYDROGEN/1,3-DIOXOLANE HYDRATES IN THE PRESENCE OF AMINO ACIDS

ROOM D

SESSION 3-D2 MITIGATION TECHNOLOGY AND ENERGY STORAGE

SESSION CHAIR: ZAOXIAO ZHANG, ENI OKO

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:50-15:00	750	YONG SHUAI, HAO ZHANG, GUENE LOUGOU BACHIROU, BOSHU JIANG	EXPERIMENTAL STUDY ON TWO-STEP THERMOCHEMICAL REDUCTION OF CO ₂ CATALYZED WITH NIFE ₂ O ₄ ENHANCED BY CUO

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Day 3: Dec 1

Oral Presentations

15:00-15:10	753	MINGZHE GUO, HUIQING LIU, CHAO PU, LIANGYU MA, YUNLIN GAO	NUMERICAL SIMULATION ANALYSIS OF CO ₂ STORAGE DURING CYCLIC STEAM STIMULATION IN OFFSHORE HEAVY OIL RESERVOIR
15:10-15:20	792	LIN GAO, SONG HE, YAWEN ZHENG	THE MECHANISM AND POTENTIAL FOR REDUCING ENERGY CONSUMPTION OF CO ₂ CAPTURE IN POWER SYSTEM
15:20-15:30	847	AYAJ AHAMAD ANSARI, RANDEEP RAVESH	INFLUENCE OF SAND PARTICLE SIZE ON THE KINETICS OF CO ₂ HYDRATE FORMATION IN A PILOT SCALE REACTOR
15:30-15:40	865	ENI OKO, ALEX O IBHADON, JOHN OWOLABI, MUHAMMAD IBRAHIM IRSHAD	REVIEW OF CATALYST-AIDED SOLVENT REGENERATION IN POST-COMBUSTION CO ₂ CAPTURE PROCESS
15:40-15:50	11	JIANDA WANG, XIUCHENG DONG, KANGYIN DONG	HOW DIGITAL INDUSTRIES AFFECT CHINA'S CARBON EMISSIONS? ANALYSIS OF THE DIRECT AND INDIRECT STRUCTURAL EFFECTS
15:50-16:00	258	SUITAO QI, XIAO TAN, RUI HUA, WENHUI ZHANG	COMPARATIVE STUDY ON STRUCTURES AND ENERGIES OF SO ₂ ADSORPTION ON CU, LI-DOPED MGO(100) BY DFT AND EXPERIMENTAL APPROACHES
16:00-16:10	779	CHUAN WANG, YUKUN HU, XIAOYUAN CHENG	UNDERSTAND THE IMPACT OF THE NET ZERO CARBON COMBUSTION SOLUTION ON THE SCALE FORMATION OF STEEL HEATING PROCESS
16:10-16:20	678	BOLUN YANG, SHUHUI CHEN, YUE WU, WENXIANG ZHANG, SHANSHAN WANG, TONG YAN, SONGJIE HE, HEPING MA	A 3D ULTRAMICROPOROUS POROUS ORGANIC FRAMEWORKS FOR SO ₂ CAPTURE WITH HIGH CAPACITY AND SELECTIVITY
16:20-16:30	905	HAILONG LI, SHENGCHUN LIU, CHANGZHENG HU, BEIBEI DONG	DIFFERENT CONTROL STRATEGIES FOR MEA BASED CHEMICAL ABSORPTION

ROOM E

SESSION 3-E2 ENERGY SCIENCES

SESSION CHAIR: JINQING PENG

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:50-15:00	35	SHUANG YE, YOU-RONG LI	NUMERICAL STUDY ON THE COUPLING EFFECT OF SESSILE ETHANOL DROPLET EVAPORATION AND ITS INDUCED THERMAL FLOW IN PURE VAPOR ENVIRONMENT AT LOW PRESSURES
15:00-15:10	54	DEFU CHE, LEI DENG, JIAHAO JIANG, SHENGLI YU, TING WANG, LIANGUO JIANG, YABIN WANG, ZHANCHAO SUO, JIANFEI SHI, LINGYU JIAN CHEN, RUI ZHAO, WEN-LONG CHENG	STRUCTURAL OPTIMIZATION OF FLOW AND HEAT TRANSFER CHARACTERISTICS OF INTEGRAL HELICAL FINNED TUBES BASED ON GENETIC ALGORITHM
15:10-15:20	67		EXPERIMENTAL AND NUMERICAL STUDY ON HEAT TRANSFER CHARACTERISTICS OF SUPERCRITICAL CARBON DIOXIDE FLOWING UPWARD IN A VERTICAL TUBE
15:20-15:30	86	PEI LU	ENTROPY GENERATION RATE ANALYSIS OF TWO-PHASE FLOW IN A T-JUNCTION
15:30-15:40	118	HAIYAN LEI, CHUANSHAN DAI, DEQIAN ZHANG	ACHIEVEMENT OF SIMULATED FORMATION WITH HIGH TEMPERATURE GRADIENT AT LAB-SCALE
15:40-15:50	146	WENQUAN TAO, LI CHEN, YANG XIA, JI-WANG LUO	TOPOLOGY OPTIMIZATION OF LIQUID-COOLED HEAT SINKS WITH DIFFERENT INLETS AND OUTLETS
15:50-16:00	149	YOU-RONG LI, RUI-FENG GUO	STUDY ON ENERGY TRANSFER MECHANISM DURING ETHANOL EVAPORATION IN THE ANNULAR POOL HEATED FROM INNER CYLINDER AT LOW PRESSURES
16:00-16:10	178	XIAOXIAO XU XIAOXIAO XU, CHAO LIU, CHUANG WU, DAN LI, DONGNAN CAI	EXPERIMENT AND SIMULATION INVESTIGATION ON THE FLOW AND HEAT TRANSFER INSTABILITY OF SUPERCRITICAL CO ₂ HEATED IN VERTICAL TUBE UPWARD FLOW
16:10-16:20	185	LIWEN JIN, XIN CUI, WEICHAO YAN, CHENGCHENG TIAN, YILIN LIU, XIANGZHAO MENG, XINYU WANG	REGRESSION MODEL OF A COUNTER-FLOW EVAPORATIVE COOLER BASED ON HOLLOW FIBER MEMBRANES
16:20-16:30	200	JIANGYAN LIU, KUINING LI, JINGHONG WANG, WANLING ZHANG, WEI LUN, BIN LIU	EXPERIMENTAL RESEARCH OF A DEHUMIDIFICATION SYSTEM WITH SELF-COOLED LIQUID DESICCANT

ROOM F

SESSION 3-F1 INTELLIGENT ENERGY SYSTEM

SESSION CHAIR: OTTORINO VENERI, CLEMENTE CAPASSO

TIME	PAPER ID	AUTHOR	PAPER TITLE
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Day 3: Dec 1

Oral Presentations

14:50-15:00	190	OTTORINO VENERI, CLEMENTE CAPASSO, MICHELA COSTA, DAVIDE ADINOLFI	EXPERIMENTAL PROCEDURE FOR THE CHARACTERIZATION OF ENERGY FLOWS IN E-BIKES OPERATING ON REAL DRIVING CYCLES
15:00-15:10	193	ANDREA LUIGI FACCI, STEFANO UBERTINI, GABRIELE LORETI, ALESSANDRO ROSATI, JURI TABORRI, STEFANO ROSSI	SMART ENERGY COMMUNITY FOR ELECTRIC VEHICLES RECHARGE IN A BUILDING ENVIRONMENT
15:10-15:20	231	XIAOBO QU, ZILING ZENG	EN-ROUTE CHARGING SCHEDULE OPTIMIZATION FOR LIGHTWEIGHT ELECTRIC BUSES IN THE POST-COVID 19 ERA
15:20-15:30	346	JING ZHAO, YANG CHAO, WEIDA WANG, YING LI, CHANGLE XIANG	A SMOOTH PATH PLANNING LEARNING STRATEGY DESIGN FOR AN AIR-GROUND AMPHIBIOUS VEHICLE CONSIDERING MODE SWITCHING
15:30-15:40	423	HONGWEN HE, RUCHEN HUANG, XIANGFEI MENG	INTELLIGENT SOC REFERENCE PLANNING FOR HYBRID ELECTRIC BUS: A HIERARCHICAL PREDICTIVE ENERGY MANAGEMENT STRATEGY
15:40-15:50	440	OCKTAECK LIM, HIEU LE TRONG	AN INVESTIGATION ON THE PERFORMANCE CHARACTERISTICS OF THE ELECTRIC SCOOTER WITH VARIABLE INPUT PARAMETERS
15:50-16:00	349	HONGWEN HE, YUANKAI WU, YONG WANG, TANG YINGJUAN	ENERGY MANAGEMENT OF HYBRID ELECTRIC VEHICLE UNDER CAR-FOLLOWING SCENARIO BASED ON MULTI-AGENT REINFORCEMENT LEARNING
16:00-16:10	802	HONGMING XU, QUAN ZHOU, CETENGFEI ZHANG, CHONGMING WANG, MIN HUA	ONLINE DOUBLE-LAYER SYSTEM IDENTIFICATION SCHEME OF BATTERY WITH STATE OF HEALTH PREDICTION
16:10-16:20	820	XU NAN, KONG YAN, YAN SUI, QIAO LIU	DATA-DRIVEN ENERGY MANAGEMENT BASED ON ADAPTIVE DYNAMIC PROGRAMMING
16:20-16:30	438	YANG CHAO, RUIHU CHEN, WEIDA WANG, MUYAO WANG, LIUQUAN YANG	PREDICTIVE AND COORDINATED POWER CONTROL STRATEGY FOR SERIES HYBRID ELECTRIC VEHICLE WITH FUZZY ADAPTIVE FILTER

ROOM S

14:50-16:30	PANEL: Challenges in the commercialization of biomass renewable energy technologies 1
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ROOM S

12:00-12:45

KEYNOTE 1 (YONG CHEN)**ROOM A****SESSION 4-A1 RENEWABLE ENERGY
SESSION CHAIR: HUIMING YIN, TAO MA**

TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	502	SANEEJ NIHADH, SAQAFF ALKAFF	NEW DESIGN ARRANGEMENT FOR THE PV ROOF-INTEGRATED SYSTEM
13:10-13:20	531	XINGXING ZHANG, PEI HUANG	FUTURE CLIMATE CHANGE IMPACTS ON THE SOLAR POWER SHARED ENERGY COMMUNITY: A CASE STUDY IN SWEDEN
13:20-13:30	555	LAURENT LINGUET, SARA ZERMANI, MAHA SALLOUM, JÉRÉMY MACAIRE	VERY SHORT-TERM SOLAR IRRADIANCE FORECASTING IN FRENCH GUIANA WITH MACHINE LEARNING MODELS AND SATELLITE DATA
13:30-13:40	596	LAURENT LINGUET, SARA ZERMANI, MAHA SALLOUM, JÉRÉMY MACAIRE, JESSICA BECHET	FEATURE SELECTION USING KERNEL CONDITIONAL DENSITY ESTIMATOR FOR DAY-AHEAD REGIONAL PV POWER FORECASTING IN FRENCH GUIANA
13:40-13:50	622	HENRY WILLIAMS, K. MAX ZHANG, YUMING SUN, KHALED HASHAD	ANALYSIS OF THE POTENTIAL FOR SITE VENTILATION TO IMPROVE OVERALL EFFICIENCY OF UTILITY-SCALE SOLAR FARMS
13:50-14:00	707	MEI SUN, ZHILONG GUO	HOW TO REDUCE THE IMPACT OF DISTRIBUTED ENERGY ON POWER GRID—A THREE-LEVEL GAME MODEL WITH COMMUNITY ENERGY TRANSACTION
14:00-14:10	900	HAN YUE, DENGXIN AI, KE XU, ZHIYONG GAN, YE LI	STUDY ON THE PERFORMANCE OF SOLAR COUPLED HEAT PUMP COGENERATION ZERO CARBON ENERGY SYSTEM FOR VILLA
14:10-14:20	682	ARNUSORN SAENGPRAJAK, WUTTHISAT CHOCKUA, JENJIRA PIAMDEE	MATHEMATICAL MODELING AND EFFICIENCIES EVALUATION OF THE DOUBLE STAGE PV/T DRYING SYSTEM FOR MULBERRY LEAVES DRYING
14:20-14:30	787	QIBIN LIU, JUAN FANG, XUNLIANG LIU, HAILONG HUO, XIAOPING YI	EFFICIENT EXPLOITING OF SOLAR ENERGY REJECTED BY PHOTOVOLTAIC CELLS VIA A THERMALLY REGENERATIVE AMMONIA BATTERY
14:30-14:40	855	CHEN ERJIAN, JIA TENG, DOU PENGBO, ZHAO YAO, DAI YANJUN	PERFORMANCE ASSESSMENT OF A MULTI-MODE SOLAR ASSISTED ABSORPTION-COMPRESSION SYSTEM FOR BOTH HEATING AND COOLING
14:40-14:50	TEA/COFFEE BREAK		

ROOM B**SESSION 4-B1 CLEAN ENERGY CONVERSION TECHNOLOGY
SESSION CHAIR: ANDERS AVELIN, MARINA BERTOLINI**

TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	13	ZAOXIAO ZHANG, XIAOMEI WU, WANYI XU, HONGXIA WANG	REDUCING CARBON DIOXIDE EMISSION IN THE PROCESS OF OXYGEN-THERMAL COAL TO CALCIUM CARBIDE POLYGENERATION SYSTEM
13:10-13:20	64	ALESSANDRO ROMAGNOLI, SUNDAR RAJTHANGAVELU RAJ THANGAVELU, ALESSIO TAFONE	DESIGN OPTIMIZATION OF A NOVEL CRYO-POLYGENERATION DEMONSTRATOR-TECHNO-ECONOMIC FEASIBILITY STUDY FOR A TROPICAL CLIMATE IN SINGAPORE
13:20-13:30	155	JIANGYAN LIU, YI XIE, KUINING LI, ZHONGMING LIU, CHUANG WU	MULTI-OBJECTIVE OPTIMIZATION OF A NOVEL TRIGENERATION SYSTEM BASED ON SUPERCRITICAL CO ₂ POWER CYCLE AND LIBR ABSORPTION REFRIGERATION CYCLE
13:30-13:40	183	QIBIN LI, JUNRONG TANG, YI QUE	THERMO-ECONOMIC ANALYSIS AND MULTI-OBJECTIVE OPTIMIZATION OF A NOVEL CCHP SYSTEM DRIVEN BY GEOTHERMAL ENERGY
13:40-13:50	198	LIN GAO, CHAOWEI WANG, YANBING WEI	A NEW FLEXIBLE ENERGY SYSTEM THROUGH DECOUPLING UNITS WITH DIFFERENT DYNAMIC CHARACTERISTICS
13:50-14:00	681	QIBIN LIU, TAIXIU LIU, YUANLONG QIN	A MULTI-ENERGY THERMOCHEMICAL HYBRID CHP SYSTEM INTEGRATED DUAL-STAGE ENERGY STORAGE
14:00-14:10	743	WEIDONG CHEN	A NOVEL AND GENERAL OPTIMISED OPERATIONAL STRATEGY FOR CCHP SYSTEM CONSIDERING OPTIMAL LOAD MATCH
14:10-14:20	137	MUDITHA ABEYSEKERA, HECTOR BASTIDA, CARLOS E. UGALDE-LOO, DANIEL ALEJANDRO MORALES SANDOVAL	DYNAMIC MODEL OF A BOILER ADAPTABLE TO GREEN FUELS FOR A HEATING SYSTEM
14:20-14:30	590	JIANZHONG WU, MUDITHA ABEYSEKERA, JONATHAN AMIRMADHI	MODELLING OF ELECTRICAL - THERMAL - HYDRAULIC SYSTEM INTERDEPENDENCIES IN 5TH GENERATION DISTRICT HEATING AND COOLING NETWORKS
14:30-14:40	767	KIM CHOON NG, MUHAMMAD AHMAD JAMIL, NIDA IMTIAZ, BEN BIN XU, HASEEB YAQOOB, MUHAMMAD WAKIL SHAHZAD	A RESILIENT INNOVATIVE INDIRECT EVAPORATIVE COOLER FOR DATA CENTERS COOLING
14:40-14:50	TEA/COFFEE BREAK		

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Day 4: Dec 2

Oral Presentations

ROOM C

SESSION 4-C1 MITIGATION TECHNOLOGY AND ENERGY STORAGE

SESSION CHAIR: DANIEL KUCEVIC, LINGSHI WANG

TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	901	HONGJIE JIA, CHAOYU DONG, YUNFEI MU, MARUI LI, XIAOHONG DONG	TCRDN: ALLIED TEMPORAL CONVOLUTION-RECURRENT DIAGNOSIS NETWORK FOR THE THERMAL HEALTH MANAGEMENT OF LITHIUM-ION ENERGY SYSTEM
13:10-13:20	942	ERIK DAHLQUIST, FREDRIK WALLIZ, MASOUME SHABANI, JERRY YAN	OPERATING STRATEGIES ON IMPROVING LIFETIME AND PROFITABILITY OF A BATTERY INTEGRATED INTO A RESIDENTIAL PV SYSTEM
13:20-13:30	692	DONGXIAO ZHANG, XIAO GUANG YIN, QIANG ZHENG, NANZHE WANG, JIAN LI	THEORY-GUIDED DEEP LEARNING OF ELECTROCHEMICAL PERFORMANCE OF LI-ION BATTERIES DURING DISCHARGE
13:30-13:40	256	LISHENG ZHANG, XINLEI GAO, XINHUA LIU, SHICHUN YANG	RESEARCH: IN-SITU DETECTION OF LITHIUM DEPOSITION OF LITHIUM ION BATTERIES
13:40-13:50	809	LEI XUANMIAO	THE SYNTHESIS OF HIGH-QUALITY V2C AS ELECTRODE MATERIALS FOR SUPERCAPACITORS
13:50-14:00	511	LI WANG, XIUFEN HE, YUNONG LIU	THERMODYNAMIC AND ECONOMIC ANALYSIS OF EXTERNAL COMPRESSION AIR SEPARATION UNIT WITH LARGE SCALE ENERGY STORAGE
14:00-14:10	893	HAILONG LI, SHENGCHUN LIU, XUEQIANG LI, YABO WANG, ZHONGYAO ZHANG	COMPARING COOLING METHODS FOR LI-ION BATTERIES
14:10-14:20	321	UMBERTO BERARDI, LEILA ABDOLMALEKI	COMPARATIVE ANALYSIS OF THREE SOLAR ENERGY-BASED SYSTEMS WITH HYDROGEN AND ELECTRIC BATTERY STORAGE IN SINGLE HOUSES
14:20-14:30	856	MASSIMO GUARNIERI, NICOLA POLI, ANDREA TROVÒ, CINZIA BONALDO	OPTIMAL ENERGY STORAGE SYSTEMS FOR LONG CHARGE/DISCHARGE DURATION
14:40-14:50	TEA/COFFEE BREAK		

ROOM D

SESSION 4-D1 ENERGY SCIENCES

SESSION CHAIR: REBEI BEL FDHILA

TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	515	YOURONG LI, CHUNMEI WU, RUIQI HUANG	EFFECTS OF CAPILLARY RATIO ON THE STABILITY AND PATTERN EVOLUTION OF COUPLED CONVECTION IN A CZOHRALSKI CONFIGURATION
13:10-13:20	517	YOURONG LI, CHUNMEI WU, GAOSONG ZHAO	INVESTIGATION ON THE CONDENSATION OF DROPLET IN ITS OWN VAPOR ENVIRONMENT
13:20-13:30	518	YOURONG LI, CHUNMEI WU, YUANQING LIN	EXPERIMENTALLY INVESTIGATION ON THE EFFECT OF VAPOR ENVIRONMENT ON THE EVOLUTIONS OF THERMAL PATTERNS DURING SESSILE DROPLET EVAPORATIONS
13:30-13:40	699	XUELING LIU, JIANGSHENG WANG, JINTAO NIU, FU YUGUO	DEAN INSTABILITY PHENOMENON AND ITS EFFECT ON HEAT TRANSFER IN SINUSOIDAL CHANNEL
13:40-13:50	719	LIN DING, QUNFENG ZOU, YUE SUN	FLOW-INDUCED VIBRATION AND HEAT EXCHANGE CHARACTERISTICS OF A ROTATING CYLINDER WITH TWO DEGREES OF FREEDOM
13:50-14:00	726	DARIO COLORADO-GARRIDO, ABEL BONFIL GARCIA	A NEW TWO-PHASE FRICTION MULTIPLIER APPROACH FOR ANNULAR FLOW IN HELICALLY COILED TUBE
14:00-14:10	733	GUO YUNFEI, HUIQING LIU, RENJIE LIU	COMPREHENSIVE ANALYSIS AND IMPROVE METHOD FOR HEAVY OIL RECOVERY OF DIP RESERVOIR USING SAGP THERMAL METHOD BASED ON NUMERICAL ANALYSIS
14:10-14:20	786	XIAOXIAO XU, XIAOXIAO XU, CHAO LIU, DAN LI, CAO YONG, ZHANG SHIJE	EXPERIMENTAL STUDY ON SUPPRESSING HEAT TRANSFER DETERIORATION OF SUPERCRITICAL CO ₂ HEATED IN VERTICAL TUBES BASED ON HELMHOLTZ SELF-OSCILLATING CAVITY
14:20-14:30	908	AGUS SASMITO, AHMAD ZUETER, PUTRA HANIF AGSON GANI, MINGHAN XU	DEVELOPMENT OF A 1+1D REDUCED-ORDER MODEL IN DOUBLE-PIPE GEOTHERMAL HEAT EXCHANGER SYSTEMS: FROM SINGLE TO MULTIPLE BOREHOLES

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Day 4: Dec 2

Oral Presentations

14:30-14:40	49	XIANGLEI LIU, MENG CHEN	PHASE CHANGE COMPOSITES WITH HIGH THERMAL CONDUCTIVITY BASED ON BAMBOO-DERIVED SIC CERAMICS
14:40-14:50	TEA/COFFEE BREAK		
ROOM E			
SESSION 4-E1 ENERGY MANAGEMENT, POLICY AND ECONOMICS			
SESSION CHAIR: MEI SUN, GORDON HUANG			
TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	218	RONGXIN WU, BOQIANG LIN	CAN CHINA'S CARBON EMISSION TRADING SCHEME IMPROVE CO ₂ EMISSION EFFICIENCY OF IRON AND STEEL INDUSTRY? EMPIRICAL EVIDENCE FROM THE SYNTHETIC CONTROL METHOD
13:10-13:20	236	ZHIZHOU TAN, BOQIANG LIN	HOW DOES THE PAIRS TRADING STRATEGY BASED ON RELATIVE VALUE ARBITRAGE PERFORM IN THE CARBON TRADING MARKET? - EVIDENCE FROM CHINA'S PILOT CARBON TRADING MARKETS
13:20-13:30	242	CAN WANG, WENJIA CAI, YIBING ZHAO, YIDAN CHEN	RECYCLING CARBON PRICING REVENUE AND THE EFFECTS ON INCOME INEQUALITY AND REGIONAL DISPARITY: A CGE-BASED STUDY OF CHINA
13:30-13:40	643	AMIT KUMAR, MATTHEW DAVIS, LUKE SPERRY	DEVELOPMENT OF A BOTTOM-UP FRAMEWORK TO DETERMINE ENERGY EFFICIENCY CONTRIBUTION POTENTIAL OF MORE THAN 100 MEASURES FOR MEETING NATIONAL NET-ZERO GHG EMISSIONS
13:40-13:50	685	SHAOZHOU QI, XIUJIE TAN, SHIHAN CHENG, SHENGAO FENG	PREDICTING CHINA'S CARBON PRICE FROM 2021 TO 2060 BASED ON A MULTI-SCALE INTEGRATED MODEL
13:50-14:00	6	PATRIK HILBER, SANJA DUVNJAK ZARKOVIC, NOVALIE HOU, EBRAHIM SHAYESTEH	THE SWEDISH POWER SYSTEM RESILIENCE AGAINST BAD WEATHER CONDITIONS
14:00-14:10	73	ÍÑIGO DEL GUAYO, ÁLVARO CUESTA	A JUST TRANSITION FOR COAL. AN ANALYSIS FROM THE PERSPECTIVE OF THE EUROPEAN UNION, WITH A PARTICULAR ATTENTION TO THE CASE OF SPAIN
14:10-14:20	317	PAOLO GABRIELLI, LINDA BRODNICKE, GIOVANNI SANSAVINI	IMPACT OF RENEWABLE-ENERGY POLICY DESIGN ON THE ECONOMIC, SOCIAL, AND ENVIRONMENTAL BENEFITS OF MULTI-ENERGY SYSTEMS
14:20-14:30	351	HOWARD CHEUNG, LEO K C CHAN, NANCY C Y WONG	PRELIMINARY LITERATURE REVIEW ON THE ROLES OF SMART CITY TECHNOLOGIES FOR ENERGY POLICY MAKING IN A POLICY CYCLE
14:30-14:40	407	CAN WANG, WENJIA CAI, YIBING ZHAO, YIDAN CHEN	EFFECTS ON CARBON EMISSION AND CARBON POLICY CHOICES OF THE AGING SOCIETY-A CASE STUDY OF CHINA
14:40-14:50	TEA/COFFEE BREAK		
ROOM F			
SESSION 4-F1 INTELLIGENT ENERGY SYSTEM			
SESSION CHAIR: HAORAN JI			
TIME	PAPER ID	AUTHOR	PAPER TITLE
13:00-13:10	601	GORAN STRBAC, XI ZHANG, ZIHANG DONG, LASCELLE MAURICETTE	ELECTRIC VEHICLE CO-ORDINATION STRATEGIES FOR ENHANCING SYSTEM RESILIENCE IN MULTI-ENERGY MICROGRIDS
13:10-13:20	619	LANG ZHAO, DONG PENG, YIZHENG LI, YUAN ZENG	COOPERATIVE DECISION MODEL OF ELECTRIC VEHICLE PARTICIPATION IN POWER SYSTEM GENERATION AND RESERVE BASED ON RISK MEASUREMENT THEORY
13:20-13:30	734	QIAO WANG, MIN YE, MENG WEI, GAOQI LIAN, CHENGUANG WU	OPTIMIZED DEEP CONVOLUTIONAL NEURAL NETWORKS BASED STATE OF CHARGE ESTIMATION FOR LITHIUM-ION BATTERY
13:30-13:40	775	ZHANGYU LU, XIZHENG ZHANG	CONTROL STRATEGY OF HYBRID ENERGY STORAGE SYSTEM BASED ON EXACT FEEDBACK LINEARIZATION AND SLIDING MODE CONTROL
13:40-13:50	837	CHAO LONG, SIQI WANG	A CASE STUDY OF EV CHARGING BEHAVIORS AND ELECTRICITY DEMAND OF A PUBLIC CAR PARK IN ENGLAND
13:50-14:00	842	GONGPOP LEELAMIAN	DESIGN OF MOBILE AIR-CONDITIONING SYSTEM (MACS) FOR SMALL ELECTRIC VEHICLE CONVERSION
14:00-14:10	882	HAILONG ZHANG	ECONOMY-ORIENTED OPTIMIZATION OF HYBRID ELECTRIC VEHICLE UNDER CAR-FOLLOWING PROCESS

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Day 4: Dec 2

Oral Presentations

14:10-14:20	927	ZHUANG XU	CLAMPING-FORCE CONTROL OF A SENSOR-LESS ELECTRO-MECHANICAL BRAKE ACTUATOR IN NEW-ENERGY VEHICLES
14:20-14:30	605	REINHARD MADLENER, THOMAS BRUDERHOFER, FREDERIC HORTA	SOLAR PV-BASED MINIGRIDS IN RURAL AREAS OF DEVELOPING COUNTRIES: AN ECONOMIC ANALYSIS
14:30-14:40	232	ZHENJUN MA , MUHAMMAD BILAL AWAN , WENYE LIN	FORMULATION OF AN INCLUSIVE DEMAND-SIDE ENERGY FLEXIBILITY QUANTIFICATION FUNCTION FOR BUILDINGS WITH INTEGRATED THERMAL ENERGY STORAGE
14:40-14:50	TEA/COFFEE BREAK		
ROOM S			
13:00-14:40	PANEL: Design and operation optimization of aggregate energy systems		
14:40-14:50	TEA/COFFEE BREAK		
ROOM A			
SESSION 4-A2 RENEWABLE ENERGY			
SESSION CHAIR: TAO MA			
TIME	PAPER ID	AUTHOR	PAPER TITLE
14:50-15:00	18	JINGHU GONG	RESEARCH ON TROUGH SOLAR POWER USING MULTI-STAGE HEATING TECHNOLOGY
15:00-15:10	32	QIUWANG WANG, ZHIGANG GUO, JIAN YANG, HAO-NAN JIA, XING TIAN	NUMERICAL STUDY ON GRAVITY-DRIVEN PARTICLE FLOW AROUND VERTICAL PLATE OUT-WALL: EFFECT OF MIXING PART ON THE HEAT TRANSFER
15:10-15:20	88	YOU-RONG LI, ZHEN-YU WANG	THERMODYNAMIC PERFORMANCE ANALYSIS OF A SOLAR THERMAL POWER SYSTEM BASED ON STIRLING GENERATOR ON THE MOON
15:20-15:30	93	JIABIN FANG, JINJIA WEI, NAN TU, CANGHONG ZHANG, TAO HAN	NUMERICAL INVESTIGATION ON HEAT TRANSFER AND THERMOELASTIC STRESS INDUCED BY TEMPERATURE GRADIENTS AND MECHANICAL CONSTRAINTS IN SOLAR RECEIVER TUBES
15:30-15:40	579	QIBIN LIU, ZHIMEI ZHENG	EXPERIMENTAL INVESTIGATION OF MID-AND-LOW TEMPERATURE SOLAR-FUEL THERMOCHEMICAL HYBRID CONVERSION USING NEW SOLAR RECEIVERS/REACTORS
15:40-15:50	691	QIBIN LIU, TAIXIU LIU, PEIJING LI	NUMERICAL ANALYSIS AND COMPARISON OF THERMAL PERFORMANCE OF A NEW HOMOGENEOUS PARABOLIC TROUGH SOLAR RECEIVER
15:50-16:00	722	MANOSH PAUL, OGUZHAN KAZAZ, NADER KARIMI, GIOIA FALCONE, SHANMUGAM KUMAR	EFFECT OF RADIATIVE HEAT TRANSFER IN NANOFUID FOR VOLUMETRIC SOLAR COLLECTOR
16:00-16:10	783	YA-LING HE, YUANTING ZHANG, YU QIU, JIKANG WANG, XIAO-YUE LI, QING LI	AN OPTICAL-THERMAL COUPLED MODEL FOR PERFORMANCE ANALYSIS OF A MOLTEN-SALT SOLAR POWER TOWER
16:10-16:20	812	ZHANG XIAOSONG, HONGYANG WEI, LUN ZHANG	EVALUATION OF SOLAR HOT WATER SYSTEM BASED ON TEMPERATURE MONITORING DATA IN HOT SUMMER AND COLD WINTER AREA IN CHINA
16:20-16:30	852	NEIL HEWITT, KHOA LE, MING JUN HUANG, GERARD OBASI, ADAM LUNNON-COLLERY	PERFORMANCES OF FLAT PLATE SOLAR COLLECTOR WITH BIOMIMETIC MECHANISM HEAT EXCHANGER: CFD MODELLING AND SIMULATION APPROACH
ROOM B			
SESSION 4-B2 CLEAN ENERGY CONVERSION TECHNOLOGY			
SESSION CHAIR: JINLONG LIU, XI JIANG			
TIME	PAPER ID	AUTHOR	PAPER TITLE
14:50-15:00	31	DANIYAL KHAN, JESPER HOLM BJERNEMOSE, IVAR LUND	EXPERIMENTAL INVESTIGATION OF MIXER PLATE TEMPERATURE AND WALL IMPINGEMENT REGIMES IN SELECTIVE CATALYTIC REDUCTION SYSTEMS
15:00-15:10	71	COSMIN DUMITRESCU, CHRISTOPHER ULISHNEY, JINLONG LIU	COMPARATIVE PERFORMANCE OF MACHINE LEARNING ALGORITHMS IN PREDICTING NITROGEN OXIDES EMISSIONS OF A HEAVY DUTY NATURAL GAS SPARK IGNITION ENGINE
15:10-15:20	179	MARKUS KRAFT, WENMING YANG, QIREN ZHU, YICHEN ZONG, WENBIN YU	EVALUATING THE EFFECT OF N-BUTANOL ADDITIVE IN A COMMON-RAIL DIESEL ENGINE
15:20-15:30	337	OCKTAECK LIM, DUY NGUYEN	AN INVESTIGATION THE EFFECT OF INJECTOR POSITION ON SPRAY CHARACTERISTIC OF GASOLINE-BIODIESEL FUEL BLENDED
15:30-15:40	368	SHAHID RABBANI	ENHANCING AUTOIGNITION CHARACTERISTICS: A FRAMEWORK TO DISCOVER FUEL ADDITIVES AND MAKING PREDICTIONS USING MACHINE LEARNING
15:40-15:50	424	ARDHIKA SETIAWAN, OCKTAECK LIM	INVESTIGATION OF COMBUSTION CHARACTERISTICS OF GASOLINE-BIODIESEL MIXTURE ON GCI ENGINE UNDER RAPID COMPRESSION EXPANSION ENGINE

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Day 4: Dec 2

Oral Presentations

15:50-16:00	426	OCKTAECK LIM, BINYAMIN BINYAMIN	A STUDY ON STRUCTURAL AND FLOW RATE CHARACTERISTICS OF FUEL INJECTION PUMP OF MEDIUM-SPEED DIESEL ENGINE
16:00-16:10	428	OCKTAECK LIM, CAHYANI WINDARTO	A STUDY ON THE IN-CYLINDER FLOW CHARACTERISTICS WITH MULTI-COIL SPARK DISCHARGE ENERGY IN SPARK IGNITION ENGINE
16:10-16:20	429	OCKTAECK LIM, BERNIKE FEBRIANA SAMOSIR	NUMERICAL ANALYSIS FOR HIGH-PERFORMANCE ON DME (HIGH PRESSURE FUEL PUMP DURABILITY) USING THE TAGUCHI METHOD
16:20-16:30	487	WARD DE PAEPE, JEREMY BOMPAS	FUEL FLEXIBILITY OF A 100KW MICRO GAS TURBINE: COMBUSTION PERFORMANCE USING NATURAL GAS AND NON-CONVENTIONAL SYNGAS

ROOM C

SESSION 4-C2 MITIGATION TECHNOLOGY AND ENERGY STORAGE

SESSION CHAIR: RAZA NAQVI, ZHANG BAI

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:50-15:00	133	DEBO LI, YING WU, NING ZHAO, YONGXIN FENG, ZHIWEN XIE	NUMERICAL SIMULATION ON THE INFLUENCE OF FGD ATOMIZED DROPLET PARTICLES PARAMETERS ON EVAPORATION PERFORMANCE
15:00-15:10	221	SHUAI DENG, JUAN XUE, JIAJUN WANG, RUIKAI ZHAO, YADI BAI, ZE QING WU	OPTIMIZATION OF ADSORPTIVE CYCLES FOR CF ₄ /N ₂ SEPARATION BY ZEOLITE 13X
15:10-15:20	330	XIAOYING ZHANG, ZHENXUE DAI, ZHENXUE DAI	EXPERIMENTAL AND NUMERICAL INVESTIGATION ON MULTI-SCALE GRANITE SORPTION CHARACTERISTICS
15:20-15:30	383	XI JIANG, CHENG CHEN, ZHIHENG XU, QIYUAN XIE	INVESTIGATION ON NON-ISOTHERMAL PYROLYSIS MECHANISM OF LOW-DENSITY POLYETHYLENE (LDPE) USING REAXFF MOLECULAR DYNAMICS SIMULATION
15:30-15:40	508	WENMING YANG, ANQI ZHOU, ZHENWEI LI, YONGTIE CAI, LEI LUO, WEN WEN	MINERALOGY AND TEXTURE ANALYSIS OF FLY ASH FROM A MOVING GRATE BOILER
15:40-15:50	597	AFRAZ MEHMOOD CHAUDHRY	MODEL PREDICTIVE CONTROL OF A SUBSTATION OF A DISTRICT HEATING SYSTEM FOR ENHANCED ENVIRONMENTAL AND ECONOMIC PERFORMANCE
15:50-16:00	804	YINFENG WANG, YUEZHAO ZHU, WENQI ZHANG	INVESTIGATION OF THE RELEASING BEHAVIOR AND CHAR EVOLUTION DURING CARBON-RICH PETROCHEMICAL SLUDGE PYROLYSIS: INSIGHTS FROM IN-SITU FTIR AND TG-FTIR
16:00-16:10	43	HAO PENG, ZHAI XINYU, WANG JINGHANG, ZHANG XINWEN	A NOVEL COMPOSITE PHASE CHANGE MATERIAL OF POLYURETHANE FOAM BASED ON REINFORCED MICROCAPSULES FOR COLD ENERGY STORAGE
16:10-16:20	45	DONG LIU, HAO FENG, TONG SHI, YING ZHANG, QIANG LI	A MICROFLUIDIC REACTOR FOR ENHANCING ELECTROCHEMICAL WATER SPLITTING
16:20-16:30	872	SHILEI ZHANG, QIAN FU, JUN LI, LIANG ZHANG, XUN ZHU, QIANG LIAO	NI SINGLE ATOM CATALYST EMBEDDED IN GRAPHENE SIEVE FOR EFFICIENT ELECTROCHEMICAL REDUCTION OF CARBON DIOXIDE TO CARBON MONOXIDE

ROOM D

SESSION 4-D2 ENERGY SCIENCES

SESSION CHAIR: ERIK DAHLQUIST

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:50-15:00	112	SUBBA REDDY BASAPPA, M-RAMEZ HALLOUM	PERFORMANCE EVALUATION OF 33 KV POLYMERIC OUTDOOR INSULATORS EQUIPPED WITH NON-LINEAR FIELD GRADING COMPOSITES
15:00-15:10	116	JUNFENG ZHANG, YAN YIN, XIAOYU QIU, TONG HUANG	A NOVEL RIGID CROSS-LINKED POLYMER OF INTRINSIC MICROPOROUS ANION EXCHANGE MEMBRANE
15:10-15:20	147	L.-W. WEI, H. PAUL WANG	PHOTOCATALYTIC H ₂ O-TO-H ₂ O ₂ AND -H ₂ BY PD-Ti ₃ +/TiO ₂
15:20-15:30	229	CHONGHAO WANG, BOQIANG LIN	OPTIMIZATION OF CARBON REDUCTION PATHS IN CHINA: A COST-EFFICIENCY ANALYSIS BASED ON LAG REGIONS
15:30-15:40	353	LIN LU, HONG ZHONG, XU DAN	EFFICIENT AND ANTI-SALT CU PLASMONIC ENHANCED POROUS SOLAR EVAPORATOR
15:40-15:50	658	CHANGXIANG GUO, FEI CHEN	SELF-HEALING, NON-COMBUSTIBLE ELECTROLYTE SYSTEM ENABLES ROOM TEMPERATURE CHARGE/DISCHARGE CYCLE SOLID LITHIUM BATTERIES

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Day 4: Dec 2

Oral Presentations

15:50-16:00	693	HUIQING LIU, WENJING ZHAO, SHUN WANG, JING WANG, XU ZHANG	EFFECT OF NANO POLYMER MICROSPHERES ADSORPTION ON NEGATIVELY CHARGED SiO ₂ SURFACE: MOLECULAR DYNAMICS SIMULATION AND EXPERIMENTAL STUDY
16:00-16:10	584	KUEN-SONG LIN, NDUMISO VUKILE MDLOVU, ABRAR HUSSAIN, YAN-FENG CHEN	HYDROGENATION OF CO ₂ TO DIMETHYL ETHER OVER WO _x -ZRO ₂ CATALYSTS COMBINED WITH A CU-ZNO-ZRO ₂ CATALYST
16:10-16:20	94	DUŠAN STRUŠNIK, JURIJ AVSEC	EXERGOCHEMICAL SIMULATION MODELLING OF HYDROGEN THERMOCHEMICAL CU-CL CYCLE INTEGRATION IN A COGENERATION GAS STEAM POWER PLANT
16:20-16:30	150	DEBO HE, JIUPAI NI, AND CHENGSHENG NI	SURFACE MODIFICATIONS OF PEROVSKITE OXIDE ANODE WITH IN SITU EXSOLVED CeO ₂ AND Ni NANOPARTICLES FOR COKE-RESISTANT SOLID OXIDE FUEL CELLS

ROOM E

SESSION 4-E2 ENERGY MANAGEMENT, POLICY AND ECONOMICS

SESSION CHAIR: FREDRIK WALLIN, CHI ZHANG

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:50-15:00	501	RONG LI	COMPARATIVE ANALYSIS OF TRANSPORT ENERGY CONSUMPTION BETWEEN HIGH-SPEED RAILWAY AND AIR TRANSPORT
15:00-15:10	24	HOLGER SCHLÖR, SANDRA VENNGHAUS	MEASURING THE ASYMMETRY OF GERMAN SOCIETY WITH THE GERMAN SOCIAL GROUPS SKEWNESS (SGSD) EQUATION – BASED ON FOOD-ENERGY-WATER DATA
15:10-15:20	95	THUY LINH VU	OPTIMAL ELECTRICITY PRICING SCHEME CONSIDERING CONSUMER'S RENEWABLE ENERGY GENERATION AND REGRET BEHAVIOR
15:20-15:30	122	JEEHOON HAN, NAVEENKUMAR RAJENDRAN, SHERLY PRIYANKA R. B., BASKAR GURUNATHAN	TECHNO-ECONOMIC ANALYSIS OF INTEGRATED BIODIESEL PRODUCTION AND TOCOPHEROL SEPARATION FROM RAPESEED OIL DEODORIZER DISTILLATE
15:30-15:40	214	BOQIANG LIN, NAN WU	CLIMATE RISK DISCLOSURE AND STOCK PRICE CRASH RISK: IN CASE OF CHINA
15:40-15:50	217	BOQIANG LIN, MINYANG LI	UNDERSTANDING THE DEVELOPMENT OF RENEWABLE ENERGY FIRMS IN THE FACE OF ECONOMIC POLICY UNCERTAINTY -- MICRO-EVIDENCE FROM LISTED COMPANIES IN CHINA
15:50-16:00	275	KAI WEI, BOQIANG LIN	DOES USING SOLID COOKING FUELS INCREASE FAMILY MEDICAL EXPENSE IN CHINA?
16:00-16:10	310	WADAED UTURBEY, BRUNO M. LOPES	TECHNO-ECONOMIC FEASIBILITY OF DISTRIBUTED PV PLUS BATTERY SYSTEMS FOR RESIDENTIAL PROSUMERS UNDER NET METERING IN BRAZIL
16:10-16:20	374	HONGJIE JIA, KAI HOU, QIAN JIANG, ZIHENG DONG, ZEYU LIU	A GAME THEORETIC PERSPECTIVE ON ENVIRONMENT AND ECONOMIC OPERATION OF INTEGRATED ENERGY SYSTEM
16:20-16:30	621	DIPANKAR KHANNA, ESKINDER GEMECHU, AMIT KUMAR	LIFE CYCLE ASSESSMENT OF AN ELECTRIC VEHICLE: THE IMPACT OF DRIVING PATTERN AND CLIMATIC CONDITIONS ON THE ENVIRONMENTAL PERFORMANCES

ROOM F

SESSION 4-F2 INTELLIGENT ENERGY SYSTEM

SESSION CHAIR: HUICUI CHEN, WENLONG SHANG

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:50-15:10	896	SHIXUE WANG, JITING JIAN, ZEPING ZHANG, XIAOLONG YANG, JIANBO ZHANG	ANALYSIS OF CONTROL STRATEGIES IN ALTERNATING CURRENT PREHEATING OF LITHIUM-ION CELL
15:10-15:20	228	YANZHOU QIN, YUHANG LIU, ZHANGJIE CHEN, JIAYANG ZHENG	MULTIPLE COMPOUND FUZZY LOGIC CONTROL STRATEGY FOR FUEL CELL HYBRID ELECTRIC VEHICLE
15:20-15:30	299	JINQUAN GUO, JIANWEI LI, YANG LUMING	AN INTELLIGENT DRIVING CYCLE RECOGNIZE ENERGY MANAGEMENT FOR THE TRIPLE-SOURCE HYBRID ELECTRICAL FUEL CELL BUS SYSTEM
15:30-15:40	391	XIANG ZHANG, NI LIN	A COMPREHENSIVE DATA-DRIVEN FAULT DIAGNOSIS METHOD FOR ELECTRIC VEHICLES

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Day 4: Dec 2

Oral Presentations

15:40-15:50	394	CAIZHI ZHANG	ANALYSIS OF THE STANDARD SYSTEM OF CHINA FOR HYDROGEN ENERGY AND FUEL CELL VEHICLE RELATED FIELDS
15:50-16:00	850	DAVIDE ACCORDINI	THE ROLE OF CONTEXTUAL CHARACTERISTICS IN THE ADOPTION OF ENERGY EFFICIENCY MEASURES IN ELECTRIC MOTORS SYSTEMS: AN EXPLORATORY ANALYSIS
16:00-16:10	475	HAYLIN KIM, STEVEN JIGE QUAN	PREDICTING FUTURE ENERGY DEMAND FROM ELECTRIC VEHICLES IN SEOUL
16:10-16:20	544	HONGWEN HE, JIANKUN PENG, YI FAN, HAILONG ZHANG, WEIQI CHEN, ZEXING WANG	A DRL-BASED ECOLOGICAL DRIVING STRATEGY FOR SERIES HYBRID ENERGY VEHICLE INCLUDING BATTERY AGING
16:20-16:30	110	BEI LI, JIANGCHEN LI	REAL-TIME SIMULATION PLATFORM FOR THE COUPLING OF POWER SYSTEM AND TRANSPORTATION NETWORK
ROOM S			
14:50-16:30	PANEL: Agrivoltaic		

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ROOM S

10:00-12:00

PANEL: Challenges in the commercialization of biomass renewable energy technologies 2**ROOM A****SESSION 5-A1 RENEWABLE ENERGY
SESSION CHAIR: LEI WANG, DONGRAN SONG**

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:20	939	YE LI	A FEW IMPORTANT CHALLENGES IN OFFSHORE WIND TECHNOLOGY AND ITS IMPACT IN CHINA
12:20-12:30	379	TIAN SONG, LIN DING, QUNFENG ZOU, YUE SUN, LIN YANG	THE INFLUENCE OF FIN-SHAPED RODS ON WIND-INDUCED ENERGY HARVESTER
12:30-12:40	380	YAGANG ZHANG, LEYI YU, SIQI WANG, YING ZHANG	WIND SPEED PREDICTION BASED ON EMPIRICAL WAVELET TRANSFORM AND BROAD LEARNING SYSTEM ERROR CORRECTION
12:40-12:50	489	QIANG WANG, CONGXIN YANG, YE LI, SHOUTU LI, DESHUN LI, ZHITENG GAO, XIAOBO ZHENG	PRELIMINARY DISCUSSION ON WIND TURBINE PERFORMANCE ON QINGHAI PATEAU
12:50-13:00	495	JIN YANG, SIYUAN YANG, XINTIAN BI	LCA-BASED REGIONAL DISTRIBUTION AND TRANSFERENCE OF CARBON EMISSIONS FROM WIND FARMS IN CHINA
13:00-13:10	668	ALINA WILKE, PAUL WELFENS	URBAN WIND ENERGY PRODUCTION POTENTIAL: NEW OPPORTUNITIES
13:10-13:20	705	LIN DING, TIAN SONG, YUXIONG HAN, DONG LIU	EXPERIMENTAL STUDY ON WIND-INDUCED VIBRATION OF TWO SQUARE CYLINDERS IN PARALLEL WITH DIFFERENT HEIGHTS
13:20-13:30	884	TSUTOMU NISHIGAKI, CHISUZU ODA	PIEZOELECTRIC WIND ENERGY HARVESTING BY VORTEX INDUCED VIBRATION OF A FLEXIBLE CYLINDRICAL CANTILEVER SHELL
13:30-14:00	TEA/COFFEE BREAK		

ROOM B**SESSION 5-B1 RENEWABLE ENERGY
SESSION CHAIR: MANUELE GATTI, AWAIS SALMAN**

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:10	16	JIAQI ZHANG, DONGXI LIU, GUOBIN LEI, JUN ZHOU, SHENGCHAO SHI, FUZHI QI, JIE PENG, QINGYAO MENG, JIAWEI XU	A NOVEL TYPE OF HOT DRY ROCK POWER GENERATION SYSTEM
12:10-12:20	23	ZHIMIAO YAN, TING TAN, ZHEMIN WANG, TIANRUN LI, JUNYI ZHANG, BOWEN SHEN	TOWARD OMNIDIRECTIONAL VIBRATION ENERGY HARVESTING WITH A COMPACT COAXIAL DIRECTION-TRACKING DESIGN
12:20-12:30	25	XINLI LU, WEI ZHANG, JIAQI ZHANG, DONGXI LIU, QINGYAO MENG, FENG MA, MAOQIN HU	EXPERIMENTAL ANALYSIS ON TEMPERATURE STRATIFICATION CHARACTERISTICS OF STORAGE TANKS FOR GEOTHERMAL HEATING
12:30-12:40	386	LIN DING, QUNFENG ZOU, TIAN SONG, HAO KONG, CHANGJIANG ZHANG	PERFORMANCE IMPROVEMENT OF PIEZOELECTRIC ENERGY CONVERSION BY WIV OF TRIANGULAR PRISM
12:40-12:50	220	PREDRAG SPASOJEVIC	CLIMATE CHANGES INFLUENCE TO RENEWABLE ENERGIES AND PROPOSAL FOR ITS REVERSAL WITH THE DIRECT RENEWABLE ENERGY APPLICATION
12:50-13:00	284	XINLI LU, WEI ZHANG, HAO YU, JIAQI ZHANG, JIALI LIU, ZHIWEI CUI, YAPENG REN, YUE WEN, YAN JIANXUN	NUMERICAL SIMULATION OF CLOSED-LOOP HEAT EXTRACTION IN DIFFERENT GEOTHERMAL WELLS ARRANGED SYMMETRICALLY
13:00-13:10	302	QIANG ZHU, JIANGSHENG WANG, LIDE SU, JINTAO NIU	NUMERICAL SIMULATION OF ENHANCED GEOTHERMAL SYSTEM POWER GENERATION PERFORMANCE
13:10-13:20	556	QIANG LIU, XU WAN	EFFECT OF INJECTION PRESSURE ON PERFORMANCE OF AN ENHANCED GEOTHERMAL SYSTEM (EGS) USING SUPERCRITICAL CO ₂ CYCLE
13:20-13:30	238	LEI DENG, KAI ZHANG, XIAOLE HUANG, SHENGWEI XIN, YUHAO WU, HU WANG, PENG ZHANG, PEIQING CAO	EFFECT OF LARGE PROPORTION OF COAL-FIRED UNITS DIRECTLY COUPLED TO BIOMASS POWER GENERATION ON SOME BOILER PARAMETERS
13:30-13:40	156	XUN ZHU, QIANG LIAO, JUN LI, QIAN FU, LIANG ZHANG, YU SHI, YANXIANG LI	A MEMBRANE-LESS MICROFLUIDIC THERMALLY REGENERATIVE AMMONIA-BASED BATTERY FOR SMALL-SCALE WASTE HEAT RECOVERY
13:40-14:00	TEA/COFFEE BREAK		

ROOM C**SESSION 5-C1 MITIGATION TECHNOLOGY AND ENERGY STORAGE
SESSION CHAIR: GUOSHENG JIA, YUSHI LIU**

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Day 5: Dec 3

Oral Presentations

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:20	926	UMBERTO DESIDERI, LORENZO FERRARI, GUIDO FRANCESCO FRATE, ALESSANDRA GHILARDI, MIRKO BRAVI, ROBERTO LEO	ENERGY STORAGE SYSTEM FOR THERMAL LOAD FLUCTUATION BALANCING
12:20-12:30	53	XIANGLEI LIU, QIAO XU	BIOMIMETIC SIC CERAMICS FOR HIGH-PERFORMANCE SOLAR-THERMAL ENERGY STORAGE
12:30-12:40	66	DONG LIU, NING LIU	ELECTROREDUCTION OF CO ₂ OVER AG: A MULTISCALE SIMULATION
12:40-12:50	72	TAO YUBING, HAO YE, ZHIHONG WU	NUMERICAL STUDY AND STRUCTURAL OPTIMIZATION ON THERMOCHEMICAL HEAT STORAGE PERFORMANCE OF PACKED BED REACTOR
12:50-13:00	89	YONGKUN LIU, TAO YUBING	EFFECT OF ECCENTRICITY ON MELTING AND SOLIDIFICATION PROCESSES OF PHASE CHANGE MATERIAL INSIDE A SHELL-AND-TUBE LATENT HEAT STORAGE UNIT
13:00-13:10	99	WENZHUO YAO, MENG DONG CHEN, XIAO HU	WASTE CELLULAR CONCRETE FOR PREPARATION OF SHAPE-STABLE PHASE CHANGE MATERIALS
13:10-13:20	134	YUSHI LIU, KUNYANG YU, YINGZI YANG	A NOVEL BIO-BASED HYDRATED SALT PHASE CHANGE COMPOSITE WITH ENHANCED HEAT STORAGE CAPACITY
13:20-13:30	143	JIXIANG WANG, MINGLIANG ZHONG, YUFENG MAO	PHASE-CHANGE -BASED THERMAL PROTECTION FOR PULSED ELECTRICAL MACHINES
13:30-13:40	145	AN-SHIK YANG, YEE TING LEE, DIAN-HENG XIE, PEI-CIH JIANG	NUMERICAL INVESTIGATION ON MELTING BEHAVIOR OF PCM IN THERMAL ENERGY STORAGE SYSTEMS WITH AND WITHOUT FINS

13:40-14:00

TEA/COFFEE BREAK

ROOM D

SESSION 5-D1 ENERGY SCIENCES

SESSION CHAIR: XUN ZHU, LIANG ZHANG

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:10	22	XIAOLUN YAN, JIANYE MOU, XINFANG MA, FEI WANG, GUIFU DUAN, SHICHENG ZHANG	INTEGRATED ANALYSIS ON INTER-WELL COMMUNICATION IN TIGHT OIL RESERVOIR: BAIKOUQUAN FORMATION, XINJIANG, CHINA
12:10-12:20	29	YUE LI, XINFANG MA, GUIFU DUAN, SHICHENG ZHANG, JIANYE MOU	NUMERICAL INVESTIGATION OF INTERACTION MECHANISM BETWEEN HYDRAULIC FRACTURE AND NATURAL KARST CAVE IN FRACTURED-VUGGY CARBONATE RESERVOIR
12:20-12:30	263	XUN ZHU, HONG WANG, YIWEN LV, QIANG LIAO, YU-DONG DING, JUNJUN WU, QINGSHAN LIU, MIN CHENG	A MINI-REVIEW ON THE THERMAL PHYSICAL PROPERTIES OF MOLTEN BLAST FURNACE SLAG
12:30-12:40	381	YANLONG LI	SOLID PARTICLES MIGRATION AND PRODUCTION BEHAVIORS DURING NATURAL GAS HYDRATE DISSOCIATION IN SANDY SEDIMENT
12:40-12:50	485	DEFU CHE, LEI DENG, JIAHAO JIANG, KAI ZHANG, YUAN TIE, YUHAO WU, XIAOLE HUANG	SIMULATION STUDY ON SEEPAGE OF NITROGEN IN POROUS MEDIUM OF OIL-RICH COAL
12:50-13:00	763	BAISHENG NIE, JIE GONG, XIAOTONG WANG, CHAO PENG, FANBEI KONG, DAN ZHAO	REACTION MECHANISM OF COAL DUST COMBUSTION AND EXPLOSION
13:00-13:10	789	YUFENG BIAN	RECOGNITION OF MICRO-CRACKS IN COAL BASED ON SUPER-RESOLUTION AND HESSIAN FILTERING TECHNIQUES
13:10-13:20	860	RAYA AL-DADAHA, SAAD MAHMOUD, IBRAHIM ALBAIK, KAMAL DIAB, MOHAMED ISMAIL	COATING THICKNESS EFFECT ON THE CYCLIC PERFORMANCE OF ALUMINUM AND ZIRCONIUM METAL-ORGANIC FRAMEWORKS FOR HEAT PUMP APPLICATION
13:20-13:30	880	HUI HONG, YALI CAO, XUELI XING	EFFECT OF SLOSHING CONDITION ON CONDENSATION HEAT TRANSFER ON INTEGRAL-FIN TUBES
13:30-13:40	616	HUI HONG, YALI CAO, XUELI XING	A PARABOLIC PROTOTYPE OF SOLAR DRIVEN NATURAL GAS CHEMICAL LOOPING FOR SYNGAS PRODUCTION

13:40-14:00

TEA/COFFEE BREAK

ROOM E

SESSION 5-E1 ENERGY MANAGEMENT, POLICY AND ECONOMICS

SESSION CHAIR: HAORAN ZHANG, QIE SUN

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:10	401	MINDA MA, SHUFAN ZHANG, ZHILI MA	ROADMAP OF LOW EMISSION COMMERCIAL BUILDING OPERATION UNDER THE 2060 CARBON NEUTRAL GOAL

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Day 5: Dec 3

Oral Presentations

12:10-12:20	464	ZONGLIANG MA, PING JIANG, DONGYANG HAN	DATA PEPROCESSING OF CMENT CINKER SNTERING POCESS MDELING
12:20-12:30	468	LUPING HUO	LEAST-COST HYDROGEN SUPPLY CHAIN FOR OFF-SITE HYDROGEN PRODUCTION FROM LARGE SCALE RENEWABLE POWER IN CHINA—A CASE STUDY OF CHINA'S WESTERN INNER MONGOLIA
12:30-12:40	496	LIN YAO	PREDICTION OF OIL PRICE USING LSTM AND PROPHET
12:40-12:50	523	SHAOFANG XUE, YING FAN	COMPOSITIONAL LINEAR MODEL CLARIFIES COUNTRY-LEVEL ENERGY MIX DRIVERS
12:50-13:00	623	YAN LI, SHUYANG MA, HANG JING, YE WANG	QUANTUM COMPUTATION OF RENEWABLE ENERGY SYSTEMS
13:00-13:10	581	BABU KUMARAN NALINI, MICHEL ZADE, ZHENGJIE YOU, PETER TZSCHEUTSCHLER, ULRICH WAGNER	DOES OVERSIZING IMPROVE PROSUMER PROFITABILITY IN A FLEXIBILITY MARKET? - A SENSITIVITY ANALYSIS USING PV-BATTERY SYSTEM
13:10-13:20	586	LU-TAO ZHAO, ZHI-YI ZHENG	CRUDE OIL MARKET INTRADAY RISK PREDICTION BASED ON GENERALIZED HETEROGENEITY AUTOREGRESSIVE AND THRESHOLD KERNEL VARIATION METHOD
13:20-13:30	576	YI LIU, ZENZHONG ZENG	RECOVERY OF WINDS BOOSTS MORE THAN ONE-FIFTH OF THE CAPACITY FACTOR IN CHINA IN THE 2010S
13:30-13:40	624	AMIT KUMAR, ESKINDER GEMECHU, JAYRANJAN MAURYA	THE TECHNO-ECONOMIC ASSESSMENT OF ALTERNATIVE MATERIALS FOR HYDROGEN PRODUCTION VIA PHOTOCATALYTIC WATER SPLITTING
13:40-14:00	TEA/COFFEE BREAK		
ROOM F			
SESSION 5-F1 ENERGY MANAGEMENT, POLICY AND ECONOMICS			
SESSION CHAIR: Perry Yang, Xiaonan Wang			
TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:20	316	FLORIAN SIEKMANN, SANDRA VENNGHAUS, HOLGER SCHLÖR	IDENTIFYING SUSTAINABLE TRANSFORMATION TRAJECTORIES FOR A LOW CARBON ECONOMY USING A MULTI-STAKEHOLDER MCDA APPROACH – THE CASE OF GERMANY
12:20-12:30	84	MÁXIMO ALBERTO DOMÍNGUEZ GARABITOS, ADRIANA ARANGO MANRIQUE, RENÉ BÁEZ SANTANA, FÉLIX DE LOS SANTOS, VÍCTOR OCAÑA	MARKET MECHANISM TO ASSESS DEMAND RESPONSE PROGRAMS DURING THE ENERGY TRANSITION IN THE WHOLESALE ELECTRICITY MARKET OF THE DOMINICAN REPUBLIC
12:30-12:40	125	NADIA MAIZI, YACINE ALIMOU	A MULTI-SCALE, LINKING&ROLLING FRAMEWORK FOR LONG-TERM PLANNING OF RELIABLE POWER SYSTEMS IN TRANSITION
12:40-12:50	12	SUDLOP RATANAKUAKANGWAN, HIROSHI MORITA	EFFICIENCY MEASUREMENT OF AN ENERGY PLANNING MODEL CONSIDERING COST, EMISSION, AND SOCIAL IMPACT.
12:50-13:00	182	CAIRAN MIAO, QI WANG	FREQUENCY RESPONSE STRATEGIES CONSIDERING GAS-THERMAL INERTIA IN THE INTEGRATED ENERGY SYSTEM
13:00-13:10	219	BOQIANG LIN, LEI SHI	NEW UNDERSTANDING OF POWER GENERATION STRUCTURE TRANSFORMATION, BASED ON A MACHINE LEARNING PREDICTIVE MODEL
13:10-13:20	342	JUN LIU, XINGLEI LIU, JINCHUN CHEN	EXPANSION PLANNING OF COMMUNITY-SCALE REGIONAL INTEGRATED ENERGY SYSTEM CONSIDERING GRID-SOURCE COORDINATION: A COOPERATIVE GAME APPROACH
13:20-13:30	348	HOWARD CHEUNG, TONY W L HO	CASE STUDY ON OPPORTUNITIES TO REVISE ENERGY CODES BY DATA DIGITIZATION USING A SMART BUILDING ENERGY AUDIT TOOL WITH BUILDINGS IN HONG KONG
13:30-13:40	361	XIAONAN WANG, LANYU LI	SUSTAINABLE NEGATIVE EMISSION ENERGY SYSTEMS FOR CLIMATE CHANGE MITIGATION
13:40-14:00	TEA/COFFEE BREAK		
ROOM S			
12:00-13:40	PANAL: Accelerated climate change and the Food-Energy-Water-Nexus		
13:40-14:00	TEA/COFFEE BREAK		
ROOM A			
SESSION 5-A2 RENEWABLE ENERGY			
SESSION CHAIR: Eva Thorin			
TIME	PAPER ID	AUTHOR	PAPER TITLE

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Day 5: Dec 3

Oral Presentations

14:00-14:10	747	GREGORY HOPE SOEGIANTORO, DIDIEK HARDIYANTO SOEGIANTORO	INCREASING QUALITY OF HEALTH AND INCOME PER CAPITA WITH HOUSEHOLD BIODIESEL PRODUCTION FROM CHICKEN FAT AND WASTE COOKING OIL
14:10-14:20	675	ANDREW C, ELOKA-EBOKA, ANIETIE O. ETIM, PAUL MUSONGE	POTENTIAL OF BI-HYBRIDISATION OF USED FRYING/MARULA SEED OILS FOR BIODIESEL PRODUCTION VIA OPTIMIZED TRANSESTERIFICATION PROCESS
14:20-14:30	80	LEA EGGEMANN, DETLEF STOLTEN, FLORIAN RAU	THE CONTRIBUTION OF MANURE UTILISATION IN BIOGAS PLANTS IN TERMS OF CLIMATE CHANGE
14:30-14:40	269	ASHRAF ALY HASSAN, MUHAMMAD ASAD JAVED	AN EXPERIMENTAL STUDY OF ALGAL BIOMASS AND ACTIVATED SLUDGE CO-CULTURE FOR BIOPHOTOLYTIC HYDROGEN POTENTIAL AND OXYGEN REGULATION
14:40-14:50	419	JAEWON BYUN, JEEHOON HAN, OSEOK KWON	MULTI-OBJECTIVE SUPPLY CHAIN MODEL FOR LOCATING ACETIC ACID-BASED BIOETHANOL PLANTS CONSIDERING ECONOMIC AND ENVIRONMENTAL IMPACT
14:50-15:00	534	MANDY GERBER, ROLAND SPAN, MATTHIAS KÖRBER, KATHARINA GELBERG	ADAPTATION OF BIOGAS PRODUCTION TO THE RESIDUAL LOAD OF AN ELECTRICITY SELF-SUFFICIENT COMMUNITY
15:00-15:10	580	MANDY GERBER, ROLAND SPAN, ANNA LEITHÄUSER	LIGNITE AS ADDITIVE IN ANAEROBIC DIGESTION OF LIQUID DAIRY MANURE WITHOUT AN EXTERNAL INOCULUM: IMPACT ON BMP TESTS AND FERTILIZER PROPERTIES
15:10-15:20	835	SETENO KARABO NTWAMPE, JUSTINE OMA ANGADAM, SILAS CHIDI, VINCENT OKUDOH, LIM JUN WEI	FRACTIONATED DIGESTIVE JUICES OF NEPENTHES MIRABILIS FOR REDUCIBLE SUGAR RELEASE AND PHENOLIC COMPOUND' S REDUCTION FROM MIXED AGRO-WASTE PRETREATMENT
15:20-15:30	167	KAI LIN, AO XIA, YUN HUANG, XIANQING ZHU, XUN ZHU, KAIYONG CAI, ZIDONG WEI, QIANG LIAO	BIONIC TWO-STAGE MICROREACTOR LOADED WITH ENZYMES FOR HYDROLYSIS OF LIGNOCELLULOSIC BIOMASS
15:30-15:40	90	DAN LI, XIANGZE DU, XIAOMEI LEI, HUI XIN, CHONG PENG, XIANGCHEN FANG	EFFECTIVE IMPROVEMENT OF LUBRICATION PERFORMANCE FOR LOW SULFUR DIESEL BY FATTY ACID METHYL ESTERS

ROOM B

SESSION 5-B2 CLEAN ENERGY CONVERSION TECHNOLOGY

SESSION CHAIR: JINLONG LIU, HU ZHANG

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:00-14:10	654	OCKTAECK LIM, CHANGHYEON BAE	PERFORMANCE EVALUATION OF A COMMON RAIL HIGH-PRESSURE FUEL INJECTION PUMP USING DME AS FUEL AND ACTUAL ROAD DRIVING EVALUATION OF A MECHANICAL DIESEL VEHICLE
14:10-14:20	671	ZHAO ZHANG, ZUNQING ZHENG, HAIFENG LIU, CAN WANG, ZONGYU YUE, YANQING CUI, MINGSHENG WEN, XIANGEN KONG, YANGYI WU	SYNERGISTIC EFFECTS OF HIGH BOOST PRESSURE AND FUEL INJECTION STRATEGY ON DIESEL ENGINE PERFORMANCE
14:20-14:30	672	YANGHWA KIM, OCKTAECK LIM	A STUDY ON THE ADSORPTION AND DESORPTION CHARACTERISTICS OF CU-ZEOLITE CATALYST USED AS UREA SCR CATALYST
14:30-14:40	773	OCKTAECK LIM, DONGGYU YU	EXPERIMENTAL STUDY ON NOX REDUCTION PERFORMANCE OF CU-ZEOLITE SCR CATALYST FOR HEAVY-DUTY DIESEL ENGINE
14:40-14:50	845	XI JIANG, CHENG CHEN, ZHIHENG XU, QIYUAN XIE	A COMPARATIVE MOLECULAR DYNAMICS STUDY ON COMBUSTION EMISSIONS OF BIODIESEL AND DIESEL FUEL MIXTURES
14:50-15:00	144	KAI LUO, JIYING CHEN, RUI ZHAO	CYCLE POWER AND EFFICIENCY MODELLING OF STIRLING ENGINES BASED ON MODIFIED SECOND-ORDER ADIABATIC ANALYSIS AND IMPROVED ATOM SEARCH INTEGRATED BACK-PROPAGATION NEURAL NETWORK
15:00-15:10	936	OCKTAECK LIM, JEONG JAEHEE	A STUDY ON THE HIGH PRESSURE PUMP FOR DME ENGINE
15:10-15:20	839	RUI WANG, JINWEN CAI	PERFORMANCE INVESTIGATION OF ORGANIC RANKINE CYCLE WASTE HEAT RECOVERY SYSTEM UNDER COMPLETE ENGINE OPERATING LOADs
15:20-15:30	421	OCKTAECK LIM, NHU Y QUACH	A STUDY ON EFFECT OF NATURAL GAS COMPOSITION WITH VARIABLE IGNITION TIMING ON THERMAL EFFICIENCY, IGNITION DELAY AND ENGINE PERFORMANCE OF SMALL ENGINES
15:30-15:40	274	JUN LI, JUNJIE PAN	EFFECT OF FIRE SOURCE POSITION CHANGE ON SMOLDERING PROCESS OF COAL PACKED BED

ROOM C

SESSION 5-C2 CLEAN ENERGY CONVERSION TECHNOLOGY

SESSION CHAIR: XIAOHU YANG, ALESSANDRO ROMAGNOLI

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:00-14:10	311	CHUANCHANG LI, MENG FAN WANG, KAIHAO BAI, JIAN CHEN	CARBON-DECORATED DIATOMITE STABILIZED PHASE CHANGE MATERIAL FOR PHOTO-TO-THERMAL CONVERSION AND STORAGE
14:10-14:20	360	WENKE ZOU, DIANCE GAO, XU ZHANG	A GLOBAL OPTIMAL CONTROL STRATEGY BASED ON BP NEURAL NETWORK FOR CENTRAL CHILLED WATER PLANTS INVOLVING SMALL-SCALE THERMAL ENERGY STORAGE

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Day 5: Dec 3

Oral Presentations

14:20-14:30	403	CHUN CHANG	EFFECT OF MATERIAL CHARACTERISTICS ON ICE STORAGE PERFORMANCE OF AN EXTERNAL MELTING ICE-ON-COIL TUBE
14:30-14:40	409	XIULAN HUAI, LI WANG, SHANG LIU, PING WU, SHIPING ZHANG	STUDY ON WATER VAPOR ADSORPTION AND HEAT STORAGE PERFORMANCE OF ACTIVATED CARBON-HYDRATED SALT THERMAL ENERGY STORAGE SYSTEM AT DIFFERENT TEMPERATURES
14:40-14:50	410	XIAOQIN SUN, YUAN ZHANG, ZIYANG ZHU	STUDY ON THE THERMAL PERFORMANCE OF BUILDING ENCLOSURE WITH PHASE CHANGE MATERIALS UNDER VARIOUS CLIMATE CONDITIONS
14:50-15:00	480	YULONG DING, ADRIANO SCIACOVELLI, POURIYA H NIKNAM	TECHNO-ECONOMIC ANALYSIS OF HYBRID THERMAL ENERGY STORAGE IN ENERGY INDUSTRIES
15:00-15:10	494	XIULAN HUAI, LI WANG, GUODONG FU, PING WU	MICROWAVE ASSISTED SYNTHESIS OF CR-DOPED UIO-66 WITH ENHANCED WATER ADSORPTION CAPACITY
15:10-15:20	560	YONG SHUAI, DONGMEI HAN, GUENE LOUGOU BACHIROU, BOSHU JIANG, YICHENG HOU	CORROSION BEHAVIOR OF NI-BASED ALLOYS IN MOLTEN CHLORIDE SALTS FOR HIGH-TEMPERATURE THERMAL ENERGY STORAGE IN CONCENTRATING SOLAR POWER
15:20-15:30	695	MEHRDAD AHMADINEJAD, ALI SOLEIMANI, NAFISEH YAZDI, MOHSEN ABDOLAHZADEH	NUMERICAL SIMULATION OF THE EFFECTS OF TEMPERATURE-DEPENDENT THERMAL CONDUCTIVITY AND VISCOSITY ON TEMPERATURE AND VELOCITY FIELDS
15:30-15:40	552	YAN YANG, HAOPING PENG, HONGBING DING, CHUANG WEN	AN EMERGING CO ₂ SEPARATION USING SUPERSONIC FLOWS CONTRIBUTING TO CARBON CAPTURE AND STORAGE: EVALUATION OF OPERATING PARAMETERS

ROOM D

SESSION 5-D2 ENERGY MANAGEMENT, POLICY AND ECONOMICS

SESSION CHAIR: LEONARDO NIBBI, WENLONG SHANG

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:00-14:10	686	JINYUE YAN, FENGJUAN WANG, JIUPING XU	SUBSIDIES: FOSSIL FUELS VS. RENEWABLE ENERGY
14:10-14:20	776	ZHILING QIAN, YUHUAN ZHAO	GLOBAL VALUE CHAINS PARTICIPATION AND CO ₂ EMISSIONS IN RCEP COUNTRIES
14:20-14:30	129	AMIN LAHNAOUI, WILHELM KUCKSHINRICHS, SIMONN BRAUNER	ASSESSING THE DRIVERS OF ENERGY AND POWER CONSUMPTION IN THE RESIDENTIAL SECTOR IN THE SUB-SAHARAN WEST AND SOUTH AFRICAN REGIONS
14:30-14:40	255	TALA EL SAMAD, JAFAR AL-ZAILI, ABDULNASER SAYMA, SAMUEL KAMURIWO, KILLIAN TENDAI MANYUCHI, MARY WANJIRU KINOTI, MATHEW TSAMENYI	A STUDY ON THE MARKET POTENTIAL OF BIOMASS-BASED MICRO GAS TURBINES IN SUB-SAHARAN AFRICA
14:40-14:50	270	RUIYANG MA, BOQIANG LIN	INFORMATIZATION AND TECHNOLOGICAL INNOVATIONS: HOW DOES INTERNET DEVELOPMENT AFFECT GREEN TECHNOLOGY INNOVATIONS IN CHINA?
14:50-15:00	367	FANG GUO	EXAMINING HOUSEHOLD FUEL SWITCHING IN URBAN CHINA USING THE TWO-STAGE-BUDGETING FRAMEWORK FOR ENERGY AND ENVIRONMENTAL POLICIES
15:00-15:10	538	XIUJIE TAN, YISHUANG LIU, HANMIN DONG	THE EVALUATION OF ENERGY POVERTY AND ITS IMPACT ON PUBLIC HAPPINESS: EVIDENCE FROM CHINA
15:10-15:20	557	DEQUN ZHOU, DONGLAN ZHA, LIJUN WANG	IS REBOUND EFFECT 'A COST' OR 'A BENEFIT'? EVIDENCE FROM CHINA URBAN HOUSEHOLDS
15:20-15:30	578	ALONSO ALEGRE-BRAVO, LINDSAY ANDERSON	UNDERSTANDING THE MULTIDIMENSIONALITY OF ENERGY ACCESS IN REMOTE AREAS OF DEVELOPING COUNTRIES USING A MULTIVARIABLE STATISTICS APPROACH
15:30-15:40	417	ZHAO LIU, PUJU CAO, HUAN ZHANG, CHEN LI	THE RELATIONSHIP BETWEEN POPULATION FACTORS AND CARBON DIOXIDE EMISSIONS FROM CHINA'S TRANSPORT SECTOR - DOES POPULATION AGING MATTER?

ROOM E

SESSION 5-E2 INTELLIGENT ENERGY SYSTEM

SESSION CHAIR: WANDONG ZHENG, JIN YAO HO

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:00-14:10	265	HYUN MI CHO, SUMIN KIM, SUNGWOONG YANG, HYEONSEONG YUK	ENERGY CONSUMPTION IMPROVEMENT PLAN THROUGH RETROFIT ROOF OF HISTORIC BUILDING
14:10-14:20	334	JIN YAO HO, RANJITH KANDASAMY, TECK NENG WONG, PENGFEI LIU, KOK CHUAN TOH	A NOVEL SPRAY COOLED SYSTEM FOR TROPICAL DATA CENTERS
14:20-14:30	390	ZIYANG WANG, RYUJI MATSUHASHI, HIROSHI ONODERA	PILOT STUDY ON INTRUSIVE AND NON-INTRUSIVE EARLY WARNING SYSTEMS FOR THERMAL DISCOMFORT USING BODY SURFACE TEMPERATURE: TOWARDS CO-EXISTENCE OF ENERGY CONSERVATION AND THERMAL COMFORT
14:30-14:40	504	YAWEN FAN	OVERVIEW OF ENERGY VISUALIZATION TECHNOLOGY FOR SMART HOME
14:40-14:50	121	JUNHONG YANG, XUYANG CUI, MIANSHAN CUI, RUIJIE MA, XINYU SHI	APPLICATION OF NONLINEAR PROGRAMMING ALGORITHMS IN DYNAMIC HYDRAULIC OPTIMIZATION OF DISTRICT HEAT NETWORKS: A CASE STUDY FROM A CHINESE UNIVERSITY

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14:50-15:00	724	LIN LU, YANG LIU, YOUMING CHEN, JINQING PENG	INVESTIGATION ON THE OPTICAL PERFORMANCE OF THE AEROGEL LAYER IN AEROGEL GLAZING SYSTEM
15:00-15:10	752	NOUREHAN WAHBA	THERMAL COMFORT SIMULATION FOR COLD AIR DISTRIBUTION SYSTEMS BY A USER DEFINED PREDICTIVE MEAN VOTE INDEX
15:10-15:20	781	FAYCAL BENSALI, ABDULLAH ALSALEMI, ABBES AMIRA, HOSSEIN MALEKMOHAMADIA, KEGONG DIAO	ELEVATING ENERGY DATA ANALYSIS WITH M2GAF: MICRO-MOMENT DRIVEN GRAMIAN ANGULAR FIELD VISUALIZATIONS
15:20-15:30	782	RAMKISHORE SINGH, DHARAM BUDDHI, RAJESH SINGH, SHANE SHEORAN, ASHUTOSH VERMA	SENSITIVITY ANALYSIS OF INFLUENTIAL DESIGN PARAMETERS FOR SOUTH ORIENTED GLAZED FAÇADE OFFICE
15:30-15:40	912	WANGSHENG AI	THE SYNTHESIS OF HIGH-QUALITY V2C AS ELECTRODE MATERIALS FOR SUPERCAPACITORS
ROOM F			
SESSION 5-F2 INTELLIGENT ENERGY SYSTEM			
SESSION CHAIR: CLEMENTE CAPASSO, OTTORINO VENERI			
TIME	PAPER ID	AUTHOR	PAPER TITLE
14:00-14:10	160	ZUTAO ZHANG, TINGSHENG ZHANG, XIAOPING WU, DABING LUO, YAJIA PAN	A TRACK VIBRATION ENERGY HARVESTER BASED ON THE SCISSOR LINKAGE AND SLIDER MECHANISM IN RAILROAD
14:10-14:20	291	WENLONG SHANG, HUIBO BI, RUNTIAN LIU, PENGFEI CHEN, ZHENYU WEI, YUEYING ZHANG, PENG YANG	GREEN MANAGEMENT STRATEGY FOR FREE-FLOATING BIKE-SHARING SYTEMS WITH EEG-BASED QOE EVALUTION
14:20-14:30	415	TIELONG SHEN, FUGUO XU	DATA-BASED TRAFFIC PREDICTOR AND OPTIMAL POWERTRAIN CONTROL FOR CONNECTED AND AUTOMATED HYBRID ELECTRIC VEHICLES
14:30-14:40	497	BO QIU, KUN WANG, GUANLONG CAO	A SEGMENTED MANAGEMENT SYSTEM OF SMART STREET LIGHTS
14:40-14:50	566	MACARENA MARTÍNEZ LUNA, FRANCISCO JOSÉ VIVAS, FRANCISCA SEGURA, JOSÉ MANUEL ANDÚJAR	HYDROGEN-BASED APU FOR REFRIGERATED VANS. A TURNKEY SOLUTION FOR FREIGHT TRANSPORT
14:50-15:00	644	AMIT KUMAR, MATTHEW DAVIS, MINZA HAIDER	LONG-TERM ENERGY TRANSITION IN ROAD TRANSPORTATION BY 2050: A SYSTEM-WIDE COST, MARKET SHARE, AND GREENHOUSE GAS EMISSION COMPARISON OF CONVENTIONAL, BATTERY ELECTRIC AND HYDROGEN FUEL-CELL VEHICLES
15:00-15:10	591	LU Z, JAFAR A, MAHMOUD S. AL-DADAH R,, ALBAIK I, ISMAIL M	NOVEL THERMAL MANAGEMENT OF ELECTRICAL VEHICLE BATTERIES USING TWO PHASE IMMERSION COOLING INTEGRATED WITH ORGANIC RANKINE CYCLE
15:10-15:20	443	DANIELE PIAZZULLO, MICHELA COSTA	ZERO-DIMENSIONAL KINETIC MODEL FOR BIOMASS GASIFICATION SUITABLE FOR BOTH FIXED AND FLUIDIZED BED REACTORS
15:20-15:30	577	QINGWEI YANG, WEI ZHANG, ZHENHANG CHEN, YA-XIONG WANG	COMPREHENSIVE EVALUATION OF CELLS INCONSISTENCY IN LITHIUM-ION BATTERY MODULE

Day 6: Dec 4

Oral Presentations

ROOM A

SESSION 6-A1 RENEWABLE ENERGY SESSION CHAIR: WEI-HSIN CHEN, KUNIO YOSHIKAWA

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:10	74	ALIREZA REZANIAKOLAEI, LASSE AISTRUP ROSENDAHL, WEN CHEN, SHAOWEI QING, XIAOLONG GOU, SHENLI TANG, HENGFENG YUAN, XIANKUI WEN, JINGLIANG ZHONG	TWO-DIMENSIONAL THERMOELECTRIC COUPLING MODEL FOR OPTIMIZATION OF LARGE-SCALE LOW-TEMPERATURE THERMOELECTRIC SYSTEM
12:10-12:20	81	WEI-HSIN LIAO, MINGJING CAI	TOWARDS SELF-POWERED WEARABLES VIA WRIST-WORN ENERGY HARVESTERS
12:20-12:30	21	CHEN ZONGHAI, ZHENDONG SUN, LI WANG, MINCE LI	AN ENERGY MANAGEMENT STRATEGY FOR PEMFC HYBRID VEHICLES BASED ON ADAPTIVE MODEL PREDICTIVE CONTROL
12:30-12:40	91	CHIKA MADUABUCHI, RAVITA LAMBA, RAMESH KUMAR, MANISH VASHISHTHA, SUSHANT UPADHYAYA	PERFORMANCE IMPROVEMENT OF A NOVEL SOLAR THERMOELECTRIC GENERATOR USING CONICAL FRUSTUM SHAPED LEGS
12:40-12:50	168	SHENGXI ZHOU, ZHIXIAN WU, XUTAO MEI	MAGNETICALLY COUPLED BISTABLE ENERGY HARVESTERS IN ULTRA-LOW FREQUENCY ROTATION
12:50-13:00	195	LINCHUAN ZHAO, HONGXIANG ZOU, WENMING ZHANG	AN ENCLOSED HYBRID ENERGY HARVESTER BASED ON ROLLING-SWING STRUCTURE FOR ULTRA-LOW FREQUENCY WAVE ENERGY HARVESTING
13:00-13:10	336	HANKWON LIM, MUKESH UPADHYAY, SALAISARGUNAN S PARAMANANTHAM	NOVEL PEM WATER ELECTROLYSER CFD SIMULATION: PERFORMANCE ADVANCEMENT STUDY
13:10-13:20	384	LI ZHANG, LIN DING, TIAN SONG, YUE SUN, XIANGXI MAO	ENERGY CONVERSION CHARACTERISTICS OF PIEZOELECTRIC SPHERICAL WAVE ENERGY HARVESTING DEVICE
13:20-13:30	427	YUXIAO ZHU, DANIEL NEWBROOK, PENG DAI, C.H. DE GROOT, RUOMENG HUANG	SEGMENTED THERMOELECTRIC GENERATOR MODELLING USING ARTIFICIAL NEURAL NETWORKS
13:30-13:40	235	HU ZHANG	THERMOMAGNETIC GENERATION PERFORMANCE OF CLASSIC MAGNETOCALORIC MATERIALS FOR LOW-GRADE WASTE HEAT HARVESTING

ROOM B

SESSION 6-B1 CLEAN ENERGY CONVERSION TECHNOLOGY SESSION CHAIR: KUI JIAO, ZHIGUO QU

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:10	382	JICHENG MA, YUN CHEN, FUQIANG BAI, QING DU, KUI JIAO, ZHI LIU	EXPERIMENTAL STUDY ON THE EFFECTS OF NAFION CONTENT AND DISTRIBUTION IN CATALYST LAYER ON PAPER-BASED MICROFLUIDIC FUEL CELL
12:10-12:20	396	HUICUI CHEN, QIANYAO WENG, BIAO LIU, TONG ZHANG	INVESTIGATION ON START-UP PURGE STRATEGY FOR PEM FUEL CELL
12:20-12:30	460	MING FANG, JIANXIAO ZOU	RAPID RESPONSE CONTROL OF HUMIDITY FOR A POLYMER ELECTROLYTE MEMBRANE FUEL CELL TEST SYSTEM
12:30-12:40	559	MINSHAN WEI, PANPAN SONG, DING WU, HAN WANG, ZHONGYAN AN, ZHENBO LU	AERODYNAMIC PERFORMANCE INVESTIGATION ON A CO-ROTATING SCROLL HYDROGEN RECIRCULATION PUMP FOR FUEL CELL ENGINES
12:40-12:50	652	H XU	OPTIMAL DESIGN OF POLYTETRAFLUOROETHYLENE DISTRIBUTION IN A GAS DIFFUSION LAYER FOR PROTON EXCHANGE MEMBRANE FUEL CELL BY LATTICE BOLTZMANN METHOD
12:50-13:00	666	JIN LIN, YINGTIAN CHI, YIWEI QIU, QIANG HU, YONGHUA SONG, SHUJUN MU	SIMPLIFIED THREE-DIMENSIONAL MODELS FOR STUDYING THE NON-UNIFORMITY INSIDE THE FLAT-CHIP SOLID OXIDE CELL STACKS
13:00-13:10	694	SHIXUE WANG, LIKE YUE, YU ZHU, YUE FAN, CUIRU SUN	COLD START CHARACTERISTICS OF PROTON EXCHANGE MEMBRANE FUEL CELLS UNDER DIFFERENT PURGE CONDITIONS
13:10-13:20	698	CHANGJUN XIE, YANG YANG, WENCHAO ZHU, JIE SONG, ZHANFENG DENG, BO ZHAO, LEIQI ZHANG	OUTPUT CHARACTERISTIC MODELING AND MULTIPLE INFLUENCE FACTORS WEIGHT ANALYSIS OF PROTON EXCHANGE MEMBRANE FUEL CELL
13:20-13:30	744	HAOYANG ZHAO	REGULATION OF METAL CONTENT AND POROUS STRUCTURE FOR CO-ZIF DERIVED OXYGEN REDUCTION REACTION CATALYST
13:30-13:40	745	WEILING LUAN, SONGYANG LI, CHANG WANG	DATA-DRIVEN PROGNOSTICS FOR PEMFC DEGRADATION BY DEEP LEARNING METHOD

ROOM C

SESSION 6-C1 MITIGATION TECHNOLOGY AND ENERGY STORAGE SESSION CHAIR: HONGXING YANG

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Day 6: Dec 4

Oral Presentations

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:20	148	HONGXING YANG, GANG PEI, GUIQIANG LI, QILIANG WANG	AN ANALYTICAL STUDY OF OPTIMAL SPECTRAL SELECTIVITY OF SOLAR ABSORBING COATING AND THERMAL PERFORMANCE POTENTIAL OF SOLAR POWER TOWER
12:20-12:30	162	HAO PENG, ANCHAO QU, JUN ZHAO, FENG JIANG	RECYCLING BLAST FURNACE SLAG TO PREPARE NOVEL PHASE CHANGE MATERIALS FOR THERMAL ENERGY STORAGE
12:30-12:40	173	PRAVEEN LINGA, JUNJIE ZHENG, HYUNHO KIM, PONNIVALAVAN BABU	RHEOLOGICAL CHARACTERISTICS OF TETRA-N-BUTYLAMMONIUM BROMIDE HYDRATE AS A COLD STORAGE AND TRANSPORT MATERIAL
12:40-12:50	184	MINGJIA LI, XIAOHU YANG, JUNFEI GUO, YUANJI LI, BO YAN	THE THERMAL CHARACTERISTICS OF ENERGY STORAGE FINNED TUBES WITH DIFFERENT GRADIENT HEIGHTS
12:50-13:00	186	ZI-XIANG TONG, XIAOHU YANG, JUNFEI GUO, PAN WEI, GAO SHU	THERMAL ASSESSMENT ON THE PORE GRADIENT IN METAL FOAM FILLED THERMAL ENERGY STORAGE SYSTEM
13:00-13:10	207	WENJIN DING, HAO SHI, QING GONG, YAN CHAI, RUI YU, ALFONS WEISENBURGER, DIHUA WANG, ALEXANDER BONK, THOMAS BAUER	MOLTEN CHLORIDE SALT TECHNOLOGY FOR NEXT-GENERATION CSP PLANTS: COMPATIBILITY OF COST-EFFECTIVE FE-BASED ALLOYS WITH MG-PURIFIED MOLTEN MGCL2-KCL-NACL AT 700°C
13:10-13:20	246	JIABEI FENG	NUMERICAL SIMULATION OF BUILDING VENTILATION WITH PHASE CHANGE MATERIALS INTEGRATED INTO WALLS AND NIGHT VENTILATION
13:20-13:30	267	QIUWANG WANG, WEI CUI, TIANYU SI	NUMERICAL INVESTIGATION ON THE THERMAL PERFORMANCE OF PHASE CHANGE MATERIAL FILLED BY COPPER FOAM WITH TWO-DIMENSIONAL LINEAR POROSITY VARIATION
13:30-13:40	276	YANHUI FENG, DAILI FENG, PEI LI, XINXIN ZHANG	A BIOMASS-DERIVED CARBON PACKED POLYETHYLENE GLYCOL WITH ENHANCED THERMAL AND SOLAR ENERGY STORAGE PERFORMANCE

ROOM D

SESSION 6-D1 ENERGY MANAGEMENT, POLICY AND ECONOMICS

SESSION CHAIR: LEONARDO NIBBI

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:10	249	HUANYU JIA	PEER EFFECT: DOES PEER INFLUENCE THE INITIATIVE OF ENERGY SAVING BEHAVIOR OF COLLEGE STUDENTS?
12:10-12:20	454	STEVEN JIGE QUAN, PARTH BANSAL	DOES URBAN FORM RANDOMNESS IMPROVE INDOOR DAYLIGHT DURATION?
12:20-12:30	583	DANIEL FRIEDRICH, SAJID MEHMOOD, JESUS LIZANA, SERGUEY A. MAXIMOV	IMPACT OF CLIMATE CHANGE ON PAKISTAN'S BUILDING THERMAL ENERGY NEEDS AND COMFORT CONDITIONS
12:30-12:40	599	ANAS ABUZAYED, NIKLAS HARTMANN	ACHIEVING 100% RENEWABLE POWER SYSTEM IN GERMANY.
12:40-12:50	751	HAIYANG YU, SONGCHAO QI, JIABANG SONG, JIANG HU, YU ZHANG, XIAOBING HAN	GAS INJECTION DEVELOPMENT SCENARIOS AND FORECASTING FOR TIGHT OIL ENERGY
12:50-13:00	756	QIUWEI WU, XIANGYA BU, JIAN CHEN, JINYONG DONG	A GAN-CNN BASED MODEL FOR SHORT-TERM LOAD FORECASTING
13:00-13:10	761	LU-TAO ZHAO, ZHI-YI ZHENG, YUE-YUE XING	THE DYNAMIC RELATIONSHIP BETWEEN TWITTER TOPIC INDEX AND INTERNATIONAL CRUDE OIL PRICE: A NEW PERSPECTIVE BASED ON ASPECT-LEVEL SENTIMENT ANALYSIS.
13:10-13:20	791	UDAY SHANKAR, AJAYKUMAR CHAURASIYA	ANALYSIS OF STATE POLICIES AND REGULATIONS ON SOLAR PV DISTRIBUTED GENERATION SYSTEM IN RURAL INDIA
13:20-13:30	864	LEONARDO NIBBI, PAOLO SOSPIRO, MAURIZIO DE LUCIA	IMPROVING PUMPED HYDRO STORAGE (PHS) FLEXIBILITY IN CHINA
13:30-13:40	38	HIMANSHU DEHRA	ENERGY MANAGEMENT IN SUSTAINABLE ECO-CITIES OF MONARCHY OF CONCORDIA

ROOM E

SESSION 6-E1 ENERGY MANAGEMENT, POLICY AND ECONOMICS

SESSION CHAIR: HOLGER SCHLÖR

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Day 6: Dec 4

Oral Presentations

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:20	533	YINAN LI, XIAONAN WANG	POTENTIAL OF CURTAILED RENEWABLE POWER UTILIZATION UNDER CARBON NEUTRALITY – A CHINA CASE STUDY
12:20-12:30	420	KE WANG, YUJIAO XIAN	CAPTURING THE LEAST COSTLY MEASURE OF CARBON ABATEMENT IN CHINA'S IRON AND STEEL INDUSTRY
12:30-12:40	436	JUBAIR SIEED	DEVELOPMENT OF OPTIMAL POWER GENERATION MIX FOR BANGLADESH IN DIFFERENT SOCIO-ECONOMIC AND EMISSION REDUCTION POLICY SCENARIOS
12:40-12:50	465	YING DENG, KARL-KIÊN CAO, BRUNA WANKE	DESIGNING A BRAZILIAN ENERGY SYSTEM MODEL FOR STUDYING ENERGY PLANNING AT HIGH SPATIAL AND TEMPORAL RESOLUTION
12:50-13:00	490	ERIK DAHLQUIST, FREDRIK WALLIN, KOTESHWAR CHIRUMALLA, REZA TOORAJIPOUR, GLENN JOHANSSON	DEMAND FOR BALANCING POWER IN SWEDEN
13:00-13:10	416	STEVEN JIGE QUAN	LEARNING URBAN BUILDING ENERGY IN CHICAGO USING TYPICAL SUPERVISED LEARNING ALGORITHMS WITH HYPERPARAMETER TUNING
13:10-13:20	564	GORDON HUANG, XIAOYUE ZHANG, JIAPEI CHEN	SOCIO-ECONOMIC AND ENVIRONMENTAL EFFECT ANALYSIS FOR THE DEVELOPMENT OF SMALL MODULAR REACTORS
13:20-13:30	608	DINA AZHGALIYEVA	THE VIABILITY OF GREEN BONDS AS A FINANCING MECHANISM FOR GREEN BUILDINGS IN ASEAN
13:30-13:40	329	JEEHOON HAN, DONG SEONG KANG	CAPTURING THE LEAST COSTLY MEASURE OF CARBON ABATEMENT IN CHINA'S IRON AND STEEL INDUSTRY

ROOM F

SESSION 6-F1 INTELLIGENT ENERGY SYSTEM SESSION CHAIR: MEYSAM QADRAN, PAN LIU

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:10	46	MARKUS KRAFT, XIAONAN WANG, LANYU LI, ARKADIUSZ CHADZYNSKI, LAURA ONG, GOURAB KARMAKAR, MEI QI LIM	EMBEDDING ENERGY STORAGE SYSTEMS INTO A DYNAMIC KNOWLEDGE GRAPH
12:10-12:20	59	YI GUO, BO MING, QIANG HUANG, JIANHUA JIANG	COULD CHINA ACHIEVE A 100% RENEWABLE ELECTRICITY SYSTEM BY 2050?
12:20-12:30	138	KANGDI HUANG, PAN LIU	OPTIMAL DAILY GENERATION SCHEDULING OF A WIND-SOLAR-HYDRO COMPLEMENTARY SYSTEM BASED ON A THREE-STAGE MODEL COUPLING FORECAST UNCERTAINTIES
12:30-12:40	141	WEIFENG XU, PAN LIU, BO MING, KANGDI HUANG, YU GONG, XIAO LI	DAY-AHEAD CONTROLLABLE POWER GENERATION SCHEDULING OF THE HYDRO-WIND-PHOTOVOLTAIC HYBRID SYSTEM UNDER FORECAST UNCERTAINTY
12:40-12:50	266	SIMON SCHUERHOFF	DEVELOPMENT OF A METHOD FOR THE ECOLOGICAL ASSESSMENT OF GRID-CONNECTED ENERGY STORAGE SYSTEMS FOCUSING WIND ENERGY CURTAILMENT
12:50-13:00	474	HE LI	EXPLICIT STOCHASTIC OPTIMIZATION FOR HYDRO-PHOTOVOLTAIC-WIND HYBRID POWER SYSTEM CONSIDERING UNCERTAINTIES
13:00-13:10	572	A. U. N. IBN SAIF, SHAFI K KHADEM, MICHAEL CONLON AND BRIAN NORTON	IMPACT OF LOCAL ELECTRICITY MARKET ON THE LOW VOLTAGE DISTRIBUTION NETWORK
13:10-13:20	574	BADER ALQAHTANI, MANOSH C PAUL, JIN YANG, XIAOLEI LIU	OPTIMISATION OF A GRID-CONNECTED HYBRID RENEWABLE SYSTEM AT PEAK LOAD
13:20-13:30	613	JAEWON BYUN, SOONHO HWANGBO, JEEHOON HAN	TECHNO-ECONOMIC ASSESSMENT OF ELECTROCATALYTIC GLYCEROL OXIDATION BASED ON RENEWABLE ELECTRICITY
13:30-13:40	100	ZHONG-KAI FENG, WEN-JING NIU, TAO YANG, JIAN-ZHONG ZHOU, CHUN-TIAN CHENG	EVOLUTIONARY ARTIFICIAL INTELLIGENCE MODEL FOR LOAD TIME SERIES FORECASTING IN HYBRID ENERGY SYSTEM

ROOM S

SESSION 6-L1 SPECIAL SESSION SESSION CHAIR: ZHOU QUAN

Note: We follow GMT+1 time zone; Please join in ICAE 2021 by ZOOM (<https://zoom.us>); We will send the password of ZOOM meetings to the attendees through Email.

Day 6: Dec 4

Oral Presentations

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:10	298	JING ZHAO, YANG CHAO, WEIDA WANG, YING LI, CHANGLE XIANG	A SMOOTH PATH PLANNING LEARNING STRATEGY DESIGN FOR AN AIR-GROUND AMPHIBIOUS VEHICLE CONSIDERING MODE SWITCHING
12:10-12:20	486	HONGMING XU, QUAN ZHOU, CETENGFEI ZHANG, CHONGMING WANG, MIN HUA	ONLINE DOUBLE-LAYER SYSTEM IDENTIFICATION SCHEME OF BATTERY WITH STATE OF HEALTH PREDICTION
12:20-12:30	499	XU NAN, KONG YAN, YAN SUI, QIAO LIU	DATA-DRIVEN ENERGY MANAGEMENT BASED ON ADAPTIVE DYNAMIC PROGRAMMING
12:30-12:40	651	YANG CHAO , RUIHU CHEN , WEIDA WANG , MUYAO WANG , LIUQUAN YANG	PREDICTIVE AND COORDINATED POWER CONTROL STRATEGY FOR SERIES HYBRID ELECTRIC VEHICLE WITH FUZZY ADAPTIVE FILTER
12:40-12:50	611	HONGWEN HE , ZHONGBAO WEI , HAOKAI RUAN , YANG LI	PRACTICAL STATE OF HEALTH ESTIMATION BASED ON CONVOLUTIONAL NEURAL NETWORK
12:50-13:00	609	HONGWEN HE, ZHONGBAO WEI, YANG LI, XIAOFENG YANG	DEEP REINFORCEMENT LEARNING ENABLED MULTIPHYSICS-CONSTRAINED OPTIMAL CHARGING FOR LITHIUM-ION BATTERY
13:00-13:10	650	JINLONG HONG, YIFAN CHENG, YAO SUN, LIN ZHANG, YANJUN HUANG, HONG CHEN	PREDICTIVE POWERTRAIN CONTROL TO IMPROVE EFFICIENCY AND EMISSION FOR HEAVY DUTY TRUCKS
13:10-13:20	664	INTELLIGENT ENERGY SYSTEM-ELECTRIC VEHICLES	SURROGATE MODELLING FOR BATTERY STATE-OF-CHARGE ESTIMATION IN ELECTRIC VEHICLES BASED ON PSEUDO 2-DIMENSIONAL MODEL AND GRADIENT BOOSTING MACHINES
13:20-13:30	293	LEI WANG, QILIN RAN, YANG GAO, XIN DU, JIONGMING YANG	NEURAL ADAPTIVE COORDINATION CONTROL OF FLYWHEEL ENERGY STORAGE MATRIX SYSTEMS FOR WIND FARM
13:30-13:40	648	SHIJIN SHUAI, ZEMIN LIU, LUBING XU, YANFEI LI, BIN SHUAI	DEEP REINFORCEMENT LEARNING BASED ENERGY MANAGEMENT STRATEGY FOR HYBRID VEHICLES IN CONSIDERATION OF ENGINE START-UP CONDITIONS

13:40-14:00

TEA/COFFEE BREAK

ROOM A

SESSION 6-A2 RENEWABLE ENERGY

SESSION CHAIR: JUN LI, LI CHEN

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:00-14:10	570	ROLAND SPAN, VANESSA KAUB	THE INFLUENCE OF INCREASING HYDROGEN CONCENTRATIONS IN THE NATURAL GAS SUPPLY NETWORK
14:10-14:20	593	YIBIN QIU, QI LI, TIANHONG WANG, LIANGZHEN YIN, WEIRONG CHEN, HONG LIU	OPTIMAL PLACEMENT AND SIZING OF HYDROGEN ENERGY STORAGE POWER STATION CONSIDERING THE UNCERTAINTY OF GENERATION AND LOAD
14:20-14:30	814	RUKUAN CHAI, YUETIAN LIU, ZHENHUA RUI, LIANG XUE, RUICHENG ZHAO, QIANJUN LIU	MECHANISMS OF FORMATION DAMAGE IN LOW SALINITY WATER REINJECTION INTO GEOTHERMAL RESERVOIRS
14:30-14:40	866	HUSSEIN HOTEIT, XUPENG HE, BICHENG YAN, VOLKER VAHRENKAMP	EFFICIENT OPTIMIZATION OF TIME-CONTINUOUS GEOTHERMAL ENERGY EXTRACTION UNDERGOING RE-INJECTION
14:40-14:50	883	TAO ZHANG, YANHUI ZHANG, KLEMENS KATTERBAUER, ALBERTO MARSALA, SHUYU SUN, IBRAHIM HOTEIT	PHASE EQUILIBRIUM IN HYDROGEN ENERGY
14:50-15:00	894	MINGKUN JIANG	TECHNO-ECONOMIC ANALYSIS OF SEAWATER LITHIUM MINING
15:00-15:10	119	JUNHONG YANG, XUYANG CUI, MIANSHAN CUI, XINYU SHI	SIMULATION OF BIO-PELLET FUEL PRODUCTION EQUIPMENT WITH EDEM: EFFECT OF DIFFERENT PARAMETERS ON RING DIE
15:10-15:20	759	GUOYAO YU, ERCANG LUO, JINGYUAN XU, ZHIJIE JIANG	STUDY ON THE THERMOACOUSTIC GENERATOR FOR VARIABLE TEMPERATURE HEAT RECOVERY
15:20-15:30	500	WEI HE, ZIHAN CAI	STRUCTURAL OPTIMIZATION OF THERMOELECTRIC GENERATOR WITH DIFFERENT CIRCUIT LAYOUTS USED FOR EXHAUST HEAT RECOVERY

ROOM B

SESSION 6-B2 INTELLIGENT ENERGY SYSTEM

SESSION CHAIR: YUE ZHOU, ZHENG ZHUANG

TIME	PAPER ID	AUTHOR	PAPER TITLE
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Day 6: Dec 4

Oral Presentations

14:00-14:10	233	CHUNMING ZHANG	FAULT DIAGNOSIS ALGORITHM OF ENGINE COOLING FAN BASED ON PHYSICAL MODEL AND SUPPORT VECTOR MACHINE
14:10-14:20	442	MUSTAPHA OUHIMD, HASSAN BOUIA, FREDERIC KUZNIK, CHRISTIAN OBRECHT, MATHIAS BOUQUEREL, MATTHIEU FLOCH	BIM AND ADVANCED METHODS FOR GENERIC BUILDING ENERGY MODELING AND SIMULATION.
14:20-14:30	788	QINGCHANG DING, CAN DING	SHORT-TERM LOAD FORECASTING BASED ON SLIME MOULD ALGORITHM OPTIMIZED LEAST SQUARE SUPPORT VECTOR MACHINE COMBINED WITH VARIATIONAL MODAL DECOMPOSITION
14:30-14:40	879	RAPHAEL WU, GIOVANNI SANSAVINI, ARVIND SRINIVASAN	OPTIMAL DESIGN AND OPERATION OF MULTI-ENERGY SYSTEMS: FLEXIBILITY ASSESSMENT CONSIDERING INTERNAL UNCERTAINTY, SPOT AND ANCILLARY SERVICE MARKET PRICES
14:40-14:50	345	XINLI LU, WEI ZHANG, HAO YU, JIAQI ZHANG, JIALI LIU, ZHIWEI CUI, YAPENG REN, FENG MA, TIANJI ZHU, YALIN ZHANG	VOPTIMIZATION OF A GEOTHERMAL HEATING SYSTEM COUPLED WITH ENERGY STORAGE FOR OFFICE BUILDING HEATING WITH CONSIDERATION OF TIME-OF-USE ELECTRICITY PRICES
14:50-15:00	505	OMID VEISI, NASTARAN FADAEI, HADI EBADI, RAHBAR MORTEZA	DAYLIGHT OPTIMIZATION AND ENERGY RETROFIT BY USING PROPORTIONATE AUTOMATED LOUVERS IN HOME-BASED OFFICES (CASE STUDY: A HOUSE IN TEHRAN, IRAN)
15:00-15:10	240	MATEUSZ BORKOWSKI, ADAM PIŁAT	SAVING ENERGY AND EFFICIENCY INCREASE BY ENABLING FREE-COOLING MODE FOR COOLING SYSTEM IN DATA CENTER
15:10-15:20	878	ANDRA BLUMBERGA, RUTA VANAGA, JĀNIS NARBUTS, RITVARIS FREIMANIS	LABORATORY TESTING OF DIFFERENT MELTING TEMPERATURE PHASE CHANGE MATERIALS UNDER FOUR SEASON CONDITIONS FOR THERMAL ENERGY STORAGE IN BUILDING ENVELOPE
15:20-15:30	108	MASSIMO RIVAROLO, DARIA BELLOTTI, PAULA RAMOS, PAULO JORGE FELIX, SIMONE PREZIATI, RENZO DI FELICE	POWER-TO-FUEL ENERGY STORAGE SYSTEMS COMPARISON FOR COMBINED CYCLES FLEXIBILITY
15:30-15:40	402	RENEWABLE ENERGY - WIND POWER	EFFECT OF URBAN MORPHOLOGY ON WIND POWER POTENTIAL FOR HIGH-RISE BUILDINGS WITH OPENINGS

Room C

Session 6-C2 Energy Management, Policy and Economics

Session Chair: Qie Sun

Time	Paper ID	Author	Paper Title
14:00-14:10	113	HAI HUANG	INTEGRATED ASSESSMENT OF KEY MITIGATION TECHNOLOGIES IN PETROLEUM AND PETROCHEMICAL INDUSTRY UNDER CO2 EMISSIONS PEAKING AND NEUTRALITY TARGETS
14:10-14:20	127	YIN LONG, ZHONGWEN XU, YOSHIKUNI YOSHIDA	QUANTIFYING CONSUMPTION-BASED CARBON EMISSION OF MAJOR ECONOMIC SECTORS IN JAPAN
14:20-14:30	130	JIANJIAN HE	IDENTIFYING THE IMPACTS OF SUSTAINABLE DEVELOPMENT GOAL 7 ON NATIONAL RENEWABLE ENERGY FOOTPRINT
14:30-14:40	226	BOQIANG LIN, CHONGCHONG XU	CAN NEW ENERGY DEMONSTRATION CITY POLICY ACHIEVE A WIN-WIN IN ENVIRONMENT AND ECONOMY?
14:40-14:50	268	TOMISLAV CAPUDER, TOMISLAV ANTIĆ	GIS VISUALIZATION OF COVID-19 IMPACT ON PQ INDICATORS IN DISTRIBUTION NETWORKS: A CASE STUDY OF CROATIA
14:50-15:00	364	YILONG HAN, LINGYAN CAO, XIANGNING LI, YONGKUI LI	DYNAMIC ENERGY BENCHMARKING IN HEALTHCARE BUILDINGS: A DEA WINDOW ANALYSIS
15:00-15:10	603	ALI ALDERETE PERALTA	QUANTIFIED ANALYSIS OF INTERVENTIONS: THE ANAEROBIC DIGESTION CASE
15:10-15:20	606	AMIT KUMAR, MATTHEW DAVIS, CHRISTOPHE OWTRIM	PREDICTING THE EFFICIENCY OF INDUSTRIAL DEVICE RETROFITS: A TECHNOLOGY EXPLICIT APPROACH
15:20-15:30	771	AMARE TAREKE	RURAL ELECTRIFICATION AND NON-FARM OUTCOMES: EMPIRICAL EVIDENCE FROM DEVELOPING COUNTRIES
15:30-15:40	9	XINYUAN LIU, JOHN CALAUTIT, CARLOS JIMENEZ-BESCOS	INVESTIGATING THE IMPACT OF PASSIVE COOLING STRATEGIES ON THE ENERGY PERFORMANCE OF COMMERCIAL BUILDINGS IN MEGACITIES IN 2020, 2030 AND 2050

ROOM D

SESSION 6-D2 ENERGY MANAGEMENT, POLICY AND ECONOMICS

SESSION CHAIR: BIYING YU, DINA AZHGALIYEVA

TIME	PAPER ID	AUTHOR	PAPER TITLE
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Day 6: Dec 4

Oral Presentations

14:00-14:10	702	NICK MARTIN	TOWARDS THE INTEGRATION OF ENVIRONMENTAL AND BIO-ECONOMIC INDICATORS IN ENERGY SYSTEMS MODELLING
14:10-14:20	881	JIEHUI YUAN	LIFE CYCLE ASSESSMENT OF MULTI-PATHWAYS NATURAL GAS DISTRIBUTED ENERGY: A CASE STUDY IN CHINA
14:20-14:30	115	YANG-CHENG SHIH	NUMERICAL STUDY ON THE OPTIMAL HYDRAULIC DESIGN FOR THE INDOOR UNIT OF A SPLIT-TYPE AIR-CONDITIONER
14:30-14:40	15	RISHEE JAIN, ABIGAIL ANDREWS	INTEGRATING GRID INTERACTIVITY AND DEMAND FLEXIBILITY IN BUILDING ENERGY BENCHMARKING MODELS
14:40-14:50	131	EDI ASSOUMOU, GILDAS SIGGINI, VICTOR GUILLOT	LAND-USE AND EUROPEAN POWER SYSTEM TRANSITION TO CARBON NEUTRALITY: IMPLICATIONS, CHALLENGES AND OPTIMAL MIX
14:50-15:00	189	JIANGHUA LIU, XI LUO, XIAOJUN LIU	WHAT ARE THE MAIN FACTORS AFFECTING RURAL RESIDENTS' ACCEPTANCE OF CLEAN HEATING? EVIDENCE FROM A SURVEY ON FENWEI PLAIN, CHINA.
15:00-15:10	212	HONGXING YANG, JIA LIU	ACHIEVING NET-ZERO ENERGY COMMUNITIES IN HONG KONG WITH RENEWABLE ENERGY AND PUMPED HYDRO STORAGE SYSTEMS
15:10-15:20	261	JING SHI, ZEXU CHEN, ZITONG ZHANG, ZHAOFANG SONG, WANGWANG YANG, DENGQUAN LIN, JIAQI ZHANG	COMBINED OPTIMAL SCHEDULING METHOD OF HOME ENERGY MANAGEMENT SYSTEM
15:20-15:30	857	ANDRA BLUMBERGA, RUTA VANAGA, RITVARIS FREIMANIS, ZIGMĀRS ZUNDĀNS, JURIS ANTUŽS	ENERGY PERFORMANCE OF MILLENNIUM BUILDINGS (1992 – 2014) IN LATVIA
15:30-15:40	769	JIAWEI WANG, HENRIK BINDNER, SHI YOU, XIMEI LI, YI ZHENG, MARIE MÜNSTER	DATA-DRIVEN ROBUST CHANCE CONSTRAINED OPTIMIZATION FOR OPTIMAL OPERATION OF A WIND/HYDROGEN SYSTEM

ROOM E

SESSION 6-E2 ENERGY MANAGEMENT, POLICY AND ECONOMICS SESSION CHAIR: ANRIJS TUKULIS, YING YANG

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:00-14:10	312	LI ZHU, SHIBAI CUI	STUDY ON THE FRAMEWORK OF THE EVALUATION INDEX SYSTEM FOR STORM SURGE PREVENTION CAPACITY OF COASTAL CITIES
14:10-14:20	456	BIYING YU, YUN WU	THE PATH OF LOW-CARBON TRANSFORMATION IN CHINA'S POWER SECTOR UNDER THE VISION OF CARBON NEUTRALITY
14:20-14:30	458	BIYING YU, ZIMING HU, YUN WU	DEMAND OF RARE-EARTH METALS FOR WIND POWER DEVELOPMENT IN CHINA UNDER CARBON NEUTRAL TARGET
14:30-14:40	514	LANLAN LI, XINPEI SONG, KAILE ZHOU, KE LI	CLIMATE CHANGE ADAPTATION: A STUDY OF RESIDENTIAL NATURAL GAS CONSUMPTION IN HEFEI, CHINA
14:40-14:50	522	QUN CHEN, XING GOU, KE-LUN HE	QUANTIFYING STRUCTURAL THERMAL STORAGE FLEXIBILITY OF DISTRICT HEATING SYSTEM CONSIDERING HEAT TRANSFER PROCESSES AND MIGRATION DELAY
14:50-15:00	529	ROLAND SPAN, NICO SCHNEIDER	THE DOCTORAL SCHOOL CLOSED CARBON CYCLE ECONOMY: AN INTERDISCIPLINARY CONCEPT TO PROMOTE THE NECESSARY UNDERSTANDING FOR A SUSTAINABLE ENERGY AND STRUCTURAL TRANSFORMATION
15:00-15:10	530	JIAHONG LIU	MULTI-OBJECTIVE OPTIMIZATION AND DECISION-MAKING OF GREEN INFRASTRUCTURE LAYOUT CONSIDERING CARBON EMISSION
15:10-15:20	684	FANG YANG, JIE DIAN	THE MACRO-ECONOMIC IMPACT OF CONTROLLING FOSSIL ENERGY CONSUMPTION IN CHINA
15:20-15:30	598	KONSTANTINOS KYPRIANIDIS, ERIK DAHLQUIST, JINYUE YAN, MADELEINE MARTINSEN, YUANYE ZHOU	SMART AUGMENTED REALITY WITH AI SERVICE EXPERT FOR WORLD'S INDUSTRIES
15:30-15:40	676	JIANGFENG ZHANG, JIATONG WANG, LI LI, YUNFENG LIN	PEER-TO-PEER ENERGY TRADING FOR RESIDENTIAL PROSUMERS WITH BATTERY STORAGE SYSTEMS

ROOM F

SESSION 6-F2 INTELLIGENT ENERGY SYSTEM SESSION CHAIR: CHIARA D'ALPAOS, ARTURO LORENZONI

TIME	PAPER ID	AUTHOR	PAPER TITLE
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Day 6: Dec 4

Oral Presentations

14:00-14:10	765	JAN MARC SCHWIDTAL, MARCO AGOSTINI, MASSIMILIANO COPPO, FABIO BIGNUCOLO, ARTURO LORENZONI	INTEGRATING DISTRIBUTED ENERGY: VALUE STACKING FOR PV WITH POWER-TO-GAS
14:10-14:20	818	MARTA BOTTERO, GIULIO CAVANA, FEDERICO DELL'ANNA	EVALUATING THE INTERACTION OF OCCUPANT BEHAVIOR AND BACS (BUILDING AUTOMATION AND CONTROL SYSTEM) ON ENERGY CONSUMPTIONS: A FEASIBILITY ANALYSIS
14:20-14:30	826	MARINA BERTOLINI	PLAYING ON TWO MARKETS: INVESTMENT EVALUATION OF A BIOGAS – BIOMETHANE POWER PLANT IN A SMART GRID ENVIRONMENT
14:30-14:40	844	DAWID HANAK, TOLUPE FALOPE, LAO LIYUN	A UNIQUE THREE-STEP WEATHER DATA APPROACH IN SOLAR ENERGY PREDICTION USING MACHINE LEARNING
14:40-14:50	854	MARCO BINOTTI, EMANUELE MARTELLI, ALESSANDRO FRANCESCO CASTELLI, LORENZO PILOTTI, ALBERTO GIACONIA, MARCO COLOMBARI	OPTIMIZATION OF A HIGHLY INTEGRATED CSP-PV PLANT
14:50-15:00	856	MASSIMO GUARNIERI, NICOLA POLI, ANDREA TROVÒ, CINZIA BONALDO	OPTIMAL ENERGY STORAGE SYSTEMS FOR LONG CHARGE/DISCHARGE DURATION
15:00-15:10	885	FEDERICO DELL'ANNA, MARIA CRISTINA PINTO, GIULIA CRESPI, CRISTINA BECCHIO	PROPOSAL OF A MULTI-STEP METHODOLOGICAL APPROACH FOR EVALUATING THE PERFORMANCES OF SOLAR SHADING DEVICES IN OFFICE BUILDINGS
15:10-15:20	83	JIANZHONG WU, WEIQI HUA, YUE ZHOU, RUI JING	FLEXIBLE LOCAL ENERGY SYSTEM TOWARDS UK 2035 DECARBONIZATION
15:20-15:30	354	SUBBA REDDY BASAPPA, GAUTAM RAIKER, UMANAND L	ENERGY DISAGGREGATION WITH RESERVE POWER ESTIMATION AND NON-INTRUSIVE LOAD MONITORING IN DIRECT COUPLED SOLAR PHOTOVOLTAIC SYSTEMS
15:30-15:40	537	CHIARA D'ALPAOS, PETER KORT, FRANCESCA ANDREOLLI	THE VALUE OF INVESTMENTS IN PV BATTERY SYSTEMS UNDER A PEER-TO-PEER TRADING SCENARIO
ROOM S			
15:00-17:00	PANAL: Demand response in smart energy systems		

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ROOM S

10:00-12:00

PANAL: Future hydrogen society**ROOM A****SESSION 7-A1 RENEWABLE ENERGY
SESSION CHAIR: QIYUAN XIE, JIN-HYO BOO**

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:10	139	H. PAUL WANG, PO JEN MO, L.-W. WEI, YI CHEN CHEN	PREPARATION OF HOLE TRANSPORT MATERIAL-FREE FORMAMIDINIUM-METHYLAMMONIUM HYBRID PEROVSKITE SOLAR CELLS IN THE AIR AMBIENT
12:10-12:20	247	JIN-HYO BOO, SANG-HUN NAM	FABRICATION OF MOTH-EYE PATTERNED TiO ₂ LAYERS FOR BETTER EFFICIENCY AND CURRENT DENSITY OF DYE-SENSITIZED SOLAR CELLS
12:20-12:30	191	XUN ZHU, QIANG LIAO, JUN LI, QIAN FU, LIANG ZHANG, YU SHI, ZHIQIANG TANG	A THERMALLY REGENERATIVE BATTERY USING GRAPHENE MODIFIED CU/NI COMPOSITE ELECTRODES FOR HARVESTING WASTE HEAT
12:30-12:40	441	KUEN-SONG LIN, CHAO-LUNG CHIANG, NDUMISO VUKILE MDLOVU, ABRAR HUSSAIN, YUN KO	DIRECT SYNTHESIS OF CH ₃ OH FROM CO ₂ HYDROGENATION OVER Ni ₅ GA ₃ /SiO ₂ CATALYST
12:40-12:50	452	ALBERT CASTELL, NICOLAS FEAT, MARC MEDRANO, ROGER VILÀ	IMPROVING COOLING PRODUCTION COMBINING RADIATIVE COOLING AND PHASE CHANGE MATERIALS
12:50-13:00	549	H. PAUL WANG, KUEN-SONG LIN, ABRAR HUSSAIN, NDUMISO VUKILE MDLOVU	LIQUEFACTION OF WASTE TIRE RUBBER CHIPS USED FOR THE ABSORPTIVE RECYCLING OF SPILLED OILS
13:00-13:10	451	DANDAN CHEN	MOLECULAR DYNAMICS SIMULATION OF MOLTEN CaCl ₂ AND NaCl-CaCl ₂ EUTECTIC MOLTEN SALT
13:10-13:20	296	WEI-HSIN CHEN, BAPTISTE COLIN, ANELIE PETRISSANS, MATHIEU PÉTRISSANS, RAFAEL QUIRINO, LARISSA RICHA	EFFECTS OF POTASSIUM ON THE DECOMPOSITION OF WOOD AND LIGNOCELLULOSIC COMPONENTS DURING TORREFACTION
13:20-13:30	165	XUAN YIMIN, JUNYAN HE, KAI ZHANG	SUNLIGHT POWERED MULTI-ENERGY COMPLEMENTARY UTILIZATION SYSTEM FOR CO ₂ RECYCLING BASED ON CONCENTRATING SPECTRAL SPLITTING STRATEGY
13:30-13:40	206	SHIXUE WANG, YANZHE LI	EXPERIMENTAL STUDY ON THE EFFECT OF PARTIALLY FILLED METAL FOAM ON THE PERFORMANCE OF THERMOELECTRIC GENERATOR

ROOM B**SESSION 7-B1 CLEAN ENERGY CONVERSION TECHNOLOGY
SESSION CHAIR: SEON TAE KIM, JIAN LI**

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:10	532	ATMANANDMAYA ATMANANDMAYA	DEVELOPMENT OF HYBRID SOURCE THERMAL DESALINATION SYSTEM USING THERMOELECTRIC MODULE AS A POWERFUL HEAT PUMP
12:10-12:20	585	OSAMA ELSAMNI, AHMED REZK, MOHAMED REZK, MAHMOUD ELSHENITI	NUMERICAL INVESTIGATION OF COPPER FOAM ADSORPTION BEDS PACKED WITH MOF-801 FOR SPACE COOLING AND DESALINATION APPLICATIONS
12:20-12:30	673	NING ZHANG, QIFAN WANG, DANDAN SU, PENGWEI QIN, RUITAO SONG, MINXIA LI, YIHE YU	RESEARCH PROGRESS OF REFRIGERANT PHASE SEPARATION IN DISTRIBUTOR
12:30-12:40	824	YANJUN DAI, TENG JIA, PENGBO DOU, ERJIAN CHEN	FEASIBILITY AND PERFORMANCE ANALYSIS OF A NOVEL SOLAR-ASSISTED SINGLE-/DUAL-STAGE INTEGRATED MULTI-MODE ABSORPTION-RESORPTION HEAT PUMP (ARHP) SYSTEM
12:40-12:50	859	SIMIN HUANG, MINLIN YANG, ELAINE LOW, CHUNG LIM LAW, JIE-CHAO CHEN, SHOW PAU LOKE	INTEGRATION OF SOLAR HEAT RECOVERY IN THE REGENERATION UNIT OF A MEMBRANE-BASED ABSORPTION HEAT PUMP SYSTEM VIA CASCADE ANALYSIS
12:50-13:00	278	XIAOXIAO LI, YUANYUAN YU	THERMOECONOMIC ANALYSIS OF THE DRY COOLING SYSTEMS FOR SUPERCRITICAL CARBON DIOXIDE BRAYTON CYCLE
13:00-13:10	449	XUSHENG WANG, XIAOJING LV, YIWU WENG, XICONG MI	DESIGN AND SIMULATION OF LNG-FUELED SOFC-GT HYBRID SYSTEM FOR SHIP APPLICATION
13:10-13:20	197	CHAO LIU, QIBIN LI, LIYONG XIN, XIAOLI LI, WEI YU, ERGUANG HUO	CATALYTIC MECHANISM OF CU (111) SURFACE ON THE PYROLYSIS OF HFO-1234YF: A DENSITY FUNCTIONAL STUDY
13:20-13:30	732	LI ZHAO, SHUAI DENG, QIFAN WANG, DANDAN SU, RUIKAI ZHAO, MENGJIE BAI	A REVIEW: EVOLUTION AND CHALLENGE OF CONSTITUENT SEPARATION IN ADVANCED THERMODYNAMICS CYCLES
13:30-13:40	770	GUOYUAN MA, XIAOYA JIA, SHUAILING LIU, SHUXUE XU, GUOQIANG WU, YUOXUAN GONG	EXPERIMENTAL STUDY ON THE PERFORMANCE OF INVERTER AIR CONDITIONER USING R290

ROOM C**SESSION 7-C1 ENERGY MANAGEMENT, POLICY AND ECONOMICS****SESSION CHAIR: MEI SUN, XIAONAN WANG**

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:10	582	SOPHIE PATHE, VALENTIN BERTSCH	MULTI-OBJECTIVE ENERGY SYSTEM MODELING OF THE RHENISH MINING AREA MINIMIZING COSTS AND ENVIRONMENTAL IMPACTS
12:10-12:20	589	ALI AMADEH, ZACHARY LEE, K. MAX ZHANG	QUANTIFYING BUILDING DEMAND FLEXIBILITY USING A STOCHASTIC FRAMEWORK
12:20-12:30	595	ROBERT LOWE, LAI FONG CHIU	SHAPE OF THINGS TO COME: STAKEHOLDERS' VIEWS ON THE ROUTE TO NET-ZERO
12:30-12:40	815	ZEYU WANG	STABILITY DISPATCH OF MICROGRID BASED ON IMPROVED DIMENSIONAL LEARNING PARTICLE SWARM OPTIMIZATION ALGORITHM
12:40-12:50	825	SHADI FARID, FARIA NASSIRI-MOFAKHAM	HYBRID RENEWABLE ENERGY TARIFF SELECTION USING PROVIDERS AND CONSUMERS LEXICOGRAPHIC PREFERENCES SIMILARITY
12:50-13:00	828	SUJIN LEE, STEVEN JIGE QUAN	THE NONLINEAR INFLUENCE OF URBAN AND BUILDING FACTORS ON RESIDENTIAL BUILDING ENERGY USE: AN EMPIRICAL STUDY WITH QUANTILE REGRESSION IN SEOUL
13:00-13:10	843	XIAONAN WANG, VINCENT LI	USING CONVOLUTIONAL NEURAL NETWORKS TO UNDERSTAND THE IMPACT OF COVID-19 ON ELECTRICITY DEMAND IN TEXAS
13:10-13:20	877	MOZA AL NAIMI	REFLECTION ON GLOBAL AND GCC ENERGY TRANSITION PRE AND POST COVID 19
13:20-13:30	887	XIAOMIN WANG	STATISTICAL ANALYSIS OF RENEWABLE AND NON-RENEWABLE ENERGY CONSUMPTION UNDER THE EPIDEMIC SITUATION
13:30-13:40	288	MINGMING YANG, YONGNAN ZHU, YONG ZHAO, YU FAN	LIFE CYCLE ENERGY CONSUMPTION OF CHINA'S MAJOR CROPS FROM 2012 TO 2018

ROOM D**SESSION 7-D1 ENERGY MANAGEMENT, POLICY AND ECONOMICS****SESSION CHAIR: PERRY YANG**

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:20	318	MARKUS KRAFT, SEBASTIAN MOSBACH, JETHRO AKROYD, MICHAEL HILLMAN, FRANZISKA SIELKER, THOMAS SAVAGE	UNIVERSAL DIGITAL TWIN – THE IMPACT OF HEAT PUMPS ON INEQUALITY
12:20-12:30	327	AYYOUB SHARIFI, MASOUD JAVADPOOR	ANALYSIS OF THE ASSOCIATIONS BETWEEN URBAN FORM AND CO2 EMISSIONS BASED ON THE LOCAL CLIMATE ZONES CLASSIFICATION SYSTEM
12:30-12:40	539	NA LI, DONGHYUK YI, STEVEN JIGE QUAN	CORRESPONDENCE BETWEEN URBAN FORM TYPOLOGY AND RESIDENTIAL ENERGY USE PATTERN IN SEOUL
12:40-12:50	870	PERRY YANG, TAKAHIRO YOSHIDA, YOSHIKI YAMAGATA, SOOWON CHANG, AKITO MURAYAMA	GREEN RECOVERY PLANNING FOR A LOW ENERGY URBAN DISTRICT USING URBAN DIGITAL PLATFORM – A CASE STUDY OF TOKYO SHINAGAWA
12:50-13:00	30	JAEWON BYUN, JEEHOON HAN, DONG SEONG KANG	GLOBAL WARMING POTENTIAL ASSESSMENT OF METHANOL PRODUCTION FROM STEELMAKING OFF-GASES
13:00-13:10	203	CHANGAN WANG, DEFU CHE, LEI DENG, XING NING, XIANGYU XUE	ASSESSMENT OF CARBON EMISSIONS FROM UNDERGROUND IN-SITU PYROLYSIS OF TAR-RICH COAL BASED ON THE LIFE CYCLE ANALYSIS
13:10-13:20	259	MARKUS MUELLER, XIAOYU YAN, LIN ZHENG, CHUNBO LUO	LIFE CYCLE ANALYSIS FOR EVALUATING RESIDENTIAL BUILDING CARBON EMISSION TO ACHIEVE NET-ZERO EMISSIONS TARGET: CASE STUDY OF 99 HOMES IN THE SOUTHWEST OF UK
13:20-13:30	387	MAJA PERCIC, NIKOLA VLADIMIR, MARIJA KORICAN, NEVEN ALUJEVIC, NEVEN HADZIC	ANALYSIS OF ENVIRONMENTAL FOOTPRINT OF A FISHING TRAWLER WITH OVERVIEW OF EMISSION REDUCTION TECHNOLOGIES
13:30-13:40	680	HAO HONGKE, LIU WEIGUO	AN UPDATED FRAMEWORK FOR CLIMATE CHANGE IMPACT ASSESSMENT OF BIOENERGY AND AN APPLICATION IN POPLAR BIOMASS

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ROOM E**SESSION 7-E1 INTELLIGENT ENERGY SYSTEM
SESSION CHAIR: HAORAN ZHANG, JINQING PENG**

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:10	60	WANG SHENGWEI, HANGXIN LI, WENXUAN ZHAO	PERFORMANCE ANALYSIS OF AIR-CONDITIONING SYSTEM FOR HIGH-TECH CLEANROOMS UNDER DIFFERENT CLIMATE CONDITIONS
12:10-12:20	120	JUNHONG YANG, XUYANG CUI, MIANSHAN CUI, RUIJIE MA, ZEYU WANG	ESTABLISHMENT AND APPLICATION OF A NOVEL HEATING LOAD MODEL FOR BUILDING COMPLEX: A LOAD BASED ON HYBRID MECHANISTIC AND DATA DRIVEN APPROACH
12:20-12:30	161	JUN LIU, KEZHENG REN, ZEYANG WU	A HOME ENERGY MANAGEMENT SYSTEM OPTIMIZATION MODEL BASED ON DNN AND RL ADAPTING TO USERS' UNCERTAIN BEHAVIORS
12:30-12:40	304	HONGJIE JIA, XIAOLONG JIN, XIAODAN YU, YIHAN LU, YUNFEI MU, CHENGHAN ZHOU	ROBUST OPTIMAL SCHEDULING METHOD FOR INTEGRATED HEATING/ELECTRICITY COMMUNITY ENERGY SYSTEMS WITH FLEXIBLE HEATING LOADS OF BUILDINGS UNDER ENERGY PRICES UNCERTAINTIES
12:40-12:50	392	XINYUE LI	FAULT-TOLERANT CONTROL OF AIR-HANDLING SYSTEMS: THE CONTROL STRATEGY AND EXPERIMENTAL VALIDATION
12:50-13:00	519	FENGQI YOU, WEI-HAN CHEN	SEMI-CLOSED GREENHOUSE INDOOR CLIMATE CONTROL VIA A NONLINEAR MODEL PREDICTIVE CONTROL FRAMEWORK
13:00-13:10	565	ZACHARY LEE, K. MAX ZHANG	SMART THERMOSTAT CONTROLS MAY EXACERBATE PEAK WINTER HEATING DEMAND
13:10-13:20	660	WANDONG ZHENG, HAN LI, MAN FAN, HANXIAO SUO, XIANGFEI KONG, LU WANG	PERFORMANCE EVALUATION OF PHASE CHANGE MATERIALS FOR ACTIVE INDOOR THERMAL ENVIRONMENT CONSTRUCTION IN WINTER
13:20-13:30	708	JUNHONG YANG, XUYANG CUI, ZEYU WANG	APPLICATION OF LSTM TO DETERMINE THE WATER SUPPLY TEMPERATURE IN CENTRAL HEATING SYSTEMS
13:30-13:40	711	PENGCHENG LI	AIR CONDITIONING SYSTEM FAULT DIAGNOSIS BASED ON DERIVATIVE DATA OPTIMIZED SVM UNDER SAMPLE IMBALANCE

ROOM F**SESSION 7-F1 INTELLIGENT ENERGY SYSTEM
SESSION CHAIR: YINGRU ZHAO, SHUANG GAO**

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:10	587	PIETRO ELIA CAMPANA, MICHELA COSTA, GAIA MARTORIELLO, RAFFAELE TUCCILLO	A BIOMASS-SOLAR POWERED HYBRID MICRO-GRID FOR ELECTRIC VEHICLE BATTERY RECHARGING IN REMOTE AREAS
12:10-12:20	142	AYOTUNDE ADEYEMO, OLUMUYIWA TAIWO AMUSAN	DEMAND SIDE MANAGEMENT IN FUTURE SMART GRID: A REVIEW OF CURRENT STATE-OF-THE-ART
12:20-12:30	204	MAITE ETXANDI SANTOLAYA, ALBA COLET SUBIRACHS, MATTIA BARBERO, CRISTINA CORCHERO GARCÍA	INTEGRATION OF A MICROGRID LABORATORY INTO AN AGGREGATION PLATFORM AND ANALYSIS OF THE POTENTIAL FOR FLEXIBILITY
12:30-12:40	210	WEIQI HUA, HONGJIAN SUN, YUE ZHOU, RUI JING, JING JIANG, XI ZHANG	BLOCKCHAIN SMART CONTRACTS FOR GRID CONNECTION MANAGEMENT IN ACHIEVING NET ZERO ENERGY SYSTEMS
12:40-12:50	362	LEI PAN, LI SUN, YUJIE ZHOU, CHUNMEI AI	OPTIMAL DROOP CONTROL FOR SOFC/BATTERY/PV HYBRID SYSTEM BASED ON MULTI-OBJECTIVE GENETIC ALGORITHM
12:50-13:00	430	YI ZONG, CHUNJUN HUANG	OPTIMAL OPERATION OF MULTI-ENERGY SYSTEM INTEGRATED WITH AN ALKALINE ELECTROLYZER DYNAMIC POWER-TO-HYDROGEN&HEAT (P2H2) MODEL
13:00-13:10	457	YUEMIN DING, ZHONGXUAN LIU, FANG YUAN	DATA-DRIVEN AGENT MODELING FOR LIQUID AIR ENERGY STORAGE SYSTEM WITH MACHINE LEARNING: A COMPARATIVE ANALYSIS
13:10-13:20	602	REINHARD MADLENER, MUSTAFA BAYANSALDUZ, CHRISTOF KNOERI	MODELING THE TECHNICAL POTENTIAL OF ENERGY HUBS: A SPATIO-TEMPORAL ANALYSIS FOR THE SWISS CANTON OF ZURICH
13:20-13:30	615	JULIAN WANG	DYNAMIC GLAZING SYSTEM WITH CHANGEABLE NIR RESPONSE

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ROOM L**SESSION 7-L1 RENEWABLE ENERGY****SESSION CHAIR: CHUNLI TANG**

TIME	PAPER ID	AUTHOR	PAPER TITLE
12:00-12:10	907	YAMIN YAN , LINGFEI QI , HAORAN ZHANG, JINYUE YAN	ROADMAP FOR ELECTROCHEMICAL EXTRACTION OF LITHIUM FROM SEAWATER
12:10-12:20	478	ZHAO LU, RONGJIE DUAN, XIYUAN CHEN, LIYU ZHANG, XIAOHU YANG, LIWEN JIN	INVESTIGATION ON THE ELECTROCHEMICAL-THERMAL CHARACTERISTICS OF NMC LITHIUM-ION BATTERY UNDER DIFFERENT HEAT DISSIPATION CONDITIONS
12:20-12:30	462	SHUO WANG, YUNQI SUN, QING YANG, JIANLAN LI, LIANG WANG, SHIHONG ZHANG, HAIPING YANG, HANPING CHEN	VOCS EMISSIONS FROM BIOMASS GASIFICATION POWER GENERATION SYSTEM BASED ON LIFE CYCLE ANALYSIS
12:30-12:40	406	BASKORO LOKAHITA, ILMAN NURAN ZAINI ARIF HIDAYAT, MUHAMMAD AZIZ, DING LU, KUNIO YOSHIKAWA, FUMITAKE TAKAHASHI	POTENTIAL USE OF HYDROCHAR DERIVED FROM OLD LANDFILL WASTE AS A WASTEWATER ABSORBENT
12:40-12:50	470	JING CAI, QI ZHAO, CHUNGANG XU, XIAOSEN LI NICOLAS VON SOLMS, XIAODONG LIANG	MICROSCOPIC INSIGHTS ON CO ₂ DISSOLUTION AND HYDRATE FORMATION BY USING IN-SITU ANALYSIS IN THE SYSTEM OF IGCC, THF AND CP
12:50-13:00	527	HUACHENG NIE, TINGTING DU, YUEXIA LV, XINGYU ZHU, JINYUE YAN	FLOW CHARACTERISTICS OF TEMPERATURE-DRIVEN BISTABLE SLIT JET IN TUBE
13:00-13:10	762	YU LI, HUIQING LIU, HONGQUAN ZHANG, QING WANG, KE SUN	VISUAL INVESTIGATION ON OIL RECOVERY ENHANCEMENT VIA POLYMER FLOODING IN HETEROGENEOUS RESERVOIR
13:10-13:20	948	SONG QIN, XUEQIANG LI, HAILONG LI, SHENGCHUN LIU	MODELING A MULTI-STREAM HEAT EXCHANGER FOR CO ₂ CONDENSATION
13:20-13:30	802	MIN YAN, MING ZHOU, HUILIN JIA, YIRU FAN, HAIFEI LIN	LBM SIMULATION ON THE CORRELATION INFLUENCE OF PORE DISTRIBUTION AND TORTUOSITY ON GAS SEEPAGE IN TWO-DIMENSIONAL RANDOMLY GENERATED COAL
13:30-13:40	820	MIN YAN, BINBIN ZHANG, FAN YANG, HAIFEI LIN, SHUGANG LI	EXPERIMENTAL STUDY ON INFLUENCE OF PORE STRUCTURE CHARACTERISTICS OF LOW PERMEABILITY COAL ON GAS NONLINEAR SEEPAGE
13:40-14:00	TEA/COFFEE BREAK		

ROOM A**SESSION 7-A2 ENERGY SCIENCES****SESSION CHAIR: XIAOSEN LI, YI WANG**

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:00-14:20	237	YI WANG, XIAO-SEN LI, XUAN KOU	PORE-SCALE INVESTIGATION INTO OPTIMIZATION CONDITION OF HYDRATE DECOMPOSITION IN POROUS SEDIMENTS
14:20-14:30	558	YI WANG, XIAO-SEN LI, KUN WAN	EXPERIMENTAL STUDY ON HETEROGENEITY OF DIFFERENT TYPES OF HYDRATE DURING HYDRATE DECOMPOSITION
14:30-14:40	801	XIN-YANG ZENG, SI ZHANG, GUOZHONG WU, JIANG WANG, ZHIFENG YANG, JING-CHUN FENG	GROWTH KINETICS BEHAVIORS OF HYDRATE FILM ON GAS BUBBLE SUSPENDING IN WATER WITH INHIBITORS
14:40-14:50	527	HUACHENG NIE, TINGTING DU, YUEXIA LV, XINGYU ZHU, JINYUE YAN	FLOW CHARACTERISTICS OF TEMPERATURE-DRIVEN BISTABLE SLIT JET IN TUBE
14:50-15:00	554	JYOTI SINGH, PRERNA B S RAWAT, TEJASWA POOTHIA, DIPTI MEHRA, GAURAV PANDEY	COMPARATIVE STUDY ON RECOVERY OF METHANE GAS FROM NATURAL GAS HYDRATES USING COMBINATION OF DEPRESSURIZATION & THERMAL SIMULATION METHODS
15:00-15:10	26	PENGWEI QIN, HAOMIAO ZHAN, QIFAN WANG, RUITAO SONG, NING ZHANG, MINXIA LI	PERFORMANCE ANALYSIS OF TWO CO ₂ TRANSCRITICAL REFRIGERATION SYSTEMS WITH EJECTOR AND ECONOMISER
15:10-15:20	717	YAN XIE, YUJIE ZHU, JINRONG ZHONG, TAO ZHENG, CHANGYU SUN, GUANGJIN CHEN, JINGCHUN FENG	FORMATION KINETICS STUDIES OF CH ₄ HYDRATE IN BRINE AND POROUS SEDIMENTS BY MICRO-DIFFERENTIAL SCANNING CALORIMETER
15:20-15:30	768	FAN CHEN, NAVEEN MISHRA, ZHIFENG XIAO, TIANHAO YAN, JEREMY A. WILLMAN, FANGMING XIANG, KEVIN RESNIK, DAVID HOPKINSON,	RATIONAL DESIGN OF MIXED MATRIX MEMBRANES WITH METAL-ORGANIC POLYHEDRA FOR CO ₂ /N ₂ SEPARATION

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		BENJAMIN A. WILHITE, SHOUJIANG YI, HONG-CAI ZHOU	
15:30-15:40	389	JIANGSHUO DONG, JIAYING ZHENG, XIAOYU XU, PEIYAO DUAN, CHUN CHANG, MINGZHI ZHAO, XIAOBO LUO	STUDY ON HEAT STORAGE PERFORMANCE OF A SINGLE HOT WATER TANK WITH HEAT INSULATION BOARD AS THERMOCLINE LAYER
ROOM B			
SESSION 7-B2 INTELLIGENT ENERGY SYSTEM			
SESSION CHAIR: JAKUB JURASZ			
TIME	PAPER ID	AUTHOR	PAPER TITLE
14:00-14:10	941	PEIRAN LI, ZHAN ZHUANG, ZHILING GOU, QI CHEN, CHENCHEN SONG, ZHENGQUANG LIU, HAORAN ZHANG	A MULTI-TASK DEEP LEARNING MODEL FOR SOLVING IMBALANCE PROBLEM IN PHOTOVOLTAIC PANEL SEMANTIC SEGMENTATION
14:10-14:20	683	FANG JUN JIN, LEI WANG	RESEARCH ON NEURO-ADAPTIVE FAULT-TOLERANT CONTROL METHOD FOR LARGE FLOATING WIND TURBINE
14:20-14:30	355	XU ZHANG, DIAN-CE GAO, WENKE ZOU	IMPACT OF DATA SET STRUCTURE ON THE ACCURACY OF MACHINE LEARNING MODELS IN BUILDING COOLING LOAD PREDICTION CONSIDERING WEATHER AND OCCUPANCY SIMILARITY
14:30-14:40	431	TAJUDDIN NUR, HERLINA, SLAMET KASBI, OCTAECK LIM	IMPROVEMENT IN THE PERFORMANCE OF PERMANENT MAGNET GENERATORS BY MEANS OF COMBINING THE ONE-STEP OF SLOTTING OF MAGNET EDGE AND DUMMY SLOT AT STATOR TEETH
14:40-14:50	434	ESTIKO RIJANTO, SLAMET KASBI, ASEP NUGROHO, RASLI BIN ABD GHANI, SAAD MEKHILEF, OCKTAECK LIM	A MULTI-TASK DEEP LEARNING MODEL FOR SOLVING IMBALANCE PROBLEM IN PHOTOVOLTAIC PANEL SEMANTIC SEGMENTATION
14:50-15:00	373	YINCHUAN CHEN, XUE KONG, LEI YU, YAGANG ZHANG	RESEARCH ON NEURO-ADAPTIVE FAULT-TOLERANT CONTROL METHOD FOR LARGE FLOATING WIND TURBINE
15:00-15:10	920	SWAPNIL DUBEY, GIRISH KARTHIK KARRA RAVEENDRAN, BARIS BURAK KANBUR, RAJESH PUDUPADI BALACHANDER	IMPACT OF DATA SET STRUCTURE ON THE ACCURACY OF MACHINE LEARNING MODELS IN BUILDING COOLING LOAD PREDICTION CONSIDERING WEATHER AND OCCUPANCY SIMILARITY
15:10-15:20	921	SWAPNIL DUBEY, GIRISH KARTHIK KARRA RAVEENDRAN, BARIS BURAK KANBUR, RAJESH PUDUPADI BALACHANDER	IMPROVEMENT IN THE PERFORMANCE OF PERMANENT MAGNET GENERATORS BY MEANS OF COMBINING THE ONE-STEP OF SLOTTING OF MAGNET EDGE AND DUMMY SLOT AT STATOR TEETH
15:20-15:30	909	YANGLUXI LI	OPTIMAL DESIGN OF BUILDING INTEGRATED PHOTOVOLTAIC FOR A BUILT ENVIRONMENT
15:30-15:40	69	PRATIMA KUMARI, DURGA TOSHNIWAL	MACHINE LEARNING TECHNIQUES FOR HOURLY GLOBAL HORIZONTAL IRRADIANCE PREDICTION: A CASE STUDY FOR SMART CITIES OF INDIA
ROOM C			
SESSION 7-C2 INTELLIGENT ENERGY SYSTEM			
SESSION CHAIR: YUE ZHOU, YANLI LIU			
TIME	PAPER ID	AUTHOR	PAPER TITLE
14:00-14:10	612	YANLI LIU, LIQI LIU	LOAD IMAGE INPAINTING: AN ADVANCED U-NET BASED LOAD MISSING DATA RECOVERY METHOD
14:10-14:20	677	JINYUE YAN, HAORAN ZHANG, XIAODI WANG	BLOCKCHAIN ENABLED PEER TO PEER TRADING IN A SMART COMMUNITY
14:20-14:30	740	JIANZHONG WU, WENLONG MING, YUE ZHOU, XUN JIANG	FEASIBLE OPERATION REGION OF A DISTRIBUTION NETWORK CONSIDERING THERMAL CONSTRAINTS
14:30-14:40	794	XIAONAN WANG, HAKAN GUL	FUTURE INDUSTRIAL ENERGY SYSTEMS DESIGN AND DEMAND SIDE MANAGEMENT
14:40-14:50	853	EMANUELE MARTELLI, ALESSANDRO FRANCESCO CASTELLI, CRISTIAN BOVO, ANDREA FUSCO, DOMENICO GIOFFRÈ	OPTIMAL OPERATION OF VIRTUAL POWER PLANTS BIDDING IN THE DAY-AHEAD AND ANCILLARY SERVICES MARKETS
14:50-15:00	902	JINYUE YAN, PENG LI, HAORAN JI, HAO YU, JIE JIAN, JINLI ZHAO	MULTI-STAGE SUPPLY RESTORATION OF ACTIVE DISTRIBUTION NETWORKS WITH SOP INTEGRATION

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Day 7: Dec 5

Oral Presentations

15:00-15:10	903	JINYUE YAN, PENG LI, HAORAN JI, GUANYU SONG, HAO YU, YANG WANG, JINLI ZHAO	ROBUST OPERATION FOR MINIMIZING POWER CONSUMPTION OF DATA CENTERS WITH FLEXIBLE SUBSTATION INTEGRATION
15:10-15:20	758	JIANGFENG ZHANG, AYALEW BESHAH, PIERLUIGI PISU, QUENTIN DE BOEVER	OPTIMAL OPERATION OF ISLANDED VEHICLE-BORNE MICROGRID UNDER ABSENCE OF ADDITIONAL FUEL RESOURCES
15:20-15:30	830	LIANGLIANG ZHAO	ARCHITECTURE AND ANALYSIS OF MICRO-GRID DEMONSTRATION CASE
15:30-15:40	945	SHUANG GAO, HAILONG LI, YICHEN HOU, JINYUE YAN	INTEGRATING POWER-TO-HEAT TECHNOLOGY WITH CHP PLANTS FOR PARTICIPATING IN ELECTRICITY BALANCING MARKET

ROOM D

SESSION 7-D2 ENERGY SCIENCES SESSION CHAIR: PIETRO BARTOCCI, CHUANG WEN

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:00-14:10	170	JIE ZHAO, YE ZHANG, MINGJUN YANG, PRAVEEN LINGA	EFFECT OF OVERLYING WATER ON THE FORMATION AND DISSOCIATION OF METHANE HYDRATES IN SEDIMENTS
14:10-14:20	87	HAIYAN LEI, CHUANSHAN DAI, HAOJIE LI	SIMULATION OF CONTAMINANT MIGRATION OUTSIDE THE BURIED PIPE USING LATTICE-BOLTZMANN METHOD
14:20-14:30	140	HAIYAN LEI, CHUANSHAN DAI, FEI MA, SHIYI XU	A THEORETICAL ANALYSIS OF A MOVABLE MEASURING PROBE OF GROUND WATER VELOCITY BASED ON HEAT PULSE METHOD
14:30-14:40	372	X.F. ZHANG, Z.G. QU, J.Q. PU, QINLONG REN, J.F. ZHANG	AN INTERFACIAL PHOTOTHERMAL ENHANCED SALINITY-GRADIENT OSMOTIC ENERGY CONVERSION WITH HIGH THERMAL CONDUCTIVE Porous Media
14:40-14:50	491	MINGJUN YANG, XINRU WANG, JIE ZHAO, JIA-NAN ZHENG	EXPERIMENTAL SIMULATION ON DIFFERENT FORMATION MODES OF MARINE METHANE HYDRATE RESERVOIRS
14:50-15:00	687	DONG-MING MO, LIU-ZHU CAO, SHUANG YE, YOU-RONG LI	NUMERICAL STUDY ON RAYLEIGH-BÉNARD-MARANGONI CONVECTION OF COLD WATER NEAR ITS DENSITY MAXIMUM IN CYLINDRICAL POOLS WITH LARGE Aspect RATIOS
15:00-15:10	413	MINGJUN YANG, BINGBING CHEN, HUIRU SUN	INFLUENCE OF MULTIFACTORS (TEMPERATURE, PRESSURE, WATER FRACTIONAL FLOW) ON HYDRATE DISTRIBUTION AND DECOMPOSITION Characteristics
15:10-15:20	793	XUN LIU, CHU-QI SU, YI-PING WANG, QIU-SHI WAN	NUMERICAL AND EXPERIMENTAL INVESTIGATION ON SYMMETRICAL CROSS JET OF LOCALIZED AIR CONDITIONING SYSTEM WITH THERMOELECTRIC COOLING DEVICES IN COMMERCIAL VEHICLES
15:20-15:30	385	LI ZHANG, LIN DING, QUNFENG ZOU, TIAN SONG	INFLUENCE OF PITCHING RESPONSES ON THE POWER EXTRACTION OF A SEMI-ACTIVE FLAPPING HYDROFOIL IN SHEAR FLOW
15:30-15:40	796	MINGRUI ZHANG, JING-CHUN FENG, LIWEI SUN, YANYAN HUANG, SI ZHANG, ZHIFENG YANG	DIET OPTIMIZATION PROMOTES GLOBAL GREENHOUSE GAS EMISSION

ROOM E

SESSION 7-E2 CLEAN ENERGY CONVERSION TECHNOLOGY SESSION CHAIR: WANDONG ZHENG, SEON TAE KIM

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:00-14:10	19	MEHDI RASTI, JI HWAN JEONG	PREDICTION DRUM ENERGY CONSUMPTION OF A HEAT PUMP CLOTHES DRYER
14:10-14:20	28	CHUNLU ZHANG, ZHILING LI	MODELING AND ANALYSIS OF COLD ISLAND EFFECT ON THE PERFORMANCE OF AIR SOURCE HEAT PUMP PLANT
14:20-14:30	105	YUSHENG CHEN, TONG GUO , MATTHIAS GADERER	THERMODYNAMIC ANALYSIS OF THE DESIGN OF A HEAT PUMP FOR HEAT RECOVERY IN A BIOMASS HEATING NETWORK
14:30-14:40	166	SUXIN QIAN, QIANLONG WANG, YAO WANG, TIANXIN JIANG, BINGQING LIU, CHONGSHENG XU	SIMULATION STUDY OF A HEAT PUMP DUAL-TEMPERATURE DISPLAY CABINET USING TWO NATURAL REFRIGERANTS
14:40-14:50	192	DELIYA KEZIER, JIAHAO CHENG, CHUNLU ZHANG, YUEMING LU	LONG-TERM ENERGY PERFORMANCE EVALUATION AND IMPROVEMENT OF HEAT PUMP WATER HEATING SYSTEMS IN SHANGHAI

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14:50-15:00	320	SEON TAE KIM, ROBERT HEGNER, GÖKSEL ÖZUYLASI, PANAGIOTIS STATHOPOULOS, EBERHARD NICKE	PERFORMANCE ANALYSIS OF HIGH TEMPERATURE HEAT PUMP CYCLE FOR INDUSTRIAL PROCESS
15:00-15:10	388	YIQUN PAN, YAN LYU, ZHIZHONG HUANG	AN AHP-BASED COMPREHENSIVE EVALUATION METHOD FOR HVAC SYSTEMS IN COMMERCIAL BUILDINGS
15:10-15:20	453	JIAN LI, ZHEN YANG, HAILONG LI, YUANYUAN DUAN, JINYUE YAN	RECOVERING WASTE HEAT OF DATA CENTER FOR DISTRICT HEATING: BALANCE FINANCIAL AND ENVIRONMENTAL BENEFITS
15:20-15:30	512	MARCO GERON, EHSAN AFRASIABIAN, GARETH CUNNINGHAM, MARTIN MURTAGH, ROBERT BEST	NUMERICAL ANALYSIS OF A RECOVERY AIR CONDITIONING CONCEPT FOR ELECTRIC BUSES
15:30-15:40	63	ALESSIO TAFONE, ROBERTO PILI, ALESSANDRO ROMAGNOLI	DYNAMIC MODELLING OF AN ORGANIC RANKINE CYCLE COMPRESSED HEAT ENERGY STORAGE (ORC-CHEST) SYSTEM INTEGRATED WITH A CASCADED PHASE CHANGE MATERIALS (PCM) BASED PACKED BED UNIT

ROOM F**SESSION 7-F2 RENEWABLE ENERGY
SESSION CHAIR: JIN-HYO BOO, HAO YU**

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:00-14:10	371	QIAN LI, ZHIYA PAN, XUYANG ZHA, YAGANG ZHANG	A HYBRID PREDICTION METHOD FOR PHOTOVOLTAIC POWER GENERATION BASED ON SIGNAL PROCESSING AND ARTIFICIAL INTELLIGENCE
14:10-14:20	537	ANDREOLLI A., D'ALPAOS C., KORT P.	THE VALUE OF INVESTMENTS IN PV BATTERY SYSTEMS UNDER A PEER-TO-PEER TRADING SCENARIO
14:20-14:30	567	GODWIN NORENSE OSARUMWENSE ASEMOTA, NELSON M. IUUMBA	SHIELDING AND THERMOSTATIC CONTROL FOR OPTIMAL ELECTRICITY LOAD MANAGEMENT
14:30-14:40	886	ANTON EGRSAND	LATENT HEAT THERMAL ENERGY STORAGE FOR SPORT FACILITIES WITH PHOTOVOLTAIC OVERPRODUCTION
14:40-14:50	742	ZHUANG ZHENG, HANGXIN LI, XIAOWEI LUO, SHENGWEI WANG	A CONSENSUS-BASED DISTRIBUTED CONTROL METHOD OF RESIDENTIAL INVERTER AIR CONDITIONERS FOR FAIR UTILIZATION OF DEMAND FLEXIBILITY RESOURCES
14:50-15:00	914	ARIANNA BALDINELLI, LINDA BARELLI, FRANCESCO MONDI, DAMIANO AISA	OPERATION INVERSION FREQUENCY: IS IT AN ISSUE FOR SOLID OXIDE CELLS?
15:00-15:10	481	YUEXIA LV, JINYUE YAN, XINGYU ZHU, HUACHENG NIE, CHANGSHENG ZHANG	TECHNO-ECONOMIC ANALYSIS OF ROOF-MOUNTED SOLAR PHOTOVOLTAIC IN UNIVERSITY CAMPUS
15:10-15:20	483	NANHANG DONG, WEI HAN, YANG YU, QICHENG CHEN	MODELLING OF THE FLOW AND HEAT TRANSFER OF MICROALGAE SLURRY IN A PARABOLIC TROUGH COLLECTOR DRIVEN BY SOLAR ENERGY
15:20-15:30	536	YONG HAO, KAI ZHAO, ZHENYU TIAN	EFFICIENCY ENHANCEMENT BY BIONIC TREE-SHAPED REACTOR IN A PHOTOVOLTAIC THERMOCHEMICAL HYBRID SYSTEM
15:30-15:40	492	XUN LIU, YU-XUAN LI, CHU-QI SU, YI-PING WANG	ASSESSMENT ON THE INTEGRATION OF THREE-WAY CATALYTIC CONVERTER AND THERMOELECTRIC GENERATOR

ROOM L**SESSION 7-L2 RENEWABLE ENERGY
SESSION CHAIR: YUEXIA LV**

TIME	PAPER ID	AUTHOR	PAPER TITLE
14:00-14:10	438	JIE YAN	NUMERICAL WEATHER PREDICTION CORRECTION METHOD BASED ON ONLINE LSTM
14:10-14:20	61	JAROSŁAW MILEWSKI, ARKADIUSZ SZCZĘŚNIAK, ŁUKASZ SZABŁOWSKI, ALEXANDER MARTINCHIK, MACIEJ SIEKIERSKI, KONRAD ŚWIRSKI	MOLTEN BORONATED FUEL CELLS — MATHEMATICAL MODELING AND IDENTIFICATION OF PERFORMANCES
14:20-14:30	349	XIN LI, JIANGYAN LIU, KUINING LI, JINGHONG WANG, YI XIE	EVALUATION OF THE INPUT UNCERTAINTY EFFECT ON DATA-DRIVEN-BASED HVAC FAULT DIAGNOSTICS USING MONTE CARLO METHOD
14:30-14:40	550	SHUAI REN, HUAJIAO LI	RISK CONTAGION PATH IDENTIFICATION OF ABRUPT TRANSITION ON THE STOCK PRICE OF CHINA'S NEW ENERGY VEHICLE INDUSTRY CHAIN

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Day 7: Dec 5

Oral Presentations

14:40-14:50	553	XIAOJING LV, XUSHENG WANG, XICONG MI, CATALINA SPATARU, YIWU WENG	REFORMING CHARACTERISTIC OF ETHANOL FUEL AND ITS VARIATION TENDENCY UNDER SOFC/GT OPERATING SCENARIO
14:50-15:00	433	YANLING WANG	RESEARCH ON REAL-TIME SCHEDULING OF HYDRO-PV COMPLEMENTARY SYSTEM CONSIDERING THE UNCERTAINTY OF PHOTOVOLTAIC PREDICTION
15:00-15:10	899	EMERALD PIMAN SUN, WEN QIN, DEXUAN SONG, LI YANG	ENERGY EFFICIENCY: THE ECOLOGICAL RESTORATION POTENTIAL OF SHANGHAI URBAN RESIDENTS' ENVIRONMENTAL AWARENESS
15:10-15:20	481	XINGYU ZHU, QIUBAI LI, JINPENG BI, YUEXIA LV, JINYUE YAN, CHANGSHENG ZHANG	TECHNO-ECONOMIC ANALYSIS OF ROOF-MOUNTED SOLAR PHOTOVOLTAIC IN UNIVERSITY CAMPUS
15:20-15:30	649	JINPENG BI, PENGFEI SI, YUEXIA LV, JINYUE YAN	FEASIBILITY ANALYSIS OF MEDIUM TO DEEP GEOTHERMAL HEAT SYSTEM IN COLD PLATEAU AREAS
15:30-15:40	950	QINGXIANG WANG , ZHENGJIA ZHANG , HAORAN ZHANG, QI CHEN	COAL MINING AREA POTENTIAL ANALYSIS OF PHOTOVOLTAIC POWER STATIONS USING REMOTE SENSING TECHNOLOGY

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- OC:E was initiated and developed based on the existing Applied Energy network, with 50K+ professors, scientists, engineers in energy fields, participating as scientists, researchers, teachers, students, authors, reviewers, readers, speakers, and audiences at the Journals of Applied Energy, Advances in Applied Energy, the International Conferences such as International Conference on Applied Energy (ICAE: applied-energy.org), CUE, REM etc, Energy Proceedings (energy-proceedings.org), energy preprint platform (enarXiv.org), UNiLABs, and summer schools, etc.

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To join OC:E as a partner, the partner is required to offer at least one online open course in the format of (but not limited to) real time lectures, course video recordings, course presentation slides, or other materials.

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