

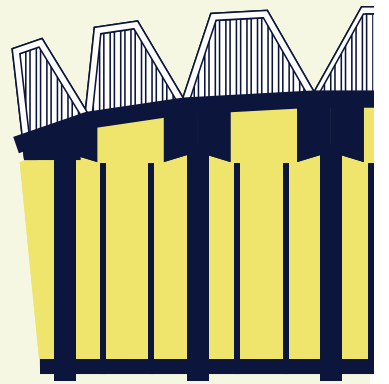
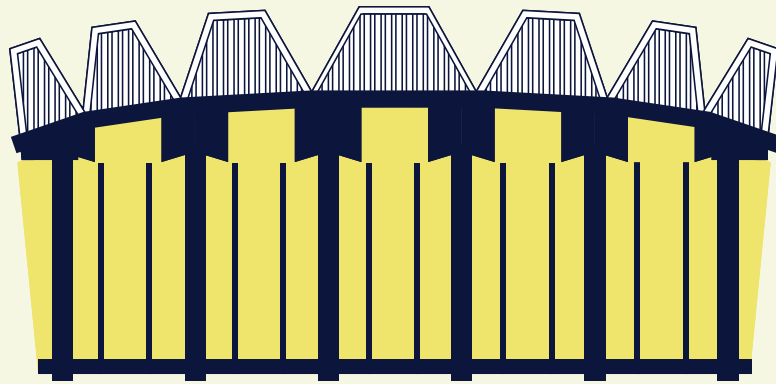
i°ca e

International Conference on Applied Energy

14th

**International Conference
on Applied Energy**

Aug. 8-11, 2022



Acknowledgements

RWE

**RUHR
UNIVERSITÄT
BOCHUM**

RUB

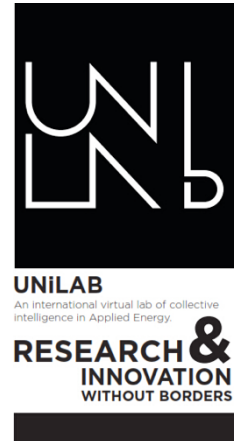
**MD
Mälardalen
University U**

 **RESEARCH DEPARTMENT**
CLOSED CARBON CYCLE ECONOMY

 **THE APPLIED ENERGY
INNOVATION INSTITUTE**



F&X



RWE

Welcome to the renewable age.

We're leading the way to a green energy world.
We're investing 50 billion euros gross by 2030.
And we have a clear target: to be carbon-neutral by 2040.

[rwe.com](https://www.rwe.com)

- Acknowledgments
- Committees
- Welcome to ICAE2022
- Keynote Speakers
- Venue's Information
- Program at a glance (on site)
- Program at a glance (online)
- Speaker's Guide
- Applied Energy System Transformation
- AWARDS: HIGHLY CITED PAPERS
- Conf. proceedings and preprints
- Panel Sessions
- Excursions

Ruhr University Bochum is located in the Ruhr area in North Rhine Westphalia – in the largest urban region of Germany. Located in the south of Bochum, close to the river Ruhr, it is at the southern edge of this urban area. Densely populated areas are located to its north. But the view to the south shows the hilly range of what we call “Bergisches Land” – an area dominated by forests, farms, and recreational areas.

Ruhr University was founded in 1962, 17 years after the second world war had ended and about ten years before the last coal mine in Bochum was closed. It was the first newly founded university in western Germany. And it has triggered the transformation process that by now has turned Bochum from a city shaped by coal and steel industry into a science city. Topics like IT security or medical technology are in the center of economic growth in Bochum.

With more than 40,000 students and 5,800 employees, Ruhr University is one of the largest research universities in Germany. Research and education are clustered in 21 faculties – from humanities over engineering sciences and natural sciences to medicine. Ruhr University truly is a comprehensive university. However, while this faculty structure is good for disciplinary research, it might not be optimal for the interdisciplinary challenges we are facing today. This is what the Research Departments were introduced for. Research Departments are interdisciplinary clusters, in which colleagues from different faculties address questions of common interest. Perspectives of different disciplines are bundled to find answers to questions, which cannot be addressed by a single discipline alone.

Today, nine research departments – from Religious Sciences to Plasmas with Complex Interactions – work on research areas that can be considered focal points of the research at Ruhr University. Solvation Science and IT Security became prestigious clusters of excellence in the German excellence initiative. But Ruhr University also values contributions by its excellent researchers on individual research areas – to be part of a research department is not mandatory for excellent research.

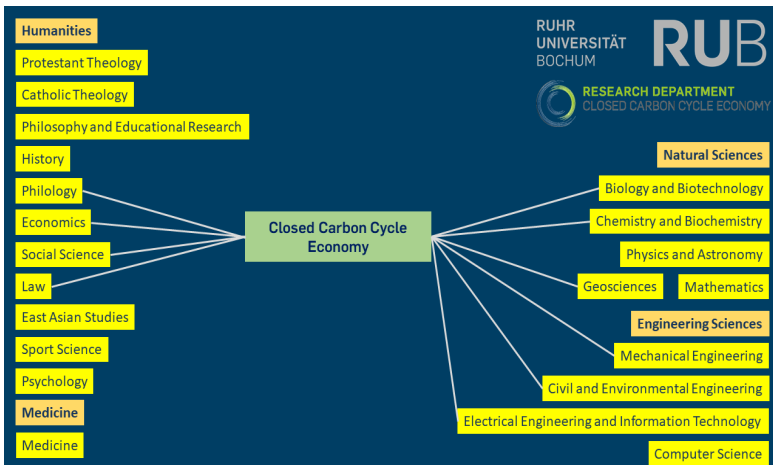


**RUHR
UNIVERSITÄT
BOCHUM**

RUB



RESEARCH DEPARTMENT CLOSED CARBON CYCLE ECONOMY



With more than 40 principle investigators from 10 different faculties, the **Research Department Closed Carbon Cycle Economy (RD CCCE)** is the most interdisciplinary among the nine research departments of Ruhr University. It was founded based on the believe that closed carbon cycles have to be developed to avoid further atmospheric CO₂ emissions. This concerns the way in which we generate electricity as well as the provision of process heat for industry, heating for buildings, energy for mobility requirements and last but not least the provision of carbon-containing raw materials for the chemical industry. Highly developed countries will only be able to remain strong if the transition to closed carbon cycles takes place without catastrophic breaks. Solutions and technologies need to be developed that can be transferred to other countries. Developing countries need to be included, their legitimate interest in development needs to be considered. Ultimately, we talk about solving global problems.

The transformation towards closed carbon cycles involves fundamental and application-oriented technical and scientific challenges. But it also raises many questions in the humanities and social sciences. The members of RD CCCE address a broad range of research topics. From fundamental research on catalysts over innovative technical solutions to legal questions and public perception.

The Doctoral School Closed Carbon Cycle Economy (DS CCCE) is an example for interdisciplinary approaches aiming at sustainable transformation processes. While the scientific work of the PhD candidates from eight different faculties is necessarily mostly disciplinary, the interaction within the DS CCCE widens their view – the challenging transformations we are facing need excellent experts in different disciplines, who have learned to communicate to experts from other disciplines. The challenges we are facing are as multidisciplinary as the International Conference on Applied Energy – **Welcome to Ruhr University!**

Committees

CONFERENCE CHAIRS

Prof. Jinyue Yan

Prof. Roland Span

ORGANIZING COMMITTEE

Prof. Hailong Li

Dr. Haoran Zhang

Dr. Mingkun Jiang

Prof. Ulf-Peter Apfel

Mr. Robin Beckmüller

Prof. Valentin Bertsch

Ms. Franziska Hoffart

Prof. Uta Hohn

Ms. Birgit Joswig

Dr. Jan-Hendrik Kamlage

Prof. Andreas Löschel

Prof. Christian Pielow

Dr. Julia Riese

Prof. Michael Roos

Dr. Maik Bohne

Prof. Klaus Steigleder

Dr. Monika Thol

Dr. Yuanwei Xu

Prof. Thomas Ernst Müller

Dr. Lingfei Qi

SCIENTIFIC COMMITTEE

Prof. Jinyue Yan (Chair), Editor-in-Chief, Advances in Applied Energy

Prof. Jianzhong Wu (Co-Chair), Co-Editor-in-Chief, Applied Energy

Prof. Zita Vale (Co-Chair), Co-Editor-in-Chief, Applied Energy

Prof. Siaw-Kiang Chou (Co-Chair), Senior Editor, Applied Energy

Prof. Umberto Desideri (Co-Chair), Senior Editor, Applied Energy

A. K. Gupta USA

A. P. Roskilly, UK

D. Chiaramonti, Italy

D. K. Zhang, Australia

F. C. Sun, China

H. B. Sun, China

H. M. Xu, UK

J. Whalen, Canada

K. Yoshikawa, Japan

M. Kraft, UK

N. Hedin, Sweden

P. Lund, Finland

R. Span, Germany

S. T. Tu, China

X. H. Xia, South Africa

Y. Yamagata, Japan

C. H. Pang, Malaysia

E. Lester, UK

A. Massardo, Italy

C. D. Rakopoulos, Greece

D. Guan, UK

E. Dahlquist, Sweden

G. Hammond, UK

H. G. Jin, China

J. Hetland, Norway

J. Z. Wu, UK

L. Kazmerski, USA

M. Obersteiner, UK

N. Zhou, USA

P. Yang, USA

S. A. Kalogirou, Cyprus

T. Shamim, USA

Y. L. He, China

Z. Y. Luo, China

X. Gao, China

G. Zhu, China

A. Meier, USA

C. S. Wang, Singapore

D. J. Lee, Taiwan

E. Martelli, Italy

G. Strbac, UK

H. L. Li, Sweden

J. Milewski, Poland

K. Hubacek, The Netherlands

M. K. H. Leung, Hong Kong

M. Sorrentino, Italy

O. Veneri, Italy

R. Madlener, Germany

S. Garimella, USA

X. G. Li, Canada

Y. M. Wei, China

T. Wu, China

F. C. Wang, China

L. Chen, China

Welcome to ICAE2022



Welcome to ICAE2022, the 14th International Conference on Applied Energy!

After we had to rely on virtual conferences for two years, we are looking forward to seeing as many of you as possible onsite again: On invitation by the Research Department Closed Carbon Cycle Economy, ICAE2022 will be hosted by Ruhr University Bochum in Germany from August 8 to 11, 2022. The conference will be held in hybrid mode, allowing both for onsite and for online participation. The theme of ICAE2022 is Closing Carbon Cycles – A Transformation Process Involving Technology, Economy, and Society. ICAE2022 will include keynotes and invited speeches, plenary sessions, dedicated workshops, and oral and poster presentations. The conference intends to represent the interdisciplinary character of the challenges, which are related to the ultimate goal of carbon neutrality. The list of addressed topics includes (but is not limited to):

- » Renewable Energy
- » Clean Energy Conversion Technology
- » Intelligent Energy Systems
- » Energy Ethics, Energy Management, Policy, Economics and Sustainability
- » Mitigation Technologies
- » Energy Science
- » Energy Storage
- » Transformation Processes

Special topic

- » Perspectives for the FEW nexus against the background of the Global Anthropocene challenges
- » Transformation Processes in Power Supply, Raw Material Supply, and Urban Structures

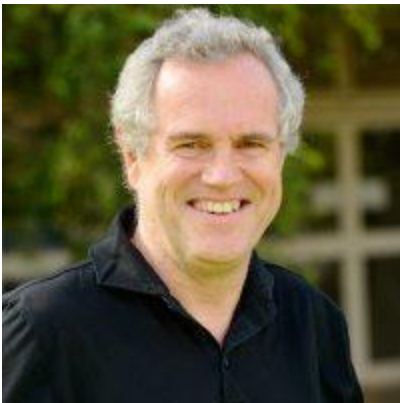
If you have any questions, please feel free to contact: icae2022@applied-energy.org

All papers will be peer-reviewed, and accepted papers are required to be presented (onsite or online) orally at the conference. Selected papers from ICAE2022 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.

We look forward to meeting you at ICAE2022 in Bochum!

Prof. R. Span, Chair of ICAE2022 and
Chair of the Research Department Closed Carbon Cycle Economy
Prof. J. Yan, Co-Chair of ICAE2022 and
Editor in Chief of Advances in Applied Energy

Keynote Speakers



Dr. Mark O'Malley

**Chief Scientist of the Energy
Systems Integration Group**

Dance partners – global coordination and synergy in the energy transition

Abstract

The energy system transition is accelerating in reaction to policies and dramatic cost declines in wind and solar photovoltaic technologies. The transition is also making the energy system more interconnected with electrification of transport and heat. This interconnection is also impacting on individual energy consumers as they start to become prosumers. This interconnectedness has enormous benefits as it gives more degrees of freedom in the design of the future energy system and leveraging of synergies, but the added complexity is posing significant challenges. Coordination across all aspects of the energy system just like good dance partners is now a central theme in the future energy system. The coordination is not only beneficial in the energy system but also at the stakeholder level with lessons to be learnt from colleagues in other disciplines, countries and regions with an increasing need for a divide and conquer strategy globally to deliver at the pace and scale that is required. This talk with a few key examples will make the case for need for global coordination in the energy transition.

Bio

Mark O'Malley is on secondment as the Chief Scientist of the Energy Systems Integration Group (ESIG). ESIG is a global organization that brings together industry, regulators, policy makers and the research community to further our collective knowledge and understanding in Energy Systems Integration. He is also the Professor of Electrical Engineering at University College Dublin.

He is a co-founder of the Global Power System Transformation Consortium (G-PST) and is the co-chair of the Research Agenda Group.

In 2020 he completed a three-year assignment as Chief Scientist, Energy Systems Integration at the US National Renewable Energy Laboratory, USA.

In 2017 he was the James M. Flaherty Visiting Professor in Electrical Engineering at McGill University where he worked on strategies to decarbonize the combined Eastern Canada and North Eastern US electricity grids.

He is recognized as a world authority on Energy Systems Integration and in grid integration of renewable energy. He works closely and collaboratively with researchers in other disciplines, including economists, social scientists, and geologists, and is on the advisory board of the European Platform for Energy Research in the Socio-Economic Nexus.

He is a Foreign Member of the US National Academy of Engineering, a member of the Royal Irish Academy and a Fellow of the Institute of Electrical and Electronic Engineers and has received two Fulbright Fellowships. He is also a Visiting Professor at Imperial College London and at Tsinghua University.

Keynote Speakers



Dr. Thomas Hüwener

**Member of the Board of
Management, Open Grid Europe
GmbH**

The importance of gas networks for the security of supply and an efficient energy transition

Abstract

Russia's attack on Ukraine has shown that a reorientation of the European energy supply is urgently needed in order to become more independent of individual supplier countries and energy sources. In the short term, this means diversifying our natural gas sources, mainly through increased LNG imports. In the mid-term we need a rapid ramp-up of renewable energies and hydrogen.

In this context, OGE aims to provide important puzzle pieces to contribute to the security of supply in Germany and Europe: As a first step, we are currently building a pipeline to connect new LNG Terminal(s) in Wilhelmshaven to the German gas grid by the end of 2022. In this project, together with politicians and authorities, we are establishing a new speed that gives confidence and hope for faster action in the energy transition.

Secondly, we see hydrogen as a key element of the energy transition. The existing gas networks play an important role for transport and storage of hydrogen and will help accelerating the expansion of renewable energy. In addition to the importance of security of supply, climate protection cannot wait, which is why we need a faster ramp-up of the hydrogen economy. To actively promote this ramp-up, OGE is involved in several projects with strong partners at the national and European level, such as the "European Hydrogen Backbone", H2ercules, or GetH2. But these projects urgently need suitable framework conditions which will require political support.

Another important pillar of the energy transition is CO2 transport: In order to support companies with unavoidable CO2 emissions to find their way to climate neutrality, CCU and CCS technologies need further development. Together with TES, OGE is actively involved in building an infrastructure for the transport of CO2 and thus enables a CO2 circular economy.

In these various fields of action, OGE paves the way to shape energy supply – today and in the future.

Bio

After having successfully completed the master's and doctoral studies at Bochum and Essen Faculties of Mechanical Engineering and Texas A&M University, Thomas Hüwener specialized in the fields of energy technology / systems and environmental engineering.

In 1997 he took over a position as a research assistant at the Institute of Turbomachinery at Essen University. In 2001 he joined E.ON Ruhrgas AG as a section manager in the Technical Applications Department, followed by several positions in the Pipeline Technology Department, in 2006 as head of the department, first with E.ON Ruhrgas AG, from 2010 onwards with Open Grid Europe.

In March 2013 he was appointed to the Board of Management of Open Grid Europe GmbH and in October 2013 he was nominated Vice President of the DVGW (German Gas and Water Industry Association).

Keynote Speakers



Dr. Ing Marie Bysveen

**Chief market developer CCUS,
SINTEF and Head of European
Energy Research Alliance (EERA)
Joint Program on CCS**

Strategic collaboration on European energy related R&I – before and beyond RePowerEU

Abstract

The European Strategic Energy Technology Plan (SET Plan) has been a successful way of organizing the collaboration between industry, research and national governments/EU Commission. The future of this ‘modus operandi’ is under revision in 2022, and will therefore be elaborated in this talk by Dr. Bysveen. She is from the not-for profit research institute SINTEF, and Norway, and she holds several key roles in the SET plan on CCUS.

An overview of how European funding on energy is organized will be presented. This includes national funding, Horizon Europe, the upcoming, large Clean Energy Technology Partnership (CETP), Innovation Fund – and Connecting Europe Facility (CEF). A success-story from CCUS on collaborative partnerships funding R&I by national governments will be given – namely ERA NET ACT (Accelerating CCUS Technologies).

An introduction to the roles of the European Energy Research Alliance (EERA) and the European Technology and Innovation Platform ZEP towards the European Commission will also be given – focusing on their advisory role on behalf of R&I and industry, respectively.

Finally – a few words will be given on the way forward, and the role of such collaborative efforts following up RePowerEU.

Keynote Speakers



Professor Yong Sik Ok

Korea University, Seoul, Korea

**Chair and Program Director,
Sustainable Waste Management
Program, Association of Pacific
Rim Universities (APRU)**

**Co-President, International ESG
Association (IESGA)**

SMART Biochar Technology — A Shifting Paradigm towards Advanced Materials and Energy Research

Bio

Dr. Ok is a full professor and global research director of Korea University, Seoul, Korea. He has published over 900 research papers and books, 92 of which have been ranked as Web of Science ESI top papers (90 have been selected as “Highly Cited Papers” (HCPs), and two as “Hot Papers”). He has been a Web of Science Highly Cited Researcher (HCR) since 2018 in Cross Field, Environment and Ecology, and Engineering. In 2019, he became the first Korean to be selected as an HCR in the field of Environment and Ecology. Again in 2021, he became the first Korean HCR in two fields: Environment and Ecology, and Engineering. He is working at the vanguard of global efforts to develop sustainable waste management strategies and technologies to address the rising crisis in electronic and plastic waste, and pollution of soil and air with particulate matter.

Dr. Ok has also served in a number of positions worldwide including, as an honorary professor at the University of Queensland (Australia), a visiting professor at Tsinghua University (China), an adjunct professor at the University of Wuppertal (Germany), and a guest professor at Ghent University (Belgium). He maintains a worldwide professional network by serving as a Co-Editor-in-Chief of Critical Reviews in Environmental Science and Technology, an Editor of Environmental Pollution, a member of the editorial advisory board of Environmental Science & Technology, and an editorial board member of Renewable and Sustainable Energy Reviews, Chemical Engineering Journal, and Environmental Science: Water Research & Technology, and several other top journals.

He currently serves as the Director of the Sustainable Waste Management Program for the Association of Pacific Rim Universities (APRU) and the Co-President of the International ESG Association. Moreover, he has served on the Scientific Organizing Committee of P4G Nature Forum: Climate Change and Biodiversity, and Nature Forum: Plastics and Sustainability. Dr. Ok has also served as the chairman of numerous major conferences such as Engineering Sustainable Development series (ESD series), organized by the APRU and the American Institute of Chemical Engineers (AIChE). In 2021, Dr. Ok hosted the first Nature conference among South Korean universities in Seoul on waste management and valorization for a sustainable future together with Chief Editors of Nature Sustainability (Dr. Monica Contestabile), Nature Electronics (Dr. Owain Vaughan), and Nature Nanotechnology (Dr. Fabio Pulizzi). Prof. Ok will host the first Nature Forum on Environmental, Social & Governance (ESG) for Global Sustainability: the “E” Pillar for Sustainable Business.

Keynote Speakers



**Professor Eric F. May FTSE,
FIChemE, GAICD**

**Managing Director, Future Energy
Exports CRC**

**Director, Gas Capture
Technologies Pty Ltd.**

Hydrogen Exports: can the promise become reality?

Abstract

As advanced economies seek to decarbonise, hydrogen has been identified as a missing link that can help solve the primary challenge of storing renewable energy. However, this is not the first time hydrogen has been promoted as the key to transitioning our energy system and prudence about over-hyped claims and projections is warranted. While there are important differences between the present hydrogen bull-market and those of the past, key barriers to its wide-scale adoption for energy storage remain. In this talk, the main challenges that need to be addressed will be identified and some of the more likely paths by which hydrogen's promise could become a reality will be presented. Research opportunities and activities underway at the Future Energy Exports CRC to help decarbonise LNG production and grow clean hydrogen exports will also be described.

Bio

Eric May is Managing Director of the Future Energy Exports (FEnEx) CRC and was named the 2021 Western Australian Scientist of the Year. His research team works closely with industry, conducting projects in hydrogen liquefaction, LNG production, gas separations, CCS and fluid property prediction. Eric was awarded the Malcolm McIntosh Prize for Physical Scientist of the Year as part of the 2012 Prime Minister's Prizes for Science. In 2017, he co-established Gas Capture Technologies Pty Ltd, a spin-out company for patented technologies to capture methane from coal mines, land-fill gas and other sources. Launched in 2020, the FEnEx CRC brings together 35 industry, government and university partners with resources of \$163 million to conduct research focussed on the decarbonisation of LNG production and the growth of clean hydrogen exports from Australia.

Keynote Speakers



Prof. Yi-Ming Wei

Beijing Institute of Technology

Uncertainties of Approaching China's Carbon Neutrality Targets

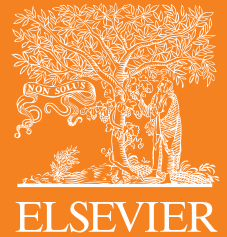
Abstract

Carbon neutrality has become the global strategy. More than 130 countries and regions around the world have proposed carbon neutrality goals, accounting for about 90% of the global economy. China has set the goal of carbon peak before 2030 and carbon neutral by 2060. According to the assessment (Wei et al., 2020), achieving China's carbon neutrality by 2060 is a deep decarbonization action aimed at 1.5°C target, but the pathway approaching this target depends on the socio-economic development, low-carbon technology diffusion, breakthrough technology innovation, and carbon sink. In this talk, the Uncertainties of Approaching China's Carbon Neutrality Targets will be introduced from Coal, CCUS, Biomass Energy, Nuclear Power, Hydrogen Energy, Carbon Sink.

Bio

Yi-Ming Wei is a distinguished professor of Beijing Institute of Technology (BIT), he is appointed as the vice president of Beijing Institute of Technology in 2019. He is the Founding Director of the Center for Energy and Environmental Policy Research at BIT. Yi-Ming Wei has more than 30 years of experience in the energy industry, including in academia, research, consulting. His recent research and teaching focus on Energy Policy and Energy Economics, CO₂ emission and Climate Policy, Energy and Climate Policy Modeling. He has performed over 40 research projects for various China governmental agencies including NDRC, MOST, NEA, NSFC, CNPC, SGCC and CAS, and such international organizations as the World Bank, EU-FP7. He published 20 books and over 300 papers in peer review Journals including Nature-Climate Change, Nature-Energy, Nature-Communications, Nature-Sustainability, Climatic Change. Prof. Wei has been awarded by the Prize of Science and Technology for Young Scholars (2001), National Natural Science Fund for Distinguished Young Scholars (2004), Hundred Talents Program of the Chinese Academy of Sciences (2005), Chair Professor of Changjiang Scholar program of the Ministry of Education of China (2008). Currently, Prof. Wei is the Co-editor-in-chief of Energy and Climate Change, Associate editor of Applied Energy. He is a Coordinate Lead Author (CLA) of the IPCC Sixth Assessment Report (AR6).

Applied Energy



Applied Energy covers a broad range of subjects from innovative technologies and systems of both fossil and renewable energy to the economic industrial and domestic use of energy.

Reasons why you should publish in *Applied Energy*

Speed

As an online only journal, there are no print delays, so once accepted your article will be made available online and fully citable quickly

Visibility

Applied Energy is available via ScienceDirect, one of the biggest academic publishing platforms, so your article will be accessible by more than 12 million researchers, scientists, students and professionals from around the world.

Impact

Applied Energy has a Journal Impact Factor of **11.446*** and a CiteScore **20.4****

Value

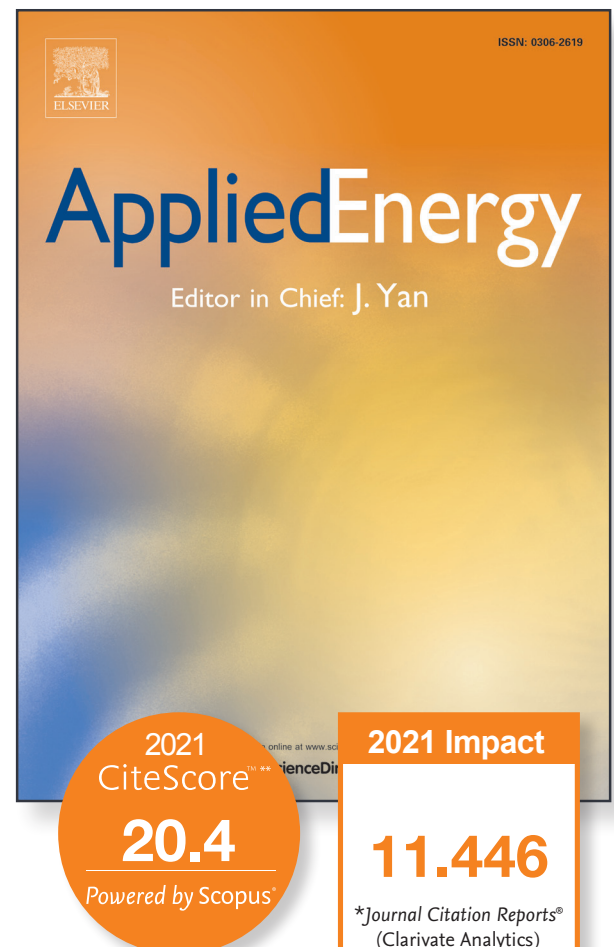
When you submit a manuscript to *Applied Energy* there are no submission fee, page charges or online colour costs

Openness

Applied Energy supports open access, so you can choose to make your research freely available

Reach

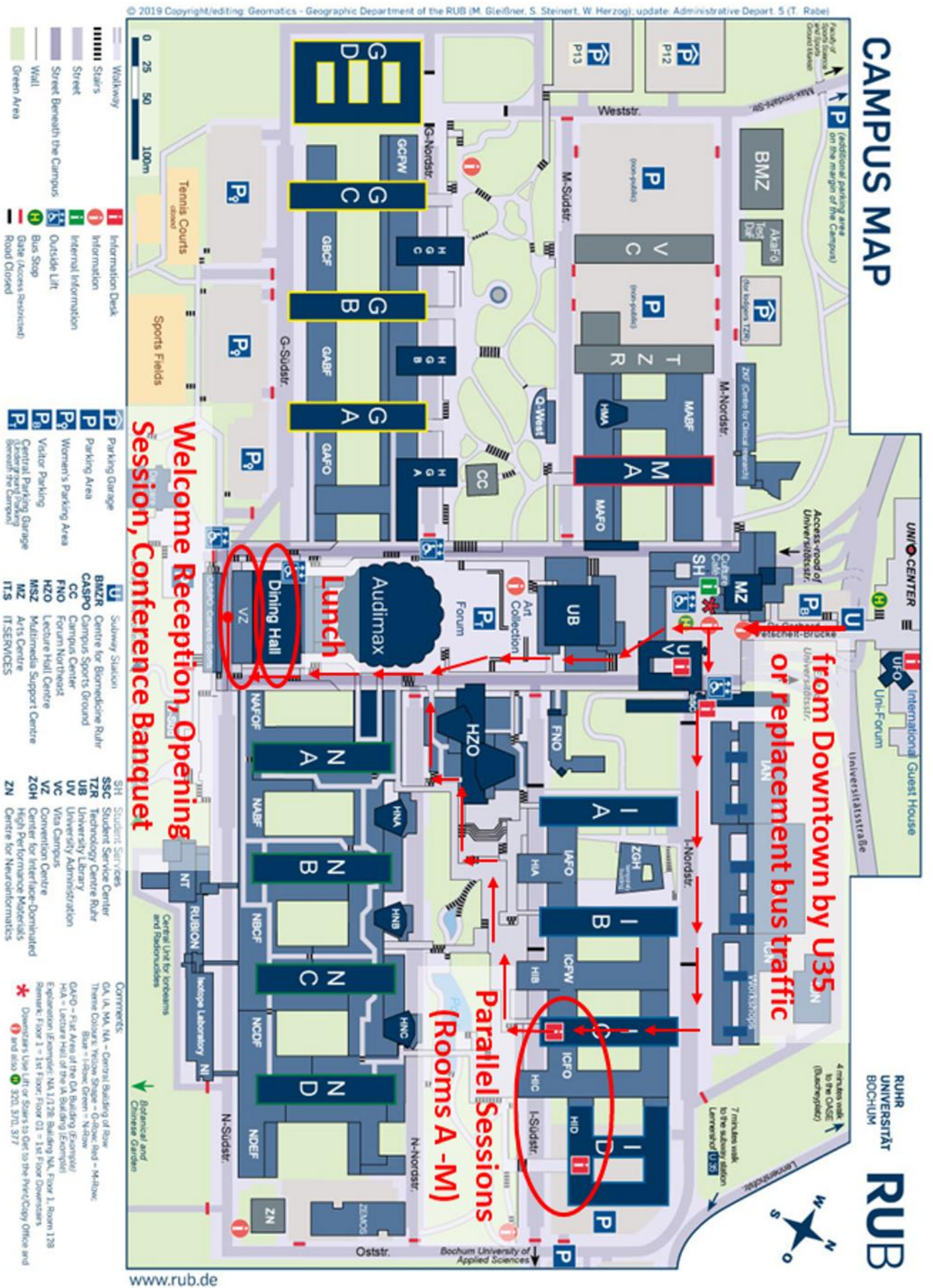
When your article has been published online, you will be sent a ShareLink which offers 50 days of complimentary online access to your article



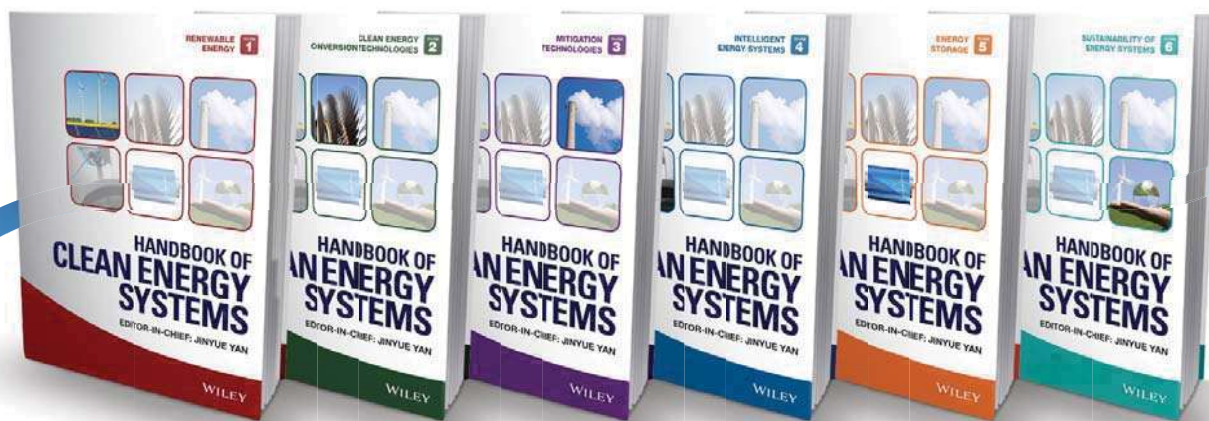
**CiteScore is an indicator of journal citation impact based on Scopus data. It measures the average number of citations in a given year from documents published in 5 previous calendar years. See journalmetrics.scopus.com for more information on CiteScore™ metrics.

Submit your manuscript today: <http://bit.ly/ApEnergy>

Venue's Information



Are you working
on the challenging
issues associated
with the development
of our future
energy systems?



See how this
new reference
can help!

Find news, sample content and more at:
wileyonlinelibrary.com/ref/hces

WILEY-VCH

WILEY

Program at a glance (on site)

Time	Day 0: Aug 8
17:00 – 20:00	Welcome Reception and Registration at the Veranstaltungszentrum (VZ)

Time	Day 1: Aug 9													
9:00 - 10:50	Welcome by chairs & rector of RUB (Room: Veranstaltungszentrum (VZ)) Keynote Mark O'Malley Keynote Thomas Hübener													
10:50 - 11:20	Tea / Coffee Break Keynote Marie Bysven													
11:20 - 12:40	Keynote Yong Sik Ok (Online)													
Lunch														
Room	IC 04/410	IC 04/408	IC 03/610	IC 03/606	IC 03/112	ID 04/445	IC 03/649	IC 03/134	IC 03/448	IC 03/447	IC 03/444	IC 03/441	HIC	
Seats	50	50	55	55	54	60	30	27	30	27	30	27	310	
	1-A1	1-B1	1-C1	1-D1	1-E1	1-F1	1-G1	1-H1	1-I1	1-J1	1-K1	1-L1	1-M1	
14:00-14:20	151	126	7	490	217	162	online sessions						Women in AE Forum	
14:20-14:40	222	320	117	334	471	345								
14:40-15:00	573	275	442	416	526	498								
15:00-15:20	519	431	521	512	322	361								
15:20-15:40	287	64	387	390	128									
15:40-16:00		559	541	511	20									
Tea / Coffee Break														
	1-A2	1-B2	1-C2	1-D2	1-E2	1-F2	1-G2	1-H2	1-I2	1-J2	1-K2	1-L2	1-M2	
16:30-16:50	341	199	562	228	270	online sessions								
16:50-17:10	348	223	198	216	306									
17:10-17:30	388	538	89	447										

Time	Day 2: Aug 10												
	2-A3	2-B3	2-C3	2-D3	2-E3	2-F3	2-G3	2-H3	2-I3	2-J3	2-K3	2-L3	2-M3
8:30 - 9:45	Online only!												Transfor.
9:45-10:15 Tea / Coffee Break													
	2-A4	2-B4	2-C4	2-D4	2-E4	2-F4	2-G4	2-H4	2-I4	2-J4	2-K4	2-L4	Transformation Forum
10:15-10:35	609	292	76	37	122	online sessions							
10:35-10:55	518	453	428	166	129								
10:55-11:15	118	148	150	393									
11:15-11:35	253	429	567	536									
11:35-11:55	268	93	476	256									
Lunch													
	2-A5	2-B5	2-C5	2-D5	2-E5	2-F5	2-G5	2-H5	2-I5	2-J5	2-K5	2-L5	2-M5
13:00 - 15:00	Online only!												Green H2
15:00 - 15:30 Tea / Coffee Break B114													
	2-A6	2-B6	2-C6	2-D6	2-E6	2-F6	2-G6	2-H6	2-I6	2-J6	2-K6	2-L6	2-M6
15:30-15:50	237	142	225	47	29	online sessions							
15:50-16:10	422	5	547	215	328								
16:10-16:30	293	194	392	21	495								
16:30-16:50	329	503	40	566	358								
16:50-17:10	242	477	167	77	432								
17:10-17:30		524			19								
19:00 Conference Banquet, Veranstaltungszentrum (VZ)													

Time	Day 3: Aug 11												
	3-A7	3-B7	3-C7	3-D7	3-E7	3-F7	3-G7	3-H7	3-I7	3-J7	3-K7	3-L7	3-M7
8:30-9:45	Online only!												
9:45-10:15 Tea/Coffee Break													
	3-A8	3-B8	3-C8	3-D8	3-E8	3-F8	3-G8	3-H8	3-I8	3-J8	3-K8	3-L8	3-M8
10:15 - 10:35	149	493	165	90	online sessions								
10:35-10:55	537	479	436	502									
10:55-11:15	163	376	65	587									
11:15-11:35	288		520	2									
11:35-11:55	425			394									
Lunch													
	3-A9	3-B9	3-C9	3-D9	3-E9	3-F9	3-G9	3-H9	3-I9	3-J9	3-K9	3-L9	3-M9
13:00-13:20	449	96	402	3	421								Big Data Forum
13:20-13:40	386	612	291	501	494								
13:40-14:00				200									
Short Break													
14:10-14:40	Keynote Eric May (Online)												
14:40-15:10	Keynote Yi-Ming Wei (Online)												
15:10-15:15	Closing (Room: Lecture Hall HIC (M))												

Time	Day 4: Aug 12 - Excursions
9:00 - 13:00	Excursion 1: The Ruhr Area – Transformation of an Industrial Area formed by Mining and Steel Industry
9:00 - 13:00	Excursion 2: Industrial Heritage Sites in Bochum
9:00 - 13:00	Excursion 3: The Medieval Roots of Bochum and its Surroundings
17:00 - ????	Excursion 4: TheFun Fair in Crange

ES=Energy Sciences	RE=Renewable Energy
MT = Mitigation technology and energy storage	SS=Special Session
CLE=Clean energy conversion technology	Panel
EE=Energy Management, Policy and Economics	Transformation Processes
ES=Energy Sciences	Energy Storage Systems
IES=intelligent energy system	

Program at a glance (online)

Time	Day 1: Aug 9												
9:00 - 10:50	Welcome by chairs & rector of RUB (Room: Veranstaltungszentrum (VZ)) Keynote Mark O'Malley Keynote Thomas Hübener												
10:50 - 11:20	Tea / Coffee Break												
11:20 - 12:40	Keynote Marie Bysven Keynote Yong Sik Ok (online)												
Lunch													
Room	IC 04/410	IC 04/408	IC 03/610	IC 03/606	IC 03/112	ID 04/445	IC 03/649	IC 03/134	IC 03/448	IC 03/447	IC 03/444	IC 03/441	HIC
Seats	50	50	55	55	54	60	30	27	30	27	30	27	310
	1-A1	1-B1	1-C1	1-D1	1-E1	1-F1	1-G1	1-H1	1-I1	1-J1	1-K1	1-L1	1-M1
14:00-14:15	on-site sessions						22	139	9	579	267	56	Women in AE Forum
14:15-14:30							227	209	23	586	367	294	
14:30-14:45							325	307	68	92	419	54	
14:45-15:00							311	360	116	79	460	366	
15:00-15:15							314	403	153	364	470	401	
15:15-15:30							385	440	168	207	504	75	
15:30-15:45							398	446	190	318	580	106	
15:45-16:00							568	347	239	276	551	290	
Tea/Coffee Break													
	1-A2	1-B2	1-C2	1-D2	1-E2	1-F2	1-G2	1-H2	1-I2	1-J2	1-K2	1-L2	1-M2
16:30-16:45	on-site sessions					441	30	191	459				
16:45-17:00						475	55	197	121				
17:00-17:15						14	120	245	450				
17:15-17:30						26	202	346	188				
Time	Day 2: Aug 10												
	2-A3	2-B3	2-C3	2-D3	2-E3	2-F3	2-G3	2-H3	2-I3	2-J3	2-K3	2-L3	2-M3
8:30-8:45	49	203	59	545	25	177	103	4	62	405			Transfor- mation Forum
8:45-9:00	238	308	338	179	304	355	72	57	424	380			
9:00-9:15	243	362	61	218	335	374	6	66	466	535			
9:15-9:30	457	540	183	420	15	279	88	134	343	569			
9:30-9:45	531	613	184	572	137	323	102	159	527	12			
9:45-10:00	262		532	557	483	91							
Tea/Coffee Break													
	2-A4	2-B4	2-C4	2-D4	2-E4	2-F4	2-G4	2-H4	2-I4	2-J4	2-K4	2-L4	
10:15-10:30	on-site sessions					326	525	411	178	266			Transfor- mation Forum
10:30-10:45						517	546	414	185	384			
10:45-11:00						539	105	427	254	543			
11:00-11:15						327	373	488	300	552			
11:15-11:30						85	549	204	407	556			
11:30-11:45						231	491	353	73	201			
11:45-12:00						489	312	464	413	265			
Lunch													
	2-A5	2-B5	2-C5	2-D5	2-E5	2-F5	2-G5	2-H5	2-I5	2-J5	2-K5	2-L5	2-M5
13:00-13:15	158	63	584	10	48	302	316	331	248	244			Green H2 Forum
13:15-13:30	247	555	434	24	82	305	283	472	269	336			
13:30-13:45	278	571	284	186	104	350	11	53	406	561			
13:45-14:00	310	97	108	224	109	435	94	78	438	337			
14:00-14:15	368	145	340	400	463	506	280	119	455	499			
14:15-14:30	437	528	17	235	176	513	296	136	594	468			
14:30-14:45	461	45	28	264	469	534	299	161	81	396			
14:45-15:00	156	220	98	530	206	577	553	261	164	397			
Tea/Coffee Break													
	2-A6	2-B6	2-C6	2-D6	2-E6	2-F6	2-G6	2-H6	2-I6	2-J6	2-K6	2-L6	2-M6
15:30-15:45	on-site sessions					87	130	272	13	173	359		
15:45-16:00						132	138	342	31	175	576		
16:00-16:15						147	174	378	42	182	32		
16:15-16:30						281	192	409	80	250	212		
16:30-16:45						371	255	426	123	277	383		
16:45-17:00						529	301	187	133	286	445		
17:00-17:15						36	418	444	143	297	533		
17:15-17:30						476	503	236	146	298	575		
Time	Day 3: Aug 11												
	3-A7	3-B7	3-C7	3-D7	3-E7	3-F7	3-G7	3-H7	3-I7	3-J7	3-K7	3-L7	3-M7
8:30-8:45	125	83	596	214	112	67	351	74	439				
8:45-9:00	181	111	27	282	211	241	454	141	395				
9:00-9:15	274	155	180	324	232	458	462	500	289				
9:15-9:30	415	252	465	317	399	195	515	565	99				
9:30-9:45	391	352	38	84	259	157	46	581	210				
Tea/Coffee Break													
	3-A8	3-B8	3-C8	3-D8	3-E8	3-F8	3-G8	3-H8	3-I8	3-J8	3-K8	3-L8	3-M8
10:15-10:30	on-site sessions				484	508	113	152	16	273	542		
10:30-10:45					369	516	189	578	169	344	171		
10:45-11:00					433	60	107	582	443	523	114		
11:00-11:15					43	291	339	583	452	487	172		
11:15-11:30					234	548	482	382	509	564	271		
11:30-11:45					574	58	95	497	50	507	485		
11:45-12:00					423	315	332	221	51		170		
Lunch													
	3-A9	3-B9	3-C9	3-D9	3-E9	3-F9	3-G9	3-H9	3-I9	3-J9	3-K9	3-L9	3-M9
13:00-13:15	on-site sessions					563	478	240	480				Big Data Forum
13:15-13:30						237	8	260	404				
13:30-13:45						589	41	333	144				
13:45-14:00						492	614	52	558				
Short Break													
14:10-14:40	Keynote Eric May (online)												
14:40-15:10	Keynote Yi-Ming Wei (online)												
15:10-15:15	Closing (Room: Lecture Hall HIC (M))												

Speaker's Guide

Presentation

The ICAE2022 includes both on-site and online presentations. All presentations will be oral. The length of presentation material should be in accordance with your allocated time. Please refer to the latest program for actual presentation times, which can be downloaded at the Conf. website: www.applied-energy.org.

On-site sessions will be streamed in parallel for online participants. All sessions will be recorded for time shifted watching. After the session, the recording will be uploaded to a cloud storage, which can be accessed using the link <https://ruhr-uni-bochum.sciebo.de/s/rtsFKuUpVHZ8fpx>. Under this SCIEBO link (valid until August 31) you will find a folder structure that reflects the structure of the program. During the discussion, questions can be asked to the presenters both from on-site and from online participants.

To come as close to the character of an on-site conference, online presentations will be transmitted live to seminar rooms, which are open for on-site participants. A chair and a co-chair, will introduce the speakers and will lead the discussion, whereby questions can be asked both from on-site and from online participants.

On-site Presentation

In general, the presentation time for on-site talks is 20 minutes (15 minutes + 5 minutes for introduction and discussion). On-site Keynote talks are 40 minutes (35 minutes + 5 minutes for introduction and discussion). You are kindly requested to be present in the relevant presentation venue at least 10 minutes before the session starts. Each presentation room is equipped with a computer with a data projector. PowerPoint is the standard presentation format. The computers in the meeting rooms are Windows-based PCs. Your presentation can be transferred via USB stick to the computer in the presentation room before the session starts. However, we will also provide a cloud storage option to upload your presentation in advance – to access the cloud storage facility use the link <https://ruhr-uni-bochum.sciebo.de/s/WSEcNNqMGBdPXsp> (upload only!). Please use your name and (most important) the ID of your presentation to allow for an easy allocation of talks. Conference volunteers will be available to assist you in case you encounter difficulties to use the IT equipment.

Presentation Venues

The following table lists all presentation venues with the associated Zoom links for online access to the sessions (each Zoom link is specific for one physical room).

Session	Room	Zoom Link	Zoom ID	Password
Opening	VZ Saal 2	https://ruhr-uni-bochum.zoom.us/j/61942737512	619 4273 7512	ICAE_2022A
A	IC 04/410	https://ruhr-uni-bochum.zoom.us/j/61942737512	619 4273 7512	ICAE_2022A
B	IC 04/408	https://ruhr-uni-bochum.zoom.us/j/65531711752	655 3171 1752	ICAE_2022B
C	IC 03/610	https://ruhr-uni-bochum.zoom.us/j/62241076695	622 4107 6695	ICAE_2022C
D	IC 03/606	https://ruhr-uni-bochum.zoom.us/j/61257114207	612 5711 4207	ICAE_2022D
E	IC 03/112	https://ruhr-uni-bochum.zoom.us/j/68901734156	689 0173 4156	ICAE_2022E

Speaker's Guide

F	ID 04/445	https://ruhr-uni-bochum.zoom.us/j/61481845586	614 8184 5586	ICAE_2022F
G	IC 03/649	https://ruhr-uni-bochum.zoom.us/j/67271615083	672 7161 5083	ICAE_2022G
H	IC 03/134	https://ruhr-uni-bochum.zoom.us/j/64645611465	646 4561 1465	ICAE_2022H
I	IC 03/448-410	https://ruhr-uni-bochum.zoom.us/j/65648664888	656 4866 4888	ICAE_2022I
J	IC 03/447	https://ruhr-uni-bochum.zoom.us/j/67751503672	677 5150 3672	ICAE_2022J
K	IC 03/444-414	https://ruhr-uni-bochum.zoom.us/j/67677675276	676 7767 5276	ICAE_2022K
L	IC 03/441	https://ruhr-uni-bochum.zoom.us/j/67851981114	678 5198 1114	ICAE_2022L
M	Lecture Hall HIC	https://ruhr-uni-bochum.zoom.us/j/65004557437	650 0455 7437	ICAE_2022M

Online Presentation

All online presenters are required to connect to the Zoom meeting assigned to their room (see the table above and the program) 15 mins before the session starts. It is recommended to download the app of Zoom (<https://zoom.us/>) and change your username to your full name and add your paper ID. Please prepare a short bio around 50 words and share it in the chat of Zoom. The chair and the co-chair of your session will briefly introduce you to the audience.

Your presentation should be in accordance with your allocated time. In general, the presentation time for online talks is 15 minutes (12 minutes + 3 minutes for introduction and discussion). Online Keynote talks are 30 minutes (25 minutes + 5 minutes for introduction and discussion). The Zoom links of the sessions are associated to the room the session is held in and are given in the table above and in the program booklet. You do not need to upload your presentation – you will be given the opportunity to share the screen of your computer for your presentation. Please make sure in advance, that your microphone and your camera work well under Zoom. Conference volunteers will be available to assist you in case you encounter technical difficulties.

Contributions During the Discussions

Both in on-site and in online sessions, microphones will be available in the rooms to allow for questions to the author during the discussion. A part of the rooms is equipped with highly sensitive room microphones, others have dedicated microphones allowing to ask questions. When you are taking part on-site, please make sure that you use a microphone for your question to make sure that the question is understood online and on the recording of the session as well. When you take part online, your microphone will be blocked to avoid noise on the channel. If you want to ask a question, please raise your hand in Zoom and switch on your camera – the conference volunteer in the room will enable your microphone to allow for questions.

Camera and Microphone of Online Participants

If you participate in sessions online via Zoom, the microphone of your computer will be blocked to avoid noise on the channel, unless you are presenting or asking questions. And we recommend that you also switch off your camera to reduce the data traffic, unless you are asking a question or you are presenting. However, in any case the computer you use should be equipped with a camera and a microphone working under Zoom to allow you to ask questions during the

Speaker's Guide

discussions. Zoom allows for testing speaker, microphone and camera in advance – please make use of this option.

Links for Zoom Sessions and Cloud Storage

Please have in mind that the links for Zoom access and for downloading of recordings are exclusively for registered participants of the 14th ICAE. Do not forward these links to anybody, who is not registered for the conference! The number of participants is limited in Zoom meetings – spreading links would lead to an uncontrollable number of participants in Zoom sessions and possibly to problems for registered participants. And recorded sessions are protected by copyright. By presenting at this conference, all presenters agree to share their results with participants of the conference. But this does not include the right to make recordings available to others, who are not registered participants of the conference. Spreading links to anybody who is not registered for the conference is a violation of copyright laws.

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.

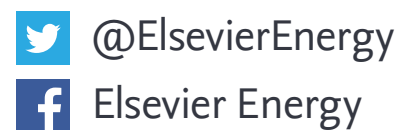
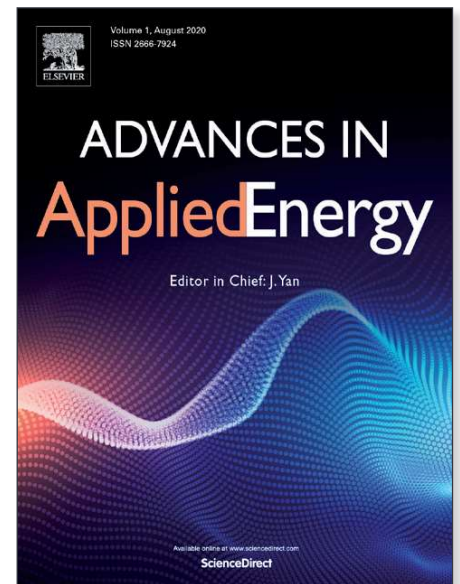
Covering a broad scope of topics, *Advances in Applied Energy* will publish applied research on all aspects of energy innovation that bridge the gaps between research, development, and implementation. Topics include, but are not limited to:

- 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.

The journal considers full length articles, reviews, letters, commentaries, perspectives, forums and news & views for publication.



Read the full Aims & Scope:
[elsevier.com/locate/adapen](https://www.elsevier.com/locate/adapen)



Speaker's Guide

Time Zone Converter

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

Day 1: Aug 9 (on site)

9:00 - 10:50	Welcome by chairs & rector of RUB Keynote Mark O'Malley Keynote Thomas Hübener		
10:50 - 11:20	TEA/COFFEE BREAK		
11:20 - 12:40	Keynote Marie Bysven Keynote Yong Sik Ok		
1-A1 (Room IC 04/410) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/61942737512 Session Name: Renewable Energy - Bio Energy 1 Session Chair: Eva Thorin, John Andresen			
Time	Paper ID	Author	Paper Title
14:00-14:20	151	Lilli Sophia Röder, Arne Gröngröft, Marcus Grünewald, Julia Riese	Demand Side Management in Biogas Plants - Dynamic Simulation of the Influence of Time-varying Agitation on Biogas Production
14:20-14:40	222	Jherwin B. Ocreto, Wei-Hsin Chen, Arjay Arpia, Analiza P. Rollon, Mark Daniel G. De Luna	Optimization of derived sugar and solubilization from macroalga catalyzed by Ferric Chloride hydrothermal microwave-assisted heating via Box-Behnken method: Product characterization using TGA/DTG and Py-GC/MS
14:40-15:00	573	Beibei Dong, Wei Li, Hailong Li	Removing CH ₄ from the Waste Gas of Biogas Upgrading
15:00-15:20	519	Matthias Körber	Gas Storage Capacity Demand to Cover Residual Load of an Electricity Self-sufficient Community for Flexible and Constant Biogas Production
15:20-15:40	287	Fangfang Li, Yangshuo Li, Xiaoyan Ji	How does electrochemical reduction of CO ₂ from bio-syngas influence the biomass gasification process for producing methanol
1-B1 (Room IC 04/408) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/65531711752 Session Name: Clean Energy Conversion Technology - Turbines and Engines Session Chair: Francesca di Mare, Zhichao Zhang			
Time	Paper ID	Author	Paper Title
14:00-14:20	126	Ruiyang HE, Hongxing Yang, Lin Lv	Fatigue Analysis and Optimal Yaw Strategy for Wind Turbines
14:20-14:40	320	Yaoharry Yao, Zhicheng Shen, Qiliang Wang, Hongxing Yang	Development of self-regulation bidirectional cross-flow turbine for hydropower harvesting from water supply pipelines
14:40-15:00	275	Giacomo Lo Zupone, Changjun Liu, Jinyue Yan, Bin Liang	Open centre turbines: from the wake analysis to the array design
15:00-15:20	431	Patrick Brosnan, Guohong Tian, Umberto Montanaro, Sam Cockerill	Non-Linear and Multi-Domain Modelling of an Opposed-Piston Free Piston Engine during Motoring
15:20-15:40	64	Yuheng Du, Guohong Tian*, Michael Pekris, Siyu Zheng, MingshanWei	Performance Analysis of Small-scale Transcritical Carbon Dioxide Scroll Expander by Computational Fluid Dynamics Modelling
15:40-16:00	559	Ward De Paepe	Impact of fuel diversification on humidified micro gas turbine potential: A thermodynamic performance assessment
1-C1 (Room IC 03/610) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/62241076695 Session Name: Energy Management, Policy, Economics and Sustainability - Energy System Design Session Chair: Christian Pielow, Andra Blumberga			
Time	Paper ID	Author	Paper Title
14:00-14:20	7	Victor Guillot, Gildas Siggini, Edi Assoumou	Local and decentralized or global and centralized: assessment of two paradigms for the European power system decarbonation
14:20-14:40	117	Jacob Mannhardt, Paolo Gabrielli, Giovanni Sansavini	Obstacle or opportunity? The impact of a natural gas phase-out on the decarbonization of the European energy system
14:40-15:00	442	Dagnija Blumberga, Kristiana Dolge	How independent is Energy Sector in the EU?
15:00-15:20	521	Dagnija Blumberga, Armands Gravelsins, Ieva Pakere, Andra Blumberga	Decarbonization of the electricity sector – barriers and policies. Case in Latvia
15:20-15:40	387	Jakapong Pongthanaisawan, Weerin Wangjiraniran, and Nitida Nakapreecha	Thailand Energy Pathways towards Carbon Neutrality 2050
15:40-16:00	541	Franziska Hoffart	Building new H ₂ pipelines or repurposing natural gas pipelines for H ₂ admixture? – An economic perspective on effective climate mitigation
1-D1 (Room IC 03/606) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/61257114207 Session Name: Transformation Processes - Energy System Transformation and System Analysis Session Chair: Valentin Bertsch, Jens Hannes			
Time	Paper ID	Author	Paper Title

Day 1: Aug 9 (on site)

14:00-14:20	490	Franziska M. Hoffart, Paola D'Orazio, Claudia Kemfert	Geopolitical and climate risks threaten financial stability and energy transitions
14:20-14:40	334	Kai Zhang, Yue Yang, Min Chen, Jinyue Yan	Quantifying the photovoltaic potential of highways in China
14:40-15:00	416	Wenxuan Zhao, Hangxin Li, Shengwei Wang	Energy performance assessment and energy conservation methods for high-tech cleanrooms: A review and future perspective
15:00-15:20	512	Giaime Niccolò Montagna, Simone Piccardo, Massimo Rivarolo, Daria Bellotti, Loredana Magistri	A multi-criteria approach for comparing alternative fuels and energy systems for maritime applications
15:20-15:40	390	Alicia Benitez, Christina Wulf, Bernhard Steubing, Jutta Geldermann, Wilhelm Kuckshinrichs	Dealing with future developments of wind offshore energy in Germany
15:40-16:00	511	Cavo M, Mantelli L, Rivarolo M	A MILP model for the design optimization of energy systems on a cruise ship

1-E1 (Room IC 03/112) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/68901734156>
Session Name: Clean Energy Conversion Technology - Fundamentals for Clean Combustion
Session Chair: Hailong Li, Gan Huang

Time	Paper ID	Author	Paper Title
14:00-14:20	217	Christin Pflieger, Till Eckhard, Jannik Böttger, Jonas Schulwitz, Stefan Schmidt, Soma Salamon, Joachim Landers, Heiko Wende, Martin Muhler, Francesca Cerciello	The Catalytic Effect of Iron Oxide Phases on the Conversion of Cellulose-Derived Chars
14:20-14:40	471	Özlem Yönder, Gunnar Schmitz, Christof Hättig	Exploring combustion reaction kinetics at the oxygen functional groups
14:40-15:00	526	Tim Eisenbach, Horacio A. Duarte, Carsten Wedler, Christin Pflieger, Martin Muhler, Roland Span	Experimental investigations on the adsorptive behavior of H ₂ O vapor on HTC char particles
15:00-15:20	322	Vanessa Angenent, Rochus Schmid	Automated rotating TEM simulations of graphitic material
15:20-15:40	128	Xiyan Li, Sebastian T. Wismann, Peter M. Mortensen, Anker Degn Jensen	An engineering model of an electrically heated steam methane reforming reactor
15:40-16:00	20	Zhichao Zhang, Yiji Lu, Yaodong Wang, Tony Roskilly	Supercritical fuel combustion in a compression ignition engine cylinder

1-F1 (Room IC 04/445) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61481845586>
Session Name: Energy Management, Policy, Economics and Sustainability - Economic and Life-Cycle Assessments
Session Chair: Andreas Löschel, Roland Span

Time	Paper ID	Author	Paper Title
14:00-14:20	162	Felix Nitsch, Manuel Wetzel	Profitability of power-to-heat-to-power storages in scenarios with high shares of renewable energy
14:20-14:40	345	Filippo Guidi	An economic evaluation of the technologies to power a hydrogen steel production process under a CO ₂ emission limit
14:40-15:00	498	Ms Gabriela Lily Steenekamp, Dr Ryan David Merckel	Is bioethanol worth the energy? An energy metrics' perspective
15:00-15:20	361	Sophie Pathe, Valentin Bertsch	Combining Life Cycle Assessment and Energy System Optimization to Model Sustainable Power Systems Transformation

TEA/COFFEE BREAK

1-A2 (Room IC 04/410) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61942737512>
Session Name: Renewable Energy - Bio Energy 2
Session Chair: Eva Thorin, Ryan Merckel

Time	Paper ID	Author	Paper Title
16:30-16:50	341	Hanmin Yang, Yuxiao Cui, Yanghao Jin, Tong Han, Linda Sandström, Pär Jönsson, Weihong Yang	Syngas production from biomass pyrolysis and in-line catalytic reforming over modified bio-char catalysts: A comparative study
16:50-17:10	348	Larissa Richa, Baptiste Colin, Anélie Pétrissans, Rafael L. Quirino, Wei-Hsin Chen, Mathieu Pétrissans	Potassium carbonate as a catalyst for wood torrefaction
17:10-17:30	388	B Trollip, RD Merckel	Fertiliser-catalysed suppression of the pyrolytic temperature for synthesis of nutrient-enriched biochar

1-B2 (Room IC 04/408) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/65531711752>
Session Name: Intelligent Energy Systems - energy conservation in buildings
Session Chair: Jingyuan Xu, Monika Thol

Day 1: Aug 9 (on site)

Time	Paper ID	Author	Paper Title
16:30-16:50	199	Jianheng Chen, Lin Lu, Quan Gong	Novel facade design technologies in achieving low-energy buildings: A case study in a hot and humid region
16:50-17:10	223	Yijie Zhang, Tao Ma, Hongxing Yang	Feasibility study on building energy system with PVB, EV and PHS: A case in Hong Kong
17:10-17:30	538	Chrstian Vering, Janik Horst, Rita Strebblow, Dirk Müller	The need for accelerating the transformation process towards a defossilized building sector: Introduction of building energy and material systems engineering (BEMSE)
1-C2 (Room IC 03/610) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/62241076695 Session Name: Energy Management, Policy, Economics and Sustainability - Social Acceptance and Ethics Session Chair: Klaus Steigleder, Rishree Jain			
Time	Paper ID	Author	Paper Title
16:30-16:50	562	Olaf Kühne, Lara Koegst	Neopragmatic reflections on coastal land loss and climate change in Louisiana in light of Popper's theory of three worlds
16:50-17:10	198	Koichi Yamada, Tamaki ISHIKAWA, Teruo MITSUMORI	Pathways to a bright future ZC society based on integrated quantitative analysis
17:10-17:30	89	Vögele, S., Josyabhatla, V. T., Ball, C., Rhoden, I., Grajewski, M., Rübberke, D., Kuckshinrichs, W	Robust Assessment of Energy Scenarios from Stakeholders' Perspectives
1-D2 (Room IC 03/606) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/61257114207 Session Name: Transformation Processes - Transport Session Chair: Andreas Löschel, Leif Gustavsson			
Time	Paper ID	Author	Paper Title
16:30-16:50	228	Xiang Li, Xiaoyu Yan	Air pollutant emissions from China's road transport under different EV development and renewable energy expansion pathways
16:50-17:10	216	Jonas Eschmann, Christoph Zink, Maximilian Pfennig	Closing Carbon Cycles on the High Seas
17:10-17:30	447	Stjepan Herceg, Luka Boban, Vladimir Soldo, Melani Ćulić	Possibility of utilizing LNG cold waste heat on the container ship
1-E2 (Room IC 03/112) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/68901734156 Session Name: Clean Energy Conversion Technology - Fundamentals for Clean Combustion Session Chair: Ulf Apfel, Xiyan Li			
Time	Paper ID	Author	Paper Title
16:30-16:50	270	DAbdallah S. Berrouk, Ahmed M Alatyar	Hydraulic Assessment of Geometrically Modified Rotating Packed Bed
16:50-17:10	306	Josiah Pelemo, Omojola Awogbemi, Daramy Vandi Von Kallon	Effect of Thermal Power Plant Fly Ash Reinforced with Silica Oxide as Catalyst for Hydrogenation

Day 1: Aug 9 (online)

9:00 - 10:50	Welcome by chairs & rector of RUB Keynote Mark O'Malley Keynote Thomas Hübener		
10:50 - 11:20	TEA/COFFEE BREAK		
11:20 - 12:40	Keynote Marie Bysven Keynote Yong Sik Ok		
1-G1 (Room IC 03/649) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/67271615083 Session Name: Renewable Energy Session Chair: Kunio Yoshikawa			
Time	Paper ID	Author	Paper Title
14:00-14:15	22	Nii Nelson, Jo Darkwa, Mark Worall, John Calautit, Robert Mokaya	Theoretical and experimental study of cocoa pod husk gasification in a fixed bed downdraft gasifier
14:15-14:30	227	Adi Prismantoko, Feri Karuana, Tito Aziz Arifiyanto, Fransiscus Xaverius Guwowijoyo, Sobar Ihsan, Hariana Hariana	Influence of coal-solid recovered fuel blended on slagging, fouling and corrosion during co-firing in a drop tube furnace
14:30-14:45	325	Ade Sana Ruhayat, Hariana Hariana, Hanafi Prida Putra, Ika Monika, Aminuddin Aminuddin, Soni Solistia Wirawan	Combustion Characteristic of Low Rank Coal Blend with EFB and Plastic Waste
14:45-15:00	311	Jingyu Ran, Guangchuan Tang, Anbang Xu, Xin Huang	Dehydration of levoglucosan to levoglucosenone in a continuous flow reactor
15:00-15:15	314	Xun Zhu, Qiang Liao, Yun Huang, Ao Xia, Xianqing Zhu, Qintao Sun, Man Liu	Biomass pyrolysis in a highly-dispersed medium for deoxygenation and upgrading: the interaction of cellulose, hemicellulose and lignin
15:15-15:30	385	Xi Jiang, Cheng Chen, Mengwei Yu, Zhihao Xing	A molecular investigation of Nickel catalysed gasification of cellulose in supercritical water
15:30-15:45	398	Bolun Yang, Zhiqiang Wu, Song Wu, Rongjiang Zhang, Jianxuan Shang, Gen Liu	Simulation and analysis of biomass pyrolysis combined with chemical-looping reforming process
15:45-16:00	568	Azharuddin Farooqui, Tariq Shamim	Performance assessment of chemical looping combustion driven steam methane reforming for blue hydrogen production
1-H1 (Room IC 03/134) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/64645611465 Session Name: Clean Energy Conversion Technology Session Chair: Yingru Zhao			
Time	Paper ID	Author	Paper Title
14:00-14:15	139	Lu Xu, Wenjia Li	Effect of graded porosity electrodes on the co-electrolysis performance of solid oxide electrolysis cells
14:15-14:30	209	Xiangfeng Wu	Measurement and analysis on variable parameters of in-plane segment electrochemical impedance spectroscopy of polymer electrolyte membrane fuel cells
14:30-14:45	307	Yulin Wang, Chao Guan, Wei He	Numerical study on the performance of proton exchange membrane fuel cell with novel baffle blocks placement in cathode gas channel
14:45-15:00	360	Zheng Li, Guogang Yang	Performance evaluation of the integrating system of TS-MSR and SOFC: effect of microchannel technology on the thermo-chemo-mechanical behavior of TS-MSR
15:00-15:15	403	Xun Zhu, Qiang Liao, Jun Li, Qian Fu, liang zhang, Yu Shi, Yichao An, Yongsheng Zhang	The optimum structure of a thermally regenerative battery with an intermediate-chamber for alleviated ammonia crossover and improved electricity generation
15:15-15:30	440	Massimo Rivarolo, Aristide Fausto Massardo, Matteo Cavo, Lorenzo Gini, Eleonora Gadducci	Comparison of different control strategies for PEM fuel cells thermal management system for Zero Emission Ship (ZEUS)
15:30-15:45	446	Wenquan Tao, Li Chen, Ruiyuan Zhang	Analysis of Carbon Particle Overlap Effects on Oxygen Reactive Transport in Catalyst Layers of Proton Exchange Membrane Fuel Cells
15:45-16:00	347	Zaoxiao Zhang, Leilei Guo, Fusheng Yang, Zhu Pengfei	The improvement of temperature distribution of the tubular solid oxide fuel cell fueled by biomass syngas by flow channel design
1-I1 (Room IC 03/448) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/65648664888 Session Name: Mitigation Technologies Session Chair: Zaoxiao Zhang			
Time	Paper ID	Author	Paper Title
14:00-14:15	9	Zejiang Jia, Zhengfu Ning, Zhipeng Wang	Insights into mechanism of wettability alteration caused by CO ₂ -brine-rock interactions from interfacial features of brine-rock via inter molecular forces
14:15-14:30	23	Hongxing Yang, Yongting Shen	Global Performance Analysis of a Novel Indoor Air Carbon Capture System
14:30-14:45	68	Trevor Hocksun Kwan	Simulation Analysis of the New Liquefaction and Adsorption Based Hybrid Carbon Capture System

Day 1: Aug 9 (online)

14:45-15:00	116	Heng Zhang, Haiping Chen, Hongming Fu, Kaili Xue	Hydrophobic modification of ceramic membrane and its application in CO ₂ capture
15:00-15:15	153	Zhongqi Mu, Zhengfu Ning, Bei Liu	Characteristics and implications of CO ₂ /CH ₄ mixtures adsorbing on shale kerogen: molecular simulation
15:15-15:30	168	Nicolas von Solms, Qian OUYANG, Jyoti Shanker Pandey, Yao Xu	Enhanced CH ₄ production and CO ₂ storage through CH ₄ /CO ₂ /N ₂ hydrate dissociation during multistep depressurization
15:30-15:45	190	Ye Huang, Angela Rolfe, Neil Hewitt, Sina Rezvani, Flavio Franco, Caterina Brandoni, Oisín De Priall	Indirectly Heated Calcium Carbonate Looping - Reducing CO ₂ Emissions from Lime Plants. A Techno-economic and Environmental Assessment
15:45-16:00	239	Can Huang, Lili Jiang, Leng Tian, Wenxi Xu, Jiaxin Wang	Prediction of Minimum Miscibility Pressure (MMP) of CO ₂ -Crude Oil Systems Considering the Differences of MMP in Different Experiments Based on Artificial Neural Network and Bayesian Optimization Algorithm

1-J1 (Room IC 03/447) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/67751503672>

Session Name: Energy Science

Session Chair: Wandong Zheng

Time	Paper ID	Author	Paper Title
14:00-14:15	579	Hao Liu, Wan-Yuan Shi, Lin Feng	Mechanisms of surface moving dot-like cells instability in thin liquid layers induced by evaporation
14:15-14:30	586	Yuan-Chun He, Wan-Yuan Shi, Lin Feng	Instabilities of Nonlinear Thermocapillary Convection in Rotating Annular Pools
14:30-14:45	92	Liwen Jin, Zhendi Ma, Zhenhua Xia, Jiawei Wang, Yuping Zhang, Guosheng Jia	Experimental investigation on thermal characteristics of pipe-in-pipe heat exchanger with different eccentricities
14:45-15:00	79	Xinli Lu, Wei Zhang, Jiaqi Zhang, Dongxi Liu, Qingyao Meng, Maoqin Hu	Study on Heat Transfer Performance and Economy of In-Tube Spray Evaporative Condenser
15:00-15:15	364	Tao Ding, Hongyu Tian, Lingyun Hou	Investigation on heat transfer in a ammonia-air micro channel
15:15-15:30	207	Z.D. Ma, H.Y. Ma, G.S. Jia, J.W. Wang, C.H. Cheng, L.W. Jin	Analysis of aquifer effects on heat extraction behavior of deep-buried ground heat exchanger in multilayer strata
15:30-15:45	318	Xinli Lu, Hao Yu, Jiaqi Zhang, Tianji Zhu, yalin Zhang, wen yue, Shuhui Li, Chenchen Li, Jiali Liu	Numerical simulation of closed-loop heat extraction associated with different geothermal-well layouts
15:45-16:00	276	J.Q. Pu, Z.G. Qu, X.F. Zhang, J.F. Zhang	Synergistic Enhanced Salinity-Gradient Osmotic Energy Conversion with Temperature Gradient and Capillary Force

1-K1 (Room IC 03/444) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/67677675276>

Session Name: Energy Science

Session Chair: Liang Wang

Time	Paper ID	Author	Paper Title
14:00-14:15	267	Qiaopeng Yao, Lei Deng, Yaodong Da, Defu Che1	Numerical Analysis of a Commercial Gas Boiler in the High-altitude Area
14:15-14:30	367	Shuang Ye, You-Rong Li	Simulation of evaporation and its induced thermal convection of ethanol droplet on different substrate at low pressure pure vapor environment
14:30-14:45	419	Seung Jin Oh, Yeongmin Kim, Byng Chan Kang, Yong-yoo Yang1, Yoon Jung Ko1, Eun I Kim1, Kim Choon Ng3	Numerical study on the performance of a dew-point evaporative cooler with a desiccant coated heat exchanger
14:45-15:00	460	Sagar Saren, Sourav Mitra, Frantisek Miksik, Takahiko Miyazaki, Kim Choon Ng, Kyaw Thu	THEORETICAL FRAMEWORK TO EVALUATE MAXIMUM TEMPERATURE LIFT IN ADSORPTION HEAT TRANSFORMER CYCLE
15:00-15:15	470	Zunyi Yu, Kun Gao, Wei Guo, Panxi Yang, Bolun Yang, Mingjie Li, Jinjia Wei, Zhiqiang Wu*	Process Analysis on In-situ Underground Pyrolysis of Tar-rich Coal
15:15-15:30	504	Esmail M. A. Mokheimer, Mohammad Raghieb Shakeel	Static stability and Flame Macrostructure of Stratified jet flames
15:30-15:45	580	Lin Feng, Wanyuan Shi, YuanChun He	Nonlinear Thermocapillary Convection of Moderate Prandtl Number Fluid in Annular Pools
15:45-16:00	551	Haoyu Yin, Xiaonan Wang	Discovery of Membrane Materials for Hydrogen Separation via Machine Learning and First Principles Methods

1-L1 (Room IC 03/441) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/67851981114>

Session Name: Energy Management, Policy, Economics and Sustainability

Session Chair: Biying Yu

Time	Paper ID	Author	Paper Title
14:00-14:15	56	Chenming Ma, Junyao Wang, Qiang Zhu, Jun Zhao, Shuai Deng	Sustainability evaluation of bioenergy carbon capture and storage technology based on emergy analysis
14:15-14:30	294	Wenlong Shang, Yanyan Chen, Washington Ochieng	Towards Carbon Neutrality: the Pricing of Bike Sharing Considering Carbon Price

Day 1: Aug 9 (online)

14:30-14:45	54	Junping Ji, Fan He, Yang Yang, Yihan Yang, Yang Sui	Impact of COVID-19 on urban CO2 emissions: A case study of Shenzhen, China
14:45-15:00	366	Wenqiang Li, Guangcai Gong	A real options analysis based decision-making model for the climate change mitigation strategies on building
15:00-15:15	401	Yue Jiang, Qi Cui, Hao Chen	Does temperature change affect the energy consumption behavior of rural households? The evidence from China
15:15-15:30	75	Holger Schlör, Sandra Venghaus	The German Energy-Carbon-Watervirtual-Nexus and the Arctic sea ice - protecting global public goods and mitigating global public bads
15:30-15:45	106	Minza Haider, Matthew Davis, and Amit Kumar	Assessment of decarbonizing the road transportation sector using low carbon fuels
15:45-16:00	290	Keling Liu, Saige Wang, Bin Chen	An urban waterlogging footprint accounting based on emergy
16:00-16:30	TEA/COFFEE BREAK		
1-F2 (Room IC 04/445) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/61481845586 Session Name: Energy Science Session Chair: Xun Zhu			
Time	Paper ID	Author	Paper Title
16:30-16:45	441	Kuining Li, Bin Liu, Deqi Chen, Xiaomin Guo, Sitong Huo	Experimental study on cold-start performance of diesel engine in extremely cold environment
16:45-17:00	475	Bowen Wang, Tong Zhong, Zixuan Wang	Experimental study of the start-up process of pure hydrogen-oxygen PEMFC stack with dead-ended anode and cathode recirculation
17:00-17:15	14	Dominik Grybos, Jacek Leszczynski, Bartosz Kozera	Prototype of pneumo-electromagnetic drive operating as motor and generator modes for compressed air energy storage systems
17:15-17:30	26	Shaowei Qing, Xiaolong Gou, Shengli Tang, Xiankui Wen, Jingliang Zhong, Yan Wang	Effect of constant-pressure-operation position on the energy-release performance of a thermal-storage compressed air energy storage system with ejector
1-G2 (Room IC 03/649) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/67271615083 Session Name: Special Topics - Porous Media, Transformation, FEW Nexus Session Chair: Shuyu Sun			
Time	Paper ID	Author	Paper Title
16:30-16:45	30	Guoxiang Zhao, Yuedong Yao, Lian Wang	An automatic history matching method for shale oil reservoir based on particle filter
16:45-17:00	55	Jiasheng Song, Lang Liu	Water Desalination through FAU Zeolite Investigated Using Molecular Dynamics Simulations
17:00-17:15	120	Biyu Jing, Yu Liu	Adsorption capacity of HFC-32 and HFO-1234yf in Covalent Organic Framework and Metal Organic Frameworks: A molecular simulation study
17:15-17:30	202	Xin Jia, Shenxin Wu	A similarity analysis and experimental study on the seepage and heat transfer models of a beach well intake system
1-H2 (Room IC 03/134) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/64645611465 Session Name: Mitigation Technologies Session Chair: Xi Jiang			
Time	Paper ID	Author	Paper Title
16:30-16:45	191	Jiwon Gu, Changgwon Choe, Aejin Lee, Yus Donald Chaniago, Junaid Haider, Hankwon Lim	HFO-based single mixed refrigerants for CO2 liquefaction: thermodynamic and economic perspectives
16:45-17:00	197	Kenneth Möllersten	Assessment of CDR methods: Technology Readiness, Costs, Impacts and Practical Limitations of Biochar as Soil Additive and BECCS
17:00-17:15	245	Hosanna Uwitonze, Ayeon Kim, Aleksey Ni, Mukesh Upadhyay, Hankwon Lim	Computational fluid dynamics of bubbling fluidized bed for gas switching reactor and CO2 capture
17:15-17:30	346	MAO Yuanhao, FAN Huifeng, SAYD SULTAN, WANG Hongxia, WU Xaiomei, ZHANG Zaoxiao	Mechanism Investigation of Advanced Metal-Ion-Mediated amine regeneration (MMAR) system
1-I2 (Room IC 03/448) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/65648664888 Session Name: Special Topics - Porous Media, Transformation, FEW Nexus Session Chair: Thomas Müller			
Time	Paper ID	Author	Paper Title
16:30-16:45	459	Kun Gao, Zunyi Yu, Wei Guo, PanXi Yang, Bolun Yang, Mingjie Li, Jinjia Wei, Zhiqiang Wu	Product distribution from Tar-rich coal in-situ pyrolysis
16:45-17:00	121	Dimitrios Pappas, Alexis Ioannidis, Xin Li1, Tiago Botelho, Michael Kouroupis, Konstantinos J. Chalvatzis	Sustainable Business Models for Sustainable Concrete – The Triple Layered Proposition

Day 1: Aug 9 (online)

17:00-17:15	450	Dan Fang, Jin Yang, Bin Chen	Impact of the spatial structure of urban agglomerations on carbon dioxide emissions in China
17:15-17.:30	188	Miaoye Kang, Yongnan zhu , Fan He, Guohua He, Mingming Yang	Evaluation of Water -Energy Benefit in China Based on Inter-Provincial Food Trade



Future Energy Center

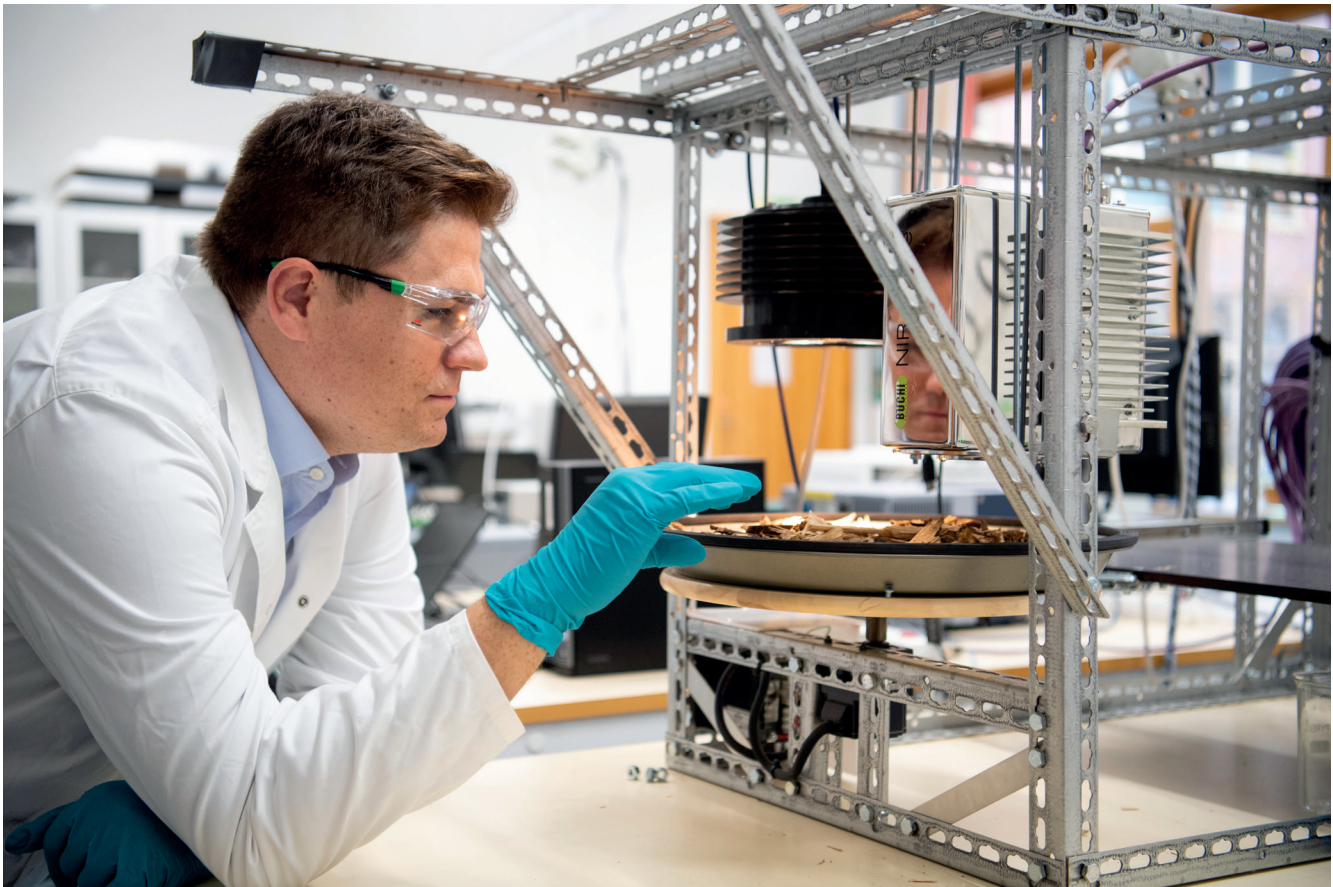
The Future Energy Center (FEC) is an internationally competitive research environment at Mälardalen University (MDH), Sweden. FEC focus on renewable energy, resource efficiency and digitalisation – towards a sustainable future, in co-production with industry and society.

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.



Day 2: Aug 10 (on site)

2-A4 (Room IC 04/410) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61942737512>

Session Name: Intelligent Energy Systems

Session Chair: Taehoon Hong, Nico Schneider

Time	Paper ID	Author	Paper Title
10:15-10:35	609	Jingwen Weng, Changren Xiao, Xiaoqing Yang, Eric Waiming Lee, Richard Kwowk Kit Yuen, Jian Wang	A smart temperature-controlled thermal management system coupling phase change material with intermittent nanofluids cooling
10:35-10:55	518	Gang Yu, Xianming Ye, Xiaohua Xia	Charging scheduling of electric vehicle charging stations
10:55-11:15	118	Tingsheng Zhang, Hao Cao, Weihua Kong, Zutao Zhang*, Jinyue Yan	A Vibration Energy Harvester Based on Parallel Transmission Mechanism with Half-Wave Flywheel for Freight Railways
11:15-11:35	253	Sophie Demasse, Valentina Sessa, Amirhossein Tavakoli	Strengthening mathematical models for pump scheduling in water distribution
11:35-11:55	268	Hong Tang, Shengwei Wang	Interactive flexibility provision scheme for demand-side management in electricity markets of multiple services: a Stackelberg game

2-B4 (Room IC 04/408) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/65531711752>

Session Name: Energy Management, Policy, Economics and Sustainability - Algorithms and System Analysis

Session Chair: Valentin Bertsch, Michael Walther

Time	Paper ID	Author	Paper Title
10:15-10:35	292	Marco Miotti, Rishree Jain	A computationally efficient algorithm to enable privacy preserving urban energy data sharing under the "15/15" rule
10:35-10:55	453	Andra Blumberga, Vita Brakovska, Ruta Vanaga, Girts Bohvalovs, Ritvars Freimanis	Single-player game for decision making in energy communities
10:55-11:15	148	Qian Huang, Jinyue Yan	Stackelberg game based P2P energy trading strategies for residential prosumers with distributed photovoltaics
11:15-11:35	429	Matthias Hermesmann, Christos Tsiklivos, Thomas Ernst Müller	Environmental Assessment of Climate-Friendly Hydrogen Supply Chains – A Trade-Off between Capacity Utilization and Transport Distance?
11:35-11:55	93	Bigyeong Shin, Seunghwan Wi, Beom Yeol Yun, Sumin Kim	CO2 emission mitigation and sale price income benefit of CLT-wall-hybrid building using life cycle assessment: A case study in South Korea

2-C4 (Room IC 03/610) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/62241076695>

Session Name: Energy Management, Policy, Economics and Sustainability - Political Aspects

Session Chair: Koichi Yamada, Shinichiro Okushima

Time	Paper ID	Author	Paper Title
10:15-10:35	76	Linda Brodnicke, Albane Seres, Paolo Gabrielli, Giovanni Sansavini	Policy instruments to enable low-carbon heating in sustainable multi-energy systems
10:35-10:55	428	Christopher Ball, Gianmarco Aniello, Wilhelm Kuckshinrichs, Valentin Bertsch	Comparing energy technologies across alternative regulatory scenarios: profitability, promotion schemes and the potential for a cost-efficient decarbonization of the German residential sector
10:55-11:15	150	Abigail Andrews, Rishree K. Jain	A policy landscape analysis of demand flexibility driven building decarbonization: a case study of New York City, USA
11:15-11:35	567	Luis Ramirez Camargo, Maria Luisa Lode, Thierry Coosemans	Assessing the relevance of renewable energy resources availability for the existence of Energy Cooperatives in Europe
11:35-11:55	476	Qing Su, Peng Zhou	How does the government promote the transition towards multi-energy complementary of power enterprises? An evolutionary game analysis

2-D4 (Room IC 03/606) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61257114207>

Session Name: Energy Storage - Thermal and Mechanical storage

Session Chair: Monika Thol, Robin Beckmüller

Time	Paper ID	Author	Paper Title
10:15-10:35	37	Rasmus Juhlin, Mohsen Assadi 2	Lessons from the offshore oil and gas industry for hydropneumatic subsea energy storage concepts
10:35-10:55	166	Firdovsi Gasanzade, Wolf Tilmann Pfeiffer, Sebastian Bauer	Proxy model development and application for coupled power plant and geostorage simulations of compressed air energy storage
10:55-11:15	393	Sébastien Pezza, Caroline Bono, Fabien Bricault, Sandrine Selosse, Edi Assoumou	Sizing of long duration storage in a variable renewable power system
11:15-11:35	536	Mr Raymond, Ojonugwa Ikeleji, Prof Tunde Bello-Ochende	Numerical Investigation of a Solar Sunrise Transient Temperature Model for Latent Heat Thermal Energy Storage System
11:35-11:55	256	Julian Steinbrecher, Markus Braun, Thomas Bauer, Alexander Bonk	Solar Salt at 620 °C: Impact of Experimental Design on Thermodynamic Stability

Day 2: Aug 10 (on site)

2-E4 (Room IC 03/112) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/68901734156>

Session Name: Energy Sciences - Hydrates

Session Chair: Roland Span, Gan Huang

Time	Paper ID	Author	Paper Title
10:15 – 10:35	122	Bhavikkumar Mahant, Omkar Singh Kushwaha, Rajnish Kumar	Experimental and modeling study of the methane gas hydrate formation using ZnO nanoparticles
10:35-10:55	129	Huiru Sun, Bingbing Chen, Jinyue Yan, Mingjun Yang, and Yongchen Song	NMR measurement of methane hydrate decomposition in sediment under water-gas two-phase flow

2-A6 (Room IC 04/410) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61942737512>

Session Name: Renewable Energy - Solar Energy

Session Chair: Roland Span, Raymond, Ikeleji

Time	Paper ID	Author	Paper Title
15:30-15:50	237	Zhe Song, Sunliang Cao, Hongxing Yang	CatBoost Method for Global Solar Radiation Prediction Based on Observational and Astronomical Predictors
15:50-16:10	422	Irfan Shaikh, Anish Modi	Simulation of 1MWe multi-field concentrated solar power plant using sliding pressure operation strategy
16:10-16:30	293	Gan Huang*, Parth H. Arya, David B. Ritzer, Jingyuan Xu, Dmitry Busko, Ulrich W. Paetzold, Bryce S. Richards	Optical properties of semitransparent perovskite solar cells for hybrid PV-thermal solar collectors
16:30-16:50	329	Emily Lloyd, Markus Hofmeister, Arkadiusz Chadzynski, Yi-Kai Tsai, Markus Kraft	Automated Multi-Domain Solar Potential Evaluation
16:50-17:10	242	Seungkeun Yeom, Jinwoo Choi, Juwon Hong, Jongbaek An, Hyuna Kang, Hakpyeong Kim, Heeju Choi, Taehoon Hong	A framework for determining the optimal window-integrated PV panel considering occupant satisfaction, energy performance, and economic feasibility

2-B6 (Room IC 04/408) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/65531711752>

Session Name: Clean Energy Conversion Systems - Hydrogen based Energy Systems

Session Chair: Robin Beckmüller, Rui Qiu

Time	Paper ID	Author	Paper Title
15:30-15:50	142	Du Wen, Muhammad Aziz	Cost-optimal design of a novel integrated renewable multi-generation system based on green hydrogen and ammonia production
15:50-16:10	5	Jinyue Cui, Muhammad Aziz	Techno-Economic Analysis of Methanol as a Hydrogen Carrier
16:10-16:30	194	Asal Saeidfar, Serhat Yesilyurt	Effect of Cathode Composition and Pt loading on the Performance of PEMFCs
16:30-16:50	503	Silvia Crosa, Eleonora Gadducci, Massimo Rivarolo, Loredana Magistri, Aristide Fausto Massardo	Validation of voltage degradation coefficients for 30 kW PEM Fuel Cell stacks
16:50-17:10	477	Manuel Ojeda, John Andresen	Integration of by-product O2 from electrolysis in wastewater treatment
17:10-17:30	524	Maria José Mendoza Morales, Julien Blondeau, Ward De Paepe	Towards zero-carbon emission cogeneration through hydrogen fueling: Assessment of the impact of CH4/H2 blends on the thermodynamic performance of a gas turbine CHP unit

2-C6 (Room IC 03/610) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/62241076695>

Session Name: Energy Management, Policy, Economics and Sustainability - Social Acceptance and Ethics

Session Chair: Klaus Steigleder, Andreas Löschel

Time	Paper ID	Author	Paper Title
15:30-15:50	225	Irene Niet	Public Values in Power: an exploratory framework applied to the case of The Netherlands
15:50-16:10	547	Michael Walther, Katja Witte	Social perception and acceptance of industrial transformation and its specific technology paths
16:10-16:30	392	Esther Trost, Dr. Maik Bohne	Between protest, silence and support – municipal actors and their impact on German power line extension: two case studies
16:30-16:50	40	Shinichiro Okushima	How to evaluate energy sufficiency: A direct measurement approach
16:50-17:10	167	Lauren Excell, Devan Addison-Turner, Rishree Jain	Quantifying the impact of building retrofits on energy equity

2-D6 (Room IC 03/606) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61257114207>

Session Name: Transformation Processes - Process Industries

Session Chair: Julia Riese, Zhuang Sun

Time	Paper ID	Author	Paper Title
------	----------	--------	-------------

Day 2: Aug 10 (on site)

15:30-15:50	47	Xinyi Wu, Jing Meng	Least-cost net-zero technology transition of global iron and steel plants: a bottom-up study
15:50-16:10	215	Lars Finkewirth, Ali Abeelshafy, Grit Walther	A comparative environmental assessment of the cast iron and steel melting technologies in Germany
16:10-16:30	21	Peipei Chen, Jing Meng*, Shaohui Zhang*	Technological solutions to China's carbon neutrality in the steel and cement sectors
16:30-16:50	566	Stefan Herrig, Iris Rieth, Tania Begemann, Michael Walther, Anna Leipprand	Towards a Climate-Neutral Basic Materials Industry in North Rhine-Westphalia
16:50-17:10	77	Christian Wolfersdorf, Tobias Ginsberg, Jan Eurlings, Jens Hannes	Circular economy pilot plants and projects at the Niederaußem RWE Innovation Centre – Current status and initial operational results
2-E6 (Room IC 03/112) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/68901734156 Session Name: Clean Energy Conversion Technology - Air Conditioning and Refrigeration - Fundamentals Session Chair: Ulf Apfel, Xiaosong Cheng			
Time	Paper ID	Author	Paper Title
15:30-15:50	29	Meng Wang, Manosh C. Paul*, Phillip Dobson	Influence of Thermophoretic Force on Nanoparticle Deposition in a Microchannel Heat Sink
15:50-16:10	328	Quan GONG, Lin LU, Jianheng CHEN	Spectral modulation for Self-adaptive Passive Radiative Cooling
16:10-16:30	495	Nils von Preetzmann, Roland Span	Density Measurements on Binary Helium + Neon Mixtures over the Temperature Range from (100 to 233) K at Pressures up to 10 MPa
16:30-16:50	358	Zhe Chen, Fu Xiao	Interpretable machine learning for AHU fault detection and diagnosis: Rule extraction from black-box models
16:50-17:10	432	Munendra Pal Singh, Muhammed Saeed, and Abdallah Sofiane Berrouk	Bifurcation analysis on Ledinegg Instability behaviour in the Heated Channel under Supercritical condition
17:10-17:30	19	Sijia Wang, Shaohua Li, Yu Liu, Yongchen Song, Lanlan Jiang	Co-injection of CO ₂ and nanoparticles enhance sequestration potential in subsurface aquifers

Day 2: Aug 10 (online)

2-A3 (IC 04/410) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61942737512>

Session Name: Renewable Energy

Session Chair: Sebastian Schwede

Time	Paper ID	Author	Paper Title
8:30-8:45	49	Yi-Wei Xiong, Alchris Woo Go, Yi-Hsu Ju, Artik Elisa Angkawijaya	Production of fatty acid methyl esters (FAME) from free fatty acids (FFA) under non-isothermal and non-catalytic subcritical conditions
8:45-9:00	238	Renfu Tu, Qi Liao, Ning Xu, Rui Qiu, Yongtu Liang, Jian Du, Haoran Zhang	Low-Carbon Transitions for Pipeline Carriers: Multi-Product Pipeline Capacity Evaluation to Maximize Biofuel Pipeline Transportation
9:00-9:15	243	Xun Zhu, Qiang Liao, Yun Huang, Ao Xia, Xianqing Zhu, Jingmiao Zhang, Shuai Wu, Dong Feng	Effects of oxytetracycline on mesophilic/thermophilic anaerobic digestion for biogas production from swine manure
9:15-9:30	457	Bosheng Su, Shenghua Huang, Yilin Wang, Zhilong Xu, Yupeng Huang	A novel solar-and-biogas-fired CCHP integrated with chemically recuperated gas turbine
9:30-9:45	531	Diego Neves Kalatalo, Andrew Cantanhede Cardoso, Jackson Costa da Silva, Luiz Alberto Baptista Pinto Júnior, Pedro de França Santos, Rogério Luiz Veríssimo Cruz, Carlos Alberto Gurgel Veras	Heat and mass transfer of biomass particles under acoustic oscillation fields
9:45-10:00	262	Leif Gustavsson and Roger Sathre	Lifecycle climate impact of cars and trucks powered by bioelectricity, biofuels or fossil fuels

2-B3 (IC 04/408) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/65531711752>

Session Name: Special Topics - Porous Media, Transformation, FEW Nexus

Session Chair: Thomas Müller

Time	Paper ID	Author	Paper Title
8:30-8:45	203	Ronald Wennersten	Can distributed power systems help in the transformation of urban structures towards minimizing the use of fossil fuels?
8:45-9:00	308	Erik Dahlquist, Madeleine Martinsen, Stefan Hellstrand	Scenarios for resource utilization
9:00-9:15	362	Niklas Reinert, Dmitri Domanski	The Ruhr Metropolis - an energy region on the move
9:15-9:30	540	Agus Sasmito, Ferri Hassani, Muhammad Abdur Rasyid, Azlan Aslam, Rafiei Arash	Transforming Power Draw Trend of Ore Crushing by Applying Microwave Heating
9:30-9:45	613	Mohammad Reza Yazdi-Samadi	Exploring the investment cost of construction of renewable power plant considering the effect of climate impact

2-C3 (IC 03/610) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/62241076695>

Session Name: Clean Energy Conversion Technology

Session Chair: OckTaeck Lim

Time	Paper ID	Author	Paper Title
8:30-8:45	59	Peng Qian, Minghou Liu, Chang Liu, Wenjing Zhang	Numerical Study on the flow field of a combustor with triple swirlers
8:45-9:00	338	Ock Taeck Lim, Tran Khai	An Experimental Study On The Flame Development And Ignition Delay Of The Gasoline-biodiesel Blends In A Constant Volume Combustion Chamber Under GCI Conditions
9:00-9:15	61	Jun Sui, Yimin Li, Dongjiang Han	Sensitivity Analysis for HCCI-ICE Applied for SOFC-ICE Hybrid System
9:15-9:30	183	Ardhika Setiawan, OckTaeck Lim	Investigation of combustion characteristics of dual direct injection strategy of diesel-propane fuel under rapid compression expansion engine
9:30-9:45	184	Ock Taeck Lim, Cahyani Windarto	Combustion and performance characteristics of the spark discharge energy effect on rapid compression and expansion machine (RCEM) working with propane and diesel fuel direct injection
9:45-10:00	532	Kjetil Johan Torgersen, Erlend Velken Røstbø, Oda Marie Ellefsen, Peter Breuhaus, Mohammad Mansouri*	Preliminary Evaluation of Synergistic Effects of Water Electrolysis Integration for Recirculating Aquaculture Systems

2-D3 (IC 03/606) (IC 03/606) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61257114207>

Session Name: Special Topics - Porous Media, Transformation, FEW Nexus

Session Chair: Holger Schlör

Time	Paper ID	Author	Paper Title
8:30-8:45	545	Deepak Sharma, Suwin Sandhu, Tshering Yangki, Trang Nguyen	Climate Change and Energy-Food-Water Resource Policies in Sub-Saharan Africa: A Perspective
8:45-9:00	179	Yongnan Zhu, Linrui Shi, Haihong Li, Chenyang Zhu, Hanqing Liu	Analysis on the evolution of residential water-energy nexus, a case study in Beijing China

Day 2: Aug 10 (online)

9:00-9:15	218	Christian Gelleri	Local currencies in the context of climate protection
9:15-9:30	420	Bin Chen, Xing Fan	Food-water-energy nexus in the crop-livestock coupled system-a case study in China
9:30-9:45	572	Shivenes Shammugam, Basil Oberholzer, Andrea Bassi, Stelios Grafakos	Assessing the environmental and socio-economic impacts of the integration of climate resilience and low emission pathways in the energy and agriculture sectors in least-developed countries
9:45-10:00	557	Vania Paccagnan	Industrial water stewardship and collaborative approaches to WEF nexus

2-E3 (IC 03/112) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/68901734156>

Session Name: Energy Science

Session Chair: Wei-Hsin Chen

Time	Paper ID	Author	Paper Title
8:30-8:45	25	Chen Chen, You-Rong Li	Numerical Study on Coupled Natural Convection Inside and Outside a Closed Cylindrical Cavity
8:45-9:00	304	Yuanqing Lin, Chun-Mei Wu, You-Rong Li	Experimentally investigation on the evolution of thermal patterns during sessile ethanol droplet evaporation
9:00-9:15	335	OckTaeck Lim, Binyamin Binyamin	Numerical investigation on thermal fluid-structure interaction analysis on the plunger/barrel interface leakage of a high-pressure fuel pump for medium-speed diesel engine
9:15-9:30	15	Dominik Grybos, Jan Markowski, Jacek Leszczynski	A technology for efficiently converting energy stored in compressed air under low pressure to ensure security of electricity supply
9:30-9:45	137	Ndumiso Vukile Mdlovu, Kuen-Song Lin, Chao-Yen Wang, Hong-Paul Wang, Abrar Hussain	Liquefaction of Waste Tire Rubber Chips Used for the Absorptive Recycling of Spilled Oils
9:45-10:00	483	Junwen Wang, Jingchun Feng, Yan Xie, Pian Li, Yanyan Huang, Zhenwu Zhou, Mingrui Zhang, Liwei Sun	Formation Kinetics Characteristics of CH ₄ Hydrate in "Haima" Cold Seep Environment with Varied Dissolved Methane Concentration

2-F3 (ID 04/445) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61481845586>

Session Name: Energy Science

Session Chair: Jingchun Feng

Time	Paper ID	Author	Paper Title
8:30-8:45	177	Bo Li, Wen-Na Wei, Ting-Ting Zhang, Xiang-Zhen Meng	Experimental study of ice-involved methane hydrate dissociation by depressurization below the quadruple point
8:45-9:00	355	Zhenyuan Yin, Jidong Zhang, Daoyi Chen, Shuaijun Li	Analysis of fluid production behavior induced by depressurization between gas- and water-saturated hydrate-bearing sediments
9:00-9:15	374	Yunchao Li, Shangfei Song, Bohui Shi, Qingyun Liao, Qingping Li, Haiyuan Yao, Jing Gong	Molecular-level study on decomposition kinetics of CO ₂ -CH ₄ hydrates by depressurization
9:15-9:30	279	Yi Wang, Xuan Kou, Xiao-Sen Li, Kun Wan	From Laboratory Scale to Field Scale: Investigation of Gas Production Test from Methane Hydrate Reservoir
9:30-9:45	323	Ray Xu, Xuan Kou, Yi Wang, Xiao-Sen Li,	Experimental Study Into the Effects of Fluid Flow on Hydrate Formation
9:45-10:00	91	Yi-Jian Zhu, Yan-Song Chu, Xing Huang, Ling-Ban Wang, Chang-Yu Sun, Guang-Jin Chen	Experimental research on the hydrate-bearing sediment stability during methane hydrate depressurization mining

2-G3 (IC 03/649) (IC 03/649) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/67271615083>

Session Name: Energy Storage Systems

Session Chair: Ottorino Veneri

Time	Paper ID	Author	Paper Title
8:30-8:45	103	Xun Zhu, Qiang Liao, Jun Li, Qian Fu, liang zhang, Yu Shi, Dong Li	Electrical power production from low-grade waste heat using a density-induced membrane-free thermally regenerative battery
8:45-9:00	72	Jiangyan Liu, Yi Xie, Kuning Li, Jinghong Wang, Bin Liu, Zhaoting Liu	Optimization of low temperature compound heating strategy for lithium-ion battery pack
9:00-9:15	6	Difan Jia, Fu Xuqi, Ma Zhanyao, Zuo Xiaowu	Voltage-temperature Feature-based Capacity Estimation Method for Li-ion Battery Cell Combining Probability Density Function and Random Forests
9:15-9:30	88	Kai Luo, Geng Wang, Jingqi Gao	Study of the formation of the solid electrolyte interphase in Li-ion batteries using accelerated reactive molecular dynamics
9:30-9:45	102	Amit Kumar, Matthew Davis, Ayodeji Okunlola	Assessing the value of electrolytic hydrogen in power sectors for reversible gas-to-power conversion

2-H3 (IC 03/134) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/64645611465>

Session Name: Energy Storage Systems

Session Chair: Xiaohu Yang

Day 2: Aug 10 (online)

Time	Paper ID	Author	Paper Title
8:30-8:45	4	Bohui Lu, Yongxue Zhang	Experimental and numerical investigation of the effect of geometric parameters on the charging and discharging performances of a vertical latent heat thermal energy storage unit
8:45-9:00	57	Chen Zhan, Wenzhi Cui, Longjian Li, Xiaojun Quan, Yuqi Zhang, Wang Dou, Tiande Yang	SHAPE-STABILIZED PHASE CHANGE MATERIALS WITH HIGH THERMAL CONDUCTIVITY PREPARED BY MAGNETIC FREEZE CASTING
9:00-9:15	66	Qibin Li, Penglai Wang	Thermodynamic analysis of Carnot Battery energy storage systems based on organic flash cycle
9:15-9:30	134	Kai Luo, Danlei Yang, Guihua Tang, Yuanhong Fan, Xiaolong Li, Qiang Sheng	Research on the feasibility of integration and conversion of supercritical carbon dioxide coal-fired power cycle and energy storage cycle
9:30-9:45	159	Xinli Lu, Wei Zhang, Hao Yu, Feng Ma, Fei MA, Tianji Zhu, yalin Zhang, Shuhui Li, Chenchen Li, Jiali Liu	Effects of expanded graphite and nano-ALN on the thermal conductivity and specific heat capacity of phase change materials
2-I3 (IC 03/448) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/65648664888 Session Name: Intelligent Energy Systems Session Chair: Peng Li			
Time	Paper ID	Author	Paper Title
8:30-8:45	62	Qingsong An, Zhichao Xu	Optimization of tourist attractions integrated energy system based on improved annealing particle swarm
8:45-9:00	424	So-Bin Cho, Aaron Epiney, Paul Talbot, Todd Allen, Xiaodong Sun	Comparing Least-Cost Portfolios for Decarbonized Power Systems under the New Negative Price Regime: A Case Study of Texas
9:00-9:15	466	Chaouki Ghenai, Ezhil Reena Joy, Vladimir Terzija, Ramesh Bansal, Petr Vorobev, Rajesh Kumar, Sujil Vijayan	Artificial Intelligence and its applications in Renewable Integrated Power Systems
9:15-9:30	343	Mohammad Jamjoum, Raneem Negry, Zaid Haymoor	Transformers Efficiency Variability in Energy Hub Modelling
9:30-9:45	527	Emanuele Martelli, Alessandro Francesco Castelli, Lorenzo Pilotti, Alessandro Monchieri	Optimal design of an Aggregated Energy System with N-1 reliability
2-J3 (IC 03/447) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/67751503672 Session Name: Renewable Energy Session Chair: Pietro Campana			
Time	Paper ID	Author	Paper Title
8:30-8:45	405	Takuro Kobashi, Liya Xue, Junling Liu, Mengyue Li	The Energy-Economic-Environmental Multi-benefits of Urban Rooftop Photovoltaic Integrated with Electric Vehicles System
8:45-9:00	380	Koji Tokimatsu, Rino Hirose	Estimating the potential for PV installation in non-residential buildings in Japan
9:00-9:15	535	Ye-Obong Udoakah, Emmanuel Mudaheranwa, Jun Liang, Liana Cipcigan	Black Start Application in Power System Restoration using Distributed Energy Resources
9:15-9:30	569	Shaopeng Guo, Pietro Elia Campana, Haohao Jiang	Numerical study and validation of the thermal performance of floating PV systems
9:30-9:45	12	Dina Azhgaliyeva	Firm Investment in Renewable Energy: An Empirical Evidence from the People's Republic of China
9:45-10:15	Tea/Coffee Break		
2-F4 (ID 04/445) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/61481845586 Session Name: Renewable Energy Session Chair: Hongxing Yang			
Time	Paper ID	Author	Paper Title
10:15-10:30	326	Yong Shuai, HAO ZHANG, Guene Lougou Bachirou, Boshu Jiang, Lianxuan Wu, Yanming Guo, Boxi Geng	Experimentally validated numerical model of multi-spectral bands radiative transport in solar receiver/reactor with photo-active porous absorber reacting media
10:30-10:45	517	Oguzhan Kazaz, Nader Karimi, Shanmugam Kumar, Gioia Falcone, Manosh C. Paul	Numerical Investigation of the Influences of Nanoparticle Size and Tilt Angle in a Directly Absorption Solar System
10:45-11:00	539	qingzhong yang, Qian Zhang, Xingyu Li, Cong Chen, Xiaoxu Ma, Yonghua Gong	Numerical Study on Heat Transfer Performance of Molten Salt Flowing in Inclined Non-uniform Heated Tube for Concentrating Solar Receiver
11:00-11:15	327	Emad Abdelsalam, Hamza Nawafa, Malek Alkasrawi, Dana Ibrahim	A Novel Design of a Twin-Tower Solar Power Plant for Power and Distilled Water Generation
11:15-11:30	85	Derek Ingham, Lin Ma, Mohamed Pourkashanian, Stavros Michailos, Bashar Shboul, Kevin Hughes, Godfrey Udeh, Mohammed Alfailakawi, Ismail AL-Arfi	Multi-objective optimal sizing of a hybrid concentrated solar power-biogas for desalination and power generation

Day 2: Aug 10 (online)

11:30-11:45	231	Khaled Mohamad, P. Ferrer	Cavity receiver designs for parabolic trough collector
11:45-12:00	489	Daniela De Luca, Paolo Strazzullo, Antonio Caldarelli, Eliana Gaudino, Emiliano Di Gennaro, Marilena Musto, Roberto Russo	The Influence of the Energy Bandgap in High Vacuum Flat Plate Photovoltaic Thermal (PV-T) Collectors
2-G4 (IC 03/649) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/67271615083 Session Name: Energy Management, Policy, Economics and Sustainability Session Chair: Ronald Wennersten			
Time	Paper ID	Author	Paper Title
10:15-10:30	525	Chiara D'Alpaos, Alberto Benato, Alarico Macor	Is there any future for Italian biogas plants after the Government incentive phase out?
10:30-10:45	546	Ding Li, Xue Lan, Anna Sun, Liu Huilin	What's China's preference in its global gas cooperation? — A perspective from governance mode
10:45-11:00	105	Amit Kumar, Matthew Davis, Luke Sperry	Development of an economy-wide decarbonization assessment framework for an emission intensive and a net energy exporting jurisdiction
11:00-11:15	373	Wenjing Zhu, Cuncun Duan, Dan Song, Bin Chen	Technical efficiency assessment of wastewater treatment plants in China based on electricity stress index and DEA model
11:15-11:30	549	Mark Kyeredey Ansah, Xi Chen, Hongxing Yang	A BIM-based integrated environmental and cost optimization approach for low carbon buildings
11:30-11:45	491	Lin Tang, Jin Yang	Economic Benefits and Carbon Emissions of China's Regional Coal-Fired Power Sector: An input-output based hybrid approach
11:45-12:00	312	Feng Jiang, Saige Wang, Bin Chen	Water-carbon nexus for an urban physical-virtual water supply system-a case study of Beijing-Tianjin-Hebei region in China
2-H4 (IC 03/134) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/64645611465 Session Name: Mitigation Technologies Session Chair: Fu Wang, Zhien Zhang			
Time	Paper ID	Author	Paper Title
10:15-10:30	411	Xinyi Zhou, Xingyu Liang, Ziyang Liu, Xu Lv, Jun Liu, Wenzhi Lv, Yibao Wang	Investigation on the influence of post injection strategies on lube oil dilution
10:30-10:45	414	Guozhen Li, Nicholas J. Miles, Philip Hall, Zheng Wang, Jiarui Gao, Yubang Shen	Numerical investigation of immiscible liquid-liquid dispersion in a static mixer without inserted elements
10:45-11:00	427	Zirui Zhao, Xinyu Zhang	Numerical study of cavitation and flash boiling in GDI nozzle
11:00-11:15	488	xingyu liang, Bowen Zhao, Lintao Wei, Song Zhang	The effect of fuel sulfur content on the emission characteristics of marine auxiliary diesel engine
11:15-11:30	204	Yu Zhu, Jiamei Li, Shixue Wang	Theoretical and Experimental Research of a New Non-Frosting Thermoelectric Generation System for Waste Cold Recovery
11:30-11:45	353	Pengfei Ma, Yunsong Yu, Zaoxiao Zhang, Geoff G.X. Wang	Digital Twin Model for Solid Waste Treatment in Rotary Kiln
11:45-12:00	464	Bolun Yang, Zhiqiang Wu, Wei Guo, Rongjiang Zhang, Guangju Ma, Xifeng Liu, Guoming Lv, Benren Wang, Suke Yang	Technology of free calcium oxide (f-CaO) digestion in steel slag by origin adjusting under the vision of carbon neutralization
2-I4 (IC 03/448) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/65648664888 Session Name: Intelligent Energy Systems Session Chair: Clemente Capasso			
Time	Paper ID	Author	Paper Title
10:15-10:30	178	Qiao Wang, Min Ye, Meng Wei, Gaoqi Lian, Yan Li	A Random Health Indicator and Deep Learning Approach Based Capacity Estimation for Lithium-Ion Batteries with Different Fast Charging Protocols
10:30-10:45	185	OckTaeck Lim, Hieu Le Trong	Study on the effect operating and structure parameters to dynamic and required power of electric assisted bicycle
10:45-11:00	254	Gaoqi Lian, Min Ye, Qiao Wang, Meng Wei, Xinxin Xu	Generalized Regression Neural Network Based State of Charge Estimation for Lithium-Ion Battery with Ambient Temperature Consideration
11:00-11:15	300	Zhenpo Wang, Peng Liu, Li Da, Zhaosheng Zhang, Junjun Deng	Multi-feature and multi-dimension statistical analysis for battery pack safety in numerous real-world electric vehicles
11:15-11:30	407	Aihua Tang, Yukun Huang, Jianming Li, Quanqing Yu	State-of-charge estimation of series-parallel battery packs based on fusion models
11:30-11:45	73	Ruchen Huang, Hongwen He	Intelligent Emission Reduction-Conscious Energy Management Strategy for Hybrid Electric Bus: A Deep Reinforcement Learning Method
11:45-12:00	413	Yi Ma, Catalina Spataru, Xiaojing Lv, Yiwu Weng	Thermodynamic Characteristics of An Innovative NH ₃ -fueled SOFC Cycle for Zero Emission Ship Power

Day 2: Aug 10 (online)

2-J4 (IC 03/447) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/67751503672>

Session Name: Special Topics - Porous Media, Transformation, FEW Nexus

Session Chair: Shuyu Sun

Time	Paper ID	Author	Paper Title
10:15-10:30	266	Hongxin Guo, Linsong Cheng, Pin Jia, Peng Wang	Degassing Process and Water-flooding Oil and Gas Mechanism of Cores with Different Fracture Occurrences in Weakly Volatile Carbonate Reservoirs
10:30-10:45	384	Tao Zhang, Shuyu Sun	Intelligent Phase Stability Test in the On-site Hydrogen Production using the Thermodynamics-Informed Neural Network
10:45-11:00	543	Adekunle Adelaja, Sogo Mayokun Abolarin, Olugbenga Noah	Developing Basic Unit Cell (BUC) Model For Natural Convection Heat Transfer Characteristics In Packed Beds of Proposed Coated Particle Nuclear Fuel Design
11:00-11:15	552	Yuqi Wu, Keyu Liu, Senyou An, Shengbiao Liu, Samuel Fagbemi, Chengyan Lin	Modeling the Physical Properties of Hydrate-Bearing Sediments: Considering the Effects of Occurrence Patterns
11:15-11:30	556	Hongqing Song, Junming Lao, David A. Weitz, Liyuan Zhang, Chiyu Xie, Yuhe Wang	Pore-scale investigation on reservoir hydrogen storage: mechanisms and the optimization of storage capacity and efficiency
11:30-11:45	201	Su Yiru, Lang Liu	Understanding the effect of ion concentration on interfacial resistance in carbon nanotube membrane via molecular dynamics simulation
11:45-12:00	265	Can Huang, Leng Tian, Jiabin Wang, Zongke Liu, Zechuan Wang	Dynamic Prediction Model for a Lifecycle Process of Multi-Layer Oil Reservoir in porous media

2-A5 (IC 04/410) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61942737512>

Session Name: Renewable Energy

Session Chair: Lei Wang, Jiawei Chen

Time	Paper ID	Author	Paper Title
13:00-13:15	158	Yagang Zhang, Zhiya Pan, Xue Kong, Leyi Yu	Composite wind speed prediction model based on optimized VMD and error correction
13:15-13:30	247	An-Shik Yang, Jun-Yu Jiang, YEE TING LEE, Yuan-Lung Lo, Yu-Hsuan Juan, Yang Li	Assessment of Wind Energy Harvest of High-Rise Building Array for Different Urban Patterns
13:30-13:45	278	Lin Ding, Tian Song, Yuxiong Han	Research on Wind-induced Vibration and Energy Harvesting of Two Square Cylinders in Tandem with Different Heights
13:45-14:00	310	Lin Ding, Tian Song	Effects of Mass Ratio and Cross-Section Shape on Performance of Wind-Induced Vibration Piezoelectric Energy Harvester
14:00-14:15	368	Yung Jeh CHU, Heung Fai Lam, Hua Yi PENG	A Thin Cambered Bent Biomimetic Wind Turbine Blade Design by Adopting the 3D Wing Geometry of a Borneo Camphor Seed
14:15-14:30	437	Lei Wang, Bolong Mao	Modeling and economic optimization scheduling strategy of wind-solar-storage coupled off-grid hydrogen production system
14:30-14:45	461	Lei Wang, Xuesong Chang	Off-grid wind-solar coupled hydrogen production system architecture optimization
14:45-15:00	156	Davide Astiaso Garcia, Azim Heydari, Farshid Keynia, Gholamreza Memarzadeh, Afef Fekih, Roberto Capata	A New Hybrid Intelligent Method for Short Term Electric Power Production Forecasting from Uncertain Renewable Resources

2-B5 (IC 04/408) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/65531711752>

Session Name: Clean energy conversion technology

Session Chair: Qie Sun, Taixiu Liu

Time	Paper ID	Author	Paper Title
13:00-13:15	63	Chao Liu, lang liu, Tingyu Xiao	Preliminary design and thermodynamic analysis of a nuclear driven water-electricity co-generation system
13:15-13:30	555	Zhang Bai, Bo Zheng, Shengdong Zhou, Yunyi Han, Yawen Cheng, Hongliang Liu	Flexibility Improvement Evaluation of a Wind-driven Hydrogen Production System Based on the Synergistic Operation of Multi-type Electrolyzers
13:30-13:45	571	Zhijia Ge, Junhong Hao, Xingce Wang, Shungjiang Wang, Yunxi Yang, Liang Tian, Fang Dong	Overall modeling and simulation analysis of distributed energy system based on solid oxide fuel cell and PVT units
13:45-14:00	97	Debo Li, Wanlong Jin, Chao Ye, Zhihao Chen, Zhaoli Chen, Yongxin Feng	Numerical Analysis on Airfoil Fin Channel for Supercritical CO2 Low Temperature Recuperator
14:00-14:15	145	Xiaoxiao Li, Yuanyuan Yu	Determination of the optimal heat transfer area of the dry cooling system for the supercritical CO2 power cycle using a multi-objective approach
14:15-14:30	528	Andrew Cardoso, Carlos Veras	Gas engine Oxy Fuel Combustion for Combined Heat and Power Applications
14:30-14:45	45	Qingsong An, Ruoxue Yan	Power generation analysis and optimization of ORC system for LNG cold energy recovery based on thermal match enhancing method
14:45-15:00	220	Li Zhao, Hong-Rui Li	Analysis and Realizability of the Supercritical Carbon Dioxide Ericsson Cycle

Day 2: Aug 10 (online)

2-C5 (IC 03/610) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/62241076695>

Session Name: Clean energy conversion technology

Session Chair: Zhiguo Qu

Time	Paper ID	Author	Paper Title
13:00-13:15	584	Yuqi Zhang, Wenzhi Cui, Longjian Li, Chen Zhan, Fei Xiao, Xiaojun Quan	Comprehensive effect of the pore size and thickness of aligned porous electrode on hydrogen evolution reaction
13:15-13:30	434	Goel Sanket, VANMATHI S, JAYAPIRIYA U S	Miniaturized 3D Printed Carbon Cloth-Based Hydrogen Fuel Cell
13:30-13:45	284	Xicong Mi, Xusheng Wang, Catalina Spataru, Xiaojing Lv, Yiwu Weng	Hydrogen Production Characteristic of Diesel Reforming under Ship SOFC-GT Operation Environment
13:45-14:00	108	Zaoxiao Zhang, Leilei Guo, Fusheng Yang, Jiaxuan Liu	Dynamic analysis of a thermal coupling fuel cell system and metal hydride tank with parallel PID controllers
14:00-14:15	340	Hui Wang, zelin wang, junqiang bai, jihong zhu, weihong zhang	Topology optimization of fuel cell cooling channel in proton exchange membrane fuel cell
14:15-14:30	17	Taiheng Zhang, Hongbin Zhao	Thermodynamic analysis of a new hybrid system combined power and heat integrated solid oxide fuel cell, gas turbine, Rankine steam cycle with compressed air energy storage
14:30-14:45	28	Zhuo Zhang, Fan Bai, Pu He, Wenquan Tao	Investigation of a novel cathode flow field of proton exchange membrane fuel cell
14:45-15:00	98	Yutaro Akimoto, Shin-nosuke Suzuki, Keiichi Okajima	Evaluation of current intensity distribution of PEMFC based on 4-points magnetic field measurement

2-D5 (IC 03/606) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61257114207>

Session Name: Mitigation technology and energy storage

Session Chair: Zaoxiao Zhang

Time	Paper ID	Author	Paper Title
13:00-13:15	10	Kai Luo, Zhongze Bai, Xi Zhuo Jiang	The effects of oxygen on the performance of NO reduction by HCN
13:15-13:30	24	Jing Wang, Xi Zhuo Jiang	Effects of Methane on Ammonia Combustion in Air: A ReaxFF Molecular Dynamics Study
13:30-13:45	186	Zhijun Li, Zhiyang Su, Miansong Yang, Xuebao Wang, Shilong Li	How NOx spills over to the Pt in proximity of Ba on γ -Al ₂ O ₃ (100)
13:45-14:00	224	xingyu liang, Bowen Zhao, Tengting Li	Impact of fuel cetane number on physical characteristics of marine auxiliary diesel engine soot particles
14:00-14:15	400	Bolun Yang, Suitao Qi, Chunhai Yi, Guangxu Cheng, Xiao Tan	Rh-based catalysts supported by reduced state nanocage Mn _x Fe _{1-x} O for low-temperature efficient direct decomposition of NO
14:15-14:30	235	Bo Xu, Wanyuan Shi	Influence of CuCl ₂ on the anti-SO ₂ performance of FeOCl
14:30-14:45	264	Tao Liu, Yiqiang Li, Han Cao	Study on CO ₂ huff and puff production mechanism and limit action distance of tight reservoir
14:45-15:00	530	Han Cao, Yiqiang Li, Tao Liu	Experimental Investigation On Nano Thermal Insulator Assisted Steam Flooding For Enhanced Heavy Oil Recovery

2-E5 (IC 03/112) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/68901734156>

Session Name: Energy Sciences

Session Chair: Xiao-Sen Li, Yi Wang

Time	Paper ID	Author	Paper Title
13:00-13:15	48	Mingjun Yang, Yongchen Song, Shuang Dong, Jia-nan Zheng	Effect of Deposit Heat Transfer on Natural Gas Hydrate Exploitation by Depressurization
13:15-13:30	82	Praveen Linga, Junjie Zheng, Zheng Liu	Experimental investigation on the formation and dissociation behaviors of methane hydrates in clayey-sandy sediments
13:30-13:45	104	Xiang Sun, Chenyi Zhang, Tingting Luo, Jinhan Xu, Suning Zhang, Ao Li, Haorui Jiang, Huimin Jin, Yu Zhang	Experimental study on the effects of temperature on the mechanical behaviours of CO ₂ hydrate-bearing sediments
13:45-14:00	109	Praveen Linga, Ye Zhang, Gaurav Bhattacharjee, Huanzhi Xu	Efficient energy storage at elevated temperatures enabled by an environmentally benign promoter
14:00-14:15	463	Yan Xie, Jing-Chun Feng, Mingrui zhang, Liwei sun, Yanyan Huang, Pian Li, Junwen Wang, Zhenwu Zhou	CH ₄ Hydrate Formation on the Surface of a Gas Bubble in Simulated Deep Water Environment with Different Depth
14:15-14:30	176	Bo Li, Wen-Na Wei, Ting-Ting Zhang, Jun-Hao Zhou, Xiang-Zhen Meng	Experimental study on Characteristics of Heat Transfer and Methane Hydrate Dissociation Based on Thermal Stimulation Modes
14:30-14:45	469	Guangjin Chen, Changyu Sun, Yan Xie, Yujie Zhu, Jing-Chun Feng, Tao Zheng	Competitive Domination between SDS Concentration and Driving Force in Promote CH ₄ Hydrate Formation

Day 2: Aug 10 (online)

14:45-15:00	206	Mingjun Yang, Yongchen Song, Guojun Zhao, Jia-nan Zheng	Experimental Verification of Manmade Gas Hydrate Reservoir System for Sub-seabed CO2 Sequestration
-------------	-----	---	--

2-F5 (ID 04/445) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61481845586>

Session Name: Energy Sciences

Session Chair: Shixue Wang, Mu Du

Time	Paper ID	Author	Paper Title
13:00-13:15	302	Chunmei Wu, Junfeng Shen	Molecular Insight of Droplet Spontaneous Dewetting Transition During Condensation Process on the Nanostructure Surface
13:15-13:30	305	Chunmei Wu, Zhiwei Fang	Investigation on the fluid dynamics and energy transport during continuous sessile droplet condensation
13:30-13:45	350	Xiuwei Liu, Shiqing Cheng, Dengke Shi, Dingning Cai, Fuguo Yin, Dawei Liu	Numerical Simulation of Fractured Enhanced Geothermal System Based on Projection-Based Embedded Discrete Fracture Model
13:45-14:00	435	Xinyu Zhang, Mengrong CHEN	NUMERICAL SIMULATION OF SPRAY COOLING WITH FLASH EVAPORATION
14:00-14:15	506	Minghan Xu	Experimental and Analytical Investigations of Ice Slurry Production Using Spray Freezing
14:15-14:30	513	Yulong Zhao, Mingjie Lu, Liyao Xie, Guoyin Zhang, Minghui Ge, Yanzhe Li	Experimental study of intermediate fluid thermoelectric generator (IFTEG)
14:30-14:45	534	Adekunle Adelaja, Okwesilieze Uwadoka, Olanrewaju Noah, Opeyemi Fadipe	Numerical Investigation of Heat Transfer and Pressure Drop Characteristics of Mango Bark-CO2 Nanofluid in inclined Gas Cooling Process
14:45-15:00	577	Lin Feng, Wanyuan Shi, Ji-Long Zhu	How is the Leidenfrost droplet affected by the Bénard-Marangoni cells in a heated liquid pool

2-G5 (IC 03/649) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/67271615083>

Session Name: Energy Sciences

Session Chair: Erik Dahlquist

Time	Paper ID	Author	Paper Title
13:00-13:15	316	Wei Wu, Sui Zengguang	Next-generation low-pressure-drop and high-compactness heat exchanger development for absorption cooling systems
13:15-13:30	283	Chao Ye, Wanlong Jin, Debo Li, Zhihao Chen, Zhaoli Chen, Yongxin Feng	Numerical Study on Thermal-Hydraulic Performance of Airfoil Fin Printed Circuit Heat Exchanger with Different Channel Height
13:30-13:45	11	Ziyi Qiang, Runkeng Liu, Peilin Cui, Zhenyu Liu	Geometry Effect on Voltage Generation from Capillary Driven Water Evaporation in Carbon Black Film
13:45-14:00	94	Li Zhao, Xianhua Nie, Juan Xue	Molecular dynamics investigation on second-derivative thermophysical properties of the quaternary mixed working fluid for supercritical CO2 Brayton cycle
14:00-14:15	280	Tao Huang, Linsong Cheng	Molecular simulation of gas-water competitive adsorption in shale reservoirs
14:15-14:30	296	Rukuan Chai, Yuetian Liu, Zhenhua Rui, Hongbo Zeng	Mechanisms of Mg ²⁺ -SO ₄ ²⁻ -Acidic/Basic Oil Molecules-Calcite Interaction: AFM and DFT studies
14:30-14:45	299	Fan Zhang, Jia-Jia Yu, Gu-Yuan Li	Dynamic Flow Rate Tuning of Nematic Liquid Crystal in Straight Microchannel via Horizontal Temperature Gradient
14:45-15:00	553	Adekunle Adelaja, Olabode Olakoyejo, Sogo Mayokun Abolarin, Samuel Omosehin, Omotayo Oluwatusin, Manasseh Oyekeye	Numerical Study of the Thermal-Hydraulic Performance of Water-Based Al ₂ O ₃ - Cu Hybrid Nanofluids in a Double-Layer Microchannel Heat Sink

2-H5 (IC 03/134) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/64645611465>

Session Name: Energy Sciences

Session Chair: Wandong Zheng

Time	Paper ID	Author	Paper Title
13:00-13:15	331	Hongyu Huang, Lisheng Deng, Zhaohong He, Qiwei Li, Jun Li	Effect of the channel length on adsorption and desorption performances of SBA-15
13:15-13:30	472	Xun Zhu, Qiang Liao, Yun Huang, Ao Xia, Xianqing Zhu, Yiming Lai, Mian Xu	Green production of lignin nanoparticles for high-performance supercapacitor through deep eutectic solvent fractionation of wheat straw
13:30-13:45	53	Jia-Jia Yu, wenpeng Li, Xingrong Xu, Qi Liu, Peng Liang, Junjie Xia	Direct numerical simulations of natural convection in a vertical open cavity with suspending heat sources
13:45-14:00	78	Guang Yang, Hai Wang	A fast and elaborate simulation method for complex chilled water distribution system
14:00-14:15	119	Jingwen Yan, Donghao Jin, Xin Liu, Chaoqun Zhang, Chi Li, Xinying Li, Jia Wei, Jing Fu, Heyang Wang, Gang Liu	Coupled combustion and hydrodynamics model for the prediction of tube temperature of heating surface of supercritical boiler
14:15-14:30	136	Shengchun Liu, Baomin Dai, Minghui Wang, Qilong Wang, Ziang Kong, Qi Wang, Peng Xiao, Yuetong Sun	Energetic and life cycle economic assessment of air source CO2 heat pump for space heating integrated with DMS utilizing zeotropic mixture

Day 2: Aug 10 (online)

14:30-14:45	161	Kian Jon Chua, T.D. Bui, Vivekh Prabakaran, Md Raisul Islam, weidong chen, Dan Zhao	High-Performance Flat-sheet Membrane Dehumidifier
14:45-15:00	261	Chunlu Zhang, Yujia He, Nassim Fakrouche	Evaluation of the effect of the internal heat exchanger positioning onto the transcritical carbon dioxide booster system
2-15 (IC 03/448) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/65648664888 Session Name: Energy Storage Systems Session Chair: Xiaohu Yang, YEE TING LEE			
Time	Paper ID	Author	Paper Title
13:00-13:15	248	An-Shik Yang, Dian-Heng Xie, YEE TING LEE, Liang-Han Chien, Pei-Cih Jiang	Characterization of Melting Process of PCM in Cold Thermal Energy Storage Tanks with Varied Fin Configurations
13:15-13:30	269	xianglei liu, Changjian Yuan	Li2CO3-doped dark calcium carbonate pellets for direct solar energy capture and fast heat storage
13:30-13:45	406	Hongyu Huang, Lisheng Deng, Jun Li, Linfa Xiao	Nano-porous Carbon Supported Magnesium Hydroxide for Thermochemical Heat Storage Performance Enhancement
13:45-14:00	438	Muditha Abeysekera, Hector Bastida, Carlos E. Ugalde-Loo, Yue Zhou, Daniel Alejandro Morales Sandoval, Pranaynil Saikia, Iván de la Cruz Loredó	Optimal Operation of a Public Health Facility considering Energy Storage Retrofits
14:00-14:15	455	Ji Zhang, Zhi Cao, Sheng Huang, Xiaohui Huang, Yan Yang, Chuang Wen	Solidification performance improvement of phase change material for latent heat thermal energy storage using novel branch-structured fins and nanoparticles
14:15-14:30	594	Xinyu Huang, Xiaohu Yang	Investigation and optimization of melting performance of a triplex-tube latent heat thermal energy storage system by rotational mechanism
14:30-14:45	81	Chongwei Wang, Tingxiang Jin	Biomass-based PCM from daisy stem and paraffin for building thermal management
14:45-15:00	164	Xinli Lu, Wei Zhang, Hao Yu, Feng Ma, Fei MA, Tianji Zhu, yalin Zhang, wen yue, Shuhui Li, Jiali Liu	Experimental study on the thermal energy storage characteristics of a cascaded latent heat thermal energy storage system
2-J5 (IC 03/447) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/67751503672 Session Name: Clean energy conversion technology Session Chair: Chuang Wen, Hongbing Ding			
Time	Paper ID	Author	Paper Title
13:00-13:15	244	Cosmin Dumitrescu, Christopher Ulishney, Jinlong Liu	On the Conversion of Diesel Engines to Dedicated Ammonia: Lean, Stoichiometric or Rich Operation
13:15-13:30	336	Ock Taeck Lim, Bernike Febriana Samosir	Prediction of Selective Catalytic Reduction (SCR) of NOx Emissions in Diesel Engine using Deep Neural Network (DNN) Model
13:30-13:45	561	Yitong Xie, Chaokui Qin, Shuangqian Guo	The Influence of Hydrogen Injection into Natural Gas Networks on Gas Appliances
13:45-14:00	337	OckTaeck Lim, Duy Nguyen	An Experiment Study on Spray and Combustion Characteristics of Gasoline-Biodiesel Blends Under GCI Conditions in a Constant Volume Combustion Chamber
14:00-14:15	499	Danan Chen, Jun Li*, Xing Li, Yijun Guo, Hongyu Huang, Noriyuki Kobayashi	Effects of H2 addition on the OH* chemiluminescence of NH3/air swirl flame
14:15-14:30	468	Agustin Valera-Medina, HUA XIAO, Syed Mashruk, Zhenwei Zhou, Jun LI, Shuqi Wu, Yanze Guo, Aiguo Chen, You Gong, Mi Yang	Effects of Carbon Dioxide on Combustion of Methane/Hydrogen in a Swirl Combustor
14:30-14:45	396	Jaehee Jeong, Ocktaeck Lim	A Study on the Plunger type High Pressure pump for DME Engine
14:45-15:00	397	Tata Sutardi, Chatphol Meesri, Dwika Budianto, Cahyadi, Rendi Januardi, Ilham Arnif, Indah Sakina, Nur Endah, Yustika Agustin, Wiwie Chaeruni	Performance test on the effect of conditioned fuel with magnetic radiation into 30 kVA Diesel Engine
15:00 - 15:30	TEA/COFFEE BREAK		
2-F6 (ID 04/445) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/61481845586 Session Name: Clean energy conversion technology Session Chair: Li Zhao			
Time	Paper ID	Author	Paper Title
15:30-15:45	87	Tian You, Fang Wang	Environmental analyses on the ground source heat pump using various low-GWP refrigerants
15:45-16:00	132	Wenji Song, Ziping Feng, Yafei Hu, Jiayao Tian, Chong Huang	Research on part-load performance of air source gas engine-driven heat pump system for cooling application
16:00-16:15	147	Haiyan Lei, Chuanshan Dai, Haobo Fang, Yonghui Miao, Yuanhong Tong	Numerical Simulation of the Effect of aquifer permeability on the heat output of an open loop geothermal single well system

Day 2: Aug 10 (online)

16:15-16:30	281	Haiyan Lei, Chuanshan Dai, Wanjing Hou	Optimal design and operation of a geothermal district heating system using deep downhole heat exchanger and heat pump
16:30-16:45	371	Xiaoxuan Chen, Zhen Li, Hongqing Ding	A new structure and its model of the data center waste heat recovery system
16:45-17:00	529	Christian Vering, Dirk Müller, Stephan Göbel, André Wachau, Daniel Mock, Ralf Noack, Andreas Zottl	How to calibrate heat pump test stands for load-based testing – towards technology-neutral prescriptions
17:00-17:15	36	Zhanghua Wu, Ercang Luo, Limin Zhang, Yiwei Hu, Geng Chen, Jingyuan Xu, Kaiqi Luo	A heat-driven thermoacoustic heat pump with a single direct-coupling configuration capable of utilizing medium/low-grade heat for domestic applications
17:15-17:30	476	Qing Su, Peng Zhou	How does the government promote the transition towards multi-energy complementary of power enterprises? An evolutionary game analysis

2-G6 (IC 03/649) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/67271615083>

Session Name: Clean energy conversion technology

Session Chair: Li Chen

Time	Paper ID	Author	Paper Title
15:30-15:45	130	Shuai Deng, Meng Lin, Lei Zhao	Bulk vs. Surface Phenomena in Reacting Materials for Solar Thermochemical Fuel Generation
15:45-16:00	138	Yinglun Tang, Xiaotao Yang, Wenjia Li*	Improvement of mass transfer on anode side of anion exchange membrane water electrolyzer by ordered hydrophilic/hydrophobic structure
16:00-16:15	174	Yunesky Masip Macia, Roberto Carmona, Ricardo Miranda, Angel Rodríguez Soto, Pablo Rodríguez, René Garrido, Daniel Serafini, Marcelo Mena	Assessment of the green hydrogen chain value for port operations: A case of study in Chile
16:15-16:30	192	Zaoxiao Zhang, Leilei Guo, Jing Yao, Huan Wang	Design of fuel cell system integrated with solid-state hydrogen source to achieve high energy density for portable applications
16:30-16:45	255	Ben Chong, He Li, Guidong Yang	Ball-in-ball structured phosphorus-oxygen incorporated cobalt sulfide electrocatalyst with layer-stacked morphology for overall water splitting
16:45-17:00	301	Zhiguo Qu, Jian-Fei Zhang, Guobin Zhang, Jianlin Fu	A Three-dimensional Multiphase Non-isothermal Model Based Parametric Sensitivity Analysis of Proton Exchange Membrane Electrolyzer
17:00-17:15	418	Bosheng Su, Shenghua Huang, Yilin Wang, Zhilong Xu	Hydrogen production based on methane co-reforming integrated with carbon capture
17:15-17:30	503	Silvia Crosa, Eleonora Gadducci, Massimo Rivarolo, Loredana Magistri, Aristide Fausto Massardo	Validation of voltage degradation coefficients for 30 kW PEM Fuel Cell stacks

2-H6 (IC 03/134) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/64645611465>

Session Name: Mitigation technology and energy storage

Session Chair: Xiaoyan Ji

Time	Paper ID	Author	Paper Title
15:30-15:45	272	Jiang Lili, Tian Leng, Can Huang, Jiaxin Wang, Zechuan Wang, Hengli Wang	A determination method of CO ₂ -oil miscible state in the heterogeneous low-permeability reservoir
15:45-16:00	342	Zaoxiao Zhang, Hongxia Wang, Xiaomei Wu, FAN Huifeng, MAO Yuanhao	Electrochemical characteristics of copper ions in electrochemically-mediated amine regeneration CO ₂ capture
16:00-16:15	378	Matia Riemer, Vicki Duscha	Carbon Capture in Hydrogen Production - Review of Modelling Assumptions
16:15-16:30	409	Atmanandmaya, Umanand Loganathan, Subba Reddy B	Sustainable Solution to Mitigate Carbon Emission for the Cumulative Electrical and Thermal Energy Demand in Silk Reeling Process in Southern India
16:30-16:45	426	Linsong Cheng, Zhihao Jia, Baobiao Pu, Yongchao Xue	Study On the Influence of Different Ratios of CO ₂ and N ₂ on Extra-Heavy Oil Reservoirs Developed by Multi-Thermal-Fluid Huff-Puff
16:45-17:00	187	Xiangyu Yan, Buchu Lu, Qibin Liu	Experimental study of solar-driven CO ₂ photo-thermochemical CH ₄ reforming for fuel production
17:00-17:15	444	Zemeng Wang, Xiaonan Wang	Machine learning boosts CO ₂ capture: Review and Perspectives
17:15-17:30	236	Juli Ayu Ningtyas, Aejin Lee, Junaid Haider, Yus Donald Chaniago* and Hankwon Lim*	Integration of post-combustion CO ₂ capture using methanol as the solvent and H ₂ gas stripping to methanol synthesis process

2-I6 (IC 03/448) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/65648664888>

Session Name: Energy Sciences

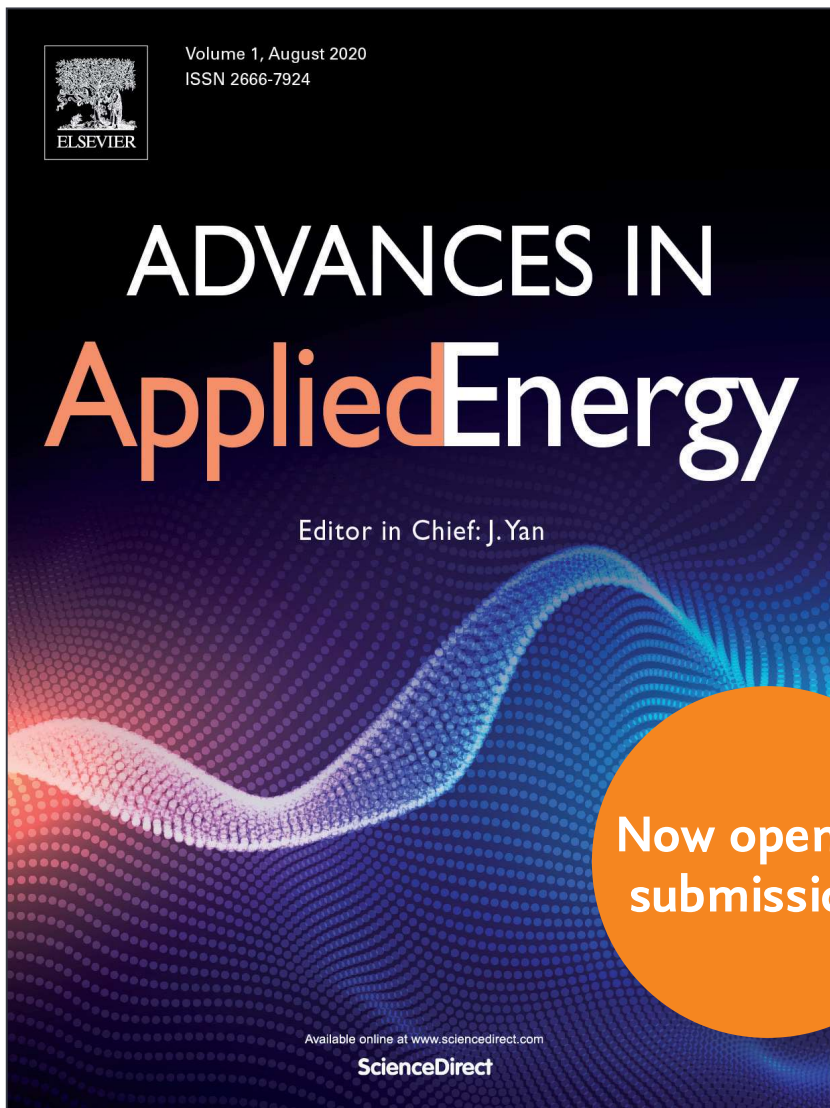
Session Chair: Guosheng Jia

Time	Paper ID	Author	Paper Title
15:30-15:45	13	Fan Zhang, Lan Peng, You-Rong Li	Experimental investigation of temperature distribution near the evaporating interface in a cylindrical pool at low pressures

Day 2: Aug 10 (online)

15:45-16:00	31	Guang Yang, Hai Wang, Youfu Wu	Improvement of Mathematical Model and Coefficients Identification of Adjustable Jet Pumps
16:00-16:15	42	T.B. Duc, W Pang, G Cheng, Dong Chen Wei	Development and Performance of a Compact Counter-Flow M-cycle Cooler for Tropics
16:15-16:30	80	Defu Che, Lei Deng, Bing Bai, Hu Liu, Jingwen Xue, Pengcheng Wang	Numerical Simulation on Two-Phase Flow Patterns for Water Boiling in Horizontal Heated Tubes
16:30-16:45	123	Hao Ma, Wanyuan Shi	Spontaneous continuous jumping of condensate droplets on superhydrophobic surface
16:45-17:00	133	Peng Qian, Minghou Liu, Chang Liu, Wenjing Zhang	Research on heat dissipation characteristics of combined surface strengthening and jet impingement under non-uniform heat flux
17:00-17:15	143	Zaoxiao Zhang, Leilei Guo, Fusheng Yang, Leilei Guo	A multi-stage cooling metal hydride reactor for hydrogen separation and purification
17:15-17:30	146	Xiaoxiao Xu Xiaoxiao Xu, Xiaoxiao Li, Jinxiao Zhou	Numerical Study of the Transient Cooling Heat Transfer Performance of Supercritical CO ₂
2-J6 (IC 03/447) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/67751503672 Session Name: Energy Sciences Session Chair: Tariq Shamim			
Time	Paper ID	Author	Paper Title
15:30-15:45	173	Siyu Qin, Ruiyang Ji, Changming Yang, Zixiang Tong, Chun Yang, Xiangzhao Meng	Investigation of heat transfer enhancement in a confined two-phase closed thermosyphon
15:45-16:00	175	Xin-Yao He, Lin Feng*, Wan-Yuan Shi*	Migration of Condensed Droplets Driven by Non-uniform Magnetic Field
16:00-16:15	182	Yuji Nakamura, Takuya Yamazaki, Haruya Yata, Daiki Matsugi, Erika Tomita	Structure of Solid-Gas Hybrid Flames
16:15-16:30	250	Hanwen Cao	Experimental study on pressure drop and effect of diameter-enlarged section in two-phase loop thermosyphon
16:30-16:45	277	Lin Ding, Yue Sun, Yu Liu, Tian Gao, Pengcheng Liao	Flow-induced Vibration and Heat Transfer Characteristics of Two Cylinders with constraint
16:45-17:00	286	Ivan CK Tam, WE Lin Chan, Arun Kr Dev	Case Studies of Single Nitrogen Expander Liquefaction for FLNG
17:00-17:15	297	Lin Ding, Yue Sun, Dong Liu	Flow-induced Vibration and Heat Transfer Characteristics of Triangular Arranged Heat Exchange Tubes
17:15-17:30	298	Lin Ding, Yue Sun, Zuomei Yang	Effect of Upstream Stationary Cylinder on Heat Transfer and Flow-Induced Vibration of Downstream Staggered Cylinder
2-K6 (IC 03/444) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/67677675276 Session Name: Intelligent energy system Session Chair: Soowon Chang			
Time	Paper ID	Author	Paper Title
15:30-15:45	359	Sarula Chen, Tianxin Chang, Yang yang	Preliminary Experimental Study on the Thermal and Energy-saving Performances of a Modular Thermo-activated Wall
15:45-16:00	576	Xianya He, Jingzhi Huang, Zekun Liu, Nianyuan Wu, Rui Jing, Jian Lin, Yingru Zhao*	Topology optimization of TABS system in high-rise building based on genetic algorithm
16:00-16:15	32	Guang Yang, Hai Wang, Dinghuang Xing	Pipeline Block Localization in Water Distribution Networks Using Artificial Neural Network
16:15-16:30	212	Daniel Zinsmeister, Vedran Peri	Implementation of a Digital Twin of the CoSES District Heating Prosumer Laboratory
16:30-16:45	383	Huan Zhang, Wandong Zheng, Ye Li	Optimization of distributed multi-energy complementary energy system for low-carbon community
16:45-17:00	445	Wenquan Tao, Li Chen, Yi Yuan, Xingbao Lv	Modelling and Optimization of Residential Combined Heat and Power System with Proton Exchange Membrane Fuel Cells
17:00-17:15	533	Nima Monghasemi, Stavros Vouros, Konstantinos Kyprianidis, Amir Vadiee	A non-linear grey-box model of buildings connected to district heating systems
17:15-17:30	575	Lin Fan, Huai Su, Shiliang Peng, Li Zhang, Jinjun Zhang	Joint Optimization of Preventive Maintenance and Spare Parts Inventory for Gas Compressor in Pipeline System

Advances in Applied Energy



A brand new,
peer-reviewed
open access
journal.

Editor-in-Chief:

Jinyue Yan

*Royal Institute of Technology and
Mälardalen University, Sweden*

Now open for
submissions

 @ElsevierEnergy

 Elsevier Energy



Find out more and submit
your manuscript online:
elsevier.com/locate/adapen



Day 3: Aug 11 (on site)

3-A8 (Room IC 04/410) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61942737512>

Session Name: Energy Management, Policy, Economics and Sustainability - Business Models and Market Mechanisms

Session Chair: Franziska Hoffart, Filippo Guidi

Time	Paper ID	Author	Paper Title
10:15-10:35	149	Rui Qiu, Haoran Zhang, Yongtu Liang, Jinyue Yan	Green Hydrogen-based Energy Storage as a Service: Energy, Economic and Environmental Analysis
10:35-10:55	537	Joel Rogawski, Reinhard Madlener	Cost Optimization Model and Management Strategies for Distributed Energy Resources in Industrial Microgrids
10:55-11:15	163	Natalia Restrepo, Jorge M. Uribe	Cash Flow Investment and Capital Structure in Large US Energy Firms: 1988-2020
11:15-11:35	288	Christoph Gärtner, Elias Röger, Till Heller	An optimal bidding model to market flexibility on the balancing electricity markets
11:35-11:55	425	Gianvito Colucci, Matteo Nicoli, Daniele Lerede, Laura Savoldi	Dynamic accounting for end-use CO2 emissions from low-carbon fuels in energy system optimization models

3-B8 (Room IC 04/408) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/65531711752>

Session Name: Mitigation Technologies - Carbon Capture and Storage

Session Chair: Ulf Apfel, Beibei Dong

Time	Paper ID	Author	Paper Title
10:15-10:35	493	Daniel Mullen, Prof Mathieu Lucquiaud	Zero Carbon Electricity with CCS: A Techno-Economic Analysis of Combined Cycle Gas Turbines
10:35-10:55	479	Antoine Verhaeghe, Lionel Dubois, Laurent Bricteux, Diane Thomas, Ward De Paepe	Absorption-based carbon capture energy penalty reduction for micro gas turbine applications: investigation of advanced carbon capture configurations
10:55-11:15	376	J. Janicka, P. Debiagi, A. Scholtissek, A. Dreizler, B. Epple, R. Pawellek, A. Maltsev, C. Hasse	The potential of retrofitting existing coal power plants for operation with green iron: a case study

3-C8 (Room IC 03/610) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/62241076695>

Session Name: Energy Storage - Battery and Chemical Storage

Session Chair: Julia Riese, Rasmus Juhlin

Time	Paper ID	Author	Paper Title
10:15-10:35	165	Maite Etxandi-Santolaya, Lluc Canals Casals, Cristina Corchero	Redefining the EV Battery End of Life: Internal Resistance Related Limitations
10:35-10:55	436	Prerna Sinha, Kamal K. Kar	Ni-Co oxide anchored carbon dots for high-performance asymmetric supercapacitor
10:55-11:15	65	Pascal Koschwitz, Daria Bellotti, Cheng Liang, Bernd Epple	Dynamic simulation of a novel small-scale power to ammonia concept
11:15-11:35	520	Masoume Shabani, Fredrik Wallin, Erik Dahlquist, Jinyue Ya	Techno-economic viability of battery storage for price arbitrage under dynamic pricing tariffs in grid-connected residential building

3-D8 (Room IC 03/606) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61257114207>

Session Name: Clean Energy Conversion Technology - Air Conditioning and Refrigeration - Systems

Session Chair: Monika Thol, Robin Beckmüller

Time	Paper ID	Author	Paper Title
10:15-10:35	90	Tze Yeung Cho, Jingyuan Xu*, Ercang Luo, Simone Hochgreb	A thermoacoustic refrigerator with a compact thermal buffer tube
10:35-10:55	502	Xiaosong cheng, Thomas Meyer, Cristina Ricart, Meinard Gimm, Felix Ziegler, Yonggao Yin	Comparison study of the pre-cooled and internally cooled liquid desiccant systems with different working fluids
10:55-11:15	587	Ma Xiaochen, Shi Wenchao, Yang Hongxing	Development of a wettability combined CFD model of indirect evaporative cooler with spray and water film optimization
11:15-11:35	2	Adrián Mota Babiloni, Ali Khaled Shaker Al-Sayyab, Ángel Barragán Cervera, Pau Giménez Prades, Adrián Fernández Moreno, Joaquín Navarro Esbrí	Experimental Assessment of the Internal Heat Exchanger in Vapour Compression Systems with Low GWP refrigerant R516A
11:35-11:55	394	Nan Zhang, Yiji Lu, Sambhaji Kadam, Zhibin Yu	Numerical analysis of the heat pump assisted integrated thermal management for fuel cell back up battery electric vehicles

3-A9 (Room IC 04/410) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61942737512>

Session Name: Energy Management, Policy, Economics and Sustainability - Algorithms and System Analysis

Session Chair: Sophie Pathe, Kamini Singh

Time	Paper ID	Author	Paper Title
13:00-13:20	449	Jakob Boehm, Christian Doetsch	First Assessment of the Resilience of a Generic Residential Quarter using Five Levels of Energy Supply

Day 3: Aug 11 (on site)

13:20-13:40	386	Ramin Bahmani, Christine van Stiphoudt, Mohammad Ansarin, Gilbert Fridgen	Energy flexibility scheduling optimization considering aggregated and non-aggregated industrial electrical loads
3-B9 (Room IC 04/408) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/65531711752 Session Name: Mitigation Technologies - Negative Emissions Session Chair: Matthias Körber, Franziska Hoffart			
Time	Paper ID	Author	Paper Title
13:00-13:20	96	Zhuang Sun, Muhammad Aziz	Methanol production through solar-assisted biomass direct chemical looping gasification: negative carbon emission scenario
13:20-13:40	612	Beibei Dong, Shuo Wang, Qie Sun, Jan Skvaril, Eva Thorin, Hailong Li	Aggregated Negative Emission from Biomass Fired CHP Plants in Sweden
3-C9 (Room IC 03/610) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/62241076695 Session Name: Energy Management, Policy, Economics and Sustainability - Economic and Life-Cycle Assessments Session Chair: Michael Roos, Natalia Restrepo			
Time	Paper ID	Author	Paper Title
13:00-13:20	402	Kamini Singh, Anoop Singh	Building Blocks of Peer-to-Peer Energy Trading in a Smart Grid
13:20-13:40	291	Yan Li, Saige Wang, Bin Chen, Dan Song	Urban land use optimization for efficient carbon metabolism
3-D9 (Room IC 03/606) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/61257114207 Session Name: Transformation Processes - Power Session Chair: Valentin Bertsch, Ieva Pakere			
Time	Paper ID	Author	Paper Title
13:00-13:20	3	Dieudonné Ecike Ewanga, Damien Ernst	Enhancing power reliability using microgrids
13:20-13:40	501	Alaa Krayem, Fredrik Wallin	Impact of Spatial Aggregation on Electricity Profiles
13:40-14:00	200	Phu Thuc Pham	Impacts of the Energy Transition on CO2 emission from conventional coal-fired power plants
3-E9 (Room IC 03/112) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/68901734156 Session Name: Intelligent Energy Systems - energy conservation in buildings Session Chair: Xianming Ye, Jingwen Weng			
Time	Paper ID	Author	Paper Title
13:00-13:20	421	Michel Gross, Lisa Altieri, Tobias Reiners, Valentin Bertsch	Mine water utilisation for climate-friendly heat supply in residential and commercial buildings with ultra-low temperature heating networks
13:20-13:40	494	Chiaria Anfosso, Lorenzo Gini, Daria Bellotti, Loredana Magistri	Dynamic model validation of an innovative NIR-solar façade panels-based integrated system
14:00-14:10	Short Break		
14:10 - 14:40	Keynote Prof. Eric May Hydrogen Exports: can the promise become reality?		
14:40 - 15:10	Keynote Prof. Yi-Ming Wie Uncertainties of Approaching China's Carbon Neutrality Targets		

Day 3: Aug 11 (online)

3-A7 (Room IC 04/410) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61942737512>

Session Name: Renewable Energy

Session Chair: Tao Ma

Time	Paper ID	Author	Paper Title
8:30 - 8:45	125	Nor Hazlina Md Khairi, Yutaro Akimoto, Keiichi Okajima	Exploiting Rooftop Solar Photovoltaic Production At Educational Building In Malaysia
8:45 - 9:00	181	Takuro Kobashi, Paul Deroubaix, Léna Gurriaran, Fouzi Benkhelifa, Philippe Ciais, Katsumasa Tanaka	Solarev City Concept In Paris And Ile-de-France: A Promising Idea?
9:00 - 9:15	274	Wei Wu, Fuxiang Li	A High-Resolution Approach For Performance Estimation Of Photovoltaics Under Partial Shaded Conditions
9:15 - 9:30	415	Linux Farungsang, Alvin Christopher G. Varquez, and Tokimatsu Koji	Assessment Of Rooftop Solar Photovoltaic Potential Based On Machine Learning And GIS Spatial Analysis In Bangkok, Thailand
9:30 - 9:45	391	Yi-Xian Yan, Chang Huang, Wei-Liang Wang, Qi Zhang	A Coupling Model Of Solar Irradiance And BP Neural Network For Photovoltaic Power Forecasting

3-B7 (Room IC 04/408) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/65531711752>

Session Name: Renewable Energy

Session Chair: Jinqing Peng

Time	Paper ID	Author	Paper Title
8:30 - 8:45	83	Derek Ingham, Lin Ma, Mohamed Pourkashanian, Stavros Michailos, Ismail AL-Arifi, Kevin Hughes, Mohammed Alfailakawi	Performance Improvement Of Aerosols Impacted Concentrated Solar Power In Arid Regions: Case Study Of Solar Power Tower Hybridization With Wind Turbines In Kuwait
8:45 - 9:00	111	Jad Sunna, Emad Abdelsalam, Hamza Nawafa, Malek Alkasrawi	A Smart Hybrid Solar Chimney Power Plant
9:00 - 9:15	155	Jingyu Ran, Ziqi Wang, Zhongqing Yang, Ruiming Fang, Xiaolong Wu, Jiang He, Zuhra C Kadirova	Bi2MoO6 QDs In Situ Deposited Pomelo Peel-Derived Carbon Enhance Photothermal Catalytic CO ₂ Reduction In Full Solar Spectrum
9:15 - 9:30	252	Qiliang Wang, Zhicheng Shen, Yao Yao, Hongxing Yang*	Techno-economic Analysis Of The Novel Solar Power Towers With Unique Solar Selective Coatings Prescribed For The Negative Thermal-Flux Regions
9:30 - 9:45	352	Jad Sunna, Emad Abdelsalam, Hamza Nawafah, Malek Alkasrawi, Ali Muheidat	A Hybrid Solar Chimney Power Plant For Electricity Generation Al Ain Case Study

3-C7 (Room IC 03/610) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/62241076695>

Session Name: Energy Science

Session Chair: Haitao Zhao

Time	Paper ID	Author	Paper Title
8:30 - 8:45	596	Wei He, Zihan Cai, Shenchun Liu, Yabo Wang, Yulin Wang	Effect Of Exhaust Parameters On Optimal Structure Of Thermoelectric Generator With Different Circuit Layouts
8:45 - 9:00	27	Alireza Rezaniakolaei, Lasse Aistrup Rosendahl, Shaowei Qing, Xiaolong Gou, Shengli Tang, Xiankui Wen, Jingliang Zhong, Hengfeng Yuan, Shangkun Ren, Peng E	Design Of Partially Hollow PDMS Filler For High-Performance Flexible-Bulk Thermoelectric Generators
9:00 - 9:15	180	Ruihua Chen, Shuai Deng, Weicong Xu, Li Zhao, Ruikai Zhao	A Two-Dimensional Model For Continuous Thermally Regenerative Electrochemical Cycle For Low-Grade Heat Harvesting
9:15 - 9:30	465	Shixue Wang, Yu Zhu, Shenming Li	Experimental Investigation Of TEG Based Wet Flue Gas Waste Heat Recovery System Using Vertical Rectangular Gas Channel
9:30 - 9:45	38	Wei-Hsin Chen, Yen-kuan Lin	Effects Of Different Composition Ratio Alloys Without/With Equal-Segmented TEG On Thermoelectric Performance

3-D7 (Room IC 03/606) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61257114207>

Session Name: Energy Science

Session Chair: Pietro Bartocci

Time	Paper ID	Author	Paper Title
8:30 - 8:45	214	Dengke Shi, Shiqing Cheng, Fuguo Yin, Xiuwei Liu, Dawei Liu, Dingning Cai, Hongchao Tan	Adaptability Analysis Of Single-Well Water Injection-Production Under Different Well Patterns In Ultra-Low Permeability Reservoirs
8:45 - 9:00	282	Xiang Wei, Chun-Mei Wu, You-Rong Li	Solid-vapor Interfacial Thermal Conductance And Its Relationship With Cluster Evolution And Bond Strength
9:00 - 9:15	324	Hangpeng Jiang, Kun Wang, Dongping Chen	Modeling PAH Kinetics In JP-10 Combustion Chemistry Through Updated HYCHEM Approach
9:15 - 9:30	317	Jin Guan, Zongze He, Xiaojing Lv, Yiwu Weng	A Dual-Drive Approach For Modelling Heavy-Duty Gas Turbine Based On Field Data And Intelligent Genetic Algorithm

Day 3: Aug 11 (online)

9:30 - 9:45	84	Zihao Jia, Hailong Tang, Fangfei Ning, Min Chen	Research On The Automatic Control Method Of The Multi-Dimensional Gas Turbine Simulation
3-E7 (Room IC 03/112) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/68901734156 Session Name: Energy Storage Systems Session Chair: Quanqing Yu			
Time	Paper ID	Author	Paper Title
8:30 - 8:45	112	Hu Xu, Qingsong An	Study On Thermodynamic Parameters Of Liquid Air Energy Storage System Coupled With LNG
8:45 - 9:00	211	Maria F. Gaele, Clemente Capasso, Tonia M. Di Palma, Ottorino Veneri	Effect Analysis Of High Discharging Current Rates On Li-ion Cells
9:00 - 9:15	232	Yizhao Gao, Ziqiang Sun, Xi Zhang1	Development A Simplified Multi-Particle Model For LiFePO4 Lithium Ion Battery
9:15 - 9:30	399	Yiming Lai, Xianqing Zhu, Mian Xu, Jun Li, Xun Zhu, Qiang Liao	Recovery And Reutilization Of Anode Graphite Through Deep Eutectic Solvent Leaching From Spent Lithium-Ion Batteries
9:30 - 9:45	259	Rui Wang	Double-layer Graphite Felt Electrode Balanced Effective Reaction And Stable Transport For Flow Batteries
3-F7 (Room IC 04/445) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/61481845586 Session Name: Energy Science Session Chair: Jingchun Feng			
Time	Paper ID	Author	Paper Title
8:30 - 8:45	67	Xuan Kou, Yi Wang, Xiao-Sen Li	Secondary Hydrate Formation In Nature: Closing Carbon Cycles
8:45 - 9:00	241	Kun Wan, Yi Wang, Xiao-Sen Li	Experimental Study On Hydrate Decomposition By Symmetrical Well Pattern Through Depressurization Method
9:00 - 9:15	458	Yanyan Huang, Jingchun Feng , Yan Xie, Zhenwu Zhou, Junwen Wang, Pian Li, Mingrui Zhang, Liwei, Sun	Effect Of Ions On Methane Hydrate Phase Equilibrium In Deep-Water Environment Of "Haima" Cold Seep
9:15 - 9:30	195	Zhenyuan Yin, Xuejian Liu, Hailin Huang	Coupling L-Met And THF In Promoting CO ₂ Hydrate Kinetics And Its Significance On Hydrate-Based CO ₂ Storage
9:30 - 9:45	157	Xian Sun, Xiao-Hui Wang, Chang-Yu Sun*, Guang-Jin Chen	Experimental Study Of The Joint Gas Production From Hydrate Reservoirs With Underlying Gas
3-G7 (Room IC 03/649) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/67271615083 Session Name: Intelligent Energy Systems Session Chair: Qie Sun			
Time	Paper ID	Author	Paper Title
8:30 - 8:45	351	Yi Xie	Distributed Collaborative Optimization Of Integrated Energy System Based On Multi-Agent Game
8:45 - 9:00	454	Yinan Li, Xiaonan Wang	Design And Management Of A Day-Ahead Double Auction Energy Market Through Multi-Agent Reinforcement Learning
9:00 - 9:15	462	Mustafa Alparslan Zehir, Osman Tufan Dogan, Hakan Merdanoglu, Ertan Yakici, Serhan Duran, Hayri Can Akyildirim	EV-integrated Community Microgrid Scheduling Considering Distributed Generation, Non-flexible Load And Dynamic Pricing Uncertainties
9:15 - 9:30	515	Saurabh Ratra, R.C. Bansal, Derminder Singh, R. Naidoo	Improving Multi-objective Voltage Stability Problem By FACTS devices Placement Through Circular Optimization Algorithm
9:30 - 9:45	46	Wenjie Zhang, Chengchu Yan, Junjian Fang	Grid-Friendly Interaction Between Zero-energy Buildings And Grids: A Critical Review On The Performance Evaluation And Optimization
3-H7 (Room IC 03/134) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/64645611465 Session Name: Intelligent Energy Systems Session Chair: Shiyu Yang			
Time	Paper ID	Author	Paper Title
8:30 - 8:45	74	Xin Wen, Jun Zhao, Rendong Shen, Yang L	Multi-time-scale Scheduling Strategy For Regenerative Electric Heating System Based On Thermal Demand Response
8:45 - 9:00	141	Chengxu Zhu, Chaoxian Lv, Xiaotong Zhang, Wei Jin	Island Partition-Based Recovery Of AC/DC Hybrid Distribution Network With Coordination Of Multiple Sources
9:00 - 9:15	500	HU Wei, MA Kun, PAN Xiaojie, XU Youping, WANG yukun, ZHANG mujie, SHI mengxuan, LIAN xingwang	A Fast Evaluation Method Of Power Flow Rationality For Power System Operation Mode Based On Deep Belief Network
9:15 - 9:30	565	Emanuele Martelli, Vincenzo Dipierro, Michele Rossi, Riccardo malabarba	A MILP Model For The Design Optimization Of Energy Communities

Day 3: Aug 11 (online)

9:30 - 9:45	581	Pengfei Su, Yue Zhou, Jianzhong Wu	Multi-Objective Production Scheduling Of A Steel Plant With Electric Arc Furnaces
3-I7 (Room IC 03/448-410) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/65648664888 Session Name: Intelligent Energy Systems Session Chair: Yue Zhou			
Time	Paper ID	Author	Paper Title
8:30 - 8:45	439	Yanbei Liu, Xiaonan Wang	Blockchain Technologies For Decarbonization
8:45 - 9:00	395	Ahmed Taimoor, Fahad Javed, Asad Waqar Malik	Nonintrusive Load Monitoring (NILM) Using A LSTM With Socio Economic Parameters
9:00 - 9:15	289	Jiaxin Gao, Wenbo Hu, Dongxiao Zhang ³ , Yuntian Chen	TgDLF2.0: Theory-guided Deep-Learning For Electrical Load Forecasting Via Transformer And Transfer Learning
9:15 - 9:30	99	Li Zhu, Yixin Dong, Yong Sun	Optimal Capacity Configuration Of Wind-Photovoltaic-Thermal Pump-Storage Hybrid Power System Based On Parametric Techniques And Dynamic Evaluation
9:30 - 9:45	210	Zhaoying Wang, Jinchao Li, Han Li	Performance Analysis Of Interactive Cascade Ventilation Combined With Solar Energy For The Epidemic Prevention And Control
9:45 - 10:15	Tea/Coffee Break		
3-E8 (Room IC 03/112) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/68901734156 Session Name: Renewable Energy Session Chair: Erik Dahlquist			
Time	Paper ID	Author	Paper Title
10:15 - 10:30	484	Eliana Gaudino, Marilena Musto, Antonio Caldarelli, Daniela De Luca, Emiliano Di Gennaro, Roberto Russo	Efficiency Model For Performance Characterization Of High Vacuum Flat Plate Collectors
10:30 - 10:45	369	JINGYU RAN, Ziqi Wang, Zhongqing Yang, Ruiming Fang, Zukhra C Kadirova, Zhang Jiang	Co-doping Of Dioxide Atoms Of G-C3N4 To Enhance Photoreduction Of CO ₂ To Solar Fuel And Mechanism Investigation
10:45 - 11:00	433	Shang Liu, Meng Lin	Multiphysics Modeling Of Solar Interfacial Evaporation Devices
11:00 - 11:15	43	Abrar Hussain, Kuen-Song Lin*, Ndumiso Vukile Mdlovu, Yun Ko, Yung-Chen Hsieh	Preparation And Characterization Of Sulfated Zirconia Catalysts Admixed With A CuO-ZnO-ZrO ₂ Catalyst For CO ₂ Hydrogenation To Dimethyl Ether
11:15 - 11:30	234	Yun Ko, Kuen-Song Lin, Ndumiso Vukile Mdlovu, Abrar Hussain	Preparation And Characterization Of MIL-101(Cr) From Waste PET Bottles For CO ₂ Conversion Into Propylene Carbonate
11:30 - 11:45	574	Li Zhang, Huai Su, Karine Zeitouni, Laurent Yeh, Lin Fan, Luxin Jiang, Jinjun Zhang	Time Series Graph Feature-Based Method for Operation Pattern Recognition in Oil Pipeline System
11:45 - 12:00	423	Quach Nhu Y, Ocktaeck Lim	An investigation on effect of equivalence ratio for exhaust gas and temperature distribution on the metal plate
3-F8 (Room IC 04/445) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/61481845586 Session Name: Energy Management, Policy, Economics and Sustainability Session Chair: Wenlong Shang			
Time	Paper ID	Author	Paper Title
10:15 - 10:30	508	Nargessadat Emami, Reza Fazeli, Kevin Dillman, Jukka Heinonen	Technoeconomic Analysis Of Green Hydrogen In Iceland
10:30 - 10:45	516	Shaofang Xue, Ying Fan	Clustering Analysis Of Evolution Patterns Of Compositional National Energy Mix
10:45 - 11:00	60	Ai Xin, Chen Mian	Feasibility Analysis For Horizontal Wellbore Structure Simplification Of Shale Oil
11:00 - 11:15	291	Yan Li, Saige Wang, Bin Chen, Dan Song	Urban Land Use Optimization For Efficient Carbon Metabolism
11:15 - 11:30	548	Jiehui Yuan, Juan Yuan, Yan Yi, Xiaoming Tang, Junlin Yu	Exploring The Energy Transition Path For Carbon Neutrality: A Case Study Of Jiangxi Province, China
11:30 - 11:45	58	Xiaolin Chu , Peng Wang, Ruijuan Zhao , Dayong Lv	A Hybrid Method Of Hourly Electricity Consumption Forecasting For Building Cluster Based On PSO-RF
11:45 - 12:00	315	Jiaxiang Zou, Saige Wang, Bin Chen	Multi-objective Optimization For Energy -Water Nexus Of Urban Water Cycle Based On NSGA-II Model-A Case Study Of Beijing
3-G8 (Room IC 03/649) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/67271615083 Session Name: Energy Management, Policy, Economics and Sustainability Session Chair: Zhien Zhang			
Time	Paper ID	Author	Paper Title

Day 3: Aug 11 (online)

10:15 - 10:30	113	Yue Yuan, Yixing Chen	A Novel Multi-Task Learning Model For Day-ahead Energy Forecasting Of Commercial Building With Attention Mechanism
10:30 - 10:45	189	Zhikai Wang, LinSong Cheng , Renyi Cao, Pin Jia	A Semi-Analytical Model For Pressure Transient Analysis Of Partially Penetrating Inclined Fracture Networks For Multi-Stage Fractured Horizontal Well
10:45 - 11:00	107	Garrett Clark, Mathew Davis, Amit Kumar	Net-zero Pathways For Cement Sector
11:00- 11:15	339	Yang Liu, Jiamin Yan, ZhangBao Hu, Youming Chen	Carbon Saving Potential Of Aerogel Glazing Based On Life Cycle Theory: A Case Study Of Beijing
11:15 - 11:30	482	Lanyu Li, Ping He, Xiaonan Wang	A Survey On China's Carbon Sink And Carbon Market
11:30 - 11:45	95	Jian Su, Peng Zhou, Wenya Wang	Fluctuation Behavior Analysis Of Natural Gas Price Of Asian-Pacific Market From Complex Network Perspective
11:45 - 12:00	332	Xuan Yang, Cuncun Duan, Bin Chen	Provincial Low-Carbon Emission Efficiency Measurement And Optimization In China Based On SBM-DEA Model And DID Model

3-H8 (Room IC 03/134) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/64645611465>

Session Name: Renewable Energy

Session Chair: Leteng Lin

Time	Paper ID	Author	Paper Title
10:15 - 10:30	152	Liu Jing, Jun Zhao, Haiqiao Wei, Wenjia Li, Yang Li, Chuangwei Liu, Xiaowen Wang, Yueyang Wang	Carbon Dioxide Conversion Into Methanol On Defective Graphene-Supported Single-Atom Cu From First Principles
10:30 - 10:45	578	Miao Qing, Li Dingding , Wang Xiao, Zhang Shigang, Li Minxia	Analysis Of Applicable Conditions Of Electric Compression Type Large Temperature Difference Unit
10:45 - 11:00	582	Linchen Fu, Huaping Lin, Likai Zhu, Qingang Xiong, Qinhui Wang , Yefeng Zhou	Simultaneous Regulation Of Pore Structure And Acid Sites Over Desiccated Ga Co-modified HZSM-5 For Waste Plastics Catalytic Upgrading
11:00- 11:15	583	Yunlei Cui, Yaning Zhang, Chaoyue Liu, Qingang Xiong	Microwave-assisted Pyrolysis Of Plastic For High-Quality Oil Production
11:15 - 11:30	382	Shiyang Hu, Xianqing Zhu, Jun Li, Chuanchang Xu, Xun Zhu, Qiang Liao	Co-gasification Of Polyethylene And Biomass Using Lignocellulosic Biomass Components: Thermal Decomposition Behaviors, Synergistic Effect And Gaseous Products
11:30 - 11:45	497	Rabia Jalil Khan, Chun Yin Lau, Jianyu Guan, Shao-Yuan Leu	Future of Lignin Based Aromatics: Sustainability Assessment And Downstream Processing Of Lignin Feedstock Into Value-Added Products
11:45 - 12:00	221	Arun K. Vuppaladadiyam, Shao-Yuan Leu	Evaluation OF PYROLYSIS CHARACTERISTICS OF MICROALGAE SPIRULINA PLATENSIS IN THE PRESENCE OF ALKALI BIFUNCTIONAL CATALYST SORBENT MATERIAL: A TG-MS analysis

3-I8 (Room IC 03/448-410) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/65648664888>

Session Name: Clean Energy Conversion Technology

Session Chair: Lu Ding

Time	Paper ID	Author	Paper Title
10:15 - 10:30	16	Zhe Kang, Yang Bai, Shangsi Feng, Zhijun Wu	Effect Of Direct Water Injection Pressure On Cycle Performance And Emissions Characteristics Within A Compression Ignition Internal Combustion Rankine cycle Engine
10:30 - 10:45	169	Bartocci P, Abad A, Cabello A, de Las Obras Loscertales M, Mendiara T, Lu W, Yang H, Fantozzi F	Design Of The Air Reactor For A Chemical Looping Combustion Plant Coupled With A Turbo Expander Carbon Capture and Storage Is A Technology Of Paramount Importance For Sustainable Development Goal 7 (Affordable and Clean Energy) And Sustainable Development
10:45 - 11:00	443	Wei Shen, Jiyu Liao, Xingyu Liang, Kun Wang	Systematic Construction Of Combustion Reaction Models For Large Hydrocarbon Fuels Based On A Two-Step Reaction Scheme
11:00- 11:15	452	Panxi Yan, Wei Guo1, Jianxuan Shang, Bolun Yang, Zhiqiang Wu	Tar Distribution Prediction For Rapid Pyrolysis Based On Modified CPD Model Under Upgrading Of Coal With Low-Carbon Emissions
11:15 - 11:30	509	Abaimov N, Ryzhkov A, Ding L, Osipov P	Hydrodynamic And Thermochemical Interaction Of Low-Grade Coal Swirling Flow With An Axial Steam Jet
11:30 - 11:45	50	Lin Zhao, Chang'an Wang, Qinqin Feng, Yujie Hou, Yunlei Sun, Defu Che	Numerical Study On The Oxy-fuel Combustion Characteristics Of Combustible Exhaust Gas In A Gas-Fired Boiler
11:45 - 12:00	51	Meijing Chen, Chang'an Wang, Xinyue Gao, Qisen Mao, Lei Zhou, Zhongpan Liu, Defu Che	Effects Of Mass Transfer Resistance On Slow Oxidation Characteristics Of Coal Under Fixed-bed Conditions

3-J8 (Room IC 03/447) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/67751503672>

Session Name: Energy Storage Systems

Session Chair: Clemente Capasso

Time	Paper ID	Author	Paper Title
10:15 - 10:30	273	Sugandha Singh, Manas Ghorai, Kamal Kar	Cobalt modified semiconducting donor-acceptor pair conjugated microporous polymer as redox-active trifunctional electrocatalyst

Day 3: Aug 11 (online)

10:30 - 10:45	344	Tien-Fu Yang, Wei-Mon Yan, Pei-Yi Lin, Cong-You Lin, Chang-Chong Yang, Uzair Sajjad	Numerical And Experimental Study On Thermal Management Of 21700 Li-ion Battery Pack
10:45 - 11:00	523	Zirui Shao, Yang Jiang, Gregory Offer, Huizhi Wang	Modeling Of The Thermal Behaviors Of Silicon/Graphite Composite Electrodes For Lithium-ion Batteries
11:00 - 11:15	487	Dong Li, Yongsheng Zhang, Yu Shi, Liang Zhang, Jun Li, Qian Fu, Xun Zhu, Qiang Liao	Performance Of A Thermally Regenerative Ammonia-Based Flow Battery With 3D Electrodes Composed Of Copper Rod Arrays
11:15 - 11:30	564	LiPeng An, Weizhuo Li, Jiaqi Wang, Zhi Liu, Jinqiao Liang, Qing Du, Kui Jiao	Experimental Study On The Effect Of Electrochemical Performance Of Ternary Lithium Battery Using LiNi _{0.8} Co _{0.1} Mn _{0.1} O ₂ With Nano-TiO ₂ Coating
11:30 - 11:45	507	Capasso C, Iannucci L, Patalano S, Veneri O, Vitolo F	Model Based Thermal Analysis Of A LiNMC Battery Cell
11:45 - 12:00			

3-K8 (Room IC 03/444-414) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/67677675276>

Session Name: Intelligent Energy Systems

Session Chair: Ottorino Veneri

Time	Paper ID	Author	Paper Title
10:15 - 10:30	542	Jae Heo, Soowon Chang	Economic And Environmental Impacts Of Installation Of Fast Charging On Existing Buildings For V2B Uses
10:30 - 10:45	171	Yuekuan Zhou, Lu Zhou	A Synergistic Battery-Hydrogen Network For Renewable Sharing And Energy Use In Buildings And Fuel Cell Electric Vehicles
10:45 - 11:00	114	Guannan Li, , Yubei Wu, Xi Fang, Jiangyan Liu, Zixi Wang	Performance Evaluation Of Cross-Building Energy Prediction Methods Using Deep Transfer Learning Strategies For Office Buildings
11:00 - 11:15	172	Yen-Chen Lee, Ming-Hsuan Hu, Yang-Cheng Shih	Optimization Of Cabinet Configuration In A Data Center
11:15 - 11:30	271	Ying Zeng, Qiang Gong, Xiaodong Liu, Ebu Adu	The Application Of Time Series Data Mining Algorithm In Building Energy Efficiency
11:30 - 11:45	485	Chiaria Anfosso, Daria Bellotti, Lorenzo Gini, Matteo Pascenti, Loredana Magistri	Experimental Results Of An Innovative NIR- solar Façade Panels-Based Polygeneration System
11:45 - 12:00	170	Hongbing Ding, Yuanyuan Dong, Yu Zhang, Chuang Wen	A Novel CO ₂ Capture Concept Using Energy Conversion In Transonic Flows

3-F9 (Room IC 04/445) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/61481845586>

Session Name: Clean Energy Conversion Technology

Session Chair: Pietro Bartocci

Time	Paper ID	Author	Paper Title
13:00 - 13:15	563	LI Shuaiqi, HE Shihui, HUANG Chong, SONG Wenji, FENG Ziping	Performance Analysis And Optimization of Heat Pump Steam Generator System Based On Exergy Analysis
13:15 - 13:30	237	Zhe Song, Sunliang Cao, Hongxing Yang	CatBoost Method For Global Solar Radiation Prediction Based On Observational And Astronomical Predictors
13:30 - 13:45	589	Yanning Liao, Jing Li, Xun Yang, Kuan Sun, Shan Shan Chen	Self-healing Polyurethane Phase Change Materials Preparation And Thermal Characteristics Of Storage Research
13:45 - 14:00	492	Juan Zuo, Yyunting Yao, Ciwei Gao	Lagrange Algorithm Based Decentralized Market Clearing For Power-Gas Networks Considering Emission Cap

3-G9 (Room IC 03/649) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/67271615083>

Session Name: Clean Energy Conversion Technology

Session Chair: Xueqiang Li

Time	Paper ID	Author	Paper Title
13:00 - 13:15	478	Raffel Dharma Patria, Shazia REHMAN, Jianyu Guan, Arun Vuppaladadiyam, Shao-Yuan Leu	Energy Consumption And Environmental Effect Of Production And Waste Management Of Petroleum-Based And Bio-Based Plastics
13:15 - 13:30	8	Sibo Wan, Fan Zhang, Yourong Li	Effect Of Buoyancy Flow On Evaporation Process Of Water In Cylindrical Pool Heated By Sidewall At Low Pressures
13:30 - 13:45	41	Dan Li, Xiaoxiao Xu, Longda Teng, Ranjun Qiu, Chao Liu	The Characteristics And Mechanisms Of Self-excited Oscillation Of Supercritical CO ₂ Flowing In A Helmholtz Oscillator
13:45 - 14:00	614	Muhammad Khristamto Aditya Wardana, Ock Taeck Lim	The Effect Of Urea Injectors To Optimize Ammonia Uniformity And NO _x Conversion In SCR System

3-H9 (Room IC 03/134) Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/64645611465>

Session Name: Renewable Energy

Session Chair: Jan Skvaril

Time	Paper ID	Author	Paper Title
------	----------	--------	-------------

Day 3: Aug 11 (online)

13:00 - 13:15	246	Norbert Miskolczi, Szabina Tomasek	Carbon Dioxide Reduction By Carbonate Looping: Utilization Of Bio-Char Obtained By Sewage Sludge Pyrolysis
13:15 - 13:30	260	Changwen Xiao, Xiaosen Li, Gang Li, Yang Yu, Jianxing Yu	Numerical Analysis Of Production Behavior In Different Layers In Shenhu Area, South China Sea
13:30 - 13:45	333	Kai Dong, Lu Ding	An Integrated Gasification Combined Cycle With Biomass Hydrothermal Treatment
13:45 - 14:00	52	Omojola Awogbemi, Daramy Vandí Von Kallon, Josiah Pelemo	Recent Advances In Food Waste Conversion Technologies
3-19 (Room IC 03/448-410) Zoom Link: https://ruhr-uni-bochum.zoom.us/j/65648664888 Session Name: Clean Energy Conversion Technology Session Chair: Zhang Bai			
Time	Paper ID	Author	Paper Title
13:00 - 13:15	480	Adekunle Adelaja, Olufemi George, John Ogbemhe, Sogo Mayokun Abolarin, Olabode Olakoyejo	Prediction Of Pressure Gradient During Condensation In Inclined Heat Exchanger Using Machine Learning Techniques
13:15 - 13:30	404	Shiyu Yang, H. Oliver Gao, Fengqi You	Phase-Change-Material-Enhanced Grid-Interactive Building Energy Management: An Evaluation Of Different Designs And Controls In Different Metro Areas Of The US
13:30 - 13:45	144	Baomin Dai, Chen Liu Shengchun Liu, Ruirui Zhao, Peifang Yang, Jiabao Qian, Tianyahui Xu, Peng Xiao	Thermodynamic Analysis of a Transcritical CO ₂ System With Ejector And Integrated Mechanical Subcooling For Heating And Cooling
13:45 - 14:00	558	Konrad Gürtler, David Low Beer, Jeremias Herberg	Yet another legitimacy crisis? The German coal phase out
Short Break			
14:10 - 14:40	Keynote Eric May (online)		
14:40 - 15:10	Keynote Yi-Ming Wei (online)		
15:10 - 15:15	Closing		

Applied Energy System Transformation

Applied Energy System Transformation: Inter- and Transdisciplinary Perspectives 2-M3 and 2-M4, Lecture Hall HIC Wednesday, 10/08/2022, 8:30 - 12:00

- 8:30 - 8:40 **Energy System Transformation as Socio-technical Challenges and Wicked Problems – Added Value of Inter- and Transdisciplinarity – An Introduction**
Prof. Dr. Michael Roos, Chair for Macroeconomics, Faculty of Management and Economics, RUB
- 8:40 - 8:55 **Energy System Transformation: The Ethical Perspective**
Prof. Dr. Klaus Steigleder, Chair for Applied Ethics, Institute of Philosophy, RUB
- 8:55 - 9:10 **Energy System Transformation: The Economic Perspective**
Prof. Dr. Andreas Löschel, Chair for Environmental/Resource Economics and Sustainability, Faculty of Management and Economics, RUB
- 9:10 - 9:25 **Energy System Transformation: The Legal Perspective**
Prof. Dr. Johann-Christian Pielow, Director of the Institute for Mining and Energy Law, RUB
- 9:25 - 9:40 **Energy System Transformation: The Governance and Participation Perspective**
Dr. Jan-Hendrik Kamlage, Research Group Leader Participation and Transformation, Center for Environmental Management, Resources and Energy, Faculty of Management and Economics, RUB
- 9:40-10:00 **Discussion** (based on the thesis on the challenges and wicked problems of the energy system transformation formulated by each speaker from his professional perspective in his keynote; working out the added value of inter- and transdisciplinarity) Moderation: Prof. Dr. Michael Roos
- 10:00 - 10:30 **Coffee Break**
- 10:30-11:15 **The Ruhr Metropolis: Inter- and Transdisciplinary Living Lab of Applied Energy System Transformation**
- 10:30-10:40 **Hydrogen Metropolis Ruhr – Promoting the Hydrogen Innovation Ecosystem Ruhr by Regional Network Management**
Jörg Kemna, HUB-Manager, Business Metropole Ruhr GmbH (BMR)
- 10:40-10:45 **Questions by Moderator**
- 10:45-10:55 **Contributions of Sewage Treatment Plants to Energy System Transformation**
Dr. Emanuel Grün, Executive Board Member for Water Management and Technical

Applied Energy System Transformation

Services, Emschergenossenschaft and Lippeverband

10:55-11:00 **Question by Moderator**

11:00-11:10 **Transformation Research for the Energy Transition – Climate Protection and Raw Material Supply**

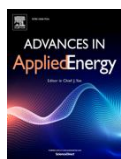
Prof. Dr. Görgo Deerberg, Deputy Director, Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT

11:10-11:15 **Question by Moderator**

11:15-12:00 **Panel Discussion: Applied Energy System Transformation – Challenges and Added Values for Sustainable Transformation of Districts, Cities and Regions**

- Patrick Schneckeburger, LivingLab TransUrban.NRW and Member of the Management of E.ON Energy Solutions GmbH
- Katrin Schirmacher, Head of Project Communications, Amprion (tbc)
- Ulf C. Reichhardt, Managing Director, NRW.Energy4Climate (tbc)
- Claudia van Laak, Office Manager, Open District Hub e. V.

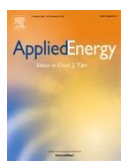
AWARDS: HIGHLY CITED PAPERS



Advances in Applied Energy (2021)

Authors	Title
Gray N., McDonagh S., O'Shea R., Smyth B., Murphy J.D.	Decarbonising ships, planes and trucks: An analysis of suitable low-carbon fuels for the maritime, aviation and haulage sectors
Wang Y., Yuan H., Martinez A., Hong P., Xu H., Bockmiller F.R.	Polymer electrolyte membrane fuel cell and hydrogen station networks for automobiles: Status, technology, and perspectives
Li H., Wang Z., Hong T., Piette M.A.	Energy flexibility of residential buildings: A systematic review of characterization and quantification methods and applications
Zhao N., You F.	New York State's 100% renewable electricity transition planning under uncertainty using a data-driven multistage adaptive robust optimization approach with machine-learning
Zheng W., Hu J., Wang Z., Li J., Fu Z., Li H., Jurasz J., Chou S.K., Yan J.	COVID-19 Impact on Operation and Energy Consumption of Heating, Ventilation and Air-Conditioning (HVAC) Systems
Marqusee J., Becker W., Ericson S.	Resilience and economics of microgrids with PV, battery storage, and networked diesel generators
Vecchi A., Li Y., Ding Y., Mancarella P., Sciacovelli A.	Liquid air energy storage (LAES): A review on technology state-of-the-art, integration pathways and future perspectives
Feng C., Wang Y., Chen Q., Ding Y., Strbac G., Kang C.	Smart grid encounters edge computing: opportunities and applications
Wei M., Lee S.H., Hong T., Conlon B., McKenzie L., Hendron B., German A.	Approaches to cost-effective near-net zero energy new homes with time-of-use value of energy and battery storage
Yin Z., Zheng J., Kim H., Seo Y., Linga P.	Hydrates for cold energy storage and transport: A review
Chen Y., Zhang D.	Theory-guided deep-learning for electrical load forecasting (TgDLF) via ensemble long short-term memory

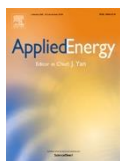
AWARDS: HIGHLY CITED PAPERS



Applied Energy (2021) Highly cited review papers

Authors	Title
Tushar W., Yuen C., Saha T.K., Morstyn T., Chapman A.C., Alam M.J.E., Hanif S., Poor H.V.	Peer-to-peer energy systems for connected communities: A review of recent advances and emerging challenges
Himeur Y., Ghanem K., Alsalemi A., Bensaali F., Amira A.	Artificial intelligence based anomaly detection of energy consumption in buildings: A review, current trends and new perspectives
Zhang L., Wen J., Li Y., Chen J., Ye Y., Fu Y., Livingood W.	A review of machine learning in building load prediction
Wang Y., Zou R., Liu F., Zhang L., Liu Q.	A review of wind speed and wind power forecasting with deep neural networks
Soto E.A., Bosman L.B., Wollega E., Leon-Salas W.D.	Peer-to-peer energy trading: A review of the literature
Mayer M.J., Gróf G.	Extensive comparison of physical models for photovoltaic power forecasting
Chang M., Thellufsen J.Z., Zakeri B., Pickering B., Pfenninger S., Lund H., Østergaard P.A.	Trends in tools and approaches for modelling the energy transition
Li Z., Lu Y., Huang R., Chang J., Yu X., Jiang R., Yu X., Roskilly A.P.	Applications and technological challenges for heat recovery, storage and utilisation with latent thermal energy storage
Yu K., Liu Y., Yang Y.	Review on form-stable inorganic hydrated salt phase change materials: Preparation, characterization and effect on the thermophysical properties
Pan H., Qi L., Zhang Z., Yan J.	Kinetic energy harvesting technologies for applications in land transportation: A comprehensive review
Chen Q., Zhang G., Zhang X., Sun C., Jiao K., Wang Y.	Thermal management of polymer electrolyte membrane fuel cells: A review of cooling methods, material properties, and durability

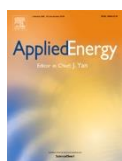
AWARDS: HIGHLY CITED PAPERS



Applied Energy (2021) Highly cited research papers

Authors	Title
Jiang P., Fan Y.V., Klemeš J.J.	Impacts of COVID-19 on energy demand and consumption: Challenges, lessons and emerging opportunities
Werth A., Gravino P., Prevedello G.	Impact analysis of COVID-19 responses on energy grid dynamics in Europe
Bogdanov D., Gulagi A., Fasihi M., Breyer C.	Full energy sector transition towards 100% renewable energy supply: Integrating power, heat, transport and industry sectors including desalination
Esmat A., de Vos M., Ghiassi-Farrokhfal Y., Palensky P., Epema D.	A novel decentralized platform for peer-to-peer energy trading market with blockchain technology
Khanali M., Akram A., Behzadi J., Mostashari-Rad F., Saber Z., Chau K.-W., Nabavi-Pelesaraei A.	Multi-objective optimization of energy use and environmental emissions for walnut production using imperialist competitive algorithm
Rouleau J., Gosselin L.	Impacts of the COVID-19 lockdown on energy consumption in a Canadian social housing building
Shang W.-L., Chen J., Bi H., Sui Y., Chen Y., Yu H.	Impacts of COVID-19 pandemic on user behaviors and environmental benefits of bike sharing: A big-data analysis
Halbrügge S., Schott P., Weibelzahl M., Buhl H.U., Fridgen G., Schöpf M.	How did the German and other European electricity systems react to the COVID-19 pandemic?
Fekri M.N., Patel H., Grolinger K., Sharma V.	Deep learning for load forecasting with smart meter data: Online Adaptive Recurrent Neural Network
Madurai Elavarasan R., Pugazhendhi R., Jamal T., Dyduch J., Arif M.T., Manoj Kumar N., Shafiullah G.M., Chopra S.S., Nadarajah M.	Envisioning the UN Sustainable Development Goals (SDGs) through the lens of energy sustainability (SDG 7) in the post-COVID-19 world
Tian J., Xiong R., Shen W., Lu J.	State-of-charge estimation of LiFePO ₄ batteries in electric vehicles: A deep-learning enabled approach
Li Q., Wang T., Li S., Chen W., Liu H., Breaz E., Gao F.	Online extremum seeking-based optimized energy management strategy for hybrid electric tram considering fuel cell degradation
Al-Qahtani A., Parkinson B., Hellgardt K., Shah N., Guillen-Gosalbez G.	Uncovering the true cost of hydrogen production routes using life cycle monetisation
Fasihi M., Weiss R., Savolainen J., Breyer C.	Global potential of green ammonia based on hybrid PV-wind power plants
Miao Z., Chen X., Baležentis T.	Improving energy use and mitigating pollutant emissions across “Three Regions and Ten Urban Agglomerations”: A city-level productivity growth decomposition
Khaleghi S., Karimi D., Beheshti S.H., Hosen M.S., Behi H., Berecibar M., Van Mierlo J.	Online health diagnosis of lithium-ion batteries based on nonlinear autoregressive neural network
Du Y., Zandi H., Kotevska O., Kurte K., Munk J., Amasyali K., Mckee E., Li F.	Intelligent multi-zone residential HVAC control strategy based on deep reinforcement learning
Wang C., Wang S., Gao Z., Song Z.	Effect evaluation of road piezoelectric micro-energy collection-storage system based on laboratory and on-site tests
Cesaro Z., Ives M., Nayak-Luke R., Mason M., Bañares-Alcántara R.	Ammonia to power: Forecasting the levelized cost of electricity from green ammonia in large-scale power plants
Su C., Urban F.	Circular economy for clean energy transitions: A new opportunity under the COVID-19 pandemic
Li J., Yu T., Zhang X., Li F., Lin D., Zhu H.	Efficient experience replay based deep deterministic policy gradient for AGC dispatch in integrated energy system
Rocha H.R.O., Honorato I.H., Fiorotti R., Celeste W.C., Silvestre L.J., Silva J.A.L.	An Artificial Intelligence based scheduling algorithm for demand-side energy management in Smart Homes
Xu Y., Zheng Y., Yang Y.	On the movement simulations of electric vehicles: A behavioral model-based approach

AWARDS: HIGHLY CITED PAPERS



Applied Energy (2020) Highly cited review papers

Authors	Title
Wang J., Geng L., Ding L., Zhu H., Yurchenko D.	The state-of-the-art review on energy harvesting from flow-induced vibrations
Nozariasbmarz A., Collins H., Dsouza K., Polash M.H., Hosseini M., Hyland M., Liu J., Malhotra A., Ortiz F.M., Mohaddes F., Ramesh V.P., Sargolzaeiaval Y., Snouwaert N., Öztürk M.C., Vashae D.	Review of wearable thermoelectric energy harvesting: From body temperature to electronic systems
Rissman J., Bataille C., Masanet E., Aden N., Morrow W.R., III, Zhou N., Elliott N., Dell R., Heeren N., Huckestein B., Cresko J., Miller S.A., Roy J., Fennell P., Cremmins B., Koch Blank T., Hone D., Williams E.D., de la Rue du Can S., Sisson B., Williams M., Katzenberger J., Burtraw D., Sethi G., Ping H., Danielson D., Lu H., Lorber T., Dinkel J., Helseth J.	Technologies and policies to decarbonize global industry: Review and assessment of mitigation drivers through 2070
Hui H., Ding Y., Shi Q., Li F., Song Y., Yan J.	5G network-based Internet of Things for demand response in smart grid: A survey on application potential
Chen W.-H., Chen C.-Y.	Water gas shift reaction for hydrogen production and carbon dioxide capture: A review
Zhou Y., Wang Y., Wang K., Kang L., Peng F., Wang L., Pang J.	Hybrid genetic algorithm method for efficient and robust evaluation of remaining useful life of supercapacitors
Cagnano A., De Tuglie E., Mancarella P.	Microgrids: Overview and guidelines for practical implementations and operation
Vega F., Baena-Moreno F.M., Gallego Fernández L.M., Portillo E., Navarrete B., Zhang Z.	Current status of CO ₂ chemical absorption research applied to CCS: Towards full deployment at industrial scale
Lingayat A.B., Chandramohan V.P., Raju V.R.K., Meda V.	A review on indirect type solar dryers for agricultural crops – Dryer setup, its performance, energy storage and important highlights
Wang Z., Hong T.	Reinforcement learning for building controls: The opportunities and challenges
Jin X., Wu Q., Jia H.	Local flexibility markets: Literature review on concepts, models and clearing methods
Wang H., Chen L., Qu Z., Yin Y., Kang Q., Yu B., Tao W.-Q.	Modeling of multi-scale transport phenomena in shale gas production — A critical review
Ibrahim M.S., Dong W., Yang Q.	Machine learning driven smart electric power systems: Current trends and new perspectives

AWARDS: HIGHLY CITED PAPERS

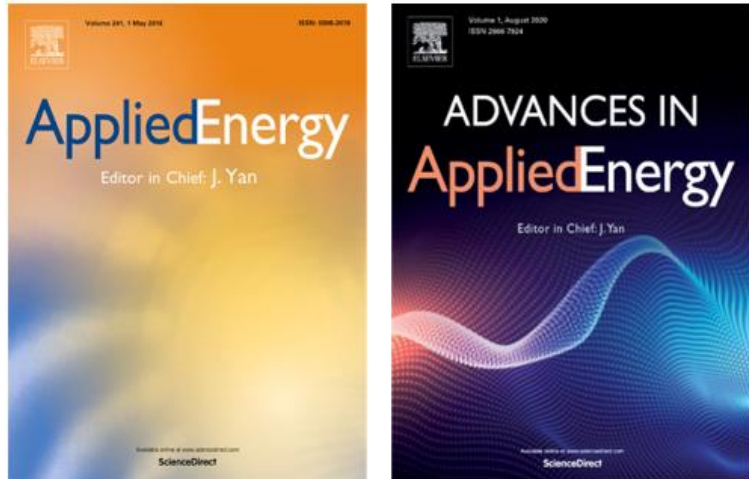


Applied Energy (2020) Highly cited research papers

Authors	Title
Röck M., Saade M.R.M., Balouktsi M., Rasmussen F.N., Birgisdóttir H., Frischknecht R., Habert G., Lützkendorf T., Passer A.	Embodied GHG emissions of buildings – The hidden challenge for effective climate change mitigation
Liu Z., Jiang P., Zhang L., Niu X.	A combined forecasting model for time series: Application to short-term wind speed forecasting
Madurai Elavarasan R., Shafiullah G.M., Raju K., Mudgal V., Arif M.T., Jamal T., Subramanian S., Sriraja Balaguru V.S., Reddy K.S., Subramaniam U.	COVID-19: Impact analysis and recommendations for power sector operation
Mahdi J.M., Mohammed H.I., Hashim E.T., Talebizadehsardari P., Nsofor E.C.	Solidification enhancement with multiple PCMs, cascaded metal foam and nanoparticles in the shell-and-tube energy storage system
Ma M., Ma X., Cai W., Cai W.	Low carbon roadmap of residential building sector in China: Historical mitigation and prospective peak
Emadi M.A., Chitgar N., Oyewunmi O.A., Markides C.N.	Working-fluid selection and thermoeconomic optimisation of a combined cycle cogeneration dual-loop organic Rankine cycle (ORC) system for solid oxide fuel cell (SOFC) waste-heat recovery
Zhang C., Li J., Chen Y.	Improving the energy discharging performance of a latent heat storage (LHS) unit using fractal-tree-shaped fins
Somu N., M R G.R., Ramamritham K.	A hybrid model for building energy consumption forecasting using long short term memory networks
van Leeuwen G., AlSkaf T., Gibescu M., van Sark W.	An integrated blockchain-based energy management platform with bilateral trading for microgrid communities
Mayer M.J., Szilágyi A., Gróf G.	Environmental and economic multi-objective optimization of a household level hybrid renewable energy system by genetic algorithm
Shen S., Sadoughi M., Li M., Wang Z., Hu C.	Deep convolutional neural networks with ensemble learning and transfer learning for capacity estimation of lithium-ion batteries
Magazzino C., Mele M., Schneider N.	The relationship between air pollution and COVID-19-related deaths: An application to three French cities
Li P., Zhou K., Lu X., Yang S.	A hybrid deep learning model for short-term PV power forecasting
Qu X., Yu Y., Zhou M., Lin C.-T., Wang X.	Jointly dampening traffic oscillations and improving energy consumption with electric, connected and automated vehicles: A reinforcement learning based approach
Zhao J., Liu Y., Guo X., Wei R., Yu T., Xu L., Sun L., Yang L.	Gas production behavior from hydrate-bearing fine natural sediments through optimized step-wise depressurization
Wang Z., Hong T., Piette M.A.	Building thermal load prediction through shallow machine learning and deep learning
Lu X., Liu Z., Ma L., Wang L., Zhou K., Feng N.	A robust optimization approach for optimal load dispatch of community energy hub
Yang X., Guo J., Yang B., Cheng H., Wei P., He Y.-L.	Design of non-uniformly distributed annular fins for a shell-and-tube thermal energy storage unit
Gong C., Yi L., Zhang Z., Sun J., Liu F.	Assessment of ultra-lean burn characteristics for a stratified-charge direct-injection spark-ignition methanol engine under different high compression ratios
Tian Y., Lai R., Li X., Xiang L., Tian J.	A combined method for state-of-charge estimation for lithium-ion batteries using a long short-term memory network and an adaptive cubature Kalman filter
Gorre J., Ruoss F., Karjunen H., Schaffert J., Tynjälä T.	Cost benefits of optimizing hydrogen storage and methanation capacities for Power-to-Gas plants in dynamic operation
Khaloie H., Abdollahi A., Shafie-khah M., Anvari-Moghaddam A., Nojavan S., Siano P., Catalão J.P.S.	Coordinated wind-thermal-energy storage offering strategy in energy and spinning reserve markets using a multi-stage model
Gong C., Li Z., Sun J., Liu F.	Evaluation on combustion and lean-burn limit of a medium compression ratio hydrogen/methanol dual-injection spark-ignition engine under methanol late-injection
Yang X., Yu J., Xiao T., Hu Z., He Y.-L.	Design and operating evaluation of a finned shell-and-tube thermal energy storage unit filled with metal foam

Conf. proceedings and preprints

Selected best papers from the conference will be considered for publication in a special issue jointly in **Applied Energy**, **Advances in Applied Energy**.



Energy Proceedings is a peer-reviewed, open-access collection of high-quality conference papers, covering a broad field of multidisciplinary subjects in not only in energy sciences and technologies but also in energy-related economics and social sciences, including policy and legal studies. The papers published in Proceedings—selected from high-quality conferences, workshops, and other scientific meetings—will constitute comprehensive, focused themes and timely topics.

<http://www.energy-proceedings.org/>



EnerarXiv is an open access preprint platform for the energy field, covering cutting-edge research in multidisciplinary and interdisciplinary fields including energy science and technology and energy-related economics, social sciences, and policy and law. Enerarxiv is committed to creating a high-quality sharing and exchange community for scholars and enthusiasts in the energy field. We provide a platform for uploading and sharing preprints, and the latest scientific developments, cutting-edge knowledge, and related information in order to stimulate more discussion and thinking, promote exchanges and collisions, and add momentum to scientific research and industry in the energy field.

<http://www.enerarxiv.org/>



Panel Discussion (Online)

Room: M Lecture Hall HIC

Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/65004557437>

UNiLAB-Big Data Analytics for Smart Energy Systems

Time: 13:00–14:00 PM Aug 11 (CET+0)

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. So, a new UNiLAB focus on Big Data Analytics for Smart Energy Systems was launched and this panel will discuss frontier research in this area and publish the 1st competition theme and agenda organized by this new UNiLAB.

Speakers:



Junhua Zhao (Moderator)

The Chinese University of Hong Kong,
Shenzhen



Jianwei Huang

The Chinese University of Hong
Kong, Shenzhen



Xudong Wang

State Grid Tianjin Electric Power
Company



Jian Qiu

Alibaba Cloud



Yanli Liu

Tianjin University



Yan Xu

Nanyang Technological University



Panel Discussion (Online)

Room: M Lecture Hall HIC

Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/65004557437>

Green Hydrogen in Emission Mitigation

Time: 13:00–14:30 PM Aug 10 (CET+0)

The climate crisis is the greatest challenge facing our generation. Mitigation-related activities are taking place across the world at the nation, state, and local levels as well as in the private sector. As the future fuel of choice, green hydrogen, defined as hydrogen produced from water electrolysis with zero-carbon electricity, is expected to play a decisive role in the fight with the benefits of zero-emission, high-energy density, and flexibility. But today, green hydrogen production faces enormous challenges, including its cost and economics, infrastructure limitations, and potential increases in CO₂ emissions. Before green hydrogen can see widespread adoption as an alternative fuel, hydrogen must overcome several key obstacles to adoption.

The panel discussion focuses on addressing the challenge of sustainable, reliable, and affordable green hydrogen in production, conversion, storage, and utilization to curb our carbon footprint and embrace a cleaner future.

Organizing Committee



Dr. Dina Azhgaliyeva
Asian Development
Bank Institute



Dr. Haoran Zhang
The University of
Tokyo



Dr. Yuntian Chen
EIT Institute for
Advanced Study



Dr. Meng Yuan
Aalborg University



Mr. Weike Peng
The Hong Kong
Polytechnic University

Panel Discussion

Moderator



Short Bio

Dr. Haoran Zhang, Researcher at the Center for Spatial Information Science at the University of Tokyo, Senior Scientist at Location mind Inc. in Japan. His research interest includes smart supply chain technologies, GPS data in shared transportation, urban sustainable performance, GIS technologies in renewable energy systems, and smart cities. He has Ph.D.'s in both Engineering and Sociocultural Environment and was awarded Excellent Young Researcher by Japan's Ministry of Education, Culture, Sports, Science, and Technology.

Haoran Zhang

Researcher

The University of Tokyo,
Japan



Short Bio

Dr. Yuntian Chen is an Assistant Professor at the EIT Institute for Advanced Study (EIAS), China. He also works as a doctoral supervisor at Shanghai Jiao Tong University and an adjunct professor at China University of Petroleum (Beijing). Before joining EIAS in Jan 2022, he obtained a Ph.D. degree in Energy and Resources Engineering from Peking University, China, and B.S. from Tsinghua University, China. His research focuses on smart energy and scientific machine learning. Specifically, the design and implementation of data-driven technologies and optimization algorithms to tackle problems in energy fields, and the integration of domain knowledge with machine learning algorithms to construct physics-aware AI models. He is a member of the young editorial board of Advances in Applied Energy

Yuntian Chen

Assistant Professor

EIT Institute for
Advanced Study, China

Speakers



Making Hydrogen Society a Reality in Asia

Abstract

Hydrogen is a potentially transformative multi-functional fuel that could help many countries achieve ambitious decarbonisation targets. High concentrations of heavy industries and rising transport emissions make hydrogen's potential particularly enticing in Asia. However, hydrogen's widespread deployment requires assessing multiple dimensions of its feasibility. This presentation highlights the environmental, economic and geopolitical feasibility of making hydrogen mainstream in Asia. The analysis suggests that relevant policies in Asia need to prioritise green hydrogen over blue and grey hydrogen; create financial incentives that facilitate transitions from grey and blue to green hydrogen; and commit to infrastructure that eases the import and export of fuels, raw materials and related technologies. A regional cooperative framework that is led by Japan and places a mutually beneficial co-innovation process at its core could also help make the hydrogen economy a reality in Asia.

Short Bio

Dr. Nandakumar Janardhanan is Research Manager-Climate and Energy, and Regional Coordinator South Asia, at the Institute for Global Environmental Strategies, Japan. Dr. Janardhanan has experience in areas including policy research, market research and academia. He has been associated with several policy think tanks, research organisations and Universities of international repute. Dr. Janardhanan currently holds Adjunct Fellow positions with the Institute of Chinese Studies (India) and Institute of Australia India

Nandakumar

Janardhanan

Research

Manager-Climate
and Energy

Institute for Global
Environmental
Strategies, Japan

10 min

Engagement (Australia). Formerly he was a Visiting Fellow with the Japan Institute of International Affairs, (Japan), and Fellow with the 'Climate CoLab' of Massachusetts Institute of Technology.



Saule Zholdayakova
Acting Head
Hydrogen Energy
Competence Center,
KMG Engineering,
Kazakhstan

10 min

Towards hydrogen economy in Kazakhstan

Abstract

The energy transition is driving governments and industries to adopt various measures to reduce their climate impacts while maintaining the stability of their economy. Hydrogen technologies are one of the central topics in the energy transition. Considering the benefits of hydrogen in the country's long-term energy and decarbonization strategy, the Kazakhstan government should identify priorities for the future. This presentation presents the first country-scale assessment of hydrogen technologies in Kazakhstan by focusing on policy, technology, and economic aspects. Our preliminary analysis has shown that Kazakhstan should approach hydrogen mainly as a part of its long-term decarbonization strategy. While coping with the financial risks of launching a hydrogen economy, the country can benefit from the export potential of low-carbon hydrogen in the near term. The export potential of low-carbon hydrogen in Kazakhstan is justified by its proximity to the largest hydrogen markets, huge resource base, and potentially low cost of production (in the case of blue hydrogen). Technology options for hydrogen transportation and storage were in Kazakhstan defined in the lecture. Our work also revealed target hydrogen utilization areas in emission sectors regulated by Kazakh Emission Trading System.

Short Bio

Acting Head of Hydrogen Energy Competence Center, Head of Hydrogen Technologies Research Laboratory at KMG Engineering, Kazakhstan. Graduated from Tokai University, Japan. The research topic is related to hydrogen energy systems and hydrogen storage methods by metal hydrides.



Hui Zhou
Assistant Professor
Tsinghua University,
China

10 min

Renewable hydrogen production & storage with thermocatalysis

Abstract

The annual increase in carbon dioxide concentration in the atmosphere has brought about a series of global climate change problems, such as the intensification of the greenhouse effect and the frequent occurrence of extreme weather. Therefore, many countries in the world have proposed the goal of carbon neutrality, striving to achieve low carbon and zero carbon emissions. Hydrogen is a carbon-free fuel, which is promising in the future world. This presentation will introduce the production of renewable hydrogen from bioenergy with thermocatalysis. Moreover, due to the low energy density, the storage of hydrogen is a challenge in the hydrogen industrial chain. This presentation will also cover the carbon dioxide hydrogenation process which can store hydrogen from renewable energy sources.

Short Bio

Dr. Hui Zhou is an Assistant Professor at Department of Energy and Power Engineering, Tsinghua University, China. He completed his B.Sc. and Ph.D. in 2010 and 2015, respectively at Tsinghua University. After graduation, he moved to Columbia University in the City of New York and then Ames Laboratory of US DOE as a postdoctoral researcher. From 2018 to 2021, he was a Marie Curie Individual Fellow at ETH, Zurich. His research interests are carbon neutrality and renewable energy, with a focus on bioenergy, hydrogen energy, and carbon capture and utilization. He has published more than 60 articles in journals such as Nature Catalysis (cover article), Nature Communications, and Energy & Environmental Science. In 2020, he has been awarded the Arthur C. Stern Distinguished Paper Award. In 2021, he obtained the MCAA Best Innovator Award. He was also awarded the Top Ten Rising Stars of Science and Technology of China. He has served as the presider of the session of Biomass to Energy, Chemicals, and Functional Materials of the 256th American Chemistry Society National Meeting. He is currently the Founding Associate Editor of Carbon Capture Science & Technology and the Associate Editor of Frontiers in Energy Research.



Cuiwei Liu
Associate Professor
China University of
Petroleum (Huadong),
China

10 min

Hydrogen gas pipelines

Abstract

Blending hydrogen into existing natural gas pipelines in a certain proportion is an effective way to achieve large-scale, long-distance, and low-cost storage and transportation of hydrogen. However, due to the density difference between hydrogen and natural gas, the addition of hydrogen in the natural gas will cause the non-uniform concentration distribution in the pipeline, resulting in the increase or decrease of local hydrogen partial pressure. The higher hydrogen concentration exceeding the set one may lead to pipeline failure, leakage, measurement error, and terminal appliance. Although non-uniform concentration distribution of mixed gas has been confirmed by some research, the stratification of H₂-CH₄ in the pipeline is less considered, which should be solved.

Short Bio

Dr. Cuiwei Liu is an Associate Professor in China University of Petroleum (Huadong). His research focuses on natural gas and hydrogen gas pipelines. Specifically, the flow in the pipe and the safety design about the pipelines. To date, he has published 30 high-quality journal papers and conference papers.

Q&A

10 min

Discussion:

40 min

Moderator



Dina Azhgaliyeva
Research Fellow
Asian Development
Bank Institute, Japan

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 Ph.D., 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".

Speakers



Mathieu Geze
Director Asia
HDF Energy, Indonesia

Short Bio

Based in Jakarta, Mathieu is Director Asia at HDF Energy, a French Independent Power Producer dedicated to hydrogen power.

Mathieu has over 13 years of experience in Renewable Energy through various positions within IPP, EPC and key supplier companies.

Prior to joining HDF Energy in 2018, Mathieu managed the development of the North African and East European subsidiaries of a French developer and EPC. Then for 4 years, he was Business Development Manager at ArcelorMittal Exosun.



Eric Zusman
Senior Policy
Researcher and Area
Leader
Institute for Global
Environmental
Strategies, Japan

Short Bio

Eric Zusman is a Senior Policy Researcher/Area Leader at the Institute for Global Environmental Strategies in Hayama, Japan. Dr. Zusman holds a bachelor's degree in Mandarin Chinese from Rutgers University, a dual Masters's Degree in public policy and Asian studies from the University of Texas at Austin, and a Ph.D. in political science from the University of California, Los Angeles. For much of the past two decades, he has conducted research on environmental issues in Asia. This has included working with China's Yellow River Conservancy Commission, the Chinese Research Academy on Environmental Science, Woodrow Wilson Center's China Environment Forum as well as Taiwan's Academia Sinica. He has published books and articles on water scarcity, air pollution regulation, environmental law, multilevel governance, sustainability transitions, low carbon development, and the Sustainable Development Goals. He is currently serving as a lead author for the sixth assessment report of the Intergovernmental Panel on Climate Change (Chapter 17).



Victor Nian
Co-Founder and CEO
Centre for Strategic
Energy and Resources,
Singapore

Short Bio

Dr. Victor Nian is the Co-Founder and Chief Executive Officer of the Centre for Strategic Energy and Resources, an independent Think-and-Do Tank with a global headquarters in Singapore. Dr. Nian has been a career advocate for energy transition and sustainable development with a vision of building clean energy ecosystems for empowering and accelerating the global energy transition effort in an equitable way across countries and regions in the world. Dr. Nian brings onboard a suite of expertise in energy and sustainable development, especially in policy and strategy, nuclear energy, energy transition and net-zero pathways, technology road mapping, hydrogen economy, and maritime energy transition, among others from his experience in advising public and private organizations on those subject matters. He is recognized as one of the go-to-persons on nuclear energy and sustainable energy related issues in Southeast Asia.



Panel Discussion (Online)

Room: M Lecture Hall HIC

Zoom Link: <https://ruhr-uni-bochum.zoom.us/j/65004557437>



Women in Applied Energy

Time: 14:00–16:00 PM Aug 9 (CET+0)

“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.

Speaker



Dr. Yanli Liu
Tianjin University
Moderator



Jill S. Tietjen
Technically Speaking, Inc



Jianzhong Wu
Multi-Vector Energy
Systems



Chi Zhang
Beijing Institute of
Technology

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



Jill S. Tietjen
Technically Speaking,
Inc

Powering Your Life and Career

Short Bio

Ms. Tietjen is the President and CEO of Technically Speaking, Inc. An electrical engineer, she has spent more than 45 years in the electric utility industry where she provided planning consulting services to electric utilities and organizations comprising the electric utility industry and served as an expert witness before public utility commissions and other government agencies. In 2015, she served as the CEO of the National Women’s Hall of Fame, based in Seneca Falls, New York. Today, she is a worldwide advocate for telling women’s stories and writing women into history.

An author (12 books published to date) and international speaker, Tietjen is the co-author of the award-winning and bestselling books Her Story: A Timeline of the Women Who Changed America and Hollywood: Her Story, An Illustrated History of Women and the Movies. Her latest book (2022) is Over, Under, Around, and Through: How Hall of Famers Surmount Obstacles. Her introduction to engineering textbook, Keys to Engineering Success, was published by Prentice Hall in 2001. Her ebook for the Institute of Electrical and Electronics Engineers’ Women in Engineering series titled Recognizing and Taking Advantage of Opportunities was published in 2016. She is the series editor for Springer’s Women in Engineering and Science series, has written two volumes in the series and has served as co-volume editor for two volumes. She blogged for The Huffington Post from 2014-2018.

Tietjen has received numerous awards and honors including Women eNews 21 Leaders of the 21st Century (2016); the 2001 Woman in Technology Award from the Women’s Foundation of Colorado, Subaru, and News4; Tau Beta Pi’s Distinguished Alumna Award; and she was named a Woman of Distinction by Girl Scouts – Mile Hi Council. In 2017, she received the Advocate for Women and Girls Award from Girl Scouts of Colorado and the General Palmer Award from ACEC-Colorado. She served as the 1991-1992 National President of the Society of Women Engineers (SWE). She was the first woman president of the Rocky Mountain Electrical League, the trade association in the West serving the electric utility industry. Tietjen is a member of the Board of Directors for Georgia Transmission Corporation of Tucker, Georgia and served as an outside director for Merrick & Company of Greenwood Village, Colorado from 2010-2021. She has been inducted into the Colorado Women’s Hall of Fame and the Colorado Author’s Hall of Fame. Her story, titled “Engineering Women Back into History,” was aired on Rocky Mountain PBS as part of the Great Colorado Women film series and is accessible through the Colorado Women’s Hall of Fame web site film library.

Tietjen graduated from the University of Virginia (Tau Beta Pi, Virginia Alpha) with a B.S. in Applied Mathematics (minor in Electrical Engineering) and received her M.B.A. from the University of North Carolina–Charlotte. She is a registered professional engineer in Colorado.



Jianzhong Wu
Multi-Vector Energy
Systems

Women in Applied Energy

Short Bio

Prof Jianzhong Wu is Professor of Multi-Vector Energy Systems and Head of School of Engineering at Cardiff University. His research focus on Smart Grid and Multi-Vector Energy Systems. He has contributed to more than 60 EC, EPSRC and industry funded projects as a Principal Investigator or a Co-Investigator. He has published more than 300 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 a Co-Chair of INCOSE UK Energy Systems Interest Group, Co-Director of £18m UK Energy Research Centre, an Associate-Director of £5m EPSRC Supergen Energy Networks Hub, and a co-Principal Investigator of £24.5m WEFO funded FLEXIS project investigating future integrated energy systems. He is a member of the UK Government BEIS Taxonomy Energy Working Group, Wales Smart Energy System Group, Northern Power Grid Technical Panel of ED2 £3.2b Business plan, and the Scottish Power Energy Networks Strategic Stakeholder Panel for England and Wales. He is also a member-at-large of the IEEE Technical Committee on Carbon Neutrality.

He is co-Editor-in-Chief of Applied Energy and a Fellow of Energy Institute and Fellow of the Learned Society of Wales.



Chi Zhang
Beijing Institute of
Technology

A Changing Decade for Women in Academia and Applied Energy

Short Bio

Dr. Chi Zhang, Professor of School of Management and Economics, Beijing Institute of Technology. She is the assistant editor of Applied Energy and the vice-director of Lancet Countdown Asia Center. Her research areas include climate mitigation's impacts to environment and health, energy economics and climate policy, environmental economics and management. She has published more than 30 peer reviewed journal and conference proceeding papers, including in the Lancet Public Health, Applied Energy, Energy Conversion and Management and etc. She serves as a leading author of annual China report of the Lancet Countdown on health and climate change. She has performed high-level research projects for Swedish Agency for Economic and Regional Growth, Swedish International Development Cooperation Agency in Sweden, National key research and development program, and NSFC in China. Dr. Zhang has 9 years' experiences in organizing international academic conference and chaired several conferences. She was the assistant editor of Handbook of Clean Energy Systems (6 Volumes; Wiley).

Discussion

20 min

Important Notes:

1. All excursions should be reserved on site together with the conference registration.
2. Transportation fees are included in the contribution to expenses
3. For the excursions 1 to 3, the contribution to expenses will be charged at the registration; please have cash (10 Euro) available for payment



1) The Ruhr Area – Transformation of an Industrial Area formed by Mining and Steel Industry

The cities along the river Ruhr and the structure of their population have largely been formed by coal mining and steel industry. However, with the decrease of the mining activities back in the 1960s a continuous change of these structures started. More recently this structural change has been accelerated by attempts to establish more sustainable and knowledge-based structures, which are attractive for high-tech ventures. This goes along with efforts to drastically reduce greenhouse-gas emissions – a necessity that is particularly challenging for a highly industrialized area. The bus excursion will lead to places that can be considered examples for this ongoing transformation process.

Departure: Friday, August 12, 9:00 AM, Bochum Central Station

Contribution to expenses: 10 Euro

2) Industrial Heritage Sites in Bochum

Immigration of working-class men and women driven by the large companies in steel and coal industry has created a multicultural society in the cities along the river Ruhr. And their inhabitants are self-confident and proud of their industrial history. This has created a unique awareness of industrial heritage. Living quarters originally built for workers in industry have turned into privileged living areas and shut-down industrial sites were turned into cultural heritage sites, where today exceptional and very



often alternative cultural events take place. The excursion will visit such cultural heritage sites in Bochum by bus. After the bus tour, the German Mining Museum (located in the center of Bochum and close to the hotels) with its underground (mockup) mining banks can optionally be visited.

Departure: Friday, August 12, 9:00 AM, Bochum Central Station

Contribution to expenses: 10 Euro



3) The Medieval Roots of Bochum and its Surroundings

The cities along the river Ruhr have largely been formed by the time of their industrialization in the late 19th and early 20th century, and then again by the time of reconstruction in the 1950s after almost total destruction during the second world war. However, the region has been populated long before. There are several places where remains of the ancient history of the region are still visible – castles, manors, churches, monasteries, and even complete streets in neighbor communities. This bus excursion leads to places that are representative for the remains of this pre-industrial time.

Departure: Friday, August 12, 9:00 AM, Bochum Central Station

Contribution to expenses: 10 Euro



4) The Fun Fair in Crange

After two years of Corona break, the fun fair in Crange, a suburb of Herne close to Bochum, takes place again from August 5 to 14. The fun fair in Crange is the largest fun fair on the European continent with a large number of rides, fortune shacks, beer bars and festival tents – and with several hundred thousand visitors. For those of you who are a little adventurous and not afraid of crowds we can organize a trip to Crange by public transport (U35 to Herne Central Station and then by bus to the fair ground. However, it will not be possible to stay together in larger groups on the fair ground. So, it is up to you to remember the way back... 😊

Departure: Friday, August 12, 5:00 PM, Bochum Central Station

Contribution to expenses: free of charge, public transport is free if you have the 9 Euro ticket (see the updated information on public transport), but rides can be rather expensive.



Photo by Markus Reddig

CALL FOR PAPERS

cue
Low-carbon Cities & Urban Energy

Applied Energy Symposium:

LOW CARBON CITIES & URBAN ENERGY SYSTEMS

SEPT 24-27, 2022 in MATSUE, JAPAN

www.applied-energy.org/cue2022

i°caee
International Conference on Applied Energy



i°caee
International Conference on Applied Energy

CEN2023: Applied Energy Symposium

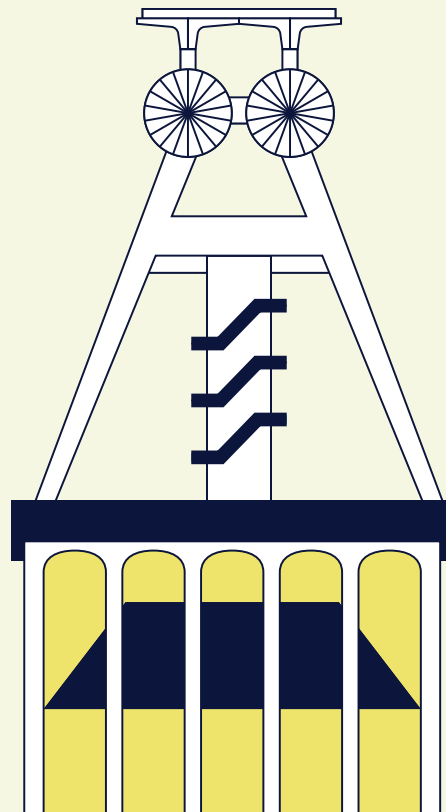
CLEAN ENERGY TOWARDS CARBON NEUTRALITY

April 22-25, 2023 | NINGBO, CHINA

www.applied-energy.org/CEN2023



www.applied-energy.org/icae2022



Bochum • Germany