

# icae

9<sup>th</sup> International Conference on Applied Energy

**ENERGIZING THE FUTURE**

**Cardiff - U.K.**

August 21-24, 2017





# *Call For Papers*

## **Topics**

- Low carbon cities
- Urban energy systems
- Urban planning integrated with energy systems
- Energy efficiency in buildings
- BIPV & renewable energy applications in urban systems
- Smart cities and microgrid
- Smart home energy management systems
- EV and eco-traffic
- High-efficiency vehicle engines
- Energy storage
- Urban wastes to energy
- Urban emissions mitigation
- Low carbon and ecological city indicators
- Distributed energy systems
- District heating and CCHP
- Nexus of energy-water in urban system
- Climate change and cities
- Policy options targeting low-carbon energy systems
- Responses to low carbon energy transition
- Demand side management
- Distributed wireless sensors and power transfer
- Big data and visualization for energy management systems

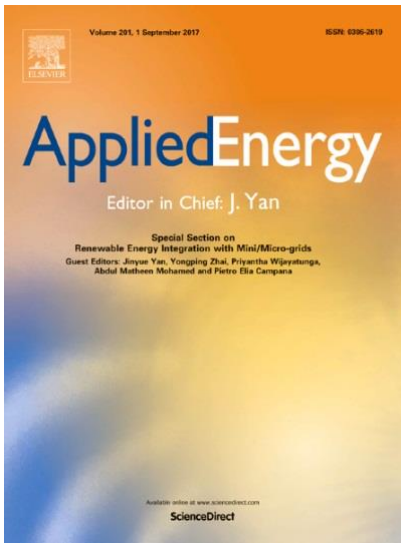
*Deadline for draft paper: Mar. 31, 2018*

*Notification of acceptance: Apr. 30, 2018*

*Deadline for final paper: May. 15, 2018*

Special Issue of selected papers from CUE2018 will be published in prestigious journals including Applied Energy (IF:7.182)

- **Welcome to ICAE2017**
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# Applied Energy

Applied Energy provides a forum for information on innovation, research, development and demonstration in the areas of energy conversion and conservation, the optimal use of energy resources, analysis and optimization of energy processes, mitigation of environmental pollutants, and sustainable energy systems. The breadth of coverage ranges from innovative technologies and systems of both fossil and renewable energy to the economic industrial and domestic use of energy with no or minor impact on the environment. Applied Energy is also concerned with the attendant problems of modeling and forecasting, conservation strategies, and the environmental, social and economic impacts of energy policies and usage, including climate change mitigation and other environmental pollution reduction.

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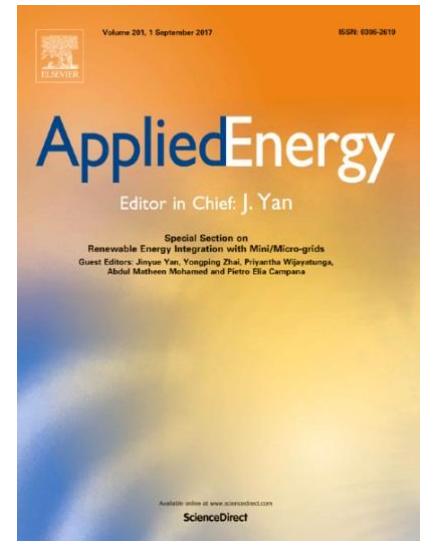
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# *Call For Papers*

*Deadline for draft paper: Jun. 30, 2018  
Notification of acceptance: Aug. 1, 2018  
Deadline for final paper: Sept. 1, 2018*

## **Topics**

- High penetration of renewable energy
- Mini/microgrid
- Technology innovation
- Implementation
- Commercialization
- Financing & policy

Special Issue of selected papers from REM2018 will be published in prestigious journals including Applied Energy (IF:7.182)

# Welcome to ICAE2017



The Local Organizing Committee of ICAE2017 warmly invites you to attend the 9th International Conference on Applied Energy during Aug 21-24, 2017, in Cardiff, the United Kingdom. The theme of ICAE2017 is “Energizing the future”. As the conference chairmen, it is a great honour for us to make an invitation for all of you to this exciting event, with the cordial hospitality and the warm welcome of Cardiff City.

As a continuation of this prestigious conferences series, we will follow the style of the former eight successful conferences, held in Hong Kong, Singapore, Perugia/Italy, Suzhou/China, Pretoria/South Africa, Taipei/Taiwan, Abu Dhabi/United Arab Emirates and Beijing/China, to have you enjoy the program and social activities provided by the host.

ICAE2017 will include keynote and invited speeches, plenary sessions, oral presentations, and poster sessions on different topics:

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

We are looking forward to seeing you in Cardiff!

## Conference Chairs

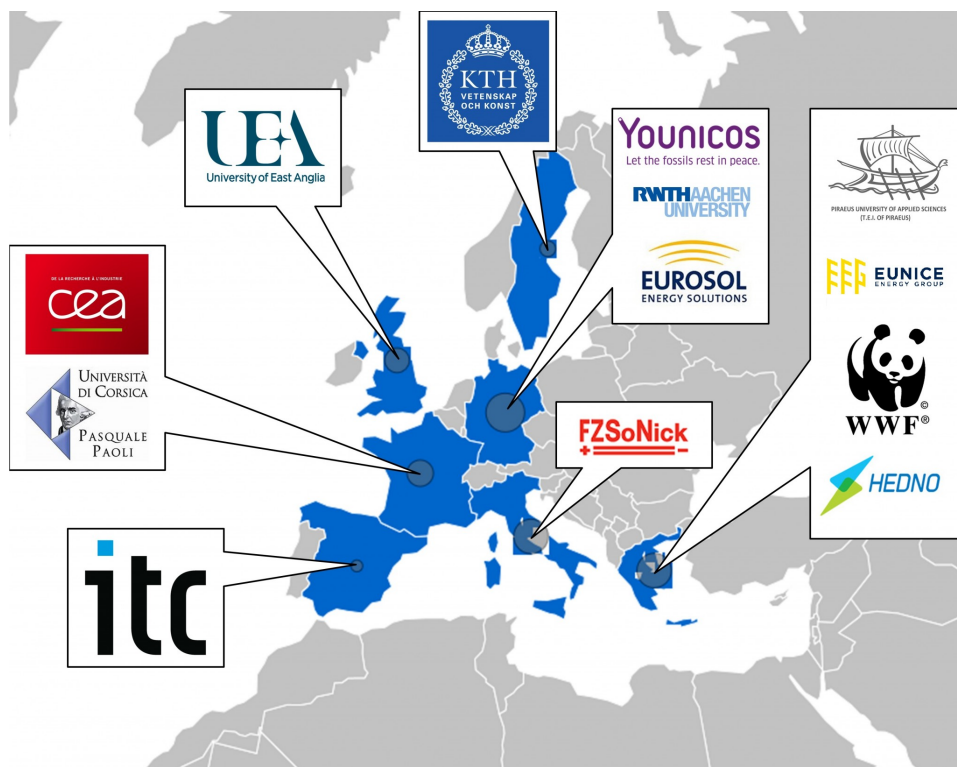
**Prof. Hywel Thomas**

**Prof. Jianzhong Wu**

**Prof. Jinyue Yan**



## Technology Innovation *for the* Local Scale Optimum Integration of Battery Energy Storage





# Acknowledgements



Applied Energy  
Innovation Institute



**MÄLARDALEN UNIVERSITY  
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Technology Innovation for the Local Scale  
Optimum Integration of Battery Energy Storage



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An international virtual lab of collective intelligence in Applied Energy.

**RESEARCH &  
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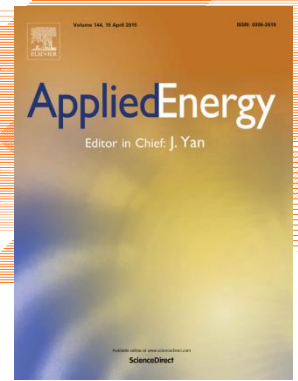


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Distributed Energy and  
Microgrid (DEM)

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Mälardalen University, Sweden  
University of Victoria, Canada  
Cardiff University, United Kingdom  
Lawrence Berkeley National Lab., USA  
State Grid Tianjin Electric Power, China



# Applied Energy

## New Section: Progress in Applied Energy

**Cite Score: 7.78** 

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Editor-in-Chief  
**Professor J. Yan**

The internationally-renowned journal *Applied Energy* is launching a new section - *Progress in Applied Energy*, which will bridge the gap between development and implementation, focusing:

- On fast-paced, cutting-edge research from forward looking aspects of energy innovations
- On renewable energy and clean technology
- From energy efficiency to climate change mitigation

As the world strives to meet the shared targets of combating climate change and providing sustainable energy access for all, there is a critical need for timely and rapid publication of new energy solutions.

*Progress in Applied Energy* is the best platform to address these issues, at a time when there is societal pressure to come up with breakthroughs.

### What are we looking for?

- Papers must present ground-breaking insights to the field, which will have a positive impact on society, and excite and inspire readers
- Review articles will provide a comprehensive view of the latest trends, bridging scientific frontiers

### Why submit to our new section?

Submit and be part of the change in shaping the future of energy research as this new section:

- Provides a home for top scientists and engineers to publish high quality papers
- Fast-tracks papers to reach researchers as quickly as possible
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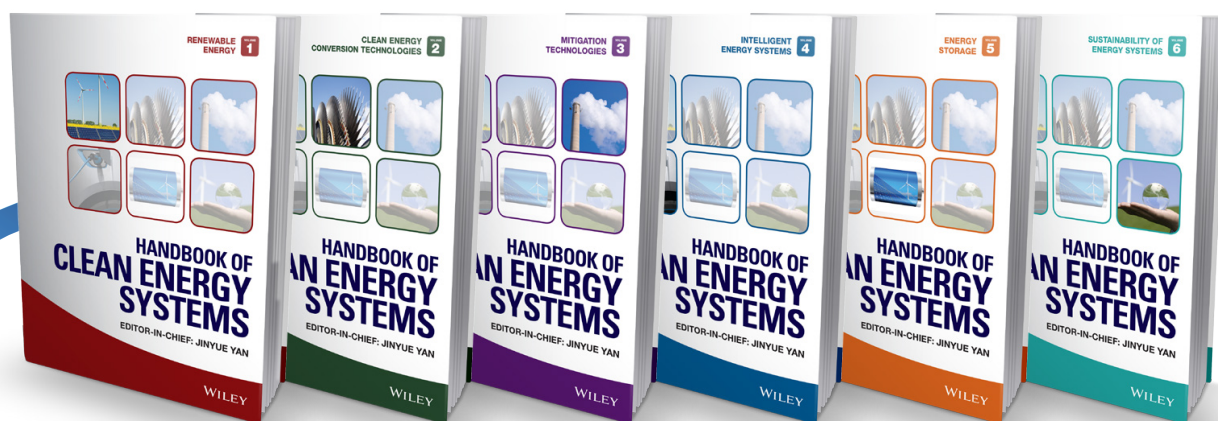
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# Keynote Speakers



**Prof. John Loughhead**

**Department for  
Business, Energy and  
Industrial Strategy  
UK**

***Keynote: Future Trends in UK Energy – What Are Major Development Areas for Future UK System?***

In the context of technological opportunities and its commitment to reduce greenhouse gas emissions, what are the major development areas for a future UK energy system?

***Bio***

Prof. John Loughhead is Chief Scientific Adviser at the Department for Business, Energy and Industrial Strategy (BEIS). Prior to this, he was the Chief Scientific Adviser at the Department of Energy and Climate Change (DECC). He has held several prominent roles in the UK and internationally including Executive Director at the UK Energy Research Centre (UKERC) and Corporate Vice-President of Technology and Intellectual Property at Alstom. John's professional career has been predominantly in industrial research and development for the electronics and electrical power industries, including advanced high power industrial gas turbines, new energy conversion systems, spacecraft thermal management, electrical and materials development for electricity generation and transmission equipment and electronic control systems. He is a Chartered Engineer, graduating in Mechanical Engineering at Imperial College and a Fellow of the Royal Academy of Engineering, the Institution of Mechanical Engineers, the Queen Mary University of London as well as both the UK and Australian national Academies of Engineering.

# Keynote Speakers



**Prof. Suresh V.  
Garimella**

**Purdue University  
USA**

## ***Keynote: Energy Use in Information and Communications Technologies: The Role of Thermal Management***

Data centers account for a significant and growing fraction of the worldwide electricity demand, owing to the rapid proliferation of electronics devices and associated digital data generation. Despite this rapid growth in total energy consumption, the largely ad hoc approaches to space conditioning in large data centers and server farms have led to unconscionable inefficiencies that are driving information technology companies to lower their overall energy footprint. The sheer magnitude of heat dissipation in these large-scale computing facilities is staggering, and calls for urgent improvement of data center cooling strategies, which consume a significant fraction of the total energy used at the facility level. In particular, technologies that allow for increases in the data center operating temperature have the potential to eliminate energy-intensive air-conditioning systems and enable year-round rejection of waste heat to the ambient. Liquid cooling offers a low-thermal-resistance thermal transport mechanism that may enable such operation without increasing the temperature of the electronic devices. Embedding liquid coolant channels directly in electronic devices offers further potential improvement in efficiency and performance scaling by enabling dramatic changes in the system architecture, such as 3D chip stacking. This talk will review key challenges encountered in the thermal management of information technology equipment at different scales, from data centers down to small-scale portable electronics, as well as recent technological developments related to embedded liquid-cooling strategies that may enable significant energy savings and performance gains.

## ***Bio***

Prof. Suresh Garimella is Purdue University's Executive Vice President for Research and Partnerships, and the Goodson Distinguished Professor of Mechanical Engineering. He is also Director of the National Science Foundation Cooling Technologies Research Center. He received his PhD from the University of California at Berkeley in 1989, his MS from The Ohio State University in 1986, and his Bachelor's degree from the Indian Institute of Technology Madras in 1985. He has supervised over 90 PhD and MS students, and co-authored 500 refereed journal and conference publications and 12 issued patents. Dr. Garimella serves on the Board of Directors of Modine Manufacturing Company. Dr. Garimella has also served as Jefferson Science Fellow at the U.S. Department of State, where he explored pathways to a clean energy future, analyzing cross-cutting issues at the intersection of energy security and climate change. He also served a five-year term (2011-16) as Senior Fellow of the State Department's Energy and Climate Partnership of the Americas (ECPA), a regional partnership announced by President Obama at the 2009 Summit of the Americas to promote clean energy, advance energy security, fight energy poverty, reduce greenhouse gas emissions, support strategies for sustainable landscapes and build capacity for climate change adaptation. Dr. Garimella serves in editorial roles with several leading journals. He is Fellow of the American Association for the Advancement of Science (AAAS) and the American Society of Mechanical Engineers (ASME). His efforts in research and engineering education have been recognized with the 2014 ASME Charles Russ Richards Memorial Award, 2011 NSF Alexander Schwarzkopf Prize for Technological Innovation, 2010 ASME Heat Transfer Memorial Award, 2010 Distinguished Alumnus Award from IIT Madras, 2009 ASME Allan Kraus Thermal Management Award, and 2004 ASME Gustus L. Larson Memorial Award, among others.

# Keynote Speakers



**Prof. Siaw-Kiang Chou**

**National University of  
Singapore (NUS)  
Singapore**

***Keynote: East Asia Energy Policy: Research & Outlook***

Due to increases in population and sustained industrialization, urbanization and motorization that come with economic growth, the East Asian region is estimated to double its primary energy demand between 2013 and 2040. This increase in energy demand has implications on countries' energy security and efforts in mitigating climate change. There is a need to rapidly develop and deploy energy efficient technologies, phase-out the use of fossil fuel in the power generation sectors and proactively increase the share of renewables in the energy mix. In view of this, it is important to understand the future trajectory of energy demand growth with respect to economic development, future energy choice, and the subsequent investment requirements and research needs to better prepare for the future.

***Bio***

Prof. Siaw-Kiang Chou is a Fellow and Past President of the Institution of Engineers (IES), Singapore, and a Fellow of the American Society of Heating, Refrigerating and Air-Conditioning Engineers. He is a Fellow of the Singapore Academy of Engineering, the ASEAN Academy of Engineering and Technology, the Energy Institute, UK, and the ASEAN Federation of Engineering Organisations. He chairs the Advisory Committee of the School of Mechanical and Aeronautical Engineering of Singapore Polytechnic, and is co-Chairman of the Technical Evaluation Panel on the Grant for Energy Efficiency Technology (GREET) of the National Environment Agency, Singapore. Up till March 2016, he was Chairman of the Advisory Board of the ASEAN Plan of Action on Science and Technology and was a member of the International Advisory Board of the APEC Center for Technology Fore-sighting. He is a national representative on the Board of Advisers, ASEAN Committee on Science and Technology (COST). He is credited with the formulation of the Envelope Thermal Transfer Value (ETTV) and the Residential Envelope Transmittance Value (RETV) energy standards used in the Singapore Green Mark Incentive Scheme. He is presently an editor of the Elsevier journal, Applied Energy, and serves on the editorial boards of a number of other energy related journals.

# Keynote Speakers



**Prof. Roland Span**

**Ruhr-University  
Germany**

## ***Keynote: Closed Carbon Cycle Economy***

In 2015, the delegates at COP 21 in Paris expressed the political will to effectively mitigate climate change, but society still has a long way to go to rid itself of CO<sub>2</sub> emissions. How to accomplish this task? In the long term, problems due to anthropogenic greenhouse gas emissions can only be resolved by restructuring entire social and economic systems to employ closed carbon cycles. Carbon utilization is unavoidable but its net impact on the environment can be minimized through holistic consideration of cyclic processes that offer opportunities to offset emissions. Beyond designing new technologies lies the even broader idea of a closed carbon cycle economy. This approach integrates the technical and social aspects of long-term transitions from current structures for supplying society with power, fuel, and resources to those based on closed carbon cycles. This leads to a large number of fundamental and application-oriented challenges relating to engineering and natural sciences, whilst raising just as many questions in the fields of humanities and social sciences.

In 2015, the Closed Carbon Cycle Economy Research Department was founded at Ruhr-University Bochum. Researchers from the fields of engineering, natural sciences, humanities and social sciences collaborate in an interdisciplinary environment. Based on experiences from German efforts to mitigate climate change, the lecture will address lessons learned, visions for future developments, and – most importantly – the need for interdisciplinary cooperation.

## ***Bio***

Prof. Roland Span studied mechanical engineering at Ruhr-University Bochum (RUB) from 1983 to 1988. In 1992, he completed his Ph.D. with a thesis introducing a new reference equation of state for carbon dioxide. His work was supervised by Prof. W. Wagner. In 1999, he completed his habilitation with a thesis entitled “Multiparameter Equations of State – An Accurate Source of Thermodynamic Property Data”. At ALSTOM Power Technologies in Switzerland, he worked on gas-turbine related topics, including humidified gas-turbines and CCS. In 2002, he became chair of Thermodynamics and Energy Technologies at University of Paderborn. In 2006, he changed to RUB, where he is chair of Thermodynamics, leading an institute with about 25 scientific co-workers and 25 student co-workers. Prof. Span has published highly cited scientific papers dealing mostly with experimental and theoretical work on thermodynamic properties and the application of corresponding models to process simulations in energy technologies. He is member of several scientific committees, including editorial boards and working groups of international unions like IAPWS. He is dean of the faculty of mechanical engineering, one of three speakers of the Research Department Closed Carbon Cycle Economy at RUB and member of the European Academy of Sciences and Arts.



# Panel Sessions

Day 1

## Grid Integration of Renewable Energy Systems using DC Technologies

13:40-15:20

Calon 1

Replacement of conventional synchronous generation with low-carbon technologies has been accelerated over the last years to reduce gas emissions and mitigate climate change. This Special Session will focus on the grid integration of renewable energy systems using enabling technologies based on DC systems. A number of academic stakeholders from international institutions will provide a unique perspective on the state-of-the-art aspects related to the session. The attendees of the session will benefit from the opportunity to learn about relevant outputs of large research projects such as BEST PATHS, PROMOTiON and ANGLE DC.

**Chair:** Dr. Carlos Ugalde-Loo

**Participants:** Prof. Bin Li (Tianjin University, China); Dr. Andrea Pitto (RSE S.p.A., Italy); Dr. Max Parker (University of Strathclyde, UK); Dr. Willem Leterme (KU Leuven, Belgium); Dr. Eduardo Prieto (UP Catalunva, Spain); Dr. Chao Long (Cardiff University, UK)

Day 1

## Applied Energy UNiLAB of Distributed Energy & Microgrid (DEM)

15:50-17:30

Calon 1

UNiLAB of DEM is an international virtual lab of collective intelligence in Applied Energy, in order to enhance international collaboration for scientific excellence for science and engineering, and demonstrate technologies in analysis, control, operation, planning and other applications in DEM. This panel will discuss the latest development of DEM and a new initiative to establish a world-leading sustainable research ecosystem of multi-energy Microgrids. The research ecosystem will be built upon a 5-Dimensional Cloud-based platform of Campus Multi-Energy Microgrids. Research data, tools and even source code will be shared through the platform.

**Chair:** Prof. Hongjie Jia

**Participants:** Prof. Jinyue Yan (Royal Institute of Technology and Mälardalen University, Sweden); Prof. Jianzhong Wu (Cardiff University, UK); Dr. Yunfei Mu (Tianjin University, China)

Day 2

## Energy Systems Modelling: From Theory to Application

08:10-09:50

Calon 1

The rapid transformation of energy systems is taking place in order to address the so-called energy trilemma, which refers to improving security of supply, reducing emissions and ensuring that energy is affordable for consumers. Due to the complex nature of energy systems, and the interdependencies that exist between different energy vectors within energy systems, it is increasingly challenging to find cost-effective pathways to address the energy trilemma.

In order to unpack these complexities and better understand efficacy of decisions made in energy systems, numerous computer models were developed and yet new modelling tools are being produced to assist with studying the energy systems. The focus of this panel will be on different modelling approaches for studying various aspects of energy systems. The panelists will talk about specific modelling approaches and discuss a case study in which their proposed approaches were applied.

**Chair:** Dr. Meysam Qadrdan

**Presentation:** Dr. Reza Fazeli (University of Iceland, Iceland); Dr. Sheila Samsatli (University of Bath, UK), Dr. Modassar Chaudry (Cardiff University, UK); Dr. Xin Zhang (National Grid, UK)

# Panel Sessions

Day 2

## Applied Energy UNiLAB of Synergies between Energy Networks (SEN)

10:20-12:00

Calon 1

The vision and missions of Applied Energy UNiLAB of Synergies between Energy Networks (SEN) include: 1) facilitating international collaboration for research & development in synergies between energy networks; 2) developing concepts and technologies for energy systems integration and demonstrate the techno-economic benefits; and 3) promoting whole systems approach to energy systems design and operation.

This panel will discuss the next generation integrated energy networks including the latest development of Energy Internet, Multi-Vector Energy Systems and Energy System Integration and the new initiatives that are being developed in UNiLAB SEM.

**Chair:** Prof. Jianzhong Wu

**Participants:** Prof. Thomas Kolb (KIT Germany); Prof. Geert Deconinck (KU Leuven, Belgium); Prof. Hongbin Sun (Tsinghua University, China); Prof. Hongjie Jia (Tianjin University, China)

Day 2

## Ammonia for Power

13:40-15:20

Calon 1

A potential enabler of a low carbon economy is the energy vector hydrogen. However, issues associated with hydrogen storage and distribution are currently a barrier for its implementation. Hence, other indirect storage media such as ammonia and methanol can be considered. Of these, ammonia is a carbon free carrier which offers high energy density, even higher than compressed air and similar to some hydrocarbons. Hence, it is proposed that ammonia, with its established transportation network and high flexibility, could provide a practical next generation system for energy transportation, storage and use for power generation. Therefore, this panel will focus on discussions based on state of the art projects running across the world to enable ammonia as a fluid for power generation.

**Chair:** Dr. Agustin Valera Medina

**Participants:** Prof. Jim Kok (University of Twente, Netherlands), Prof. Edman Tsang (University of Oxford, UK); Dr. Zhaolin Wang (University of Xiamen, China); Prof. Gldeon Grader (Techion, Israel); Prof. Arif Karabeyoglu (Koc University, Turkey)

Day 2

## Scientific Publication

15:50-17:30

Calon 1

The goal of this panel session is to provide background information on academic publishing. It outlines the various important steps that an author needs to follow in preparing his manuscript for a successful publication in an international journal. This presentation will also give you an overview of the publishing market and ethics.

**Chair:** Mrs Fernanda Ogochi

**Participants:** Prof. Jinyue Yan (Editor-in-chief of Applied Energy); Prof. Siaw-Kiang Chou (Editor of Applied Energy); Prof. Umberto Desideri (Editor of Applied Energy)



Applied Energy

## Awards of highly cited original papers (2016)

- The effect of renewable energy consumption on economic growth: Evidence from top 38 countries, *By Bhattacharya M., Paramati S.R., Ozturk I., Bhattacharya S.*
- The Calcium-Looping technology for CO<sub>2</sub> capture: On the important roles of energy integration and sorbent behavior, *By Perejon A., Romeo L.M., Lara Y., Lisbona P., Martinez A., Valverde J.M.*
- A systematic state-of-charge estimation framework for multi-cell battery pack in electric vehicles using bias correction technique, *By Sun F., Xiong R., He H.*
- Assessing the benefits of residential demand response in a real time distribution energy market, *By Siano P., Sarno D.*
- Consumption-based emission accounting for Chinese cities, *By Mi Z., Zhang Y., Guan D., Shan Y., Liu Z., Cong R., Yuan X.-C., Wei Y.-M.*
- Optimal allocation and sizing of PV/Wind/Split-diesel/Battery hybrid energy system for minimizing life cycle cost, carbon emission and dump energy of remote residential building, *By Ogunjuyigbe A.S.O., Ayodele T.R., Akinola O.A.*
- Parabolic trough receiver with corrugated tube for improving heat transfer and thermal deformation characteristics, *By Fuqiang W., Qingzhi L., Huaizhi H., Jianyu T.*
- Least-cost options for integrating intermittent renewables in low-carbon power systems, *By Brouwer A.S., van den Broek M., Zappa W., Turkenburg W.C., Faaij A.*
- Impact of energy conservation policies on the green productivity in China's manufacturing sector: Evidence from a three-stage DEA model, *By Li K., Lin B.*
- Analysis of the economic feasibility and reduction of a building's energy consumption and emissions when integrating hybrid solar thermal/PV/micro-CHP systems, *By Romero Rodriguez L., Salmeron Lissen J.M., Sanchez Ramos J., Rodriguez Jara E.A., Alvarez Dominguez S.*
- Energy performance of building envelopes integrated with phase change materials for cooling load reduction in tropical Singapore, *By Lei J., Yang J., Yang E.-H.*
- Driving-behavior-aware stochastic model predictive control for plug-in hybrid electric buses, *By Li L., You S., Yang C., Yan B., Song J., Chen Z.*
- Green growth: The economic impacts of large-scale renewable energy development in China, *By Dai H., Xie X., Xie Y., Liu J., Masui T.*
- Methanol synthesis using captured CO<sub>2</sub> as raw material: Techno-economic and environmental assessment, *By Perez-Fortes M., Schoneberger J.C., Boulamanti A., Tzimas E.*
- Hybrid PV and solar-thermal systems for domestic heat and power provision in the UK: Techno-economic considerations, *By Herrando M., Markides C.N.*



Applied Energy

## Awards of highly cited review papers (2016)

- Review of natural gas hydrates as an energy resource: Prospects and challenges, *By Chong Z.R., Yang S.H.B., Babu P., Linga P., Li X.-S.*
- Recent advances in the use of different substrates in microbial fuel cells toward wastewater treatment and simultaneous energy recovery, *By Pandey P., Shinde V.N., Deopurkar R.L., Kale S.P., Patil S.A., Pant D.*
- A review of the composite phase change materials: Fabrication, characterization, mathematical modeling and application to performance enhancement, *By Zhang P., Xiao X., Ma Z.W.*
- Thermal energy storage for low and medium temperature applications using phase change materials - A review, *By Pereira da Cunha J., Eames P.*
- Oxy-fuel combustion of pulverized fuels: Combustion fundamentals and modeling, *By Yin C., Yan J.*
- A comprehensive review of lithium-ion batteries used in hybrid and electric vehicles at cold temperatures, *By Jaguemont J., Boulon L., Dube Y.*
- A review on compressed air energy storage: Basic principles, past milestones and recent developments, *By Budt M., Wolf D., Span R., Yan J.*
- A review of recent development: Transport and performance modeling of PEM fuel cells, *By Wu H.-W.*
- Energy storage technologies and real life applications - A state of the art review, *By Aneke M., Wang M.*
- Carbon capture by physical adsorption: Materials, experimental investigations and numerical modeling and simulations - A review, *By Ben-Mansour R., Habib*



Applied Energy

## Awards of Best Reviewers (2016)

Giorgio Besagni, Italy

Alina Adriana Minea, Romania

Simone Baldi, The Netherlands

Horia Andrei, Romania

Ligang Zheng, Canada

Zhifu Mi, UK

Chao Long, UK

Yan Yu, USA

Xiandong Xu, Northern Ireland

Wei-Chiang Hong, Taiwan

Shaopeng Guo, China

Bjarne Andresen, Denmark

Taehoon Hong, South Korea

M. Hadi Amini, USA

Tolga Taner, Turkey

Roberto Cipollone, Italy

Yue Zhou, China

Jerzy Kowalski, Poland

Ali Al-Wakeel, UK

Ye Bin, USA

Xiwang Li, USA

Chongming Wang, UK

# APPLIED ENERGY GLOBAL UNILAB OF MULTI-ENERGY MICROGRID



# UNILAB

**YOU ARE WARMMLY WELCOMED TO JOIN US.**

**CONTACT: PROF. JINYUE YAN (JINYUE@KTH.SE); PROF. CHENGSHAN WANG (CSWANG@TJU.EDU.CN);**

**PROF. JIANZHONG WU (WUJ5@CARDIFF.AC.UK)**

## **VISION:**

*Establish a world-leading sustainable research ecosystem of multi-energy Microgrids  
– We innovate, we collaborate, we share, and we grow up together!*

## **THE WAY FORWARD:**

- Setup and maintain a 5-Dimensional Cloud-based platform of Campus Multi-Energy Microgrids. We share data, tools and even source code from 1D through to 5D among partners.

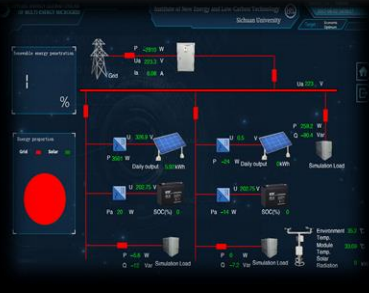
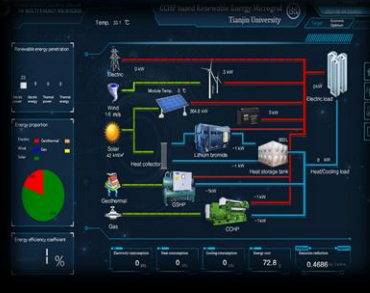
**1D:** A large amount of raw data

**2D:** Formatted case system information that are ready to use for research

**3D:** Real-time Energy Management System of Campus Multi-Energy Microgrids

**4D:** Fundamental tools for Multi-Energy Microgrids

**5D:** Advanced optimization and control tools



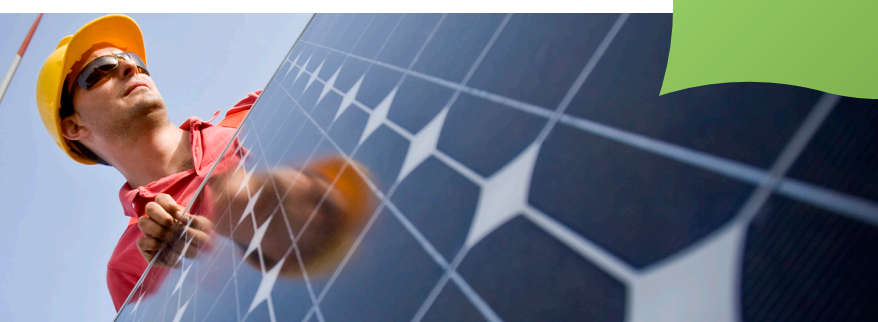
- Share our experience by organizing training and summer schools for early-career researchers
- Organize workshops and symposiums to facilitate effective communication and dissemination
- Develop Special Issues for Applied Energy
- Initiate joint research grant applications among partners
- Inform industry and policy-makers on the potential, key technologies and performance of multi-energy Microgrids
- Provide skilled workforce for the current global energy revolution



Applied Energy Global UNILAB of Multi-Energy Microgrid is an international virtual lab of collective intelligence, in order to enhance international collaboration for scientific excellence and demonstrate innovative technologies in Multi-Energy Microgrids. It is a joint initiative by the Applied Energy UNILAB of Distributed Energy & Microgrid (DEM) and the UNILAB of Synergies between Energy Networks (SEM).

Multi-energy Microgrids are able to make a good use of local distributed energy resources, especially renewable energy, optimize the synergies between different energy systems (e.g. electricity, gas, heating and cooling systems), enable the applications of novel techniques (e.g. Peer to Peer energy sharing or trading) and provide services to other Microgrids or to the bulk energy networks. Multi-energy Microgrids have the potential to change the paradigm of the whole energy system.

*We are targeting to connect 100 campus Multi-Energy Microgrids across the World. Welcome to join our family!*



# FUTURE ENERGY CENTER

**THE CHALLENGES** due to energy related emissions, increased energy demand and the fragile state of the global economy calls for rethinking global energy systems. Therefore, the research within the Future Energy Center focuses on renewable energy, energy efficiency and emission mitigation, as well as smarter modelling, optimization and management.

The Future Energy Center is one of Sweden's strongest research environments in process optimization targeting the process industry and the energy sector. We develop innovative solutions and tools within the areas of energy, building and environmental engineering.

The Future Energy Center has good relationships with both companies and recognized national and international centers, including several

Chinese universities. The profile comprises nine professors, a further fifteen senior researchers and more than forty graduate students.

## THREE FOCUS AREAS

The research at Future Energy Center is focused on three areas:

**TRACK 1** Renewable energy

**TRACK 2** Energy efficiency and emission mitigation

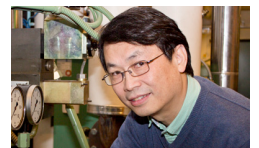
**TRACK 3** Smarter modelling/ optimisation and management

The Future Energy Center also offers studies at post-graduate level in Energy and Environmental engineering. We are also part of the research school Reesbe (Resource-Efficient Energy Systems in the Built Environment).



**CONTACT US**  
[www.mdh.se](http://www.mdh.se)

**JINYUE YAN**  
Professor of Energy Engineering.  
[jinyue.yan@mdh.se](mailto:jinyue.yan@mdh.se)



**ERIK DAHLQUIST**  
Professor of Energy Technology and Research Director.  
[erik.dahlquist@mdh.se](mailto:erik.dahlquist@mdh.se)



**FREDRIK WALLIN**  
Track leader in Energy efficiency and emission mitigation.  
[fredrik.wallin@mdh.se](mailto:fredrik.wallin@mdh.se)



**MÄLARDALEN UNIVERSITY**  
**SWEDEN**



## Cardiff University Gas Turbine Research Centre (GTRC)

### Swansea Bay Tidal Lagoon Project

#### 'SOLCER' Energy-Positive House

*Friday 25th August 2017*

#### **Trip 1 (50 max)**

- 9:15 - Departure from Mercure hotel
- 10:15-12.00 - Tour of GTRC and presentation of the Tidal Lagoon Project
- 12:30 - Tour of SOLCER 'Energy-Positive House'
- 13:30 - Departure to Cardiff Bay
- 14:15 - Free afternoon at Cardiff Bay
- 16:30 - Pick-up at Cardiff Bay to Mercure hotel

#### **Trip 2 (50 max)**

- 10:00 - Departure from Mercure Hotel
- 10:45 - Arrival at SOLCER 'Energy Positive House'
- 12:00-13.45 - Tour of GTRC and Presentation of Tidal Lagoon Project
- 14.30 - Free Afternoon at Cardiff Bay
- 16:30 - Pick-up at Cardiff Bay to Mercure hotel

#### **What is GTRC?**

In 2004, Cardiff University was selected by QinetiQ ahead of other UK consortia to take ownership of their large-scale gas turbine combustion research facility. GTRC was launched in 2007 with the support from the European Union and the Welsh Assembly Government.

GTRC enables novel large-scale research studies to be conducted into the functionality of new Gas Turbine (GT) combustion systems, components and fuels under elevated conditions of temperature and pressure, as would be experienced within a gas turbine engine during operation.

An extensive suite of bespoke test rigs are available for the characterisation of combustion and fuel systems utilising traditional as well as alternative and renewable fuels, or fuel mixtures using a multi-component gas mixing facility. An extensive suite of non-intrusive measurement techniques enable fundamental investigations of phenomena occurring within the combustion system, giving rise to poor operational or emission performance. Exhaust gas samples are conditioned and transported to a comprehensive on-line gas analysis suite, including the European reference systems for particulate matter measurement.

The currently UK research council funded GTRC research programmes focus on the following applied energy challenges : Fuel and operational flexibility; complementing intermittent renewables; chemical energy storage via hydrogen and derivatives such as ammonia; Carbon Capture and Storage/Utilisation (CCS/U) strategies, including oxyfuel and selective exhaust gas recirculation; risk and hazard management including PM emissions and explosion hazards. As part of regional development

funding, some of these research themes are being developed into demonstration projects. All GTRC projects are sponsored by or in collaboration with industry, including Siemens, Rolls-Royce, Uniper, RWE, UK Health and Safety Executive, etc.

## **What is the Tidal Lagoon Project?**

Swansea Bay Tidal Lagoon will be the world's first tidal lagoon power plant. A tidal lagoon is a 'U' shaped breakwater, built out from the coast which contains a bank of hydro turbines. Water fills up and empties the man-made lagoon as the tides rise and fall. Electricity is generated on both the incoming and outgoing tides, four times a day, every day.

Due to the incredible tides on the West Coast of Britain, by keeping the turbine gates shut for just three hours, there is already a 14ft height difference in water between the inside and the outside of the lagoon. Power is then generated as the water rushes through 200ft long draft tubes, rotating the 23ft diameter hydro turbines.

The project was awarded a Development Consent Order in 2015 and is primed for construction. It will comprise 16 hydro turbines, a six mile breakwater wall, generating electricity for 155,000 homes for the next 120 years.



*Swansea Tidal Lagoon vision. Source: Wales Online*

Its major delivery partners include Atkins, General Electric, Andritz Hydro, Laing O'Rourke and Alun Griffiths Ltd. To know more about it go to <http://www.tidallagoonpower.com/about/>

## **About The SOLCER 'Energy Positive' House**

Energy efficient design means more energy for the national grid. Experts from Cardiff University have designed and built the UK's first purpose-built, low-cost energy smart house, capable of exporting more energy to the national electricity grid than it uses. The house (see photo below), designed by Professor Phil Jones and his team based at the Welsh School of Architecture, has been built as a prototype to meet tough targets for zero carbon housing set by UK Government.



*SOLCER house. Source: Cardiff University*

Designed and constructed as part of the Wales Low Carbon Research Institute's (LCRI) SOLCER project, and supported by SPECIFIC at Swansea University, its unique design combines for the first time reduced energy demand, renewable energy supply and energy storage to create an energy positive house.

## **Cardiff Bay**

Cardiff owes much of its history to the Industrial Revolution of the 1790's, which stimulated mining in the valleys of South Wales. By the 1880's, Cardiff had transformed from one of the smallest towns in Wales to the largest and its port was handling more coal than any other port in the world. On the eve of the First World War in 1913, coal exports reached their peak at over 13 million tonnes. At this time the international price of coal was struck in the Coal Exchange building and it was here that the world's first £1 million pound deal was signed.

After the Second World War, however, demand for coal slumped and international markets were lost as other countries developed their own steel industries. Trade was increasingly lost to container ports and by the 1960's coal exports had virtually ceased. In 1978 East Moors Steelworks closed with the loss of 3,200 jobs and this dealt a further blow to South Cardiff. Today, the Cardiff docklands area is known as Cardiff Bay and it has been transformed by the Cardiff Barrage that impounds the Rivers Taff and the Ely to create a massive fresh-water lake. A number of boat tours operate from Mermaid Quay, which allow you to gain an understanding of the history and fauna of this exciting and upcoming area. There is also a water taxi service which operates throughout the year from the Bay to the city centre and Penarth.



*Cardiff Bay. Source: Cardiff University*

Cardiff Bay is home to a number of attractions such as Techniquest Science Discovery Centre ideal for all the family, Craft in the Bay, The Welsh Assembly at the Pierhead, Butetown History and Arts Centre, the Norwegian Church Arts Centre and the Wales Millennium Centre, a stunning international arts centre. The Red Dragon Centre provides further options for family entertainment.

To book tours, check what type of food is served there and what to visit please check <http://www.cardiffbay.co.uk/>

## **Registration**

Contact Karolina Rucinska at [rucinskaka@cardiff.ac.uk](mailto:rucinskaka@cardiff.ac.uk)

Spaces are limited to 50 persons per trip. Please indicate which trip you wish to book.

## General Information

Cardiff is the capital and largest city in Wales and the tenth largest city in the United Kingdom. The city is the country's chief commercial centre, the base for most national cultural and sporting institutions, the Welsh national media, and the seat of the National Assembly for Wales. Rich in ancient history, sporting excitement, romantic ambience, eclectic culture and 'out of this world' activities, Cardiff is the perfect holiday destination for families, couples and groups. Cardiff is a thriving city, just 2 hours by train from London.

## Getting around Cardiff

### **BY CAR**

Cardiff is easily accessible via the M4 motorway, which runs through the north of the city, making London a comfortable drive away. From the Midlands, the North of England and Scotland it is a straightforward drive via the M6, M5 and M50/M4. From the South and South West of England the approach is by M5 and M4. Access from West Wales is by M4.

### **BY COACH**

Cardiff bus station is located adjacent to Cardiff Central Station and is the central hub for buses and coaches arriving from outside Cardiff. You can travel to Cardiff by National Express Coach from most UK cities. There are also Megabus routes into Cardiff from London, Swansea, Birmingham Airport, Manchester and Newcastle. The Megabus stops at Kingsway, just opposite the Hilton Hotel.

Visit [Megabus.com](http://Megabus.com) to check timetables, buy tickets and check routes to Cardiff.

Visit [National Express](http://National Express) to check information and buy tickets to Cardiff.

### **FROM CARDIFF AIRPORT**

Cardiff Airport is 12 miles west of the city centre and 10 miles from Junction 33 of the M4. The airport has direct flights to over 50 destinations and connecting flights to over 800 destinations worldwide. Visit the [Cardiff Wales airport website](http://Cardiff Wales airport website) for details. Airlines operating from Cardiff include KLM, Aer Lingus, Flybe, Vueling and Ryanair.

### **GETTING FROM CARDIFF AIRPORT**

Trains run between the Airport and Cardiff Central station and Bridgend every hour, with a shuttle bus linking the Airport station to the terminal. TrawsCymru operates the T9 express service between Cardiff Airport and Cardiff Central station every 30 minutes hours during the day, 7 days a week. Visit [TrawsCymru](http://TrawsCymru) for details.

### **AIRPORT TRANSFER SERVICES**

Rideways Transport

Flightlink Wales

### **OTHER UK AIRPORTS**

Bristol International Airport is only 1 hour away by car with routes direct from the US as well as flights from within the UK and Europe. From March 2013, Greyhound coach services will provide a link to and from Cardiff to Bristol Airport. Birmingham, Manchester and London Airports are also all easily accessible from Cardiff.

## **BY TRAIN & RAIL**

Cardiff has direct rail links to many cities in the UK including London, Birmingham, Manchester, Nottingham, Bristol and Southampton. The journey time from London Paddington to Cardiff is just over 2 hours and leaves every 30 minutes.

To search train timetables and buy tickets, visit National Rail Enquiries. Visit [TheTrainLine.com](http://TheTrainLine.com) to search timetables, buy tickets and more for UK trains to Cardiff. For visitors taking the train from Europe, visit the Eurostar website.

Trains will still be running over alternative routes, so please check before you travel at [nationalrail.co.uk](http://nationalrail.co.uk)

## **BY BOAT & SEA**

For those travelling from mainland Europe there is a wide choice of entry points to the UK served by many ferry companies. Ferry ports link with the national motorway system to provide fast and easy access to Cardiff. One resource for ferries to the UK can be found [here](#).

If you are lucky enough to have your own boat, you can find out more about short term moorings in Cardiff Bay at this [website](#) or moor your boat in nearby Penarth using this [website](#).

## **BY BICYCLE**

Cardiff is very flat and easily negotiated by bike. You will find plenty of bike racks around the city centre and cycle paths like the Taff Trail provide traffic-free routes. To get here by bike, we would recommend using Google Maps' excellent Bike route planner. An example journey – from Bristol to Cardiff – can be seen at this [link](#). The Taff Trail also provides a great bike ride to Cardiff from Brecon. Learn more about the Taff Trail and cycling routes [here](#).

## **Climate and Clothing**

August is the warmest month averaging at around 20 degrees Celsius, but weather and temperature change often and rapidly. It is good to have emergency waterproof clothing at all times.

## **Currency and Banking**

The British Pound is the currency of United Kingdom. ATMs and credit cards are widely accepted.

## **Electricity**

Power is supplied from UK wall sockets at about 220 volts (actually 220-240). The alternating current cycle is rated at speed of 50Hz. UK adapters will be required.

## **Time Difference**

GMT (UTC), Summer (DST) BST (UTC+1)

## **Travel Guide**

Cardiff is a capital city of Wales which is part of the United Kingdom. It means that visitors can embark on a great tour, which can take them to not only through Wales, but also England, Scotland, and Northern Ireland.

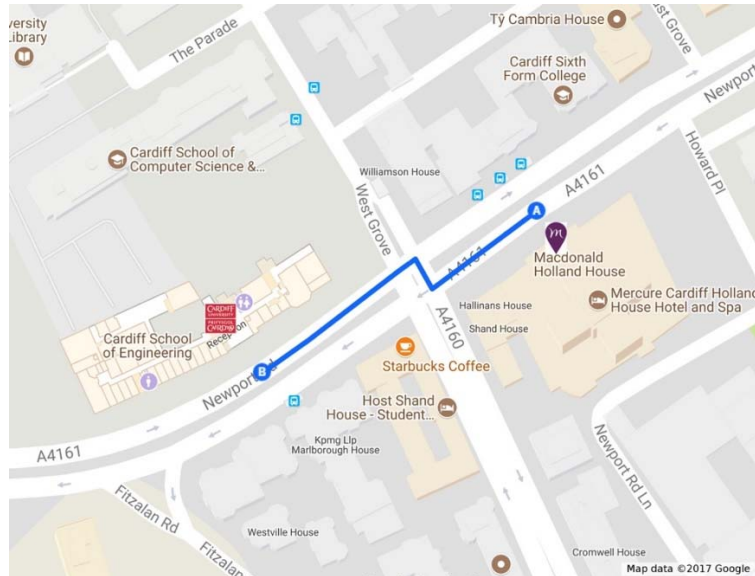
To find out more about Cardiff and Wales go to <http://www.visitcardiff.com/> and <http://www.visitwales.com/>

For tourist information about the UK click on <https://www.visitbritain.com/gb/en>

# Venues Information

## Conference Venues

The conference will be held at Mercure Hotel and Cardiff School of Engineering, which are in 3-mins walking distance. The conference badge will have to be worn at all times to access the conference venues.



### Registration area

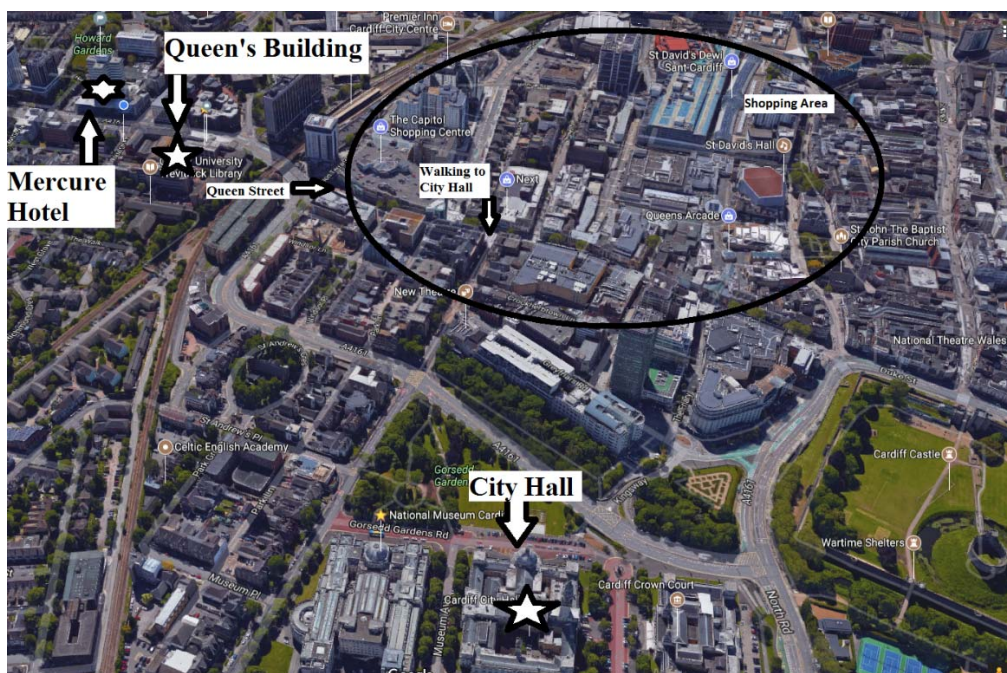
Mercure, Ground floor

### Conference Banquet

Mercure, Calon 1 and 2, ground floor

### Drinks reception

City Hall



# Venues Information

## Keynotes and plenaries

Mercure, Calon 1 and 2, ground floor

## Information desk

School of Engineering, Ground floor

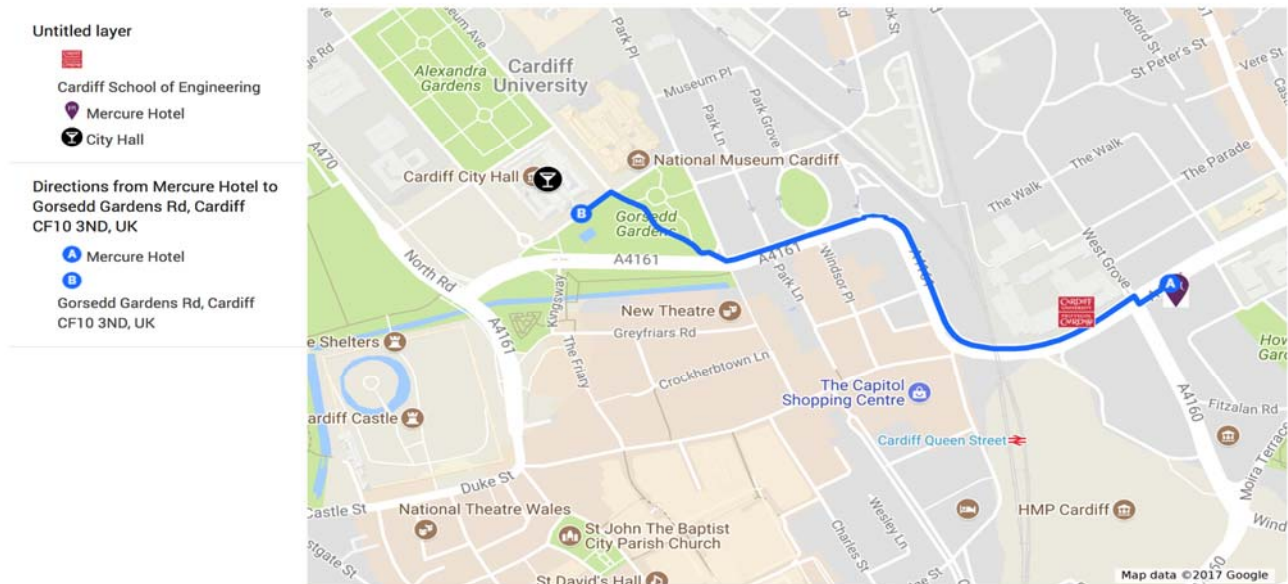
## Coffee and tea breaks

Mercure, Ground and 1st floor

## Lunch breaks

Mercure, Ground and 1st floor

## Mercure to City Hall



## Mercure Cardiff Holland House Hotel and Spa

24-26 Newport Rd, Cardiff CF24 0DD, UK

- ↑ 1. Head northeast on Newport Rd Ln toward Howard Pl 167 ft
- ↶ 2. Turn left onto Howard Pl 259 ft
- ↶ 3. Turn left onto Newport Rd/A4161 371 ft
- ↷ 4. Turn right onto Fitzalan Pl/West Grove/A4160 43 ft
- ↶ 5. Turn left onto Newport Rd/A4161  
Continue to follow A4161 0.4 mi
- ↷ 6. Slight right at Park Pl 59 ft
- ↶ 7. Slight left toward Gorsedd Gardens Rd 0.1 mi
- ↶ 8. Turn left onto Gorsedd Gardens Rd  
Destination will be on the right 194 ft

## Cardiff City Hall

Gorsedd Gardens Rd, Cardiff CF10 3ND, UK

# Speaker's Guide

## Presentation

Length of presentation material should be in accordance with your allocated time. You are requested to load your presentation files before the session starts. Each oral presentation at the breakaway venues is limited to 20 minutes, which include the questions and answers. Please refer to this program booklet for actual presentation times. 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 laptop computer with a data projector. PowerPoint is the standard presentation format. The computers in the meetings rooms are provided to Window-based PC Users. Conference volunteers will be available to assist you in case you encounter difficulties to use the IT equipment.

## Presentation Venues

The opening ceremony and keynote speeches will be held at the Calon suite, Mercure Hotel. The following table lists all the presentation venues with abbreviations which are used in the detailed programme in the late part of this booklet.

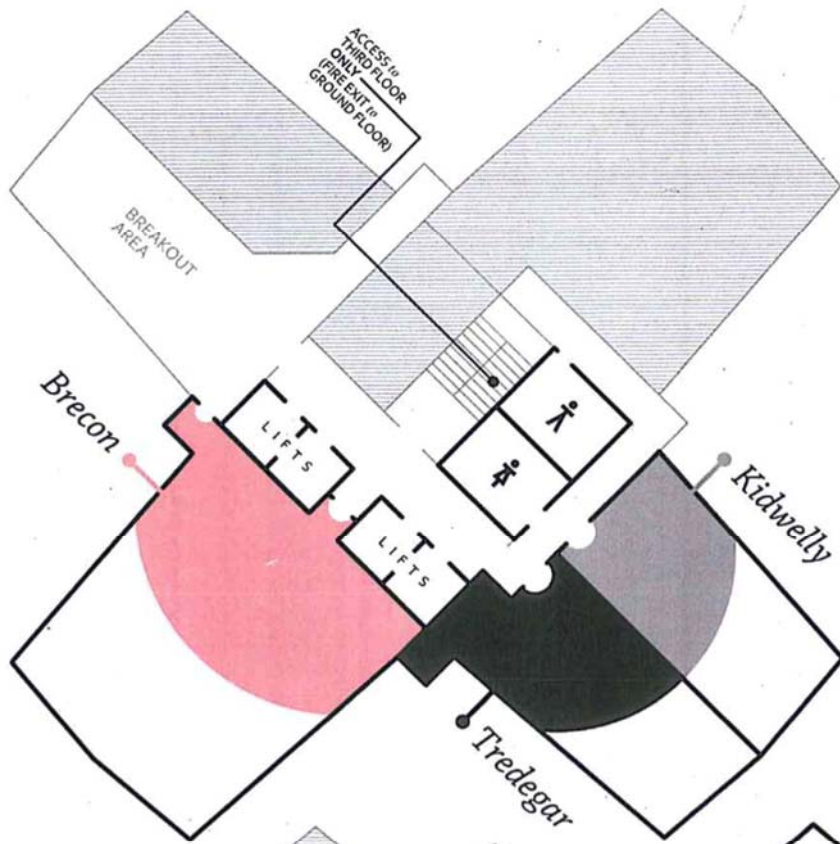
SESSION	VENUE ROOM	LOCATION
A	Caernarfon	Mercure, Floor 1
B	Brecon	Mercure, Floor 2
C	Pembroke	Mercure, Floor 3
D	Kidwelly	Mercure, Floor 3
E	S/1.29	School of Engineering, Floor 1
F	S/1.24	School of Engineering, Floor 1
G	S/1.25	School of Engineering, Floor 1
H	S/1.22	School of Engineering, Floor 1
I	Calon 2	Mercure, Ground Floor
J	S/1.32	School of Engineering, Floor 1
K	Calon 1	Mercure, Ground Floor

The poster sessions will be held at Calon 1 and 2, ground floor of Mercure Hotel.

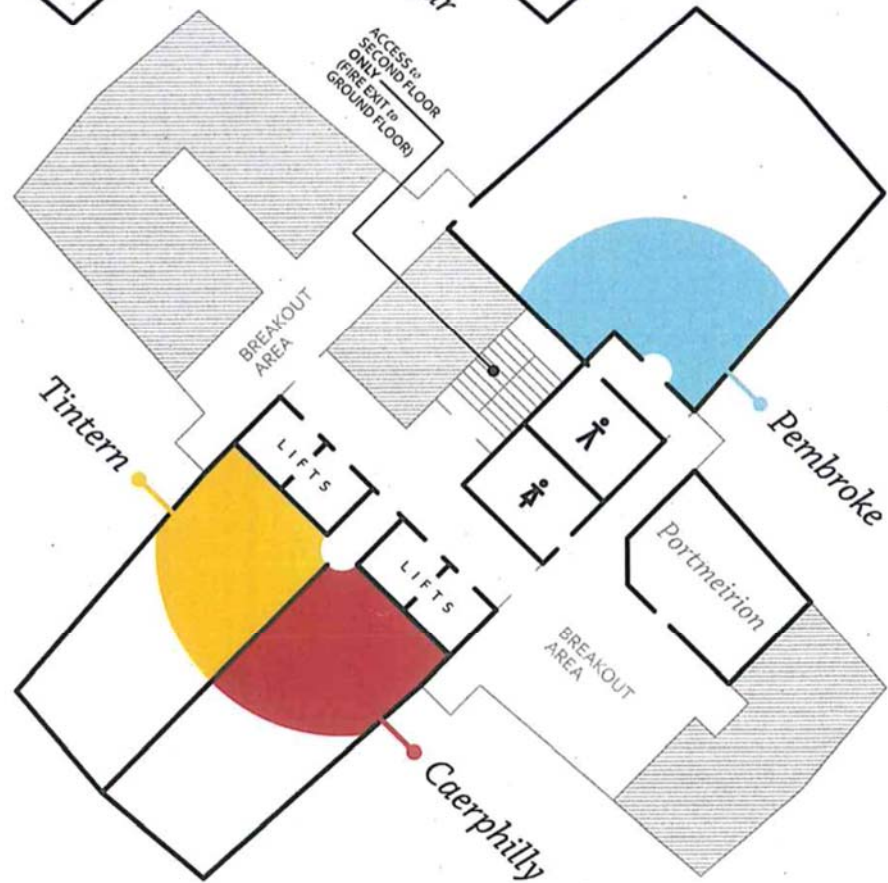


# Speaker's Guide

2



3



HOLLAND HOUSE  
2ND and 3RD FLOORS

# Programme at a Glance

Registration: Aug 21, 14:00-16:00; Aug 22-23, 8:00-17:00; Aug 24, 8:00-12:00

Editorial Board Meeting: Aug 21, 17:30-19:00, Caernarfon suite, Mercure Cardiff Holland House Hotel

Welcome reception: Aug 21, 19:00-21:30, Cardiff City Hall, Cathays Park, Cardiff, CF10 3ND

Time	Day 1: Aug 22										
09:00-09:10	Opening										
09:10-09:50	Keynote 1										
09:50-10:30	Keynote 2										
10:30-10:50	Tea/Coffee Break										
10:50-11:30	Keynote 3										
11:30-12:10	Keynote 4										
12:10-13:00	Lunch										
13:00-13:40	Poster Session I										
Afternoon	1-A3	1-B3	1-C3	1-D3	1-E3	1-F3	1-G3	1-H3	1-I3	1-J3	1-K3
13:40-15:20	RE	RE	IES	ES	MT&S	EMEC	EMEC	CECT	RE	CECT	PS
15:20-15:50	Tea/Coffee Break										
Afternoon	1-A4	1-B4	1-C4	1-D4	1-E4	1-F4	1-G4	1-H4	1-I4	1-J4	1-K4
15:50-17:30	RE	RE	IES	ES	MT&S	EMEC	EMEC	CECT	RE	CECT	PS
Time	Day 2: Aug 23										
Morning	2-A1	2-B1	2-C1	2-D1	2-E1	2-F1	2-G1	2-H1	2-I1	2-J1	2-K1
08:10-09:50	RE	RE	IES	ES	MT&S	EMEC	EMEC	CECT	MT&S	CECT	PS
09:50-10:20	Tea/Coffee Break										
Morning	2-A2	2-B2	2-C2	2-D2	2-E2	2-F2	2-G2	2-H2	2-I2	2-J2	2-K2
10:20-12:00	RE	RE	IES	ES	MT&S	EMEC	EMEC	CECT	MT&S	CECT	PS
12:00-13:00	Lunch										
13:00-13:40	Poster Session II										
Afternoon	2-A3	2-B3	2-C3	2-D3	2-E3	2-F3	2-G3	2-H3	2-I3	2-J3	2-K3
13:40-15:20	RE	RE	IES	ES	MT&S	EMEC	EMEC	CECT	EMEC	CECT	PS
15:20-15:50	Tea/Coffee Break										
Afternoon	2-A4	2-B4	2-C4	2-D4	2-E4	2-F4	2-G4	2-H4	2-I4	2-J4	2-K4
15:50-17:30	RE	RE	IES	ES	MT&S	EMEC	EMEC	CECT	RE	CECT	PS
19:00-22:00	Conference Banquet										
Time	Day 3: Aug 24										
Morning	3-A1	3-B1	3-C1	3-D1	3-E1	3-F1	3-G1	3-H1	3-I1	3-J1	3-K1
08:10-09:50	RE	RE	IES	ES	MT&S	EMEC	EMEC	CECT	RE	CECT	
09:50-10:20	Tea/Coffee Break										
Morning	3-A2	3-B2	3-C2	3-D2	3-E2	3-F2	3-G2	3-H2	3-I2	3-J2	3-K2
10:20-12:00	RE	RE	IES	ES	MT&S	EMEC	EMEC	CECT	RE	IES	
12:00-13:00	Lunch										
Afternoon	3-A3	3-B3	3-C3	3-D3	3-E3	3-F3	3-G3	3-H3	3-I3	3-J3	3-K3
13:00-14:40	RE	RE	IES	ES	MT&S	EMEC	EMEC	CECT	EMEC	CECT	
14:40-15:00	Tea/Coffee Break										
Afternoon	3-A4	3-B4	3-C4	3-D4	3-E4	3-F4	3-G4	3-H4	3-I4	3-J4	3-K4
15:00-17:00	RE	RE	IES	ES	MT&S	EMEC	EMEC	CECT	EMEC	EMEC	

MT&ES = Mitigation technology and energy storage; CECT=Clean energy conversion technology; EMEC=Energy management, policy and economics;

ES=Energy sciences; IES=intelligent energy system; RE=Renewable energy; PS=Panel Session

# Day 1

# Oral Presentations

TIME	DAY 1: August 22		
09:00-09:10	OPENING (Calon 1/2)		
09:10-09:50	Keynote 1		
09:50-10:30	Keynote 2		
10:30-10:50	TEA/COFFEE BREAK		
10:50-11:30	Keynote 3		
11:30-12:10	Keynote 4		
12:10-13:00	LUNCH		
13:00-13:40	POSTER SESSION I		
Room: Caernarfon suite Session Name: Biodiesel Session Chair: Wei-Hsin Chen, Sebastian Schwede			
Time	Paper ID	Author	Paper Title
13:40-14:00	94	Ke Li	Physicochemical characterization of biodiesel from Haematococcus pluvialis mutant induced with 15% CO <sub>2</sub>
14:00-14:20	153	Hayder Kurji, Agustin Valera-Medina, Aniekan Okon, Cheng Tung Chong	Combustion and emission performance of CO <sub>2</sub> /CH <sub>4</sub> /biodiesel and CO <sub>2</sub> /CH <sub>4</sub> /diesel blends in a swirl burner generator
14:20-14:40	302	Marco Buffi, Tine Seljak, Alessandro Cappelletti, Tomaž Katrašnik, Agustin Valera-Medina, David Chiaramonti	Emissions and combustion performance of a micro gas turbine powered with liquefied wood and its blends
14:40-15:00	643	Nor Adhahah Rashid, Kamarul Asri Ibrahim, Mohd Kamaruddin Abd Hamid, Nur Atikah Mohd Rosely, Mohd. Aiman Mohd. Noor, Azmer Shamsuddin	Forecasting of refined palm oil quality using principal component regression
15:00-15:20	768	Abdul Raouf Tajik, Tariq Shamim, Rashid Al-Rub, Mouna Zaidani	Numerical investigation of turbulent diffusion flame in the aluminum anode baking furnace employing presumed PDF
Room: Brecon suite Session Name: Solar PV applications Session Chair: Hongxing Yang, Tracy Sweet			
Time	Paper ID	Author	Paper Title
13:40-14:00	428	Fahad Javed, Ahmed Taimoor, Zainab Asif	Right-sizing solar PV and storage for household consumer using agent based modeling
14:00-14:20	440	YingDong Yu, Jiahong Liu, Ying Wang, Chenyao Xiang, Jinjun Zhou	The feasibility of solar water pumping system for Cassava irrigation in Guangxi Autonomous Region, China
14:20-14:40	525	Wanjun Qu, Hui Hong, Sanli Tang	Thermodynamic evaluation of a hybrid solar concentrating photovoltaic/Kalina cycle for full spectrum utilization
14:40-15:00	552	Jiaxin Zhao, Tao Ma	A parametric study about the potential to integrate phase change material into photovoltaic panel
15:00-15:20	591	Ming Hui Tan, Kok-Keong Chong, An-Chow Lai	Design and construction of prototype mobile sun-tracking system for concentrator photovoltaic system

# Day 1

# Oral Presentations

<b>Room: Pembroke suite</b> <b>Session Name: Smart Grid</b> <b>Session Chair: Clemente Capasso, Ramesh Bansal</b>			
Time	Paper ID	Author	Paper Title
13:40-14:00	722	Lorenzo Bartolucci, Stefano Cordiner, Vincenzo Mulone, Joao Luis Rossi, Vittorio Rocco	Renewable sources integration through the optimization of the load for residential applications.
14:00-14:20	752	Azaza Maher	Smart meter data clustering using consumption indicators: responsibility factor and consumption variability
14:20-14:40	190	Rui Xiong, Jiayi Cao	Reinforcement learning-based real-time energy management for plug-in hybrid electric vehicle with hybrid energy storage system
14:40-15:00	534	Stephen Jia Wang, Patrick Moriarty	Can new communication technology promote sustainable transport?
15:00-15:20	523	Wenjie Gang, Wang Shengwei, Jinbo Wang, Xinhua Xu	Application of distributed energy systems in subtropical and high density urban areas
<b>Room: Kidwelly suite</b> <b>Session Name: Gas Hydrates</b> <b>Session Chair: Erik Dahlquist, Xiaosen Li</b>			
Time	Paper ID	Author	Paper Title
13:40-14:00	613	Gang Li, Xiao-Sen Li, Chao Li	Measurement of permeability and verification of Kozeny-Carman equation using statistic method
14:00-14:20	655	Yi Wang, Jingchun Feng, Xiao-Sen Li, Yu Zhang, Han Han	Experimental investigation on sediment deformation during gas hydrate decomposition for different hydrate reservoir types
14:20-14:40	657	Yi Wang, Jingchun Feng, Xiao-Sen Li	Large scale experimental evaluation to methane hydrate dissociation below quadruple point by depressurization assisted with heat stimulation
14:40-15:00	129	Yang Runhua, Lixin Yang, Chaobo Li	Numerical study of contact-angle on different microstructural surfaces prepared by PIII technology
15:00-15:20	332	Zhiming Xia	Hydrate-based synchronously capture of CO <sub>2</sub> and H <sub>2</sub> S for clean H <sub>2</sub> with new synergic additives
<b>Room: S/1.29</b> <b>Session Name: Carbon capture and storage</b> <b>Session Chair: Zaoxiao Zhang, Xi Jiang</b>			
Time	Paper ID	Author	Paper Title
13:40-14:00	36	Junnan He, Shuai Deng, Li Zhao, Ruikai Zhao, Shuanjun Li	A numerical analysis on energy-efficiency performance of temperature swing adsorption for CO <sub>2</sub> capture
14:00-14:20	44	Xiangzhou Yuan, Seung Wan Choi, Eun Ji Jang, Ki Bong Lee	Chemically activated microporous carbons derived from petroleum coke: performance evaluation for CF <sub>4</sub> adsorption
14:20-14:40	103	Jieying Jing, Xuwei Zhang, Shidong Wang, Tingyu Li, Wen-ying Li	Improving CO <sub>2</sub> sorption performance of CaO/Ca <sub>3</sub> Al <sub>2</sub> O <sub>6</sub> sorbents by thermally pretreated in CO <sub>2</sub> atmosphere
14:40-15:00	203	Yannan Li, Jun Cheng, Leiqing Hu, Jianzhong Liu, Junhu Zhou, Kefa Cen	Accelerating CO <sub>2</sub> absorption rate of ionic liquid [P66614][TriZ] loaded on graphene nanoplatelets
15:00-15:20	732	Francis Bougie, Xianfeng Fan	Analysis of the regeneration of Monoethanolamine aqueous solutions by microwave irradiation

# Day 1

# Oral Presentations

<b>Room: S/1.24</b> <b>Session Name: Carbon emission trading</b> <b>Session Chair: Thomas Brudermann, Geoffrey Hammond</b>			
Time	Paper ID	Author	Paper Title
13:40-14:00	48	Ye Duan	Research on provincial shadow price of carbon dioxide in China's iron and steel industry
14:00-14:20	194	Xinghua Fan, JiuLi Yin, Xuelian Zhao, Yu Zou	Cointegration relationship between carbon price and its factors: evidence from structural breaks analysis
14:20-14:40	727	Khamila Khaqqi, Janusz Sikorski, Markus Kraft, Kunn Hadinoto	Incorporating seller/buyer reputation-based system in blockchain platform for emission trading application
14:40-15:00	649	Shupei Huang, Haizhong An	Contagions among global oil-exchange rate nexuses
15:00-15:20	179	Huan Wang, Wenying Chen, Jingcheng Shi	Analysis on carbon emission pathways of global industry sector: sustainability, middle of the road and fossil-fueled development
<b>Room: S/1.25</b> <b>Session Name: Energy monitoring and evaluations</b> <b>Session Chair: Yi-Ming Wei, Perry Yang</b>			
Time	Paper ID	Author	Paper Title
13:40-14:00	136	Ana Gonzalez Hernandez, Leonardo Paoli, Jonathan Cullen	Resource efficiency in steelmaking: energy and materials combined
14:00-14:20	117	Lukas Hardt, John Barrett, Paul Brockway, Timothy Foxon, Matthew K. Heun, Anne Owen, Peter G. Taylor	Outsourcing or efficiency? Investigating the decline in final energy consumption in the UK productive sectors
14:20-14:40	200	Michele Zinzi	Assessing the overheating risks in Italian existing school buildings renovated with nZEB targets
14:40-15:00	217	Guangyi Liu	A faster non-linear iteration solver using graph computing and its application in power flow calculation
15:00-15:20	219	John Taylor, Hanh Truong, Ardalan Khosrowpour, Abby Francisco, Neda Mohammadi	Method for visualizing energy use in building information models
<b>Room: S/1.22</b> <b>Session Name: Advanced combustion and gasification of fossil fuel</b> <b>Session Chair: Yukun Hu, Tariq Shamim</b>			
Time	Paper ID	Author	Paper Title
13:40-14:00	8	Guangsuo Yu, Qinghua Guo, Yan Gong, Juntao Wei	Co-gasification with CO <sub>2</sub> -steam mixture: kinetic model study based on shared active sites
14:00-14:20	12	Chonghe Hu, Yan Gong, Qinghua Guo, Guangsuo Yu	Investigations of CH* chemiluminescence characteristics in opposed impinging coal-water slurry flames in an entrained-flow gasifier
14:20-14:40	17	Juntao Wei, Qinghua Guo, Guangsuo Yu, Kunio Yoshikawa	Synergy behaviour on co-gasification reactivity of coal and city garbage-derived hydrochar
14:40-15:00	74	Dezhi Zhou, Wenming Yang	A bundled dynamic adaptive chemistry method toward accelerating combustion chemistry integration
15:00-15:20	389	Massimiliano Renzi, Carlo Caligiuri	Combustion modelling of a dual fuel diesel – producer gas compression ignition engine

# Day 1

# Oral Presentations

<b>Room: Calon 2</b> <b>Session Name: Other renewable energy systems</b> <b>Session Chair: Dongke Zhang, Isam Janajerh</b>			
Time	Paper ID	Author	Paper Title
13:40-14:00	712	Bosheng Su, Wei Han	Using solar energy to improve the energy performance of tri-generation systems for sewage treatment plants
14:00-14:20	815	Syed Muhammad Raza Naqvi, Erik Dahlquist	Gasification integrated with small chemical pulp mills for fuel and energy production
14:20-14:40	256	Arif Darmawan, Muhammad Aziz, Koji Tokimatsu, Anggoro Cahyo Fitrianto	Enhanced electricity production from rice straw
14:40-15:00	484	Dagnija Blumberga, Andra Blumberga, Armands Gravelins, Haralds Vigants	Sustainability of pellet production
15:00-15:20	803	Mahsa Daraei, Anders Avelin, Eva Thorin, Erik Dotzauer	Evaluation of potential fossil fuel free energy system: Scenarios for optimization of a regional integrated system
<b>Room: S/1.32</b> <b>Session Name: Hydrogen energy</b> <b>Session Chair: Dennis Y.C. Leung, Yinka Sanusi</b>			
Time	Paper ID	Author	Paper Title
13:40-14:00	112	Yang Li, Xinlei Yu, Qinghua Guo, Zhenghua Dai, Guangsuo Yu, Fuchen Wang	Kinetic study of decomposition of H <sub>2</sub> S and CH <sub>4</sub> for H <sub>2</sub> production using detailed mechanism
14:00-14:20	615	Zakir Khan	Assessment of energy flows in Integrated Catalytic Adsorption (ICA) steam gasification for hydrogen production
14:20-14:40	647	Lukman Adi Prananto, Muhammad Aziz, Muhammad Kunta Biddinika	Combined dehydrogenation and hydrogen-based power generation
14:40-15:00	667	Kaiqi Shi, Xiang Luo, Jiefeng Yan, Edward Lester, Tao Wu	Microwave-assisted pyrolysis of bamboo coupled with reforming by activated carbon for the production of hydrogen-rich syngas
15:00-15:20	715	Isam Janajerh, Almazrouei Manar, Tala Elsamad	Thermogravimetric kinetics and high fidelity analysis of crude glycerol
13:40-15:20	<b>Room: Calon 1</b> <b>PANEL SESSION</b> <b>Title: Grid Integration of Renewable Energy Systems Using DC Technologies</b>		
	Paper ID	Author	Paper Title
	653	Andrea Pitto, Diego Cirio, Iñigo Azpiri Irazabal, Per Lund, Jakob Glasdam, Emanuele Ciapessoni	Grid code compliant controllers for multi-terminal HVDC grids aimed to integrate wind power: assessing their impact on the operational security of a real-world system
	705	Max Parker, Stephen Finney, Derrick Holliday	DC protection of a multi-terminal HVDC network featuring offshore wind farms
	749	Qi Qi, Chao Long, Jianzhong Wu	Using an MVDC link to increase DG hosting capacity of a distribution network

# Day 1

# Oral Presentations

15:20 – 15:50		<b>TEA/COFFEE BREAK</b>	
<b>Room: Caernarfon suite</b> <b>Session Name: Biomass pyrolysis and gasification</b> <b>Session Chair: Kunio Yoshikawa, Sebastian Schwede</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	636	Vekes Balasundram, Norazana Ibrahim, Rafiziana Md. Kasmani, Mohd. Kamaruddin Abd. Hamid, Ruzinah Isha, Hasrinah Hasbullah, Roshafima Rasit Ali	Catalytic pyrolysis of sugarcane bagasse over cerium (rare earth) loaded HZSM-5 zeolite
16:10-16:30	692	Khanh-Quang Tran	Selective dissolution of woody biomass under hydrothermal conditions
16:30-16:50	540	Zhezi Zhang, Mingming Zhu, Dongke Zhang	Pyrolysis characteristics of cellulose isolated from selected biomass feedstocks using a thermogravimetric analyser
16:50-17:10	769	Elisa Savuto, Arash Aghaikhani, Domenico Borello, Andrea Di Carlo	Poplar from phytoremediation as a renewable energy source: gasification properties and pollution analysis
17:10-17:30	122	Mohamed Hassan Ali, Ayoola Brimmo, Gustavo Ospina	Conically stabilized turbulent premixed lean-flames sustainability
<b>Room: Brecon suite</b> <b>Session Name: Solar thermal energy</b> <b>Session Chair: Qibin Liu, Ronald Wennersten</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	59	Jiahong Liu, HenYao Xiang, YingDong Yu, Weiwei Shao, Chao Mei, Lin Xia	Analysis of a solar assisted combined cooling, heating and power (SCCHP) system
16:10-16:30	84	Guanglei Xin, Jialing Zhu	Experimental and numerical analysis of solar enhanced natural draft dry cooling tower
16:30-16:50	90	Guozhen Li, Manxuan Xiao, Jie Dong, Llewellyn Tang, Xingxing Zhang	Effect of solar radiation and natural ventilation on temperature distribution in a greenhouse: a numerical study
16:50-17:10	98	Man Fan, Hongbo Liang, Shijun You, Huan Zhang, Baoquan Yin, Xiaoting Wu	Performance analysis of a solar heating system with the absorption heat pump and oil/water heat exchanger
17:10-17:30	119	Chen Cai, Xu Guoying, Zhang XiaoSong	Numerical simulation of nanofluid-based direct absorption solar collector-direct steam generator

# Day 1

# Oral Presentations

<b>Room: Pembroke suite</b> <b>Session Name: Electric vehicles</b> <b>Session Chair: Erik Dahlquist, Ottorino Veneri</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	160	Zhengyu Chu, Xuning Feng, Minggao OuYang, Languang Lu, Jianqiu Li,Xuebing Han, Zuofu Wang	Optimal charge current of lithium ion battery
16:10-16:30	783	Shanshan Guo, Rui Xiong, Fengchun Sun, Jiayi Cao, Kan Wang	An echelon internal heating strategy for lithium-ion battery
16:30-16:50	210	Ottorino Veneri, Clemente Capasso, Davide Lauria	Optimal control strategy of ultra-capacitors in hybrid energy storage system for electric vehicles
16:50-17:10	779	Nana Zhou, Hongwen He, Zhentong Liu, Zheng Zhang	UKF-based sensor fault diagnosis of PMSM drives in electric vehicles
17:10-17:30	627	Xuejin Zhou, Huichang Niu, Zhao Li, Tu Ran	Modified electrochemical model for real-time estimation of lithium-ion concentration in battery
<b>Room: Kidwelly suite</b> <b>Session Name: Heat transfer enhancement, heat exchangers and heat pipe</b> <b>Session Chair: Rebei Bel Fdhila, HowMing Lee</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	13	Wenlong Cheng, Yu-hang Peng	Experimental investigation on the effect of heat transfer enhancement of vacuum spray flash evaporation cooling using Al <sub>2</sub> O <sub>3</sub> -water nanofluid
16:10-16:30	31	Ya Ge, Zhichun Liu, Wei Liu, Feng Shan, Fang Yuan, Rui Long	Multi-objective arrangement optimization of a tube bundle in cross-flow using CFD and genetic algorithm
16:30-16:50	39	Yin Zhang, Mingshan Zhang, Zhiyuan Wei, Shurui Guo, Enshen Long	Outdoor air thermal plume simulation of layer-based VRF air conditioners in high-rise buildings
16:50-17:10	307	Agus Sasmito, Mahmoud AlZoubi, Ali Ghoreishi, Ferri Hassani	Intermittent freezing concept for energy saving in artificial ground freezing systems
17:10-17:30	446	Bernard, Ming Chian Yew, Ming Kun Yew, Yusof Farazila, Naquiuddin Haziq	Numerical analyses of the novel geometrically graded micro-channel heat sink
<b>Room: S/1.29</b> <b>Session Name: Carbon capture and storage</b> <b>Session Chair: Xianfeng Fan, Roland Span</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	743	Chimaoge Okezue, Dmitriy Kuvshinov	Effect of chemical impurities on centrifugal machine performance: implications for compressor sizing in a CO <sub>2</sub> transport pipeline
16:10-16:30	71	Kang Li	A study of small-scale CO <sub>2</sub> accidental release in near-field from a pressurized pipeline
16:30-16:50	436	Kreangkrai Maneeintr, Kyuro Sasaki, Monthicha Rawangphai	Evaluation for offshore carbon dioxide geological storage potential in the Gulf of Thailand
16:50-17:10	501	Carolina Font Palma, Abigail González Díaz	Prospects for petcoke utilization with CO <sub>2</sub> capture in Mexico
17:10-17:30	91	Shuai Deng, Ruikai Zhao, Shuangjun Li, Li Zhao, Junnan He, Taiwei Sun	Numerical investigations and mathematical models of carbon capture by adsorption-A review



# Day 1

# Oral Presentations

<b>Room: S/1.24</b> <b>Session Name: Climate change policy</b> <b>Session Chair: Bo Shen, Jonathan Cullen</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	319	Zhyi Yuan	Scenario Analysis on CO2-equivalent emissions from alternative mobile air conditioning refrigerants in china
16:10-16:30	415	Junjie Zhang, Biying Yu	How does household income change influence carbon dioxide emissions in Chinese provinces?
16:30-16:50	477	Hanan Ishaque	Quantifying the potential impact of Pakistan's GHG mitigation policies for coal-fired power plants
16:50-17:10	502	Dagnija Blumberga, Andra Blumberga, Jelena Ziemele, Einars Cilinskis	Analysis of supporting mechanisms in nonETS sector
17:10-17:30	544	Dennis Y.C. Leung	Bioethanol: is it a suitable biofuel for Hong Kong for reducing its vehicular emissions and carbon footprint?
<b>Room: S/1.25</b> <b>Session Name: Energy monitoring and evaluations</b> <b>Session Chair: Markus Kraft, Yoshiki Yamagata</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	294	Ahmad Nafais Rahimi, Mohd Faris Mustafa, Muhammad Zakwan Zaine, Nur Atikah Mohd Rosely, Muhammad Fakhru Islam Zahran, Munawar Zaman Shahrudin, Muhammad Afiq Zubir, Norazana Ibrahim, Kamarul Asri Ibrahim, Mohd Kamaruddin Abd Hamid	Olefin mixture direct sequence retrofitting and feed composition sensitivity analysis
16:10-16:30	305	Dan Yan, Yalin Lei, Li Li, Zhien Zhang, Qing Zhu	The spatiotemporal pattern evolution of PM2.5 concentration in China-a case study from the Beijing-Tianjin-Hebei region
16:30-16:50	349	Rodrigo Patino, Christophe Goupil	Social patterns of energy usage: An international comparison
16:50-17:10	528	Jiehui Yuan, Xunmin Ou, Gehua Wang	A framework for energy countermeasure analysis to tackle climate change and air pollution: the example of China
17:10-17:30	539	Michele Zinzi	Global energy performance of residential buildings: the role of the urban climate

# Day 1

# Oral Presentations

**Room: S/1.22**

**Session Name: ORC**

**Session Chair: Li Zhao, Zhibin Yu**

Time	Paper ID	Author	Paper Title
15:50-16:10	449	Yiji Lu, Xiaoli Yu, Zhi Li, Yuqi Huang, Tony Roskilly	Comparison study of Trilateral Rankine Cycle, Organic Flash Cycle and basic Organic Rankine Cycle for low grade heat recovery
16:10-16:30	561	Yunting Ge, Liang Li, Guoqiang Xu, Savvas Tassou	An experimental investigation on a recuperative Organic Rankine Cycle (ORC) system for electric power generation with low-grade thermal energy
16:30-16:50	663	Luca Cioccolanti, Alessia Arteconi, Roberto Tascioni	Simulation analysis of an innovative micro-solar 2kWe Organic Rankine Cycle plant for residential applications
16:50-17:10	760	Oyeni A. Oyewunmi, Antonio pantaleo, Julia Fordham, Christos Markides	Optimal sizing and operation of on-site combined heat and power systems for intermittent waste-heat recovery
17:10-17:30	43	Liqi Luo, Yaodong Wang, Tony Roskilly, Haisheng Chen, Xinjing Zhang	ORC units driven by engine waste heat - a simulation study

**Room: Calon 2**

**Session Name: Other renewable energy systems**

**Session Chair: Ronald Wennersten, Yawen Zhao**

Time	Paper ID	Author	Paper Title
15:50-16:10	20	Liliana Proskuryakova, Nikolay Gnatus, Andrey Gnatus, Svetlana Voronina	Advancements in research and development for geothermal energy from 'hot dry rocks': evidence from Russia
16:10-16:30	156	Lukman Adi Prananto, Muhammad Aziz, Tubagus Ahmad Fauzi Soelaiman	Utilization of excess steam through dry steam cycle at Kamojang geothermal power plant
16:30-16:50	269	Yongzhen Wang, Jun Zhao, Qingsong An	A variable-capacity power system driven by geothermal energy: research methodology and preliminary experimental study
16:50-17:10	504	Leyla Amiri, Ghoreishi-Madiseh Seyed Ali, Agus Sasmito, Ferri Hassaniy	Evaluation of heat transfer performance between rock and air in seasonal thermal energy storage unit
17:10-17:30	791	Xianmin Guo, Jie Xue	Experimental study on performance of flash-tank vapor injection air-source heat pump system with refrigerant R32

# Day 1

# Oral Presentations

<b>Room: S/1.32</b>			
<b>Session Name: Future engines of high efficiency and low emissions</b>			
<b>Session Chair: Tariq Shamim, Wenming Yang</b>			
<b>Time</b>	<b>Paper ID</b>	<b>Author</b>	<b>Paper Title</b>
15:50-16:10	50	Kar Mun Pang, Mehdi Jangi, Xue-Song Bai, Jesper Schramm, Jens Walther	Effects of nozzle diameter on diesel spray flames: a numerical study using an Eulerian stochastic field method
16:10-16:30	88	Yuedong Chao, Xinye Chen, Jun Deng, Zongjie Hu, Zhijun Wu, Liguang Li	Research on misfire and re-firing at first combustion cycle during cold start based on a modified form tandem ion current detection system on a PFI/GDI engine
16:30-16:50	204	Hakim T. Kadhim, Aldo Rona, Hayder M.B. Obaida, Katrin Leschke	The performance of a 1.5 stage axial turbine with a non-axisymmetric casing at off-design conditions
16:50-17:10	241	Zhehao Zhang, Zongjie Hu, Jun Deng, Zhe Kang, Lang Jiang, Liguang Li, Zhijun Wu, Yuedong Chao	Effect of direct water injection during compression stroke on thermal efficiency optimization of common rail diesel engine
17:10-17:30	378	Yiji Lu, Wenbo Dou, Daofei Li, Xiaoli Yu, Tony Roskilly	Evaluation of ideal double-tank hybrid pneumatic engine system under different compression cycle scenarios
15:50-17:30	<b>Room: Calon 1</b> <b>PANEL SESSION</b> Title: Applied Energy UNiLAB on Distributed Energy & Microgrid (DEM)		

# Day 2

# Oral Presentations

<b>Room: Caernarfon suite</b> <b>Session Name: Biogas, bio-ethanol and bio-hydrogen</b> <b>Session Chair: Eva Thorin, Tine Seljak,</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	138	Wei-Hsin Chen, Teng Chien Chen	Biogas partial oxidation in a heat recirculation reactor for syngas production
08:30-08:50	491	Geoffrey Hammond, Ross Mansell	Thermodynamic analysis of bioethanol production from wheat straw
08:50-09:10	594	Germán Buitrón	Fermentative biohydrogen production in fixed bed reactors using ceramic and polyethylene carriers as supporting material
09:10-09:30	801	Sebastian Schwede, Eva Thorin, Elin Törnwall, Hanna Petersson	Post-treatment of biogas digestate – An evaluation of ammonium recovery, energy use and sanitation
09:30-09:50	716	Jingjing Chen, XiaoYan Ji, Xiaohua Lu, Changsong Wang	Mechanism study of heat transfer enhancement using twisted hexagonal tube with slurry from biogas plant
<b>Room: Brecon suite</b> <b>Session Name: Solar thermal energy</b> <b>Session Chair: Pietro Elia Campana, Hongxing Yang</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	172	Yabin Jin, Jiabin Fang, Wei jinjia, Xinhe Wang	A comprehensive model for uniform heat flux inside cavity receiver with air-carbon mixture
08:30-08:50	173	Saeed Mohammed Wazed, Ben Richard Hughes, John Kaiser Calautit, Dominic O'Connor	Solar driven irrigation systems for remote rural farms
08:50-09:10	255	Zhenjie Wan, Jinjia Wei	Experimental study on thermal performance of a water/steam cavity receiver with solar simulator
09:10-09:30	276	Jiabin Fang, Jinjia Wei, Nan Tu, Xuancheng Du,	Effect of surface thermal radiation properties on the heat losses of a solar cavity receiver
09:30-09:50	361	Yurong He, Xinzhi Wang, Jian Huang, Xing Liu, Gong Cheng	Investigation of graphene nanofluid for high efficient solar steam generation
<b>Room: Pembroke suite</b> <b>Session Name: Electric vehicles</b> <b>Session Chair: Rui Xiong, Ottorino Veneri</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	661	Xiaohong Dong, Yunfei Mu, Hongjie Jia	A load forecast method of fast charging stations for electric vehicles on the freeway considering the information interaction
08:30-08:50	717	Ramesh Bansal, Anil Swarnkar, Nikhil Gupta, K Niazi, Nand Meena, Sonam Parashar	Mobile power infrastructure planning and operational management for smart city applications
08:50-09:10	778	Yuecheng Li, Hongwen He, Jiankun Peng	Power management for a plug-in hybrid electric vehicle based on reinforcement learning with continuous state and action spaces
09:10-09:30	596	Naveen Jain, Nitin Gupta, Manoj Kumawat, Ramesh Bansal	Optimally allocation of distributed generators in three-phase unbalanced distribution network
09:30-09:50	515	Stephen Jia Wang, Patrick Moriarty	Could automated vehicles reduce transport energy?

# Day 2

# Oral Presentations

<b>Room: Kidwelly suite</b> <b>Session Name: Heat transfer enhancement, heat exchangers and heat pipe</b> <b>Session Chair: Erik Dahlquist, Xiaosen Li</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	372	Tony Roskilly, Yiji Lu, Shi Haimin, Rui Huang	Experiment study of multi-fans cooling module using different shroud structures for advanced vehicle thermal management system
08:30-08:50	564	Jundika Kurnia, Agus Sasmito	Heat transfer performance and entropy generation of helical square tubes with various curvature radiuses
08:50-09:10	42	Peng Liu, Nianben Zheng, Feng Shan, Zhichun Liu, Wei Liu, Rui Long	PIV measurement of flow structures in a circular heat exchange tube with central slant rod inserts
09:10-09:30	67	Jie Lin, Ru Zhu Wang, Kian Jon Chua	The heat and mass transfer process of the counter-flow dew point evaporative cooler
09:30-09:50	592	Munawar Zaman Shahrudin, Mohd Kamaruddin Abd Hamid, Kamarul Asri Ibrahim, Ahmad Nafais Rahimi, Muhammad Afiq Zubir, Muhammad Fakhrol Islam Zahran	Energy integrated distillation column sequence by driving force method and pinch analysis for five components distillation
<b>Room: S/1.29</b> <b>Session Name: Carbon capture and storage (CCS)</b> <b>Session Chair: Xianfeng Fan, Yukun Hu</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	338	Zaoxiao Zhang, Xiaomei Wu, Zhen Qin, Yunsong Yu	Orthogonal experiments study of CO <sub>2</sub> absorption performance in a diameter-varying spray tower
08:30-08:50	386	Ye Huang, Angela Rolfe, Sina Rezvani, Martin Haaf, Ashok Dave, Neil Hewitt	Techno-economic and environmental analysis of Calcium Carbonate looping for CO <sub>2</sub> capture from a pulverised coal-fired power plant
08:50-09:10	402	Zhiming Xia, ZhaoYang Chen, Chao Chen, Yu Zhang, Ke-Feng Yan, Xiao-Sen Li	Carbon dioxide and sulfur dioxide capture from flue gas by gas hydrate based process
09:10-09:30	532	Doyeon Kim, Nilay Shah, Claire Adjiman	Theoretical modelling for flooding points in a rotating packed bed
09:30-09:50	264	Bohao Wu, Lanlan Jiang, Meiheriayi Mutailipu	Saturation comparison of CO <sub>2</sub> containing N <sub>2</sub> at different injection velocities and conditions by X-ray CT scanning

# Day 2

# Oral Presentations

**Room: S/1.24**

**Session Name: Energy economics, finance and investment**

**Session Chair: Holger Schlör, Yi-Ming Wei**

Time	Paper ID	Author	Paper Title
08:10-08:30	645	Pu Yang	The assessment of Paris agreement and Kyoto protocol: a benefit-cost prospective
08:30-08:50	82	Hui-Ling Zhou, Bao-Jun Tang, Hong Cao	Abandonment decision of overseas oil projects under low oil price
08:50-09:10	131	Qiang Ji	Measuring the impact of driving factors on natural gas prices
09:10-09:30	306	Ali Kuyuk, Ghoreishi-Madiseh Seyed Ali	A techno-economic model for application of geothermal heat pump systems
09:30-09:50	78	Jiawen Luo	Covariance breakdowns and connectedness of crude oil futures markets with non-synchronous data

**Room: S/1.25**

**Session Name: Energy monitoring and evaluations**

**Session Chair: Konstantinos Chalvatzis, Perry Yang**

Time	Paper ID	Author	Paper Title
08:10-08:30	616	Amin Al-Habaibeh, Allan Hawas	Innovative concept of an educational physical simulation tool for teaching energy consumption in buildings for enhancing public engagement
08:30-08:50	617	Li Zhou, Iftekhar Karimi, Markus Kraft, Chuan Zhang	J-Park Simulator, a cyber-infrastructure towards smart eco-industrial parks
08:50-09:10	741	Zakia Afroz, Tania Urmee, GM Shafiullah, Gary Higgins	Technological advancement of energy management facility of institutional buildings: a case study
09:10-09:30	154	Nan Li, Wenying Chen	Coal flow of present and the future in China-a regional perspective
09:30-09:50	816	Holger Schlör	The social footprint of permanent magnet production based on rare earth elements – a social life cycle assessment scenario

**Room: S/1.22**

**Session Name: Advanced combustion and gasification of fossil fuel**

**Session Chair: Aristide F. Massardo, Michael K.H. Leung**

Time	Paper ID	Author	Paper Title
08:10-08:30	166	Binbin Zhang, Qinfeng Liang, Jianliang Xu, Haifeng Liu	The residence time of molten slag on the wall in a gasifier with modeling method
08:30-08:50	189	Xiuxiu Sun, xingyu liang, Gequn Shu	A new model incorporating cross reactions for the combustion of n-tetradecane/toluene as marine diesel fuel
08:50-09:10	134	Guangsuo Yu, Qinghua Guo, Yan Gong, Yifei Wang, Xueli Chen, Fuchen Wang	Progress on Opposed Multi-Burner (OMB) coal-water slurry gasification technology and its industrial applications
09:10-09:30	356	Carsten Wedler, Markus Richter, Roland Span	Integration of sorption kinetics in carbon conversion modelling for the description of oxyfuel combustion processes
09:30-09:50	377	Yan Zhang	Synergistic co-processing of biomass torrefaction products with coal and coal char

# Day 2

# Oral Presentations

<b>Room: Calon 2</b> <b>Session Name: Thermal and mechanical energy storage technologies</b> <b>Session Chair: Xi Jiang, Xin Cui</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	290	Yuhang Fang, Jianlei Niu, Shiming Deng	Optimizing PCM based TES system with a tube-in-tank design for emergency cooling
08:30-08:50	299	Haisheng Chen, Xinjing Zhang, Yujie Xu, Yi Zhang, Ye Huang, Xuezhai Zhou, Huan Guo	Numerical study of a quasi-isothermal expander by spraying water
08:50-09:10	300/163	Xiaofeng Xu, Xuelai Zhang, Jotham Muthoka Munyalo/ Jotham Muthoka Munyalo, Xuelai Zhang, Xiaofeng Xu	Simulation study on temperature field and cold plate melting of cold storage refrigerator car/ Study on thermophysical properties of nanofluid based composite phase change material for low temperature application
09:10-09:30	308	Agus Sasmito, Mahmoud Alzoubi, Saad Akhtar, Matthew Fong	Characterization of an open-loop ground coupled seasonal thermal energy storage system
09:30-09:50	38	Kian Jon Chua, Md Raisul Islam	A study on latent heat energy storage performance of Tetradecane
<b>Room: S/1.32</b> <b>Session Name: District heating &amp; district cooling</b> <b>Session Chair: Christos Markides, Wei Han</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	637	Qi Zhang, Pengfei Zhang, PengPeng Wu, Mingjun Wu, Zhenzhen Shi, Jaber-Douraki Majid	Optimization of feed thickness on distribution of airflow velocity in belt dryer using computational fluid dynamics
08:30-08:50	773	Jay Hennessy, Hailong Li, Fredrik Wallin, Eva Thorin, Oskar Räftegård	Economic feasibility of commercial heat-to-power technologies suitable for use in district heating networks
08:50-09:10	339	Liya Ren, Wang Huaixin	Parameter optimization and performance comparison of several power cycles for waste heat recovery from moderate temperature flue gas
09:10-09:30	549	Esmail M. A. Mokheimer, Ahmed Ali Abdel Rahman	Boosting gas turbine combined cycles in hot regions using inlet air cooling including solar energy
09:30-09:50	628	Zhang Bai, Qibin Liu, Jing Lei, Liang Gong	Thermodynamic analysis of a CCHP system integrated a chemical recuperation process of methanol decomposition
08:10-09:50	<b>Room: Calon 1</b> <b>PANEL SESSION</b> <b>Title: Energy Systems Modelling: from Theory to Application</b>		
09:50 – 10:20	<b>TEA/COFFEE BREAK</b>		

# Day 2

# Oral Presentations

<b>Room: Caernarfon suite</b> <b>Session Name: Biomass combustion</b> <b>Session Chair: Wei-Hsin Chen, Ioanna Aslanidou</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	133	Andile Blessings Maqhuzu, Fumitake Takahashi, Kunio Yoshikawa	Biofuels from agricultural biomass in Zimbabwe: feedstock availability and bioenergy potential
10:40-11:00	177	Liang Wang, Alexis Sevault, Roger Khalil, Franziska Goile, Øyvind Skreiberg, Morten Seljeskog, Rajesh S Kempegowda, Bjørn Christian Enger	Performance evaluation of a modern wood stove using charcoal
11:00-11:20	327	Yunan Sun, Guanyi Chen, Beibei Yan, Zhanjun Chen, Wenchao Ma	Thermodynamic investigation on transformation of Mercury during co-incineration of sewage sludge and municipal solid waste
11:20-11:40	398	Lei Deng, Jiaming Ye, Xi Jin, Tao Zhu, Defu Che	Release and transformation of Potassium during combustion of biomass
11:40-12:00	425	Xi Jiang, Marc Fischer	Numerical studies of CO formation during biogas combustion
<b>Room: Brecon suite</b> <b>Session Name: Solar thermal energy</b> <b>Session Chair: Gideon Grader, Dongke Zhang</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	364	Yurong He, Jian Huang, Lei Shi	Recyclable purification-evaporation systems based on Fe <sub>3</sub> O <sub>4</sub> @TiO <sub>2</sub> nanoparticles
10:40-11:00	384	Jing Li	A novel concentrated solar power system using cascade steam-organic Rankine cycle and two-stage accumulators
11:00-11:20	408	Yue Yin, Jing Ding	Thermal conductivity improvement of liquid Nitrate and Carbonate salts doped with MgO particles
11:20-11:40	479	Seyed Mojtaba Mir Hosseini	View factor of solar chimneys by Monte Carlo method
11:40-12:00	499	Sajjad Mahmoudi Nezhad, Shaowei Qing, Alireza Rezaniakolaei, Lasse Aistrup Rosendahl	Transient model of hybrid concentrated photovoltaic with thermoelectric generator



# Day 2

# Oral Presentations

<b>Room: Pembroke suite</b> <b>Session Name: Energy conservation in buildings</b> <b>Session Chair: Fredrik Wallin, Howard Cheung</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	27	Xi Chen, Hongxing Yang	Sensitivity analysis and optimization of a typical passively designed residential building with hybrid ventilation in hot and humid climates
10:40-11:00	56	Xuan Zhou	Comparison of four algorithms based on machine learning for cooling load prediction of large-scale shopping mall
11:00-11:20	60	Tom Garwood, Ben Richard Hughes, Dominic O'Connor, Michael Oates, Thomas Hodgson, John Kaiser Calautit	Geometry extraction for high resolution building energy modelling applications from point cloud data: a case study of a factory facility
11:20-11:40	81	Xinxin Liang, Yao Dong Wang	Comparison of building performance between conventional house and passive House in the UK
11:40-12:00	114	Jiayu Chen, Wei Wang, Yilong Han, Tao Xu	An IPS-calibrated outdoor air flow control strategy in multizone commercial space
<b>Room: Kidwelly suite</b> <b>Session Name: Thermodynamic analysis</b> <b>Session Chair: Zhibin Yu, Roland Span</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	292	Qiuwang Wang, Ting Ma, Xinyi Li	Investigation of gravity effect on phase change heat transfer using the lattice Boltzmann method
10:40-11:00	369	Zihao Tian, Lixin Yang	Numerical investigation on a new type of two-stage steam separator in pressurized water reactors
11:00-11:20	500	Samuel Cooper, Geoffrey Hammond, Jonathan Norman	An empirical assessment of sector-level exergy analysis
11:20-11:40	674	Ryan Merkel, Mike Heydenrych	Mass-fraction of oxygen as a predictor of HHV of gaseous, liquid and solid fuels
11:40-12:00	165	Pei Lu, Shuai Deng, Li Zhao, Yawei Shao, Dongpeng Zhao	A 3D numerical analysis on local pressure drop of R134a in a horizontal t-junction
<b>Room: S/1.29</b> <b>Session Name: Electric energy storage</b> <b>Session Chair: Ottorino Veneri, Hongwen He</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	93	Wilfried Hennings, Peter Stenzel, Noah Pflugradt	Performance of a photovoltaic plus battery home system with load profile scenarios changing over the system life
10:40-11:00	120	Weiliang Wang, Hongjie Jia, Dan Wang, Yunqiang Zhi, Liu Liu, Menghua Fan, Jin Lin	Economic dispatch of generalized multi-source energy storage in regional integrated energy systems
11:00-11:20	224	kaixiang Li, Yukang Wu, Junyao Wang, Shixue Wang	Experimental study on thermal characteristics and temperature distribution of laminated lithium-ion power battery
11:20-11:40	347	Mohan Kolhe	Battery capacity estimation for building integrated photovoltaic system: design study for different geographical location(s)
11:40-12:00	557	Pan Gechuanqi, Weilong Wang, Jing Ding, Xiaolan Wei, Jianfeng Lu, Lichan Du	Molecular dynamics simulations on the binary eutectic system Na <sub>2</sub> CO <sub>3</sub> -K <sub>2</sub> CO <sub>3</sub>

# Day 2

# Oral Presentations

<b>Room: S/1.24</b> <b>Session Name: Energy economics, finance and investment</b> <b>Session Chair: Juan C. Gonzalez Palencia, Xunmin Ou</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	468	Mette Talseth Solnørdal	Drivers for energy efficiency: an empirical analysis of Norwegian manufacturing firms
10:40-11:00	485	Reinhard Madlener, Kai Risthaus	Economic analysis of electricity storage based on heat pumps and thermal storage units in large-scale thermal power plants
11:00-11:20	563	Zishuo Huang	Energy price sensitivity analysis of integrated energy system based on a parametric equation
11:20-11:40	622	Meihui Jiang	The correlations between the regional energy flow structures in the urban agglomeration: a network perspective
11:40-12:00	740	Bo Shen	A techno-economic assessment of fuel switching options of addressing climate and environmental challenges of coal-fired industrial boilers: an analytical work for China
<b>Room: S/1.25</b> <b>Session Name: Energy planning I</b> <b>Session Chair: Bo Shen, Koichi Yamada</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	143	Leonardo Paoli, Jonathan Cullen, Richard Lupton	Probabilistic model allocating primary energy to end-use devices
10:40-11:00	182	Georgios Kopanos, Javier Silvente	Optimal energy dispatch and maintenance of an industrial coal-fired combined heat and power plant in Kazakhstan
11:00-11:20	196	Reza Fazeli	Multi-criteria decision analysis of fiscal policies promoting the adoption of electric vehicles
11:20-11:40	341	Amarasinghage Tharindu Perera, Dasaraden Mauree, Jean-Louis Scartezzini	Influence of buildings configuration on the energy demand and sizing of energy systems in an urban context
11:40-12:00	374	Yunfei Mu, Yue Wang, Lewei Zhu, Hongtao Li, Qiang Rao, Hongjie Jia, Kai Hou	Decoupled optimization of integrated energy system considering CHP plant based on energy hub model
<b>Room: S/1.22</b> <b>Session Name: Advanced combustion and gasification of fossil fuel</b> <b>Session Chair: Hongguang Jin, Anders Avelin</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	608	Zhiyi Li, Alberto Cuoci, Amsini Sadiki, Alessandro Parente	Finite-rate chemistry modelling of non-conventional combustion regimes
10:40-11:00	664	Shuai Wang, Yanqing Niu, YanHao Gong, Shi'en Hui	Effects of CO <sub>2</sub> gasification reaction on the combustion of pulverized coal char particle
11:00-11:20	672	Yinka Sanusi, Esmail M.A. Mokheimer, Raghieb Mohammad	Numerical modeling of oxy-fuel combustion in a model gas turbine combustor: effect of combustion chemistry and radiation model
11:20-11:40	763	Xiangzhou Yuan	Investigation of Indonesian low rank coals gasification in a fixed-bed reactor with K <sub>2</sub> CO <sub>3</sub> catalyst loading
11:40-12:00	192	Xiuxiu Sun, Xingyu Liang	The effects of the physical properties of fuels on the combustion characteristics of marine diesel engines

# Day 2

# Oral Presentations

<b>Room: Calon 2</b> <b>Session Name: Thermal and mechanical energy storage technologies</b> <b>Session Chair: Agus Sasmito, Hui Hong</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	632	Xiao Long Li, Xiaolan Wei, Jianfeng Lu, Jing Ding, Weilong Wang	Corrosion resistance of 310S and 316L austenitic stainless steel in a quaternary molten salt for concentrating solar power
10:40-11:00	703	Amin Al-Habaibeh, Bubaker Shakmak, Simon Fanshawe	The development of an experimental test rig to evaluate the performance of a new technology for stratified hot water storage -The Water Snake
11:00-11:20	754	Alessandro Romagnoli, Haoxin Xu, Xavier Py, Fabio Dal Magro, Najim Sadiki, Jean-Marie Mancaux	Compatibility tests between molten aluminium alloys and recycled ceramics from inorganic industrial wastes
11:20-11:40	784	Xiaohu Yang	Experimental investigation on the solidification behavior of phase change materials in open-cell metal foams
11:40-12:00	273	Yi Zhang, Yujie Xu, Huan Guo, Xinjing Zhang, Haisheng Chen, Xuezhi Zhou	Compressed air energy storage system with variable configuration for wind power generation
<b>Room: S/1.32</b> <b>Session Name: Heat pumps and refrigeration systems</b> <b>Session Chair: Shiming Deng, Taehoon Hong</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	35	Yabin Guo, Huanxin Chen, Guannan Li, Yao Huang, Jiangyu Wang,	A thermal response time ahead energy demand prediction strategy for building heating system using machine learning methods
10:40-11:00	40	Md Raisul Islam	A theoretical model on internally cooled liquid desiccant dehumidification and cooling processes
11:00-11:20	41	Huiming Zou	Experimental study on heating performance of an R1234yf heat pump system for electric cars
11:20-11:40	65	Xiaohui She	A new liquid desiccant dehumidification subcooling method for vapor-compression refrigeration systems
11:40-12:00	144	Chuan Zhang	Assessment of biodiesel plant waste heat recovery with respect to economics and CO2 emission
10:20-12:00	<b>Room: Calon 1</b> <b>PANEL SESSION</b> <b>Title: Applied Energy UNiLAB on Synergies between Energy Networks (SEN)</b>		
12:00-13:00	<b>LUNCH</b>		
13:00-13:40	<b>POSTER SESSION II</b>		

# Day 2

# Oral Presentations

<b>Room: Caernarfon suite</b> <b>Session Name: Biomass combustion</b> <b>Session Chair: Kunio Yoshikawa, Khanh-Quang Tran</b>			
Time	Paper ID	Author	Paper Title
13:40-14:00	455	Gianluca Caposciutti, Marco Antonelli, Marco Francesconi, Federica Barontini	Experimental investigation on the fixed bed of a small size biomass boiler
14:00-14:20	463	Øyvind Skreiberg	Wood stove material configurations for increased thermal comfort
14:20-14:40	676	Ahmed Al-Akaishi	CFD analysis of the fluidised bed hydrodynamic behaviour inside an isothermal gasifier with different perforated plate distributors
14:40-15:00	780	Ioanna Aslanidou, Jan Skvaril, Konstantinos Kyprianidis, Olivia Winn, Kiran Thekkemadathil Sivaram	Near-infrared spectral measurements and multivariate analysis for predicting glass contamination of refuse-derived fuel
15:00-15:20	734	Syed Muhammad Raza Naqvi	Energy, economic and environmental savings by waste recycling: a case study of Madinah City
<b>Room: Brecon suite</b> <b>Session Name: Solar thermal energy</b> <b>Session Chair: Hongxing Yang, Hui Hong</b>			
Time	Paper ID	Author	Paper Title
13:40-14:00	503	Michael Gschwendtner	Development of a solar-powered liquid piston Stirling refrigerator
14:00-14:20	529	Yanan Deng, Hui Hong, Qiongqiong Jiang, Hao Zhang, Hongguang Jin	Experimental assessment on the solar energy storage by using chemical-looping combustion
14:20-14:40	565	Yawen Zhao, Peiwen Li, Hongguang Jin	Heat transfer performance comparisons of supercritical carbon dioxide and NaCl–KCl–ZnCl <sub>2</sub> eutectic salts for solar s-CO <sub>2</sub> Brayton cycle
14:40-15:00	576	Zhi Wang, Jiabin Ni, Li Zhao, Shuai Deng, Dongpeng Zhao	Simulation and optimization of parabolic trough receiver with non-uniform heat flux distribution: a review
15:00-15:20	614	Andrea Giostri	Preliminary analysis of solarized micro gas turbine application to CSP parabolic dish plants
<b>Room: Pembroke suite</b> <b>Session Name: Energy conservation in buildings</b> <b>Session Chair: Taehoon Hong</b>			
Time	Paper ID	Author	Paper Title
13:40-14:00	186	Xin Cui, Md Raisul Islam, Siaw Kiang Chou, Kian Jon Chua, Balaji Mohan	Investigation on a combined air treatment process for air-conditioning system
14:00-14:20	419	Luisa F. Cabeza, Ruth Carbajo	Monitoring Sustainability and social justice in applied renewable energy research: A proposal of indicators
14:20-14:40	230	Dongmei Pan	A study on the effects of different bedding systems on thermal comfort – quantifying the sensitivity coefficient used for calculating Predicted Mean Vote (PMV) in sleeping environments
14:40-15:00	242	Jing Du, Shiming Deng	An experimental study on moisture distribution and a way of mitigating condensation in a bedroom with a radiation-based task air conditioning system applied to sleeping environments
15:00-15:20			

# Day 2

# Oral Presentations

<b>Room: Kidwelly suite</b> <b>Session Name: Heat transfer enhancement, heat exchangers and heat pipe</b> <b>Session Chair: Dennis Y.C. Leung, Guoying Xu</b>			
Time	Paper ID	Author	Paper Title
13:40-14:00	221	Jie Lin, Duc Thuan Bui, Ru Zhu Wang, Kian Jon Chua	Investigation of the counter-flow dew point evaporative cooler with membrane dehumidification
14:00-14:20	258	Yue Wang, Hua Tian, Gequn Shu, Guopeng Yu, Xiaonan Ma, Xiaoya Li	Simulation and optimization of metal-foam tube banks for heat transfer enhancement of exhaust heat exchangers
14:20-14:40	278	Hui Han, Chongzheng Sun, Yu Wang, Yuxing Li	Numerical simulation of horizontal tube falling film flow under tilt and sloshing conditions
14:40-15:00	291	Munawar Zaman Shahrudin, Mohd Kamaruddin Abd Hamid, Kamarul Asri Ibrahim, Ahmad Nafais Rahimi, Muhammad Afiq Zubir, Muhammad Fakhrol Islam Zahran	Energy integrated distillation column sequence by driving force method and Pinch analysis
15:00-15:20	395	Mouna Zaidani, Rashid Al-Rub, Tariq Shamim, Abdul Raouf Tajik	3D multiphysics model of the effect of flue-wall deformation on the anode baking homogeneity in horizontal flue carbon furnace
<b>Room: S/1.29</b> <b>Session Name: Thermal and mechanical energy storage technologies</b> <b>Session Chair: Agus Sasmito, Kian Jon Chua</b>			
Time	Paper ID	Author	Paper Title
13:40-14:00	315	Franco Ferrucci, Franck Lucas, Pascal Ortega, Driss Stitou	Mechanical compressor-driven thermochemical storage for cooling applications in tropical insular regions
14:00-14:20	461	Xiaohui She, Yulong Ding	Theoretical analysis on performance enhancement of stand-alone liquid air energy storage from perspective of energy storage and heat transfer
14:20-14:40	512	Binjian Nie, Xiaohui She, Yulong Ding, Helena Navarro, Daniel Smith, Adriano Sciacovelli	Charging properties of a compact energy storage device for transport air conditioning applications
14:40-15:00	543	Lihua Gao, Jun Zhao, Qingsong An, Xueling Liu, Junyao Wang	A review on system performance studies of aquifer thermal energy storage
15:00-15:20	708	Abdalqader Ahmad	CFD modelling of a novel liquid Nitrogen/Air engine and cryogenic heat exchanger for small scale applications
<b>Room: S/1.24</b> <b>Session Name: Energy economics, finance and investment</b> <b>Session Chair: Reinhard Madlener, SK Chou</b>			
Time	Paper ID	Author	Paper Title
13:40-14:00	578	Lu-Tao Zhao, Jin-Long Yan, Lei Cheng, Yi Wang	Empirical study of the functional changes in price discovery in the Brent crude oil market
14:00-14:20	633	Dayong Zhang, Qiang Ji	Modeling oil-gas price relationship: a long memory approach
14:20-14:40	488	Reinhard Madlener, Laurens Löbberding	System cost uncertainty of micro fuel cell cogeneration and storage
14:40-15:00	3	Holger Schlör, Jürgen-Friedrich Hake, Sandra Venghaus	Green Economy Innovation Index (GEII) - a normative innovation approach for Germany & its FEW Nexus
15:00-15:20	404	Meng Shen	Household electricity consumption prediction under multiple behavioural intervention strategies using support vector regression

# Day 2

# Oral Presentations

**Room: S/1.25**

**Session Name: Energy planning II**

**Session Chair: Yoshiki Yamagata, Mei Sun**

Time	Paper ID	Author	Paper Title
13:40-14:00	376	Jason Liman, Vinod Kumar Venkiteswaran, Bryony Watson, Saqaff Alkaff	Comparative study of passive methods for reducing cooling load
14:00-14:20	435	Runying An	Development paths of energy-saving and CO2 emission reduction technologies in China's iron and steel industry
14:20-14:40	516	Xiancong Zhao, Hao Bai	A review on the optimal scheduling of byproduct gases in steel making industry
14:40-15:00	519	Goran Strbac, Xi Zhang	Optimization of heat sector decarbonization strategy through coordinated operation with electricity system
15:00-15:20	521	Amarasinghage Tharindu Perera, Chatelain Timothée, Dasaraden Mauree, Jean-Louis Scartezzini	Optimum dispatch of a multi-storage and multi-energy hub with demand response and restricted grid interactions

**Room: S/1.22**

**Session Name: Heat pumps and refrigeration systems**

**Session Chair: Luca Cioccolanti, Rishree K. Jain**

Time	Paper ID	Author	Paper Title
13:40-14:00	213	Mohammed Ridha Jawad Al- Tameemi, Zhibin Yu	Thermodynamic approach for designing the two-phase motive nozzle of the ejector for transcritical CO2 heat pump system
14:00-14:20	301	Howming Lee, Heng-Yi Li	A mathematical model for estimation of the maximum heat transfer capacity of tubular heat pipes with water and mesh wicks
14:20-14:40	427	Zhenjing Wu, Huan Zhang, Jin Guo, Shijun You, WanDong Zheng	The collocation method of supplementary heat source of air-source heat pump system for space heating based on the MEBPT calculation
14:40-15:00	162	Ying Zhang, Li Zhao, Shuai Deng, Jiaxin Ni, Minglu Ma, Shan Lin, Zhengtao Zhang	Clarifying the bifurcation point on design: a comparative analysis on energy efficiency between Solar-ORC and an ORC-based solar-CCHP
15:00-15:20	714	Peter Youssef, Saad Mahmoud, Raya Al-Dadaha, Osama Elsamni, Eman Hussein	Numerical investigation of Aluminum Fumarate MOF adsorbent material for adsorption desalination/cooling application

**Room: Calon 2**

**Session Name: Distributed energy systems**

**Session Chair: Peng Li, Erik Dahlquist**

Time	Paper ID	Author	Paper Title
13:40-14:00	270	Jing Kang, Wang Shengwei, Wenjie Gang	Performance and benefits of distributed energy systems in cooling dominated regions: a case study
14:00-14:20	526	Chaoyu Dong, Fanghong Guo, Hongjie Jia, Yan Xu, Xiaomeng Li, Peng Wang	DC microgrid stability analysis considering time delay in the distributed control
14:20-14:40	696	Chao Long, Pragnesh Bhatt, Bhinal Mehta, Jianzhong Wu	Dynamic participation of DFIG for frequency regulation in electrical power systems
14:40-15:00	257	Chen Yuan, Guangyi Liu, Zhiwei Wang, Xi Chen, Mahesh S. Illindala	Economic power capacity design of distributed energy resources for reliable community microgrids
15:00-15:20	766	Haijin Liu, Bin Li	Current limiting methods for VSC-based DC distribution systems

**Room: S/1.32**

# Day 2

# Oral Presentations

Session Name: ORC			
Session Chair: Konstantinos Kyprianidis, Jun Zhao			
Time	Paper ID	Author	Paper Title
13:40-14:00	150	Xueying Wang, Hua Tian, Gequn Shu	Safe performance analysis of flammable mixture working fluid leakage in Organic Rankine Cycle
14:00-14:20	795	Oyenyi A. Oyewunmi, Antonio Pantaleo, Christos Markides	ORC cogeneration systems in waste-heat recovery applications
14:20-14:40	233	Xiaoya Li, Gequn Shu, Hua Tian, Lingfeng Shi, Daiqiang Li, Yue Wang	Preliminary dynamic tests of a CO2 transcritical power cycle for waste heat recovery from diesel engine
14:40-15:00	254	Bao Junjiang	Study of multi-stage condensation power generation systems for LNG cold energy recovery
15:00-15:20	271	Jiaxin Ni, Ying Zhang, Shan Lin, Zhi Wang, Minglu Ma, Li Zhao, Zhengtao Zhang	Dynamic simulation and analysis of Organic Rankine Cycle system for waste recovery from diesel engine
13:40-15:20	<b>Room: Calon 1</b> <b>PANEL SESSION</b> <b>Title: Ammonia for Power</b>		
	Paper ID	Author	Paper Title
	746	Jim Kok, Virginia Fratalocchi	The CSP/PSR approach in reduced chemistry of premixed ammonia combustion.
583	Bar Mosevitzky, Gideon Grader, Gennady Shter	Effect of diluent pressure on the auto-ignition kinetics of a low-carbon urea ammonium nitrate monofuel	
15:20-15:50	<b>TEA/COFFEE BREAK</b>		
Room: Caernarfon suite			
Session Name: Biomass pyrolysis and gasification			
Session Chair: Øyvind Skreiberg, Raza Naqvi			
Time	Paper ID	Author	Paper Title
15:50-16:10	139	Wei-Hsin Chen	Influence of reactor rotating speed on bamboo torrefaction
16:10-16:30	164	Tamer Ismail, Kunio Yoshikawa, Lu Ding, Mohamed Abd El-Salam	Computational fluid dynamics model on updraft gasifier using carbonized woody briquette as fuel
16:30-16:50	212	Muhammad Aziz, Ilman Nuran Zaini	Production of hydrogen from algae: Integrated gasification and chemical looping
16:50-17:10	288	Lu Ding, Minoru Fukuhara, Kunio Yoshikawa, Dai Xin, Li Muhan	Development of a novel ultra-small biomass gasification and power generation system
17:10-17:30	326	Qianqian Guo, Guanyi Chen, Beibei Yan, Zhanjun Chen, WencHao Ma, Lian Hou	The effect and grey relational analysis of alkali metal chlorides and temperature on acid-hydrolysis residual pyrolysis products

# Day 2

# Oral Presentations

<b>Room: Brecon suite</b> <b>Session Name: Solar thermal energy</b> <b>Session Chair: Wei Han, Yaodong Wang</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	642	Qibin Liu, Taixiu Liu, Jun Sui, Xiaoho Wang, Hongguang Jin	Performance investigation of a new solar-hybrid fuel-fired distributed energy system integrated with a thermochemical process
16:10-16:30	654	Yunyi Ling, Wenjia Li, Jian Jin, Yong Hao	A spectral-splitting photovoltaic-thermochemical system for solar power generation and energy storage
16:30-16:50	659	Jian Jin, Yong Hao, Wenjia Li	A new solar-thermochemical reactor concept for methane reforming
16:50-17:10	721	Muditha Abeysekera, Edward Foulds, Jianzhong Wu	Modelling and analysis of a ground source heat pump combined with a PV-T and earth energy storage system
17:10-17:30	530	Rohit Tripathi, G N Tiwari, Vijay Dwivedi, T S Bhatti	2-E (Energy-Exergy) for partially covered concentrated photovoltaic thermal (PVT) collector
<b>Room: Pembroke suite</b> <b>Session Name: Energy conservation in buildings</b> <b>Session Chair: Shiming Deng, Sally Salome Shahzad</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	483	Arun Shankar Vishnu Kalaiselvan, Umashankar S, Paramasivam S, Norbert H	Real time simulation of Variable Speed Parallel Pumping system
16:10-16:30	518	Rishee Jain	Data-driven Urban Energy Simulation (DUE-S): Integrating machine learning into an urban building energy simulation workflow
16:30-16:50	535	Yilong Han, Yujie Lu	The influence and effectiveness of information conveying means in energy behavior interventions
16:50-17:10	786	Yaodong Wang, Wan Iman Wan Mohd Nazi, Haisheng Chen, Xinjing Zhang	Passive cooling using phase change material and insulation for high-rise office building in tropical climate
17:10-17:30	411	Luisa F. Cabeza, Jaume Gasia, Marc Martin, Aran Solé, Camila Barreneche	Material selection for latent heat thermal energy storage processes with a working temperature between 100 °C and 150 °C
<b>Room: Kidwelly suite</b> <b>Session Name: Heat transfer enhancement, heat exchangers and heat pipe</b> <b>Session Chair: Michael K.H. Leung, Shengchun Liu</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	304	Hongbo Xu	Investigation on the influence of lubricant oil to the spray cooling system based on refrigerant cycle
16:10-16:30	328	Haojie Cheng, HaiYan Lei, Chuanshan Dai	Heat transfer of a single-phase natural circulation loop with heating and cooling fluids
16:30-16:50	350	Qiuwang Wang, Fei Xin, Ting Ma	Theoretical analysis of flat heat pipe with graded-porosity wick design
16:50-17:10	355	Hamid Ait Abderrahmane	Stability of an evaporating and condensing liquid film flowing down an inclined plane.
17:10-17:30	745	Nuttapol Lerkkasemsan, Prakob Kitchaiya, Apinan Namkanisorn, Boonchai Chotiviriyavanich, Ruenruedee Benjangkaprasert	Outer-tubes falling film evaporator with well-mixed surface renewal



# Day 2

# Oral Presentations

<b>Room: S/1.29</b> <b>Session Name: Electric energy storage</b> <b>Session Chair: Ottorino Veneri, Clemente Capasso</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	407	Xi Jiang, Zhao Li, Huichang Niu	Simulation of electrical abuse of high-power lithium-ion batteries
16:10-16:30	598	Zhaohui Cen	Lithium battery parameter estimation via simplified single particle model
16:30-16:50	644	Alessio Tafone, Alessandro Romagnoli, Gabriele Comodi, Emiliano Borri, Martijn van den Broek	Preliminary assessment of waste heat recovery solution (ORC) to enhance the performance of liquid air energy storage system
16:50-17:10	737	Mikhail Pugach, Mikhail Kondratenko, Stefano Briola, Aldo Bischì	Numerical and experimental study of the flow-by cell for Vanadium Redox Batteries
17:10-17:30	759	Jianwei Li	Optimal design and real-time test of a hybrid energy storage system in the microgrid power system
<b>Room: S/1.24</b> <b>Session Name: Energy for developing countries</b> <b>Session Chair: Geoffrey Hammond, Bo Shen</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	102	Thomas Brudermann, Rafia Zaman	Energy governance in resource-poor settings: the case of Bangladesh
16:10-16:30	429	Xin Li, Konstantinos Chalvatzis, Dimitrios Pappas	China's electricity emission intensity in 2020 – an analysis at provincial level
16:30-16:50	466	Muhammad Kunta Biddinika	Technology for public outreach of fuel oil production from municipal plastic wastes
16:50-17:10	553	Konstantinos Chalvatzis, Dimitrios Pappas, Dabo Guan, Xin Li	Industrial Relocation and CO2 emission intensity: focus on the potential cross-country shift from China to India and SE Asia
17:10-17:30	72	Koji Tokimatsu, Benjamin McLellan, Shinsuke Murakami, Mikael Höök, Eriko Yasuoka, Masahiro Nishio	Energy modeling approach to the global energy-mineral nexus: a case of fuel cell vehicle
<b>Room: S/1.25</b> <b>Session Name: Energy resilient urban planning</b> <b>Session Chair: Perry Yang, Holger Schlör</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	83	Yibo Chen, Hongwei Tan, Xiaodong Song	Resilient regional energy benchmarking of classified public buildings based on the Lorenz curve
16:10-16:30	168	Yoshiki Yamagata, Daisuke Murakami, Takahiro Yoshida	Dynamic urban carbon mapping with spatial big data
16:30-16:50	412	Daisuke Murakami, Yoshiki Yamagata	Micro grids clustering for electricity sharing: an approach considering micro urban structure
16:50-17:10	595	Wowo Ding, Wei You	Improving wind environment design based on assessing spatial distribution of ventilation efficiency in regional space
17:10-17:30	731	Lisha Li, Zhikai Peng, Perry Yang, Lingkun Jia, Steven Jige Quan	How the roofing morphology and housing form affect energy performance of Shanghai's workers' village in urban regeneration

# Day 2

# Oral Presentations

<b>Room: S/1.22</b> <b>Session Name: Cogeneration and polygeneration</b> <b>Session Chair: Ward De Paepe, Anders Avelin</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	146	Amir Safari, Homam Nikpey, Kambiz Hajikolaee, Mohsen Assadi	Application of an experimentally validated high-dimensional surrogate model to performance prediction of a DG unit
16:10-16:30	699	Ahmad Almajr	CFD modelling and parametric study of small scale Alpha type Stirling Cryocooler
16:30-16:50	169	Yin Zhang, Xin Wang, Yinping Zhang, Zhiyuan Wei	Analytical method to evaluate energy saving potential of thermal energy storage in cogeneration system based on load characteristics
16:50-17:10	274	Carlos E. Ugalde-Loo, Hector Bastida, Muditha Abeysekera	Dynamic modelling and control of a reciprocating engine
17:10-17:30	545	Fong Kwong Fai	Investigation on year-round dispatch of multiple chillers in trigeneration system for high-rise building application
<b>Room: Calon 2</b> <b>Session Name: Other renewable energy systems</b> <b>Session Chair: John Licari, Pietro Elia Campana</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	582	Fhazhil Wamalwa, Xiaohua Xia, Sam. M Sichilalu	Optimal energy mix of a microhydro-wind-grid system powering a dairy farm in Western Cape, South Africa
16:10-16:30	30	Silvio Barbarelli, Mario Amelio, Gaetano Florio, Nino Michele Scornaienchi	Innovative on-shore system recovering energy from tidal currents
16:30-16:50	313	Melissa Johansson, Tim O'Doherty	Feasibility of micro-hydro schemes in South Glamorgan, Wales
16:50-17:10	333	Giacomo Lo Zupone, Silvia Massaro, Silvio Barbarelli, Roberto Sulpizio	A multi-parametric criteria for tidal energy converters siting in marine and fluvial environments
17:10-17:30	556	Xu Lu, Yifei Wang	An up-scaling strategy for counter-flow based microfluidic network: a numerical study
<b>Room: S/1.32</b> <b>Session Name: Future engines of high efficiency and low emissions</b> <b>Session Chair: Aristide F. Massardo, Huiming Zou</b>			
Time	Paper ID	Author	Paper Title
15:50-16:10	585	Esmail M. A. Mokheimer, Zubairu Abubakara, Yinka Sanusi	Stability of Propane-air and oxyfuel diffusion flames in a swirl-stabilized combustor; an experimental study
16:10-16:30	600	Wenming Yang	Impact of various factors on the performance and emissions of diesel engine fueled by kerosene and its blend with diesel
16:30-16:50	775	Valentina Zaccaria, Andreas Dik, Niklas Bitén, Ioanna Aslanidou, Konstantinos Kyprianidis	Conceptual design of a 3-shaft turbofan engine with reduced fuel consumption for 2025
16:50-17:10	520	Isam Janajreh, Mohammed Hussain	Analysis of pressure wave development in a thermoacoustic engine and sensitivity study
17:10-17:30	451	Yiji Lu, Fenfang Chen, Xiaoli Yu, Tony Roskilly	Numerical study of using different Organic Rankine cycle working fluids for engine coolant energy recovery

# Day 2

# Oral Presentations

15:50-17:30	<p><b>Room: Calon 1</b></p> <p><b>PANEL SESSION</b></p> <p>Title: Scientific Publication</p>
19:00-22:00	<p><b>CONFERENCE BANQUET</b></p>

# Day 3

# Oral Presentations

<b>Room: Caernarfon suite</b> <b>Session Name: Biomass pyrolysis and gasification</b> <b>Session Chair: Agustin Valera-Medina, Domenico Borello</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	619	Zhiqiang Wu, Dongxia Ouyang	Technical-economical analysis on co-gasification of coal and biomass based on the IGCC system with a two-staged gasifier
08:30-08:50	634	Vekes Balasundram, Norazana Ibrahim, Rafiziana Md. Kasmani, Mohd. Kamaruddin Abd. Hamid, Ruzinah Isha, Hasrinah Hasbullah	Catalytic pyrolysis of sugarcane bagasse using molybdenum modified HZSM-5 zeolite
08:50-09:10	652	Umesh Kumar, Manosh Paul, Ahmed Salem	Investigating the thermochemical conversion of biomass in a downdraft gasifier with a volatile break-up approach
09:10-09:30	690	Khanh-Quang Tran	CFD pre-study of nozzle reactor for fast hydrothermal liquefaction
09:30-09:50	527	Youwang Huang	Effect of torrefaction on the high temperature steam gasification of cellulose based upon the Gibbs free energy minimization
<b>Room: Brecon suite</b> <b>Session Name: Waste to energy conversion</b> <b>Session Chair: Eva Thorin, Tine Seljak</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	373	Yiji Lu, Gao Qian, Yuqi Huang, Tony Roskilly, Xiaoli Yu	Simulation study of Ferricyanide/Ferrocyanide concentric annulus thermocell with different electrode spacing and cell direction
08:30-08:50	392	Quang-Vu Bach, Øyvind Skreiberg, Chul-Jin Lee	Process modeling for torrefaction of birch branches
08:50-09:10	410	Kunio Yoshikawa, Ee Sann Tan, T.M. Indra Mahlia, Kumaran Palanisamy	Effect of non-edible biodiesel physical and chemical properties as microturbine fuel
09:10-09:30	418	Guanyi Chen, Sirong He, Zhanjun Chen, Beibei Yan	Comparative Studies on Hydrothermal Liquefaction Characteristics of Different Agriculture Wastes: Corn Cob and Cattle Manure
09:30-09:50	481	M. Mirhosseini, A. Rezania, L. Rosendahl, Bo B. Iversen	Effect of Thermal Cycling on Zinc Antimonide Thin Film Thermoelectric Characteristics

# Day 3

# Oral Presentations

<b>Room: Pembroke suite</b> <b>Session Name: Micro&amp;mini smart grid</b> <b>Session Chair: Dan Wang, Yunfei Mu</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	748	Subham Sahoo, Chenghua Zhang, Deepak Pullaguram, Sukumar Mishra, Jianzhong Wu, Nilanjan Senroy	Investigation of distributed cooperative control for DC microgrids in different communication medium
08:30-08:50	762	Azaza Maher	Evaluation of classification methodologies and features selection from smart meter data
08:50-09:10	113	Jun Lu	Applicability analysis of insulation in different climate zones of China
09:10-09:30	472	Angelo Aquino, John Kaiser Calautit, Dominic O'Connor, Sheen Mclean Cabaneros, Tom Garwood, Ben Richard Hughes, Saeed Mohammed Wazed, Sally	Indoor environmental quality analysis of a low-energy windcatcher with horizontally-arranged heat transfer devices (HHTD)
09:30-09:50	725	Prashant Kamble, Zakir Khan, Sean Capper, Ian Watson, James Sharp	Improving downdraft gasifier stability by robust instrumentation and control systems
<b>Room: Kidwelly suite</b> <b>Session Name: Heat transfer enhancement, heat exchangers and heat pipe</b> <b>Session Chair: Rebei Bel Fdhila, Gabriele Comodi</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	358	Qiuwang Wang, Ting Ma, Ulrik Pasquier, Yitung Chen	Numerical study on thermal-hydraulic performance of a two-sided etched zigzag-type high-temperature printed circuit heat exchanger
08:30-08:50	811	Shengchun Liu	Experimental study on R245fa condensation heat transfer in horizontal smooth tube and enhanced tube
08:50-09:10	441	Jinshi Wang, Yuanzhi Qin, Haibo Dai, Ming Liu, Junjie Yan, Jingying Yang	Experimental study on pressure drop characteristic of wet air with ash particles in a horizontal tube bundle heat exchanger
09:10-09:30	448	Yiji Lu, Xiaoqiang Chen, Rui Huang, Xiaoli Yu, Tony Roskilly	Effect of fire-deck thickness on thermal status of cylinder head
09:30-09:50	566	Hailin Gu	Numerical simulation of heat transfer enhancement over a surface-mounted rib with active control

# Day 3

# Oral Presentations

<b>Room: S/1.29</b> <b>Session Name: Carbon capture and storage (CCS)</b> <b>Session Chair: Meihong Wang, Zaoxiao Zhang</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	175	Chunyan Ma, XiaoYan Ji, Shokat Sarmad, Jyri-Pekka Mikkola	Development of low-cost deep eutectic solvents for CO2 capture
08:30-08:50	314	Peng Xie, Xuesong Lu, Derek Ingham, Lin Ma, Mohamed Pourkashanian	Mass transfer characteristics of the liquid film flow in a rotating packed bed for CO2 capture: a micro-scale CFD analysis
08:50-09:10	669	Kreangkrai Maneeintr, Nutthakarn Phumkokrux, Pattara Boonpipattanapong, Suttichai Assabumrungrat, Tawatchai Charinpanitkul	Measurement of solubility and physical properties of aqueous solution of 2-(Diethylamino)ethanol for CO2 capture
09:10-09:30	475	Peizhi Liao, Yiguo Li, Meihong Wang, Xiao Wu, Jiong Shen	Review of dynamic modelling, system identification and control scheme in solvent-based post-combustion carbon capture process
09:30-09:50	494	Meihong Wang, Eni Oko	Study of absorber intercooling in solvent-based CO2 capture based on rotating packed bed technology
<b>Room: S/1.24</b> <b>Session Name: Energy market, scenarios and forecasting, and energy security</b> <b>Session Chair: Xin Li, Jianzhong Wu</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	106	Nan Li, Zhixin Yu, Hailin Mu, Yuqing Jiang	Empirical study on the regional agricultural energy efficiency convergence across provinces in China
08:30-08:50	137	Huan Wang, Jingcheng Shi, Wenying Chen	Analysis on building sector's energy consumption and mitigation potential under SSP2
08:50-09:10	236	Xunmin Ou	The low-carbon transition toward sustainability of regional coal-dominated energy consumption structure: a case of Hebei in China
09:10-09:30	281	Heather Wyman-Pain, Cain Thomas, Yuankai Bian, Furong Li	An economic analysis of part loading generators with a focus on the provision of frequency response
09:30-09:50	352	Darmp Phadungsri, Weerin Wangjiraniran, Siripha Junlakarn	Scenario analysis of disruptive technology penetration on the energy system in Thailand

# Day 3

# Oral Presentations

<b>Room: S/1.25</b> <b>Session Name: Life cycle assessments (LCA)</b> <b>Session Chair: Konstantinos Chalvatzis, Edi Assoumou</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	413	Mukalu Sandro Masaki, Lijun Zhang, Xiaohua Xia	A comparative study on the cost-effective belt conveyors for bulk material handling
08:30-08:50	704	Xiaoyu Yan, Marina Maier, Markus Mueller	Introduction of a spatiotemporal Life Cycle Inventory method using a wind energy example
08:50-09:10	808	Iman Khajehzadeh, Brenda Vale	How house size impacts on the number of furniture, appliance and tool items (FATs) in a house: an embodied energy study of New Zealand houses
09:10-09:30	101	Ana Gonzalez Hernandez, Jonathan Cullen, Richard Lupton, Chris Williams	From control data to real-time resource maps in a steel-making plant
09:30-09:50	677	Anna Kaja Lewandowska-Bernat, Umberto Desideri	Sustainable mini-grid
<b>Room: S/1.22</b> <b>Session Name: Cogeneration and polygeneration</b> <b>Session Chair: Konstantinos Kyprianidis, Yawen Zhao</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	658	Simone Giorgetti, Laurent Bricteux, Alessandro Parente, Francesco Contino, Ward De Paepe	Carbon clean combined heat and power production from micro gas turbines: thermodynamic analysis of different scenarios
08:30-08:50	681	Ward De Paepe, Simon Abraham, Panagiotis Tsirikoglou, Francesco Contino, Alessandro Parente, Ghader Ghorbaniasl	Operational optimization of a typical micro gas turbine
08:50-09:10	713	Zefeng Wang, Wei Han, Na Zhang, Jie Sun	The exergy and energy level difference graphic analysis of a CCHP system under compressor inlet air throttling (IAT) operating strategy
09:10-09:30	812	Chaudhary Awais Salman, Syed Muhammad Raza Naqvi, Jinyue Yan, Eva Thorin	A polygeneration process for heat, power and DME production by integrating gasification with CHP plant: modelling and simulation study
09:30-09:50	248	Wen-ying Li, Yanli Wu	Development of integrated high temperature and low temperature Fischer-Tropsch system for high value chemicals coproduction

# Day 3

# Oral Presentations

<b>Room: Calon 2</b> <b>Session Name: Renewable energy systems</b> <b>Session Chair: Christos Markides, Tracy Sweet</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	52	Ramesh Bansal, T Adefarati	Reliability and economic evaluation of a micro grid power system
08:30-08:50	785	Xiaohu Yang	Experimental investigation of the cubic thermal energy storage unit with coil tubes
08:50-09:10	573	Yukun Hu	Model-based multi-objective optimisation of reheating furnace operations using genetic algorithm
09:10-09:30	577	Ahmad Nafais Rahimi, Mohd Faris Mustafa, Muhammad Zakwan Zaine, Nur Atikah Mohd Rosely, Muhammad Fakhru Islam Zahran, Munawar Zaman Shahrudin, Muhammad Afiq Zubir, Norazana Ibrahim, Kamarul Asri Ibrahim, Mohd Kamaruddin Abd Hamid	Olefin mixture direct sequence energy retrofitting: feed compositions sensitivity analysis
09:30-09:50	51	Junyao Wang, Shuai Deng, Kaixiang Li, Taiwei Sun, Yongzhen Wang, Jun Zhao, Lihua Gao	A resilience analysis on energy system: a preliminary case study for solar-assisted CCS
<b>Room: S/1.32</b> <b>Session Name: Future engines of high efficiency and low emissions</b> <b>Session Chair: Wenming Yang, Huiming Zou</b>			
Time	Paper ID	Author	Paper Title
08:10-08:30	253	Jialin Liu, Hu Wang, Zunqing Zheng, Bin Mao, Linpeng Li, Mingfa Yao	Effects of pilot injection strategy on combustion and emission characteristics in gasoline compression ignition
08:30-08:50	298	Matteo Craglia, Leonardo Paoli, Jonathan Cullen	Fuel for thought: powertrain efficiencies of British vehicles
08:50-09:10	506	Zhibin Yu	Numerical investigation of a looped-tube traveling-wave thermoacoustic generator with a bypass pipe
09:10-09:30	581	Yiji Lu, Tony Roskilly, Zhichao Zhang, Xiaoli Yu, Jiang Long	Conceptual study of scroll-type rotary gasoline Internal Combustion Engine
09:30-09:50	202	Hakim T. Kadhim, Aldo Rona	Perspectives on the treatment of secondary flows in axial turbines



# Day 3

# Oral Presentations

<b>Room: Calon 1</b> <b>Session Name: Energy systems</b> <b>Session Chair: Pietro Elia Campana</b>			
08:10-08:30	724	Torben Tambo, Felix Lauman, Mette Møller Sørensen, Rasmus Jul Lindemann, Tina Mølholm Hansen	Energy harvesting through piezoelectricity - technology foresight
08:30-08:50	508	Claudia Fabiani, Julia Coma, Anna Laura Pisello, Gabriel Perez, Franco Cotana, Luisa F. Cabeza	Effect of water content on the thermal behavior of green roof substrates in dynamic environmental conditions
08:50-09:10	63	Weifeng He	Energy and cost analysis of a humidification dehumidification desalination system driven by low grade waste heat
09:10-09:30	228	Zhixin Sun, Shujia Wang, Fuquan Xu, Weifeng He	Multi-parameter optimization and fluid selection guidance of a two-stage organic Rankine cycle utilizing LNG cold energy and low grade heat
09:30-09:50	73	Chun Sing Lai, Xuecong Li, Loi Lei Lai, Malcolm McCulloch	Daily clearness index profiles and weather conditions studies for photovoltaic systems
<b>09:50 – 10:20</b>	<b>TEA/COFFEE BREAK</b>		
<b>Room: Caernarfon suite</b> <b>Session Name: Solar PV applications</b> <b>Session Chair: Yong Hao, Pietro Elia Campana</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	25	Jiahong Liu, HenYao Xiang, YingDong Yu, Weiwei Shao, Chao Mei, Lin Xia	Feasibility assessment of renewable energies for cassava irrigation in China
10:40-11:00			
11:00-11:20	345	Mohan Kolhe	Parked electric vehicle's cabin temperature management using photovoltaic powered ventilation
11:20-11:40	366	Zhao Zhen, Fei Wang, Zengqiang Mi, Kangping Li, Zheng Wang	Research on a cloud image forecasting approach for solar power forecasting
11:40-12:00	423	Shanguo Zhao	Environmental performance of a solar assisted hybrid power gas heat pump based on life cycle assessment

# Day 3

# Oral Presentations

<b>Room: Brecon suite</b> <b>Session Name: Waste to energy conversion</b> <b>Session Chair: Yaodong Wang, Øyvind Skreiberg</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	28	Arif Darmawan, Muhammad Aziz, Flabianus Hardi, Koji Tokimatsu, Kunio Yoshikawa	Electricity production from black liquor: a novel integrated system
10:40-11:00	61	Rasaq. O. Lamidi, Tony Roskilly, Pankaj B. Pathare, Marcelo Calispa Aguilar, Yaodong Wang	Biogas tri-generation for postharvest processing of agricultural products in a rural community: techno-economic perspectives
11:00-11:20	151	Yulong Zhao, Shixue Wang, Zhaojun Liang, Minghui Ge	Performance analysis of wet flue-gas thermoelectric generator
11:20-11:40	316	Nanta Sophonrat, Weihong Yang	Effect of mixing methods of polyethylene and cellulose on volatile products from its co-pyrolysis
11:40-12:00	197	Eloy Velasco, Manuel Andrés, Francisco Javier Rey, Ana Tejero	Thermal behaviour of an active slab: experimental study for TABs applications
<b>Room: Pembroke suite</b> <b>Session Name: Smart buildings (energy system control and operation)</b> <b>Session Chair: Fredrik Wallin, Rishee K. Jain</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	46	Howard Cheung, Kui Shan, Wang Shengwei	A fault-tolerant control method of balancing valves for condenser fouling in water-cooled chillers
10:40-11:00	70	Huaxia Yan, Shiming Deng, Jiajia Niu	A thermal comfort based controller for a direct expansion air conditioning system
11:00-11:20	116	Jun Lu	Development of adaptive prediction mean vote (APMV) model for the elderly in Guiyang, China
11:20-11:40	132	Yudong Xia, Shiming Deng, Jing Du	Effects of superheat nonlinearity on the operational stability of a direct expansion (DX) air conditioning (A/C) system
11:40-12:00	698	Sally Salome Shahzad, John Kaiser Calautit, Angelo Aquino, Siti Diana Nabilah Nasir, Ben Richard Hughes	Neutral thermal sensation or dynamic thermal comfort? Numerical and field test analysis of a thermal chair
<b>Room: Kidwelly suite</b> <b>Session Name: Heat transfer enhancement, heat exchangers and heat pipe</b> <b>Session Chair: HowMing Lee, Dongmei Pan</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	453	Yiji Lu, Yuqi Huang, Rui Huang, Xiaoli Yu, Tony Roskilly	Study on the thermal interaction and heat dissipation of cylindrical Lithium-Ion battery cells
10:40-11:00	603	Yiping Cao, Qi Xiao, Yuansheng Lin, Qiuwang Wang	Simulation of the printed circuit heat exchanger for S-CO <sub>2</sub> by segmented methods
11:00-11:20	541	Isam Janajreh, Raed Hashaikeh, Farah Ahmed, Khadija Elqadi	Low energy membrane distillation: a numerical study on the role of conductive spacers
11:20-11:40	69	Mengjie Song, Ning Mao, Xuanjie Wang, Chaobin Dang, Wenke Zou	Review on frost layer thickness measurement and calculation
11:40-12:00	751	Pedro Dinis Gaspar, Pedro Dinho da Silva, Luís Pires, Diogo Carrilho, José Nunes	Quantification of the thermal resistance variation in evaporators surface due to ice formation

# Day 3

# Oral Presentations

<b>Room: S/1.29</b> <b>Session Name: Emissions reduction</b> <b>Session Chair: Tao Wu, Erik Dahlquist</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	157	Yan Yu, Sun Ke, Zhang Yubo, Sun Yun, Guo Junwen, Lei Deng, Defu Che	Adsorption and agglomeration characteristics of ash particles after reducing flue gas temperature below the acid dew point
10:40-11:00	158	Yan Yu, Zhang Yubo, Liu Jianhua, Dang Lijun, Qi Qingwen, Lei Deng, Defu Che	Adsorption characteristics of sulfuric acid mist on fly ash in low-low temperature flue gas system
11:00-11:20	416	Bo Qin, Jing Ding, Xiaolan Wei	Effects of filled materials on emissions of NOx from binary molten nitrate salts during storage process in a thermocline system
11:20-11:40	460	Boxi Shen, Xiangjin Kong, Zhijun Li, Li He, Jun Li, Xingyu liang, Jinou Song	Development of a 1D Urea-SCR system model coupling with wall film decomposition mechanism based on engine bench test data
11:40-12:00	593	Chung Ting Lao, Markus Kraft, Jethro Akroyd, Nickolas Eaves	Modelling of secondary particulate emissions during the regeneration of diesel particulate filters
<b>Room: S/1.24</b> <b>Session Name: Energy market, scenarios and forecasting, and energy security</b> <b>Session Chair: SK Chou, Xunmin Ou</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	806	Peng Wang, Yukun Hu, Chunsheng Wang, Zijian Liu	Analysis of energy consumption in Hunan Province (China) using a LMDI method based LEAP model
10:40-11:00	414	Toshihiro Inoue, Koichi Yamada	Economic evaluation toward zero CO2 emission power generation system after 2050 in Japan
11:00-11:20	421	Tianduo Peng	Analysis of future vehicle fuel demand and direct CO2 emissions in China
11:20-11:40	774	Eda Dal	Modeling the use of renewable energy sources for electricity generation based on technological, political and environmental constraints
11:40-12:00	445	Yuyan Weng	The role of energy efficiency improvement and energy substitution in achieving China's carbon intensity target
<b>Room: S/1.25</b> <b>Session Name: Thermal energy management</b> <b>Session Chair: Xin Cui, Yukun Hu</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	100	Joao Alencastro, Alba Fuertes, Andrew Fox, Pieter De Wilde	The impact of quality on energy performance of buildings: Quality management in social housing developments
10:40-11:00	115	Yi Li, Zhuqian Zhang	Experimental study of a passive thermal management system using copper foam-paraffin composite for lithium ion batteries
11:00-11:20	178	Kalani C. Dahanayake, Cheuk Chow, Guo Long Hou	Selection of suitable plant species for energy efficient Vertical Greenery Systems (VGS)
11:20-11:40	293	Bernard, Wen Tong Chong, Nugroho Agung Pambudi, Ming Chian Yew, Tan Ching Ng	Numerical analyses on the mist cooling for lithium-ion battery
11:40-12:00	336	Shuangquan Shao, Yuping Gao, Shen Tian, Changqing Tian, Hongbo Xu	Energy consumption analysis of the forced-air cooling process with alternating ventilation mode for fresh horticultural produce

# Day 3

# Oral Presentations

<b>Room: S/1.22</b> <b>Session Name: Fuel cells</b> <b>Session Chair: Umberto Desideri, Valentina Zaccaria</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	96	Yuemeng Zhang, Penglong Bao, Yu Wan, Sichuan Xu	Modeling and analysis of air supply system of polymer electrolyte membrane fuel cell system
10:40-11:00	141	Manuel Ojeda, Tianyu Zhao, Jin Xuan, Huizhi Wang	Ni-YSZ Nanocomposite Synthesis: mechanochemical vs novel sol-gel method for solid oxide electrolyzers
11:00-11:20	195	Ning Zhang	Effects of sulfonic group and fluorine on free energy profile of proton confined in the one-dimensional proton conductive channel
11:20-11:40	342	Yifei Wang, Dennis Y.C. Leung, Siyang Hu	Durability and stability of vapor-feed microfluidic fuel cells, a preliminary study
11:40-12:00	400	T Xu Yang, Wu Zucheng	NixCo <sub>3</sub> -xO <sub>4</sub> nanowire arrays grown on carbon fiber cloth as efficient electrocatalysts for urea oxidation
<b>Room: Calon 2</b> <b>Session Name: Solar PV applications</b> <b>Session Chair: Qibin Liu, Esmail M. A. Mokheimer</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	641	Tracy Sweet, Matthew Rolley, Wenguang Li, Manosh Paul, Gao Min, Andrew Knox	Experimental characterization and multi-physics simulation of a triple-junction cell in a novel hybrid III:V concentrator photovoltaic–thermoelectric receiver design with secondary optical element
10:40-11:00	736	Muhammad Abid, Michael Adedeji, Tonderai Ruwa, Tahir Ratlamwala, Mustafa Dagbasi	Energy, exergy, economic and environmental analysis of photovoltaic thermal systems for absorption cooling application
11:00-11:20	456	Yiji Lu, Ke Tang, Tony Roskilly, Yao Dong Wang, Ye Yuan, Long Jiang	Development and testing of novel Chemisorption Composite using SrCl <sub>2</sub> -NEG adding with Carbon coated Ni and Al
11:20-11:40	490	Marie Chantal Cyulinyana	Surface solar spectrum characteristics in tropical regions with specific reference to Rwanda.
11:40-12:00	237	Maryam Huda Ahmad Phesa	Identifying public and experts perspectives towards large-scale solar PV system using analytic hierarchy process.
<b>Room: S/1.32</b> <b>Session Name: Smart grid</b> <b>Session Chair: Peng Li, Jianwei Li</b>			
Time	Paper ID	Author	Paper Title
10:20-10:40	365	Kangping Li, Fei Wang, Zengqiang Mi, Zhao Zhen, Zheng Wang, Bo Wang	A baseline load estimation approach for residential customer based on load pattern clustering
10:40-11:00	388	Wenqi Cui, Yi Ding, Hongxun Hui, Maozhen Li	Two-stage payback model for the assessment of curtailment services provided by air conditioners
11:00-11:20	442	Goncalo Mendes, Paulo Carreira, Samuli Honkapuro, Vasco Amaral, Bruno Barroca, Rui Prada	Energy behaviour engagement in smart urban environments
11:20-11:40	443	Dan Li, Weiqi Hua, Hongjian Sun, Wei-Yu Chiu	Multiobjective optimization for carbon market scheduling based on behavior learning
11:40-12:00	682	Mazin Muhssin, Liana Cipcigan, Zeyad Obaid, Meng Cheng	Load aggregation over a time of day to provide frequency response in the Great Britain power system

# Day 3

# Oral Presentations

<b>Room: Calon 1</b> <b>Session Name: Energy systems</b>			
10:20-10:40	250	Xu Hu, Yong Li, Li Luo	The Influence of Air Gap Thickness between the Stator and Rotor on Nuclear Main Pump
10:40-11:00	265	Dai Chunhui, Li Yong, Wei Zhiguo, Li Shaodan, Qi Xiao, Xu Hu	Research of Interfacial Shear effects on Heat Transfer Characteristics of Complete Condensation in Vertical Tube
11:00-11:20			
11:20-11:40			
11:40-12:00			
<b>12:00-13:00</b>	<b>LUNCH</b>		
<b>Room: Caernarfon suite</b> <b>Session Name: Waste to energy conversion</b> <b>Session Chair: Yanqing Niu, Tao Ma</b>			
Time	Paper ID	Author	Paper Title
13:00-13:20	537	Liang Wang	Characterization of ash deposits from municipal solid waste (MSW) incineration plants
13:20-13:40	551	SiYang Hu, Dennis Y.C. Leung	Numerical modelling of the compressible airflow in a solar-waste-heat chimney power plant
13:40-14:00	586	Ilman Nuran Zaini, Weihong Yang, Pär Göran Jönsson	Steam gasification of solid recovered fuel char derived from landfill waste: A kinetic study
14:00-14:20	568	Abdul-Sattar Nizam	Waste to energy: a case study of Madinah City
14:20-14:40	62	Pankaj B. Pathare, Marcelo Calispa Aguilar, Tony Roskilly, Yao Dong Wang, Rasaan. O. Lamidi	Biogas from anaerobic co-digestion of food waste and primary sludge for cogeneration of power and heat
<b>Room: Brecon suite</b> <b>Session Name: Wind power</b> <b>Session Chair: Pietro Elia Campana, Igor Egana</b>			
Time	Paper ID	Author	Paper Title
13:00-13:20	21	Alain Ulazia, Unai Elosegui	Novel on-field method for pitch error correction in wind turbines
13:20-13:40	77	Brian Hand, Andrew Cashman	Conceptual design of a large-scale floating offshore vertical axis wind turbine
13:40-14:00	216	YanLi Liu	An analytical approach to probabilistic dynamic security assessment of power systems incorporating wind farms
14:00-14:20	317	Angelo Aquino, John Kaiser Calautit, Ben Richard Hughes	A Study on the wind-induced flutter energy harvester (WIFEH) integration into buildings
14:20-14:40	447	Rishabh Abhinav, Naran Pindoriya, Jianzhong Wu, Chao Long	Short-term wind power forecasting using wavelet-based neural network

# Day 3

# Oral Presentations

<b>Room: Pembroke suite</b> <b>Session Name: Smart grid</b> <b>Session Chair: Jianzhong Wu, Carlos E Ugalde-Loo</b>			
Time	Paper ID	Author	Paper Title
13:00-13:20	92	Lin Gao, Tao Huang, Wanning Lei, Xuyang Cui, Jiaxin Ni, Junhong Yang	Technologies in smart district heating system
13:20-13:40	390	SSung Jaewon, Nguyen Ba Hung, Ocktaeck Lim	A study of dynamic characteristics and required power of an electric bicycle equipped with a semi-automatic transmission
13:40-14:00	238	MaoMao Hu, Fu Xiao	Model-based optimal load control of inverter-driven air conditioners responding to dynamic electricity pricing
14:00-14:20	285	Charles Kagiri, Xiaohua Xia, Lijun Zhang	Optimization of a compressed natural gas station operation to minimize energy cost
14:20-14:40	348	Sheng Wang, Hongxun Hui, Yi Ding, Chengzhi Zhu	Cooperation of demand response and traditional power generations for providing spinning reserve
<b>Room: Kidwelly suite</b> <b>Session Name: Micro- and nano-technologies</b> <b>Session Chair: Yiji Lu, Tao Wu</b>			
Time	Paper ID	Author	Paper Title
13:00-13:20	601	Shaohua Wu, Wenming Yang, Markus Kraft, Jethro Akroyd, Sebastian Mosbach, Edward K. Y. Yapp, Rong Xu	Modelling of soot formation in a diesel engine with the moment projection method
13:20-13:40	610	Xiaofeng Niu	Study on stability and thermal conductivity of microencapsulated phase change material slurry for liquid desiccant dehumidification
13:40-14:00	685	Eman Hussein, Peter Youssef, Raya Al-Dadaha, Saad Mahmoud, Paul Anderson, Ashraf Hassan	Numerical investigation of MIL-101(Cr)/GrO composites performance in cooling system
14:00-14:20	18	Tu Ran	A study on the thermal characteristics of DC arc-fault in wiring fires
14:20-14:40	471	Evangelos Kalamaras, Mercedes Maroto-Valer, Jin Xuan, Huizhi Wang	A microfluidic reactor for solar fuel production from photocatalytic CO2 reduction
<b>Room: S/1.29</b> <b>Session Name: Emissions reduction</b> <b>Session Chair: Eva Thorin, Liang Wang</b>			
Time	Paper ID	Author	Paper Title
13:00-13:20	631	Tao Wu, Haitao Zhao, Gang Yang, Xueliang Mu	Recovery of elemental mercury from coal-derived flue gas using a MoS <sub>2</sub> -based material
13:20-13:40	222	Xueli Chen, Haifeng Liu, Yueqiang Qin	Release and transformation characteristics of arsenic during coal pyrolysis and gasification
13:40-14:00	311	Tata Sutardi, Manosh Paul, Nader Karimi	Numerical study of the effects of CO <sub>2</sub> addition in single coal particle gasification
14:00-14:20	174	Zaoxiao Zhang, Zhen Qin, Yunsong Yu	Dynamic effects of coal gasification on the process carbon footprint
14:20-14:40	640	Yaodong Wang	Experimental investigations on diesel engine performance and emissions using biodiesel adding with carbon coated aluminum nanoparticles

# Day 3

# Oral Presentations

<b>Room: S/1.24</b> <b>Session Name: Energy market, scenarios and forecasting, and energy security</b> <b>Session Chair: Xin Li, Bo Shen</b>			
Time	Paper ID	Author	Paper Title
13:00-13:20	497	Siripha Junlakarn, Weerin Wangjiraniran, Darnp Phadungsri	Opportunities of power generation investment in ASEAN through assessing market attractiveness
13:20-13:40	606	Juan C. Gonzalez Palencia, Mikiya Araki, Seiichi Shiga	Energy consumption and CO2 emissions reduction potential of electric-drive vehicle diffusion in a road freight vehicle fleet
13:40-14:00	694	Edi Assoumou, Paul Hugues, Nadia Maizi	Green technologies competition and uncertainty: a Monte Carlo analysis of optimal biofuels supply choices for France
14:00-14:20	646	Jing-Ming Chen, Biying Yu, Yi-Ming Wei	Roadmap of energy technology selection in China's ethylene industry
14:20-14:40	710	Seck Gondia Sokhna, Vincent Krakowski, Edi Assoumou, Vincent Mazauric, Nadia Maizi	Reliability-constrained scenarios with high shares of renewables for the power sector in 2050
<b>Room: S/1.25</b> <b>Session Name: Thermal energy management</b> <b>Session Chair: Rebei Bel Fdhila, Zhichun Liu</b>			
Time	Paper ID	Author	Paper Title
13:00-13:20	385	Vinod Kumar Venkiteswaran, Bryony Watson	Universal cooling of data centres: a CFD analysis
13:20-13:40	396	Gabriele Comodi, Massimiliano Renzi, Francesco Carducci, Antonio Giovannelli	Improving flexibility of industrial microgrids through thermal storage and HVAC management strategies
13:40-14:00	409	Mohamed Hassan Ali, Gustavo Ospina	Wastewater byproducts thermal integration
14:00-14:20	670	Tariq Shamim, Oghare Ogidiana	Techno-economic evaluation of a chemical looping combustion plant with waste heat utilization
14:20-14:40	747	Pedro Dinis Gaspar, Pedro Dinho da Silva, Christopher Delgado, Luís Pires	Experimental study and numerical simulation of the interior flow in a telecommunications cabinet

# Day 3

# Oral Presentations

<b>Room: S/1.22</b> <b>Session Name: Fuel cells</b> <b>Session Chair: Umberto Desideri, Chin tsan Wang</b>			
Time	Paper ID	Author	Paper Title
13:00-13:20	434	Andrea Calabriso	Experimental measurement technique for the assessment of the fuel crossover diffusion coefficient in the membrane electrode assembly of a direct methanol fuel cell
13:20-13:40	559	Yu Ho Kwok, Yifei Wang, Dennis Y.C. Leung, Alpha C.H. Tsang	Ru@Pt core shell nanoparticle on graphene carbon nanotube composite aerogel as a flow through anode for direct methanol microfluidic fuel cell
13:40-14:00	776	Valentina Zaccaria, Nor Farida Harun, David Tucker, Alberto Traverso, Thomas A. Adams	SOFC degradation analysis for various syngas compositions in IGFC-GT systems
14:00-14:20	505	Sonia Laura Gómez Aláez, Paolo Colbertaldo, Stefano Campanari	Zero-dimensional dynamic modeling of PEM electrolyzers
14:20-14:40	635	Luca Mastropasqua, Gioele Di Marcoberardino, Stefano Campanari, Paolo Chiesa	Simulation of oxygen transport membranes for CPO reactors in small-scale hydrogen or syngas production applications
<b>Room: Calon 2</b> <b>Session Name: Thermal energy management</b> <b>Session Chair: Luca Cioccolanti, Ward De Paepe</b>			
Time	Paper ID	Author	Paper Title
13:00-13:20	514	Rina Haiges, Yao Dong Wang, Atanu Ghoshray, Tony Roskilly	Optimization of Malaysia's power generation mix to meet the electricity demand by 2050
13:20-13:40	625	Muhammad Fakhrol Islam Zahran, Muhammad Afiq Zubir, Ahmad Nafais Rahimi, Munawar Zaman Shahrudin, Mohd Kamaruddin Abd Hamid, Kamarul Asri Ibrahim	Control properties of driving force based distillation columns design
13:40-14:00	6	Baris Burak Kanbur, Liming Xiang, Swapnil Dubey, Choo Fook Hoong, Fei Duan	Multiobjective thermodynamic and environmental optimization of the small scale LNG cold utilization system
14:00-14:20	324	Muhammad Fakhrol Islam Zahran, Ahmad Nafais Rahimi, Muhammad Afiq Zubir, Munawar Zaman Shahrudin, Mohd Kamaruddin Abd Hamid, Kamarul Asri Ibrahim	Relative gain analysis of energy efficient hydrocarbon separation sequence
14:20-14:40	393	Dawei Wu, Emmanouil Tsougranis	Dual Reutilization of LNG cryogenic energy and thermal waste energy with Organic Rankine Cycle in marine applications



# Day 3

# Oral Presentations

Room: S/1.32 Session Name: Clean energy conversion technology Session Chair: Erik Dahlquist			
Time	Paper ID	Author	Paper Title
13:00-13:20	399	Paolo Gabrielli, Marco Mazzotti	Modeling fuel cells in integrated multi-energy systems
13:20-13:40	735	Pierpaolo Polverino, Cesare Pianese	Control algorithm design for degradation mitigation and lifetime improvement of Polymer Electrolyte Membrane Fuel Cells
13:40-14:00	167	Theofilos Efstathiadis, Nikolaos Kladovasilakis, Anestis Kalfas	Rotor blade design of an axial turbine using non-ideal gases with low real-flow effects
14:00-14:20	623	Zhen Huang, Fang He	Kinetic investigations on biomass char chemical looping gasification using Fe-Ni bimetallic oxygen carrier
14:20-14:40	277	Jessica Rosati, Franca Albertini, Cecilia Bennati, Michele Bianchi, Lisa Branchini, Francesco Cugini, Andrea De Pascale, Simone Fabbri, Francesco Melino, Saverio Ottaviano, Antonio Peretto, Massimo Solzi	Preliminary investigation on a rotary magnetocaloric refrigerator prototype
14:40 – 15:00	<b>TEA/COFFEE BREAK</b>		
Room: Caernarfon suite Session Name: Biomass pyrolysis and gasification Session Chair: Meihong Wang, Ioanna Aslanidou			
Time	Paper ID	Author	Paper Title
15:00-15:20	478	Ramiar Sadegh-Vaziri, Matthaus Babler	PBE modeling of flocculation of microalgae: investigating the overshoot in mean size profiles
15:20-15:40	723	Sean Capper, Ian Watson, Zakir Khan, Prashant Kamble	Progression towards online tar detection systems
15:40-16:00	673	Meihong Wang, Mathew Aneke	Thermodynamic comparison of alternative biomass gasification techniques for producing syngas for gas turbine application
16:00-16:20	55	Ioannis Kalargaris, Guohong Tian, Sai Gu	Investigation on the long-term effects of plastic pyrolysis oil usage in a diesel engine
16:20-16:40			
16:40-17:00			

# Day 3

# Oral Presentations

<b>Room: Brecon suite</b> <b>Session Name: Other renewable energy systems</b> <b>Session Chair: Massimiliano Renzi, Peng Liu</b>			
Time	Paper ID	Author	Paper Title
15:00-15:20	459	Yiji Lu, Tony Roskilly, Zhichao Zhang, Longfei Chen, Yao Dong Wang	Experimental and numerical investigation on the macroscopic characteristics of Hydrotreated Vegetable Oil (HVO) spray
15:20-15:40	452	Kampanart Theinnoi, Porjade Suksompong, Warirat Temwutthikun	Engine performance and emissions from dual fuelled with in-cylinder injected diesel fuels and DME Port Fuel Injection (PFI)
15:40-16:00	391	Jaeyoung Han	Adaptive robust control for air flow management in a fuel cell system under driving cycle
16:00-16:20	272	Huiming Zou	Experimental investigation and performance analysis of a free piston-generator
16:20-16:40	482	Xiaotong Liu, Chunfei Wu, Shen Boxiong, Peng Yuan, Dipesh Patel	Production of carbon nanotubes (CNTs) from thermochemical conversion of waste plastics using Ni/anodic aluminum oxide (AAO) template catalyst
16:40-17:00	351	Ocktaeck Lim, Nguyen Ba Hung, Sung Jaewon	A study of the scavenging process in a two-stroke free piston linear engine using CFD
<b>Room: Pembroke suite</b> <b>Session Name: Smart buildings (energy system control and operation)</b> <b>Session Chair: Carlos E Ugalde-Loo, Sally Salome Shahzad</b>			
Time	Paper ID	Author	Paper Title
15:00-15:20	252	Dongmei Pan	A numerical study on the optimization method to optimize the cooling load sharing for a multi-chiller system in a shopping mal
15:20-15:40	344	Kanae Matsui	Proposal and implementation of real-time certification system for smart home using IoT technology
15:40-16:00	45	Howard Cheung, Wang Shengwei, Chaoqun Zhuang	Development of a simple power consumption model of information technology (IT) equipment for building simulation
16:00-16:20	790	Yang Zhang, Pietro Elia Campana, Ying Yang, Lei Wang, Anders Lundblad, Jinyue Yan	Bridging electrical load and thermal load in an office building with PV and district heating
16:20-16:40	486	Hafsa Abouadane	Performance of a new MPPT method for Photovoltaic systems under dynamic solar irradiation profiles
16:40-17:00	15	Hong Ye, Qiang Zhang	A comparative study of thermal control systems using a liquid or gas working medium

# Day 3

# Oral Presentations

**Room: Kidwelly suite**

**Session Name: Thermodynamic analysis**

**Session Chair: Yong Hao, Xingyu Liang**

Time	Paper ID	Author	Paper Title
15:00-15:20	33	Xiaoqing Zhang, Anas A. Rahman	Prediction of cooling load for a standing wave thermoacoustic refrigerator through artificial neural network technique
15:20-15:40	320	Chengxu Zhang, Michael K.H. Leung, Yiyi She	Oxygen reduction reaction mechanism of nitrogen-doped graphene derived from ionic liquid
15:40-16:00	124	Jia Liu, BinBin Qiu, Jiping Liu, Junjie Yan, Xiaoping Yang	Chaotic characteristics analysis on recognition of flow pattern of direct contact condensation in a rectangular channel
16:00-16:20	260	Qiuwang Wang, Qingfei Bian, Min Zeng	Investigation on the transient phenomena during the evolution of melt pool
16:20-16:40	11	Wenlong Cheng, Bing-Bing Han	Experimental study on effect of temperature field on recovery of reservoir using hot water flooding
16:40-17:00	826	Adnan Alhathal Alanezi , Ali Altaee	Enhanced Performance Dual Stage Pressure Retarded Osmosis

**Room: S/1.29**

**Session Name: Thermal and mechanical energy storage technologies**

**Session Chair: Xin Cui, Tao Ma**

Time	Paper ID	Author	Paper Title
15:00-15:20	130	Yuxing Li, Chongzheng Sun, Hui Han, Jianlu Zhu, Yu Wang	Sensibility analysis of pre-cooling cold box pipeline blockage in DMR liquefaction process
15:20-15:40	152	Ashmore Mawire, Adedamola Shobo, Denis Okello	Experimental thermal stratification comparison of two storage systems
15:40-16:00	171	Zaoxiao Zhang, Penghui Feng, Yang Zhang, Zhen Wu, Fusheng Yang	Transient behaviors and optimum multi-level configuration of thermal energy storage system using a metal hydride pair
16:00-16:20	223	Zhao Yang, Qiang Zhang	The research on operating characteristic of gas engine heat pump system with energy storage (ESGEHP) system
16:20-16:40	454	Ke Tang, Ye Yuan, Yao Dong Wang, Yiji Lu, Tony Roskilly, Jiang Long	Investigation of a novel composite sorbent for improved sorption characteristic
16:40-17:00	243	O.K. Ukoba, F.L Inambao, A.C Eloka-Eboka	Influence of annealing on properties of spray deposited nickel oxide films for solar cells

# Day 3

# Oral Presentations

<b>Room: S/1.24</b> <b>Session Name: Energy market, scenarios and forecasting, and energy security</b> <b>Session Chair: Nan Li</b>			
Time	Paper ID	Author	Paper Title
15:00-15:20	700	Konstantinos Chalvatzis, Alexis Ioannidis	Energy supply sustainability for island nations: a study on 8 global islands
15:20-15:40	720	Jin Xu, Hongtao Wang	Exploring the feasibility of energy self-sufficient wastewater treatment plants: a case study in eastern China
15:40-16:00	728	Amir Javed, Omer Rana, Liana Cipcigan, Charalampos Marmaras	Scalable local energy management system
16:00-16:20	629	John Kaldellis, Dimitris Zafirakis, Georgios Tzanes, Christiana Papapostolou, Kosmas Kavadias	Analyzing the limitations of vast wind energy contribution in remote island networks of the Aegean Sea archipelagos
16:20-16:40	89	Ayodeji Oke, Clinton Aigbavboa, Samkeliso Dlamini	Carbon emission trading in South African construction industry
16:40-17:00	282	Omar Al-Hafith , Satish B K , Simon Bradbury, Pieter de Wilde	Simulation of courtyard spaces in a desert climate
<b>Room: S/1.25</b> <b>Session Name: Energy economics, finance and investment</b> <b>Session Chair: Sebastian Schwede, Anders Avelin</b>			
Time	Paper ID	Author	Paper Title
15:00-15:20	334	Muhammad Afiq Zubir, Muhammad Fakhrol Islam Zahran, Ahmad Nafais Rahimi, Munawar Zaman Shahrudin, Mohd Kamaruddin Abd Hamid, Kamarul Asri Ibrahim	Systematic design of energy efficient distillation column for alcohol mixture
15:20-15:40	335	Muhammad Afiq Zubir, Muhammad Fakhrol Islam Zahran, Ahmad Nafais Rahimi, Munawar Zaman Shahrudin, Mohd Kamaruddin Abd Hamid, Kamarul Asri Ibrahim	Systematic design of energy efficient extractive distillation column for azeotrope mixture
15:40-16:00	675	Nor ADhiah Rashid, Nur Atikah Mohd Rosely, Mohd. Aiman Mohd. Noor, Azmer Shamsuddin, Mohd Kamaruddin Abd Hamid, Kamarul Asri Ibrahim	Quality prediction of refined bleached deodorized palm oil (RBDPO) using partial least square regression technique
16:00-16:20	220	xiaou Liu, Shaoyun Ge, Hong Liu, Jifeng Li, Lukun Ge	State estimation of regional interconnected electricity and gas networks
16:20-16:40	750	Eileen Tortora, Alessandro Corsini	The influence of water desalination systems on load levelling of gen-set in small off-grid islands
16:40-17:00	245	Dominic O'Connor, Ben Richard Hughes, John Kaiser Calautit	A novel design of a rotary desiccant system for reduced dehumidification regeneration air temperature

# Day 3

# Oral Presentations

<b>Room: S/1.22</b> <b>Session Name: Hydrogen energy</b> <b>Session Chair: Valentina Zaccaria, Konstantinos Kyprianidis</b>			
Time	Paper ID	Author	Paper Title
15:00-15:20	123	Jun Li, Hongyu Huang, Noriyuki Kobayashi	Hydrogen combustion as a thermal source
15:20-15:40	284	Hua Xiao, Agustin Valera-Medina, Phil Bowen, Stephen Dooley	3D simulation of ammonia combustion in a lean premixed swirl burner
15:40-16:00	683	Aleksandra Sveshnikova, Gioele Di Marcoberardino, Claudio Pirrone, Aldo Bischì, Alexander Ustinov, Gianluca Valenti, Stefano Campanari	The impact of humidification temperature on a 1 kW proton exchange membrane fuel cell stack
16:00-16:20	555	Xiao Chen	Investigation on the size and trajectory of mixed jet diffusion flames in cross wind
16:20-16:40	571	Huimin Zhang	NiCu/C catalyst for ammonia electrolysis to produce hydrogen
16:40-17:00	121	Yinka Sanusi, Esmail M.A. Mokheimer	A numerical investigation of hydrogen production in an integrated membrane reformer-combustor
<b>Room: Calon 2</b> <b>Session Name: Energy planning III</b> <b>Session Chair: Thomas Brudermann, Juan C. Gonzalez Palencia</b>			
Time	Paper ID	Author	Paper Title
15:00-15:20	287	Dimitris Zafirakis, John Kaldellis, Georgios Tzanes, Christiana Papapostolou, Kosmas Kavadias	PHAROS: an integrated planning tool for meeting the energy and water needs of remote islands using RES-based hybrid solutions
15:20-15:40	267	Wenhui Chen	Modeling the determinants of CO2 emissions in BRICS countries: Based on panel quantile regression
15:40-16:00	184	Olusegun Oguntona, Clinton Aigbavboa	Biomimicry principles as evaluation criteria of sustainability in the construction industry
16:00-16:20	802	Norhan Bayomi, John E, Mike Heinrich	Emission saving potentials from transition to natural gas usage: a view from five major emitters
16:20-16:40	433	Amin Lahnaoui, Christina Wulf, Didier Dalmazzone	Building an optimal hydrogen transportation system for mobility, focus on minimizing the cost of transportation via truck
16:40-17:00	176	Wenying Chen, Huan Wang, Nan Li, Weilong Wang, Jingcheng Shi	Development and application of global multi-region energy system model (GTIMES)

# Day 3

# Oral Presentations

Room: S/1.32

Session Name: Energy planning IV

Session Chair: Fredrik Wallin

Time	Paper ID	Author	Paper Title
15:00-15:20	159	Zakia Afroz, GM Shafiullah, Tania Urmee, Gary Higgins	Prediction of indoor temperature in an institutional building
15:20-15:40	145	Ayodeji Oke, Clinton Aigbavboa, Samkeliso Dlamini	Energy savings and sustainable construction: examining the advantages of nanotechnology
15:40-16:00	639	Yousef Saif, Ali Almansoori, Ali Elkamel, Muhammad Rizwan	A circular economy solid waste supply chain management based approach under uncertainty
16:00-16:20	711	Yi Huang, Qi Chu, Qun Yi, Jie Feng, Wen-ying Li, Kechang Xie, Qiwen Sun	Process systems engineering of high-low temperature Fischer-Tropsch synthesis integration in olefin production
16:20-16:40	394	Olusegun Oguntona	Biomimetic reinvention of the construction industry: energy management and sustainability
16:40-17:00	346	Xianglong Luo	Thermodynamic analysis and optimization of a novel zeotropic organic Rankine cycle

# Day 1

# Poster Presentations

Room: Calon 1/2

Poster session I

August 22, 13:00-13:40

Poster ID	Paper ID	Author	Paper title
P1-1	193	Rui Xiong, Quanqing Yu	Open circuit voltage and state of charge online estimation for lithium ion batteries
P1-2	755	Bin Chen, Weisi Yang, Saige Wang	Embodied carbon emission analysis of eco-industrial park based on input-output analysis and ecological network analysis
P1-3	53	Yongnan Zhu, Yong Zhao, Haihong Li, Lizhen Wang, Shan Jiang, Lei Li	Quantitative analysis of the water-energy-climate nexus in Shanxi Province, China
P1-4	359	Yu Wang	Impacts of climate change on the cooling loads of residential buildings differences between occupants with different age
P1-5	764	Saige Wang, Bin Chen	The societal costs of deep decarbonization in China
P1-6	765	Xin Ding, Saige Wang, Bin Chen	Impacts of climate change on sectoral energy-water nexus: a review
P1-7	804	Ge Wang, Qi Zhang, Hailong Li, Yan Li, Siyuan Chen	The impact of social network on the adoption of real-time electricity pricing mechanism
P1-8	58	Bingkang Li, Yuwei Wang, Jingmin Wang, Wenhai Yang	Research on dynamic industrial differential electricity price for energy conservation and emission reduction
P1-9	110	Nan Li, Yuqing Jiang, Zhixin Yu, Liwei Shang	Analysis of agriculture total-factor energy efficiency in China based on DEA and Malmquist indices
P1-10	458	Heng Shi, Minghao Xu, QiuYang Ma, Chi Zhang, Ran Li, Furong Li	A whole system assessment of novel deep learning approach on short-term load forecasting
P1-11	665	Zheng Qiao, Hongbin Sun, Qinglai Guo	Optimal gas storage capacity in gas power plants considering electricity and natural gas systems constraints
P1-12	800	Di Wang, Di Wang	Analysis of the price correlation between the international natural gas and coal
P1-13	9	Zhi Zhuang, Zhuling Zheng	Study on energy consumption ration for office buildings
P1-14	128	Yuanhao Guo, Ye Duan	Regional total-factor coal consumption efficiency in China: a meta-frontier SBM-undesirable approach
P1-15	191	Zhiguo Gan, Yunzhong Jiang	Supervisory ability development and dual control actions of water resources
P1-16	266	Song Pan	An investigation on energy consumption of air conditioning System in Beijing subway stations
P1-17	599	Xiaolin Chu, Dong Yang, Xiaohong Li, Rui Zhou	Evaluation of CCHP system performance based on operational cost considering carbon tax
P1-18	680	Tongtian Sheng, Hongbin Sun, Qinglai Guo, Zhaoguang Pan, Jingyi Zhang	Two-stage state estimation approach for combined heat and electric networks considering the dynamic property of pipelines
P1-19	761	Yating Liu, Saige Wang, Bin Chen	Regional water-energy-food nexus in China based on multiregional input-output analysis
P1-20	797	Jimin Kim, Taehoon Hong, Minhyun Lee, Kwangbok Jeong, Youngcheol Kang, Hyuna Kang	Experimental analysis on filters of natural ventilation system in terms of indoor environmental quality and energy consumption

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# Poster Presentations

P1-21	215	Nugroho Agung Pambudi	Industrial carbon capture storage (CSS) model using times-Japan framework
P1-22	279	Guiyu Yang, Lin Wang, Hao Wang, Weiwei Shao	Analysis of the relationship between food production, water resources, and power consumption in North China
P1-23	379	Na Wei	Research on the comprehensive effect of ecological regulation in the mainstream of Weihe basin
P1-24	381	Hao Bai, Xiancong Zhao	Research on the load shifting potential of on-site power plants with byproduct gasholders in steel enterprises under time-of-use power price
P1-25	297	Boyi Zhang	Reliability improvement using ant colony optimization applied to placement of sectionalizing switches
P1-26	542	Yunlong Peng, Wowo Ding, Zhi Gao	An approach on the correlation between urban morphological parameters and ventilation performance
P1-27	671	Zaoshi Jiang, Wei You, Wowo Ding	Calculation of ground view factor as an index for urban thermal environment optimization
P1-28	823	Teng Wu, Hailong Li, Fredrik Wallin	Optimizing the energy structure for space heating - an approach based on external cost
P1-29	49	Meiheriayi Mutailipu, Yu Liu, Bohao Wu, Yongchen Song, Dayong Wang, Li Ai	Gas-water two phase flow simulation based on pore network model for reservoir rocks
P1-30	249	Xingbo Li	Determination of swelling effect in CO <sub>2</sub> -brine systems using microfocus X-ray CT
P1-31	289	Yinting Fan	Experimental study of density-driven-convection mixing in Hele-Shaw cell
P1-32	678	Chunyan Ma, XiaoYan Ji, Chang Liu, Xiaohua Lu	Evaluation and comparison of aqueous ChCl/Urea and other physical absorbents for biogas upgrading process
P1-33	744	Mohammad Rehan, Suoton Philip Peletiri	Energy savings in CO <sub>2</sub> capture system through intercooling mechanism
P1-34	798	Kun Guo, Hailong Li, Zhixin Yu	Carbon dioxide electrochemical reduction: structure-dependent activity and selectivity
P1-35	286	Chunjing Lin, Wang Fang, Fan Bin, Liqiong Han, Shiqiang Liu, Yuemeng Zhang, Sichuan Xu	Comparative study on the heat generation behavior of lithium-ion batteries with different cathode materials using accelerating rate calorimetry
P1-36	321	Yongchun Yang, Wenhai Yang, Yajing Gao, Xiangning Xiao	Analysis of energy storage characteristics of power quality integrated control system based on MMC
P1-37	382	Xiaodong Peng, Xiaohui She, Yongliang Li, Yulong Ding	Thermodynamic analysis of a liquid air energy storage system use of compression heat
P1-38	607	Kai Wang, Shouxiang Wang, Fei Teng, Goran Strbac, Lei Wu	Optimal allocation of ESSs for mitigating fluctuation in active distribution network
P1-39	620	Weiping Diao, Jiuchun Jiang, Caiping Zhang, Hui Liang, Michael Pecht	Energy state of health estimation for battery packs based on the degradation and inconsistency
P1-40	787	Fabian Benavente, Góran Lindbergh, Anders Lundblad, Pietro Elia Campana, Yang Zhang, Saul Cabrera	State of charge profiles estimation for small off-grid PV-battery systems in Bolivia
P1-41	87	Changan Wang	Influence of oxy-fuel atmosphere on microscopic physical-chemical properties of high-alkali ash at softening temperature
P1-42	147	Jixiang Zhang, Xuefei Hu, Jianyi Chen, Yaodong Wei, Jianfei Song	Experimental study on performance of two types of corrugated plate gas-liquid separators



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# Poster Presentations

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P1-44	679	Howming Lee, Shiao-Huei Chen	Perfluorocompounds emission control with thermal plasma torches
P1-45	406	Youn-Jea Kim, Youn-Jea Kim	Performance evaluation of cleaning energy of an induced gas flotation machine using multiple-size-group (MUSIG) model
P1-46	511	Sheen Mclean Cabaneros	Hybrid artificial neural network models for the effective prediction and mitigation of urban roadside NO2 pollution
P1-47	64	YanChao Lu, Jiangjiang Wang	Thermodynamics performance analysis of solar-assisted combined cooling, heating and power system with thermal storage
P1-48	108	Qiu-Nan Lv	Raman spectroscopic studies on microscopic mechanism of CP-CH4 mixture hydrate
P1-49	149	Mengjie Song, Liyuan Liao, Ning Mao, Wenyi Huang, Xuanjie Wang, Xiaosheng Zheng, Mingwei Ma	Experimental study on the thermal stability of organic binary phase change materials for thermal energy storage systems
P1-50	275	Guanghui Leng, Geng Qiao, Guizhi Xu, Thibault Vidal, Yulong Ding	Erythritol-Vermiculite form-stable phase change materials for thermal energy storage
P1-51	546	Tianrun Yang, Changjiang Wang, Qie Sun, Ronald Wennersten	Study on the application of latent heat cold storage in a refrigerated warehouse
P1-52	662	Xinhe Zhang, Bo Qu, Wei Huang, Xiaodong Chen, Zishuo Huang, Yujie Kang, Zhiyuan Liu	The CFD simulation and analysis of energy station thermal storage's influence to water storage tank's sliding coil
P1-53	430	Almazrouei Manar, Isam Janajerh, Luca Mazzoni, Chaouki Ghenai	A comparison of energy recovery from MSW through plasma gasification and entrained flow gasification
P1-54	819	Yuting Tan, Worrada Nookuea, Hailong Li, Eva Thorin, Jinyue Yan	Cryogenic technology for biogas upgrading combined with carbon capture - a review of systems and property impacts
P1-55	822	Worrada Nookuea, Jesús Zambrano, Yuting Tan, Hailong Li, Eva Thorin, Jinyue Yan	Comparison of Mass Transfer Models on Rate-Based Simulation of CO2 Absorption and Desorption Processes
P1-56	354	Mingjun Yang, Hang Zhou, Pengfei Wang, Yongchen Song, Nan Li	Hydrate-based CO2 capture from flue gas in constant pressure process with the presence of THF
P1-57	363	Mingjun Yang, Dayong Wang, Yi Gao, Yongchen Song, Bingbing Chen	The influence of electric field and peroxide of THF on the THF hydrate formation
P1-58	469	Zhiming Xia, Yu Zhang, Xiao-Sen Li, ZhaoYang Chen, Yi Wang, Gang Li	Formation behavior and controlling factor of methane hydrate in porous media
P1-59	66	Haitao Hu	Optimization of tube bundle arrangement for flooded shell-and-tube evaporator
P1-60	247	Haitao Hu	Heat transfer and pressure drop characteristics of two-phase propane flow in shell side of LNG spiral wound heat exchanger
P1-61	259	Qiuwang Wang, Yiping Cao, Min Zeng	Investigation on the flow noise propagation mechanism in simple expansion pipelines based on synergy principle of flow and sound fields
P1-62	426	Mohamed Al-fahham, Adel Eidan, Kareem Alwan, Assaad AlSahlani	Enhancement of the Performance Characteristics for Air-Conditioning System by Using Direct Evaporative Cooling in Hot Climates
P1-63	437	HaiYan Lei, Likun Dong, Chuanxia Ruan, Liya Ren	Study of migration and deposition of micro particles in porous media by Lattice-Boltzmann Method

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P1-64	383	HaiYan Lei, Chuanshan Dai, Xin Guo, Jinhua Lu, Haojie Cheng	Thermal conductivity measurement of a bar-like object
P1-65	799	Kai Zhu, Xueqiang Li, Yabo Wang, Hailong Li	Dynamic performance of loop heat pipes for cooling of electronics
P1-66	817	Fu Wang	A novel ammonia-based CO <sub>2</sub> capture process hybrid ammonia absorption refrigeration
P1-67	198	Ronghui Qi, Dujuan Li	Experimental study on electrolytic dehumidification with polymer electrolyte membrane for air-conditioning systems
P1-68	554	Abdul-Sattar Nizam, Zaki-ul-Zaman Asam	Assessment of Bioenergy Production from Solid Waste
P1-69	686	Hossein Ameli, Meysam Qadrdan, Goran Strbac	Techno-economic assessment of battery storage and Power-to-Gas: A whole-system approach
P1-70	820	Liang Wang	Study of CO <sub>2</sub> gasification reactivity of biocarbon produced at different conditions
P1-71	824	Md Lokman Hosain, Rebei Bel-Fdhila	Air-Gap Heat Transfer in Rotating Electrical Machines: A Parametric Study
P1-72	602	Chao Yu, Jing Ding, Qiang Peng, Xiaolan Wei, Weilong Wang	Phase Diagram Research of the LiNO <sub>3</sub> -NaNO <sub>3</sub> -KNO <sub>3</sub> Ternary Molten Salt System
P1-73	597	Yuanyuan Zhang, Jing Ding, Xiaolan Wei, Weilong Wang, Jianfeng Lu	Photolysis and chromatographic analysis of biphenyl and diphenyl ether mixtures in soil by infrared lamp irradiation
P1-74	180	Rong Gu, Jing Ding, Qinyuan Yuan, Weilong Wang, Jianfeng Lu	Thermochemical storage performance of steam methane reforming in tubular reactor with simulated solar source
P1-75	584	Qianmei Fu, Weilong Wang, Jing Ding, Jianfeng Lu	Carbon Dioxide Adsorption over Amine-Functionalized MOFs
P1-76	587	Xiaolan Wei, Jing Ding, Jianfeng Lu, Weilong Wang, Chuntao Yang, Bo Qin	Study on NO <sub>x</sub> emissions from ternary molten nitrate salts contacting several kind of metals in thermal energy storage process
P1-77	325	Xuezhi Liu, Yujie Zhou, Jinghua Wang, Shunqi Zeng, Wenbo Xia	Integrated analysis and planning of energy conversion and storage devices in multi-vector energy systems
P1-78	825	Omar K.M. Ouda, Mohammad Rehan, Nader Nader, Abdul-Sattar Nizami	Environmental and economic benefits of recovered paper: A case study of Saudi Arabia
P1-79	198	Ronghui Qi, Dujuan Li	Experimental study on electrolytic dehumidification with polymer electrolyte membrane for air-conditioning systems
P1-80	337	Ye Feng, Ke Tang, Tao Jin, Kaihao Zhang	Impact of cross-sectional area ratio on time-averaged pressure drop induced by jet pump for thermoacoustic engine

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# Poster Presentations

Room: Calon 1/2			
Poster session II			
August 23, 13:00-13:40			
Poster ID	Paper ID	Author	Paper title
P2-1	310	Mohd Hafzil Mat Yasin, Abdul Adam Abdullah, Mohd Hafiz Ali, Mohd Fahmi Othman, Ahmad Fitri Yusop	Cylinder pressure cyclic variations in a diesel engine operating with biodiesel-alcohol blends
P2-2	513	Denis Cabrera, Horacio Gonzalez, José Luis Rico	ZnAl-Zr hydrotalcite-like compounds activated at low temperature as solid base catalyst for the transesterification of vegetable oils
P2-3	517	Denis Cabrera, Horacio Gonzalez, José Luis Rico	Reaction study for the esterification of oleic acid over M-SBA-15-SO <sub>3</sub> H (M=Al, Ti) catalysts.
P2-4	612	Andrew Eloka-Eboka, Freddie Inambao, Gillian Ogbene Igbum	Biodiesel methyl ester production and testing from selected African tropical seed oil feedstocks
P2-5	729	Huda Qari	Key issues in algae biofuels: a short review
P2-6	771	Xinhai Yu, Xueqiang Li, Sebastian Schwede, Ihl Li, Zhixin Yu	Toxicity of ionic liquid on anaerobic digestion
P2-7	32	Inge Haberle, Øyvind Skreiberg, Nils Erland L. Haugen	Comparison of numerical efficiency of the thermal and the kinetic rate drying model applied to a thermally thick wood particle
P2-8	140	Wenhan Cao	Study on the ignition behavior and kinetics of combustion of biomass
P2-9	206	Karittha Im-orb, Thanaphorn Detchusananard, Amornchai Arpornwichanop	Investigation of integrated biomass pyrolysis and gasification process for green fuel production
P2-10	809	Zhen Huang, Fang He	Exploration of the mechanism of chemical looping steam methane reforming using double perovskite-type oxides La <sub>1.6</sub> Sr <sub>0.4</sub> FeCoO <sub>6</sub>
P2-11	240	Kingsley Ukoba, Freddie Inambao, Andrew Eloka-Eboka	Influence of concentration on properties of spray deposited nickel oxide films for solar cells
P2-12	438	YangYang Zhao, XinLi Lu, Jialing Zhu, Zhen Qin, Guanglei Xin, Feng Jiang, Kaiyong Hu, Wei Zhang	A study on selecting optimum flash and evaporation temperatures for four geothermal power generation systems under different geofluid's conditions
P2-13	462	Zhen Qin	The lumped-parameter model on two-phase and superheated geothermal reservoir
P2-14	558	Chin Tsan Wang	A modified serpentine flow slab for in Proton Exchange Membrane Fuel Cells (PEMFCs)
P2-15	569	Germán Buitrón	Reduction of start-up time in a microbial fuel cell through the variation of external resistance
P2-16	687	Pilar Dorado, Sara Pinzi, M. Dolores Redel, David E. Leiva-Candia, José Antonio Soriano	Influence of ethanol/diesel fuel and propanol/diesel fuel blends over exhaust and noise emissions
P2-17	688	Pilar Dorado, Sara Pinzi, M. Dolores Redel, David E. Leiva-Candia, Iosvani Lopez	Ternary blends of diesel fuel oxygenated with ethanol and castor oil for diesel engines
P2-18	205	Luigi Benedetto Scarponi, Michele Bianchi, Andrea De Pascale, Lisa Branchini, Francesco Melino, Antonio Peretto	Simplified model for pv panels performance prediction

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# Poster Presentations

P2-19	235	Weiwei Shao, Mingming Zhu, Jiahong Liu, Baisha Weng, Chenyao Xiang, Jianguo Gong, Ning Wang, Guiyu Yang	Photovoltaic water lifting and ecological water supplement for Xiang'an Water System in Xiamen City
P2-20	626	Luyao Liu	Forecasting power output of Photovoltaic system using An BP network method
P2-21	818	Pietro Elia Campana, Fadi Atif Fakhir, Dhaha Mohamed, Yang Zhang, Yang Ying, Anders Lundblad, Bengt Stridh, Jinyue Yan	Grid-connected micro-grids with energy storage for peak shaving
P2-22	821	Ying Yang, Yang Zhang, Pietro Elia Campana, Jinyue Yan	Peak-shaving and profit-sharing model by Aggregators in residential buildings with PV
P2-23	10	Zhi Zhuang	Adaptability study on auxiliary heat sources in domestic solar hot water system in China
P2-24	142	Chun Chang, Guanghui Leng, Chuan Li, Binjian Nie, Xiaodong Peng	Investigation on transient cooling process in a water heat storage tank with inclined sidewalls
P2-25	465	Xiaodong Peng, Chun Chang, Guanghui Leng, Binjian Nie, Chuan Li, Xiaohui She	Influences of the key characteristic parameters on the thermal performance of a water pit seasonal thermal storage
P2-26	531	Chun Chang, Xiaodong Peng, Guanghui Leng, Binjian Nie, Chuan Li, Xiaohui She	Heat transfer enhancement of a molten salt parabolic trough solar receiver with concentric and eccentric pipe inserts
P2-27	170	Jixiang Zhang, Baohui Jiang, Cheng Qian	Characterization of bio-crude from hydrothermal liquefaction of Enteromorpha prolifera by FT-ICR mass spectrometry
P2-28	214	Nugroho Agung Pambudi, Lip Huat Saw, Valian Lukad, Danar WijaYanto, Renanto Handogo	Exergy analysis of boiler process powered by biogas fuel in ethanol production plant: a preliminary analysis
P2-29	367	Norfadhilah Hamzah, Koji Tokimatsu, Kunio Yoshikawa	Prospective for power generation of solid fuel from hydrothermal treatment of biomass and waste in Malaysia
P2-30	498	Sajjad Mahmoudi Nezhad, Alireza Rezaniakolaei, Lasse Aistrup Rosendahl	Experimental study on effect of operating conditions on thermoelectric power generation
P2-31	588	Guiqiang Li	Optimizing on thermoelectric elements footprint of the photovoltaic-thermoelectric for maximum power generation
P2-32	107	Yaxu Zhu	Status and development suggestions of wind heating in Northern China
P2-33	810	Xi Lu	Reducing model complexity of DFIG-based wind turbines to improve the efficiency of power system stability analysis
P2-34	85	Changan Wang	Investigation on Correlations between Chemical Properties of High-alkali Solid Fuels
P2-35	109	Yan Gong, Chonghe Hu, Qinghua Guo, Xiaoxiang Wu, Guangsuo Yu	Chemiluminescence and Structure Characteristics in CH <sub>4</sub> /O <sub>2</sub> Coflow Jet Diffusion Flames
P2-36	651	Hantao Wang, Huiming Zhang, Chenghong Gu, Furong Li	Optimal design and operation of CHPs and energy hub with multi objectives for a local energy system
P2-37	231	Qunli Zhang, Donghan Sun, Mingshuang Wang, Chaohui Yin	Analysis of typical energy saving technology in the sewage treatment plant
P2-38	234	Qunli Zhang, Xingquan Fan, Wenjing Zhang, Zhiming Wang	Utilization potential and economic feasibility analysis of bathing sewage and its heat generated in colleges and universities
P2-39	318	Qunli Zhang, Qian Nie, Fang Liu, Chaohui Yin	Technology and economic analysis of sewage source heat pump combined type central heating method
P2-40	796	Tao Ma, Aotian Song	Life-cycle evaluation of different types of cooling systems in buildings

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# Poster Presentations

P2-41	533	Jarek Milewski, Tomasz Wejrzanowski, Lukasz Szablowski, Robert Baron, Arkadiusz Szczesniak, Karol Cwieka	Development of molten carbonate fuel cells at Warsaw University of Technology
P2-42	118	Fares Hatem, Ali Alsaegh, Mohamed Al-fahham, Agustin Valera-Medina	Enhancement flame flashback resistance against CIVB and BLF in swirl burners
P2-43	201	Yuhang Liu, Fujun Zhang	The effects of pressure difference on opposed piston two stroke diesel engine Scavenging process
P2-44	567	Mohamed Al-fahham, Fares Hatem, Zaid Al-Dulaimi, Agustin Valera-Medina, Samuel Bigot	Experimental study to enhance swirl burner against boundary layer flashback
P2-45	702	Aniekan Okon, Agustin Valera-Medina, Hayder Kurji, Yiqin Xue	Acoustic dynamics of a swirl premixed combustor with different operating conditions
P2-46	706	Ali Alsaegh, Agustin Valera-Medina, Fares Hatem	Visualisation of turbulent flows in a Swirl burner under the effects of axial air jets
P2-47	650	Shanshan Liu, Wei He, Dengyun Hu, Delu Chen, Xin Wu, Fusuo Xu, Sijia Li, Song Lv	Experimental analysis of a portable atmospheric water generator by thermoelectric cooling method
P2-48	444	Yang Jingbo, Wu Zucheng, Hu Qin Hai	New ionic membrane device: simultaneously generating hydrogen gas and removing hydrogen cyanide
P2-49	457	Youbo Liu, Yue Xiang	Dynamic wavelet decomposition based multi-objective operation model for HESS enabling wind power output smoothing
P2-50	183	Lukman Adi Prananto, Muhammad Aziz, Tubagus Ahmad Fauzi Soelaiman	Adoption of Kalina cycle as a bottoming cycle in Wayang Windu geothermal power plant
P2-51	209	Francisco Moles, Adrián Mota-Babiloni, Joaquín Navarro-Esbrí, Carlos Mateu-Royo	R1234yf and R1234ze as alternatives to R134a in Organic Rankine Cycles for low temperature heat sources
P2-52	211	Francisco Moles, Adrián Mota-Babiloni, Bernardo Peris, Joaquín Navarro-Esbrí, Konstantinos Kontomaris, Ángel Barragán-Cervera	Thermo-economic evaluation of low global warming potential alternatives to HFC-245fa in Organic Rankine Cycles
P2-53	323	Kaiyong Hu, Jialing Zhu, Wei Zhang, XinLi Lu	A case study of an ORC geothermal power demonstration system under partial load conditions in Huabei Oilfield, China
P2-54	375	Xianglong Luo	Modelling and optimization of an industrial combined heat, power and water system
P2-55	371	Qi Zhang, Yanbin Mu, Zhenzhen Shi, Pengfei Zhang, Jaber-Douraki Majid, Mingjun Wu	Computational fluid dynamic analysis of airflow in belt dryer: effects of conveyor position on airflow distribution
P2-56	424	Zheng Haoyue, Huimin Zhang, Wu Zucheng	Concentration of nitrogen as new energy source from wastewater by electrodeionization
P2-57	507	Washington Logrono, Abudukeremu Kadier, Péter Bakonyi, Nándor Nemestóthy, Katalin Bélafi-Bakó, Magdy Echeverría, Celso Recalde, Gabor Rakhely	A novel miniaturized terrestrial microbial fuel cell reveals rapid electrochemical signals
P2-58	251	Alaa Alhamwi, Wided Medjroubi, Thomas Vogt, Carsten Agert	OpenStreetMap data in modelling the urban energy infrastructure: a first assessment and analysis
P2-59	624	Haiyang Lin	A multi-agent based optimization architecture for energy hub operation

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P2-60	26	Shuoya Tang	Collaborative planning model for charging station and distribution network considering user benefits
P2-61	68	Muhammad Aziz, Takuya Oda	Simultaneous quick-charging system for electric vehicle
P2-62	229	Yue Xiang, Hao Zhou, Junyong Liu, Wei Yang, Yan Wu	Scale development simulation for electric vehicles
P2-63	777	Rui Xiong, Zeyu Chen	Driving cycle development for electric vehicle application using principal component analysis and k-means cluster: with the case of Shenyang, China
P2-64	813	Nima Ghaviha, Erik Dahlquist, Markus Bohlin, Christer Holmberg	Modeling of losses in the motor converter module of electric multiple units for dynamic simulation purposes
P2-65	2	Xiaohe Yan, Chenghong Gu	Cost-benefit comparison of different techniques for addressing wind curtailment
P2-66	24	Justin Trevor Lotter, R Naidoo, Ramesh Bansal	The effects of distributed generation sources within commercial retail reticulation networks
P2-67	405	Lu Zhang	Coordinated Optimal Allocation of DGs, Capacitor Banks and SOPs in Active Distribution Network Considering Dispatching Results Through Bi-level Programming
P2-68	758	Jianwei Li	A novel fault detection and fault location method for VSC-HVDC links based on gap frequency spectrum analysis
P2-69	781	John Licari	Incremental current based MPPT for a PMSG micro wind turbine in a grid-connected DC Microgrid
P2-70	262	Simon Le Blond, Da Huo, Chenghong Gu, Gang Yang	Combined domestic demand response and energy hub optimisation with renewable generation uncertainty
P2-71	329	Yue Xiang, Jie Liu, Diangang Wang, Cheng Zhang, Zhenyu Tang, Zhuozhen Jiang, Junyong Liu	Reliability assessment of cyber physical distribution system
P2-72	524	Yuan Zeng, Yunfei Mu, Hongjie Jia, Dong Wang, Ruiwen Zhang	A new demand response algorithm to maximize renewable energy usage for grid-connect microgrid
P2-73	232	Haoran Ji, Peng Li, Chengshan Wang, Guanyu Song, Jinli Zhao, Hongzhi Su, Jianzhong Wu	A strengthened SOCP-based approach for evaluating the distributed generation hosting capacity with soft open points
P2-74	618	Reza Nadimi, Koji Tokimatsu, Kunio Yoshikawa	Sustainable energy policy options in the presence of quality of life, poverty, and CO2 emission
P2-75	353	Mei Sun, Jian Ji	Design of virtual real-time pricing model based on power credit
P2-76	422	Reza Nadimi, Koji Tokimatsu	Analyzing of renewable and non-renewable energy consumption via Bayesian inference
P2-77	161	Alun Gu, Li Sun	Actual influence cost estimation of water resources in coal mining and utilization in China
P2-78	814	Xianchun Tan, Yuan Zeng, Baihe Gu	The accounting for greenhouse gas emissions of a low-carbon industrial park in China: a case study in Chongqing
P2-79	797	Jimin Kim, Taehoon Hong, Minhyun Lee, Kwangbok Jeong, Youngcheol Kang, Hyuna Kang	Experimental analysis on filters of natural ventilation system in terms of indoor environmental quality and energy consumption
P2-80	572	Simon Kaltoft Christensen, Mojtaba Mirhosseini, Alireza Rezania, Lasse Rosendahl	Thermal-Hydraulic Performance of a Corrugated Cooling Fin with Louvered Surfaces

















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