

Green Energy Today

The fourth issue 2023

*Happy
new
Year*

INTERNATIONAL
ASSOCIATION FOR
GREEN ENERGY



IAGE



Table of Contents

Issue 4, 2023

- 2 Editor's letter
- 3 IAGE president's message
- 4 Report on IGEC2023
- 5 Announcement of IGEC2024

FEATURE ARTICLE

- 7 Clean power sources
- 9 Green energy news
- 10 Report on the IJGE
- 11 Report on the international chapters

NEWS FROM TECHNICAL DIVISIONS

- 12 A venture capital fund for energy storage
- 12 An academia-industry cooperation platform
- 14 World Fuel Cell Conference 2023
- 16 Call for nominations for 2024 IAGE awards
- 17 Call for bid to host IGEC2026
- 18 Job posts
- 19 Contacts

NEWSLETTER ADVERTISING

Contact:

xiaoyu.wu@uwaterloo.ca

BECOME AN IAGE MEMBER

Apply here:

<https://www.iage-net.org/iage-membership>

	Fees (US Dollars)
Member	100
Senior Member	100
Fellow	150
Student member	Free
Retiree member	Free
Honorary Member	Free

Website:

<https://www.iage-net.org/>

Twitter: [@the_IAGE](https://twitter.com/the_IAGE)

LinkedIn:

<https://www.linkedin.com/company/the-iage/>

Communication Committee

XiaoYu Wu (committee co-chair)

Yiji Lu

Yan Yin

Jian Zhao

Hongxia Li

Munur Sacit Herdem

Front cover designed by Pelin Karakoc
@ <http://www.pelinkarakoc.design>

Back cover photo credit: XiaoYu Wu

©2023 International Association for Green Energy (IAGE). All rights reserved.

The contents of this publication may not be reproduced, in whole or in part, without the prior written consent of IAGE.

EDITOR'S LETTER

Dear readers,

I am excited to have the fourth issue of **Green Energy Today** ready for your annual recap. This is a year that has been jam-packed with various developments in different fields of green energy and in IAGE.

In this issue, Dr. Xianguo Li, the president of IAGE, shares his insights in two power generation devices, namely batteries and fuel cells, and provides a high-level comparison between them. Accelerating the global renewable power generation and improving energy efficiency were on top of the “ambitious and integrated package” that the Executive Director of the International Energy Agency set out during the COP28 to limit the global temperature rise to 1.5°C compared with preindustrial times. Therefore, discussions on efficient clean power generation are encouraged in the green energy community.

This issue also recapped several activities and milestones in IAGE, including our annual International Green Energy Conference, the first meeting of the IAGE Turkey Chapter, and the latest developments in our two technical divisions on *energy storage*, and *fuel cell and electrolyzer*.

I am also delighted to share with you that the total paper downloads from the International Journal of Green Energy (IJGE) have been increasing steadily and reached almost 100,000 by the end of the third quarter of 2023.

We also continue the “Job Posts” section in this issue, aiming to help our readers to find suitable candidates and jobs. Please contact me if your organizations have any new openings in the field of green energy.

Thank you for all your support for **Green Energy Today**! Let's look forward to embarking on new green energy adventures together in the coming year!

Sincerely,

XiaoYu Wu



XIAOYU WU, PhD

*Editor-in-chief
Green Energy Today
December 2023*

*Assistant professor, Department
of Mechanical and Mechatronics
Engineering, University of
Waterloo*

*Associate director, Waterloo
Institute for Sustainable
Aeronautics*

xiaoyu.wu@uwaterloo.ca

Welcome to the 4th issue of 2023 IAGE newsletter, Green Energy Today

Dear IAGE members,

On behalf of the International Association for Green Energy (IAGE), I'd like to wish you and your family a happy and healthy holiday season, and a prosperous 2024!

In 2023, IAGE has made substantial effort and achievement in promoting welfare for our members and beyond, advocating green energy and technologies for a cleaner world. The 15th International Green Energy Conference (IGEC2023) was successfully held in Glasgow, UK; the International Journal of Green Energy (IJGE) has made substantial progress in terms of the number and quality of papers published with continued improvement in the journal citation, download and impact factor despite of the rule changes that resulted into a dip in impact factor for most of the journals in the field; the very first volume of the IGEC Transactions was completed and will be published and available in the new year; and nearly a dozen of national/regional chapters has been established following the IAGE guidelines and practices; just to name a few.

On a broader scene, green energy development and adoption have been elevated to urgency in combating the global climate change, as manifested in the outcome of the 28th Conference of the Parties to the UN Framework Convention on Climate Changes (COP 28) that took place in Dubai, United Arab Emirates, from November 30th to December 12th, 2023. Transition to clean energy with net zero emissions is a must, not an option.

We will be happy to work and collaborate with our members and beyond to take the challenges in the coming new year and look forward to meeting new and old friends and colleagues at the 16th International Green Energy Conference (IGEC2024) to be held in Ningbo, China from June 30th to July 4th, 2024, and our very second volume of the IGEC Transactions in 2024 as well.

Enjoy your holidays and be refreshed before returning to take on the challenges.

Sincerely,



Xianguo Li, Ph.D., P.Eng., FCAE, FEIC, FCSME



**XIANGUO LI, PH.D., P.ENG.,
FCAE, FEIC, FCSME**
President, International Association
for Green Energy (IAGE)

*Professor, Mechanical and
Mechatronics Engineering
Director, Laboratory for Fuel Cell
and Green Energy, University of
Waterloo, Waterloo, Ontario N2L
3G1 Canada*

xianquo.li@uwaterloo.ca

On behalf of the Local Organizing Committee, we are pleased to report that the 15th International Green Energy Conference (IGEC2023) was successfully delivered on 10th – 13th July 2023 in Glasgow, United Kingdom.

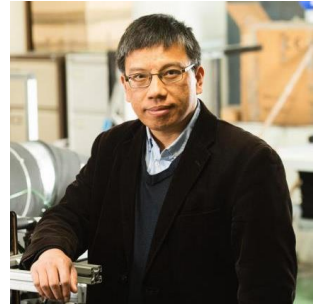
Since the 1st International Green Energy Conference in Waterloo, Canada, in 2005, this gathering has developed into a leading international multi-disciplinary conference on energy systems and technologies with no or reduced environmental, economic and social impact, and provides a forum for the exchange of technical information, for the dissemination of high-quality research results, and for the debate and shaping of future directions and priorities in energy sustainability and security.

This year’s conference featured seven invited plenary talks and 10 invited keynote talks. Our technical program included 196 contributed presentations across 24 technical sessions and five special sessions on focused research topics. Prizes were awarded for the best paper, the best student papers, and the best student presentations.

In addition to the scientific exchange, there were ample opportunities for networking during the conference, especially during its social events. On Monday, 10th July, conference delegates were invited to a Civic Reception by the Lord Provost of Glasgow in Glasgow City Chambers famed for its lavish Italianate style interior and exterior decorations. On Wednesday, 12th July, the delegates had the opportunity to experience the Scottish bagpipes before the Gala Dinner in the University of Glasgow’s Bute Hall. On the last day of the conference, bus tours were arranged for the delegates to discover the rich culture and technical achievements in Scotland.

We would like to thank everyone who helped organize and coordinate this conference, particularly the Lord Provost of Glasgow, Glasgow City Council, Glasgow Convention Bureau, the Events and Conference Department and the James Watt School of Engineering of the University of Glasgow. The financial supports from our sponsors were also greatly appreciated.

We would also like to express our gratitude to all our invited plenary and keynote speakers, special session organizers, presenters, reviewers, our International Organizing Committee, Technical Committee, and last but not the least, the International Association for Green Energy (IAGE), who made this conference fascinating and great success!



Professor Zhibin Yu
James Watt School of Engineering
University of Glasgow

Dr. Yu was the chair of IGEC2023. His research is focused on thermal energy technologies and their fundamental thermodynamic, heat transfer, fluid-dynamic problems.

Gold Sponsor



Silver Sponsor



Competition Sponsors



The 16th International Green Energy Conference (IGEC2024)

June 30 - July 4, 2024

Ningbo International Conference Center (NBICC)

Ningbo, Zhejiang, China



As multi-disciplinary international conferences, the 16th International Green Energy Conference (IGECXVI), the 5th International Conference on Energy and AI (ICEAI-V), and the Symposium on Chemical Engineering and AI join forces together to promote pioneering research and innovation in the fields of energy, environment, and AI (artificial intelligence) as well as their mutual impact and interaction. The conference aims to provide a forum for the exchange and sharing of latest technical information, dissemination of high-quality research results and new developments in the relevant fields. The conference will also provide ample opportunities for the debate and shaping of future directions and priorities in energy sustainability and security, and for the promotion of the R&D and application of AI technologies for advancing green energy, access to affordable and cheap clean energy, decarbonization and net-zero emission.

The conference will be of value and interest to researchers, scientists, engineers and practitioners working in the relevant fields of energy, environment and AI, from policy making, technical development to management and marketing.

CONFERENCE VENUE (ON-SITE)

The 16th International Green Energy Conference and the 5th International Conference on Energy and AI will be jointly held on-site at Ningbo International Conference Center (NBICC) in Ningbo, China on June 30 - July 4, 2024. Ningbo is the southern economic center of the Yangtze Delta megalopolis and is also the core city and center of the Ningbo Metropolitan Area. To the north, Hangzhou Bay separates Ningbo from Shanghai; to the east lies Zhoushan in the East China Sea. (Source: <https://en.wikipedia.org/wiki/Ningbo>)

CONFERENCE FORMAT

The conference will be composed of the following events and activities:

- General contributed abstracts/papers that will be presented orally in technical sessions.
- Keynote lectures by invited speakers.
- Panel sessions on special topics of particular interest.
- General contributed poster presentations.
- Book/Journal/Industry exhibitions.
- Social events for the conference delegates.

CONFERENCE PROCEEDINGS

All papers will be reviewed by the conference Technical Committee under the direction of the International Advisory Committee. Eligible papers will be published in the Conference Proceedings, which will be available to the conference registrants.

JOURNAL PUBLICATION

High-quality original papers of archival value will be considered for publication in Special Issues of prestigious international journals, including

- [International Journal of Green Energy](#) (Taylor & Francis)
- [Frontiers in Thermal Engineering](#) (Frontiers)
- [Energy and AI](#) (Elsevier)
- [Energy Storage and Saving](#) (Elsevier)

IMPORTANT DATES (BEIJING TIME)

Feb. 28, 2024: Abstract/Paper submission due

Submission website: <https://www.iage-net.org/igec2024-submission>

April 30, 2024: Revised abstract/paper due

April 30, 2024: Early bird registration due

CONTACT

Website: <https://www.iage-net.org/igec2024>

Conference Secretary: Drs. Bowen Wang or Jian Zhao

Email: igec_iceai@outlook.com

Call for nominations

IAGE association awards

More information on Page 16 in this issue of Green Energy Today

Clean Power Sources: Battery or Fuel Cell?

Xianguo Li, University of Waterloo

Faced with the possibility of irreversible climate changes [1], reduction in greenhouse gas emission is necessary with the target of carbon neutrality by around the middle of century. The transport sector is considered as the hardest to decarbonize, as it involves the mobility of goods and humans on the ground (on/off the road vehicles), over the water (ships) and in the air (airplanes or aviation), and a paradigm shift in the power sources powering mobility and the associated energy resources and infrastructure is required in the near future – energy transition is a must, not an option.

It's generally agreed that associated primary energy resources must be shifted towards renewable energy such as solar, wind, tidal, hydro, etc. that are free from carbon content; and a smart electricity grid coupled with smart consumers and/or prosumers might be able to accommodate the fluctuation, intermittency, and geographical and climate/weather impact inherently embodied with the renewable energy resources. However, such an electricity grid based on 100% renewable electricity is yet to be established, and how electricity generation and consumption could be balanced at all times is another pressing issue. A further daunting question remains as to how renewable electricity could be utilized to power mobility, though arguments still abound after decades of studies and controversies [2, 3]. It seems that electrification of transport sector may rely on batteries and/or hydrogen fuel cells, as supercapacitors have an extremely low energy-storage capacity.

As shown in Figure 1, a **battery** contains two reactants (one acting as equivalent to a fuel in conventional power generation systems, and another as an oxidant), reaction products, and an energy conversion device which works in bi-direction. In **discharging mode**, the energy conversion device converts the reactants into products while producing electric power output; and in **charging mode**, electricity is provided to the energy conversion device to decompose the reaction products stored onboard of battery into their reactants. Therefore, a battery might be classified as an energy storage device. On the other hand, a **fuel cell** is just an energy conversion device, that converts directly into electricity the chemical energy of a fuel, which is stored onboard of a vehicle but external to the fuel cell itself, and an oxidant, commonly oxygen from the ambient atmosphere, and the reactant products are dumped into the ambient atmosphere as well.

Since battery contains all the essential components onboard, it has a high electric energy efficiency (round trip from electricity in to electricity out), and simple operation and maintenance. On the other hand, since the amount of the reactants that can be stored onboard of battery is limited, it would have a limited driving range (when the reactants are completely consumed); and it has a low energy density when compared with fuel cell as battery carries four components (two reactants, reaction products and an energy conversion device) while fuel cell only carries two (fuel and energy conversion device). Because its energy conversion device must work in both directions (discharging and charging), the changing and high electrode



XIANGUO LI, PH.D., P.ENG., FCAE,
FEIC, FCSME

*Professor, Mechanical and
Mechatronics Engineering
Director, Laboratory for Fuel Cell and
Green Energy, University of Waterloo,
Waterloo, Ontario N2L 3G1 Canada*

Website: <https://uwaterloo.ca/fuel-cell-green-energy-lab/>

Professor Li is the Founding Editor-in-Chief of the International Journal of Green Energy, which established the International Green Energy Conference series and launched the annual review series Progress in Green Energy. He is also the Field Chief Editor, Frontiers in Thermal Engineering. Professor Li is a fellow of Canadian Academy of Engineering (FCAE), a fellow of the Engineering Institute of Canada (FEIC) and a fellow of the Canadian Society for Mechanical Engineering (CSME) and serves as VP Technical Program for CSME. Previously he served as the CSME Division Chair for the Advanced Energy Systems technical division. He also currently serves as the President of the International Association for Green Energy and President of the Fuel Cell Division, International Association for Hydrogen Energy and established the World Fuel Cell Conference series.

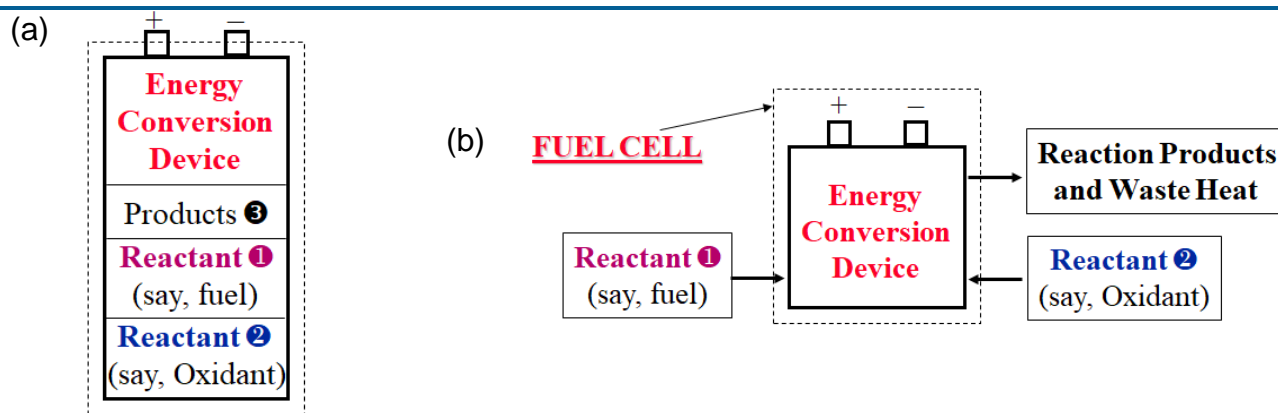


Figure 1: A schematic comparison of battery and fuel cell: (a) battery, containing onboard **four** components: an energy conversion device, two reactants (oxidant and fuel), and products; (b) fuel cell, just an energy conversion device, while fuel is external to it, with oxidant from and reaction products dumped to the ambient atmosphere.

potentials are the source of accelerated degradation, limiting the number of discharging-charging cycles, or battery's operating lifetime. In order to lessen the electrode overpotentials, hence the degree of degradation especially during the charging process when the electrode potentials are the highest, charging process must be controlled sufficiently slow such that it takes an excessively long time; and fast charging substantially shortens battery lifetime, although fast charging technologies have been developed. Further, battery reaction is sensitive to its temperature, optimal around 25°C, its operation at lower and higher temperatures will escalate its degradation, and lower temperature operations substantially reduce battery capacity as well, further limiting its driving range. Finally, since the energy conversion device in battery has access to both reactants, its electrochemical reaction occurs at all times, even during the time battery is not being operated, this often leads to safety concerns and fire hazard due to its self-accelerated thermal runaway. All these result into extreme sensitivity of battery to its manufacturing process, impose stricter manufacturing tolerance for product consistency and reliability, which is currently not being met completely yet. This might also explain why virtually all brands of battery electric vehicles have experienced self-inflicted fires whether the vehicles were in operation or not when the incidents occurred.

In comparison, a fuel cell has its reactants (fuel and oxidant) external to it, thus requiring a fuel and oxidant delivery system to transport the reactants into a fuel cell for reaction and electricity generation, leading to a lower electric energy efficiency. This is especially so, if renewable electricity is used to generate hydrogen as the fuel in the first place, then the round-trip (or life-cycle) efficiency for fuel cell would be much lower than battery. On the other hand, fuel cell only needs to carry two components (an energy conversion device and fuel), it has much higher energy and power density, thus more suitable for long-distance and/or heavy-duty applications; and the refuelling is fast, taking only minutes as compared to hours for battery charging. Further, a low electrical energy efficiency for fuel cell indicates the availability of waste heat for the thermal comfort of vehicle occupants and for maintaining proper/optimal operation temperature, as compared with batteries. Lastly, since the fuel and oxidant are only fed to a fuel cell when it is in operation, no reaction or safety concern when the fuel cell is not in operation.

As usual, there is no perfect solution. A sword has double edges as always. Now, what you would choose: a battery, or fuel cell? No matter how technology might evolve, the fundamentals determine the properties and characteristics, be it a lithium-ion battery or solid-state battery.

References:

- [1] D.I. Armstrong McKay, et al. *Science*, 377, eabn7950 (2022)
- [2] F. Kreith and R. West. *J. Energy Resour. Technol.*, 126, 249-257 (2004)
- [3] R.R. Beswick, et al. *ACS Energy Lett.*, 6, 3167-3169 (2021)

Every newsletter, the Editor will curate the news that they have read on the latest development in green energy. In this issue, I read some news on net zero emissions and hydrogen.

Net zero emissions

- The International Energy Agency (IEA) has published its landmark report [Net Zero Emissions by 2050: A Roadmap for the Global Energy Sector](#) in 2021 where they laid out the pathway for the energy sector to achieve the target of a 1.5°C global temperatures rise above pre-industrial levels. In [this 2023 update](#), the revised pathway to a net-zero economy by 2050 is provided.
- The [Net Zero by 2050 dataset](#) is provided by IEA as a reference to the Net Zero Emissions by 2050 Scenario (NZE) modelling. You can find detailed information such as the energy supply and demand, electricity generation and capacity in the dataset.
- The International Renewable Energy Agency (IRENA) and the United Arab Emirates have announced the winners of [the Teaching for Net Zero Campaign award](#) to recognize inspiring educators in energy transition.
- Renewable energy generation is critical for net zero and its global capacity needs to increase significantly to reduce carbon emissions. For example, it was [reported](#) that Wales's wind power needs to increase four times in 10 years for the green goals.
- Many have used machine learning to battle climate change. However, the carbon footprint of machine learning needs to be quantified. A recent [paper](#) led by the Hugging Face, a company that develops machine learning tools, detailed the carbon footprint of the BLOOM language model.

Hydrogen

- The 2023 [Global Hydrogen Review](#) by IEA is a useful resource to find information such as global hydrogen production and demand and hydrogen infrastructure development. They also reported global developments in areas such as trade, policy, regulation, investments, and innovation.
- IRENA and the World Trade Organization (WTO) jointly published a [report](#) on international trade and green hydrogen. Information about the current and future trade dynamics and related policies can be found in the report.
- Oil giant ADNOC, Abu Dhabi state-owned oil company, becomes a major clean hydrogen and ammonia player. ADNOC has entered into a [binding agreement](#) to buy out partner OCI's majority stake in the two companies' joint-venture fertilizer company, Fertiglobe, for \$3.62bn.
- General Motors and Komatsu, a Japanese construction vehicle manufacturer, will [co-develop](#) heavy-duty mining trucks powered by hydrogen fuel-cells.
- A hydrogen aviation company, ZeroAvia, announced their [high-performance compressor](#) for the fuel cell aviation proposal system. This company also [completed ten flights](#) of their hydrogen-electric plane in July 2023.

International Journal of Green Energy: performance in quarter 3 of 2023

International Journal of Green Energy has achieved 91106 article downloads so far in 2023.

The below figure shows how many times articles published in *International Journal of Green Energy* have been downloaded in **July, August, and September of 2023**.



2023

International Journal of Green Energy achieved 28268 downloads in quarter 3 of 2023.

Benchmarking quarter 3 downloads

We have provided data back to 2020 to give more insight to the comparative performance of the journal.



2020

11978



2021

24767



2022

26828

Journal website: <https://www.tandfonline.com/journals/lige20>

IAGE Turkey Chapter held its first meeting!

The IAGE Turkey Chapter held its first meeting on 22 October 2023. Turkey Chapter Board members and their responsibilities are given in the list below:

President, C. Ozgür Çolpan, Dokuz Eylül University, (President, Responsible of IAGE Türkiye Chapter)

Vice President, Erol Arcaklıoğlu, Member of Council of Higher Education of Türkiye, (Responsible for Universities)

Vice President, Ziya Söğüt, Vice-Rector at Piri Reis University, (Responsible for National Meetings)

Vice President, Ahmet Gökşin, Mech Eng, MSc., CEO of HAVAC Company, ASHREA Türkiye Chapter President, (Vice President, Responsible for Companies)

Member, Hikmet Karakoç, Eskisehir Technical University, (Responsible of Membership)

Member, Alper Dalkıran, Süleyman Demirel University (Responsible for Promoting the International Green Energy Conference)

Member, Hüseyin Devrim, Mech Eng, Founder of Teksis Company (Responsible of Technical Committee)

Member, Selçuk Ekici, Iğdir University, (Responsible for Promoting International Journal of Green Energy Journal)

Member, Enes Günaltılı, Research Assistant of Necmettin Erbakan University, (Responsible for Students Committee, Social Media, Meeting Reporter)

Member, Ahmet Emin Kılıç, Ph.D. Student of Yıldırım Beyazıt University, (Responsible for Students Committee, Social Media)



Professor Hikmet Karakoç
Chair of IAGE International
Committee

Faculty of Aeronautics and
Astronautics,
Eskisehir
Technical
University,
Turkey



More are coming ...

So far, IAGE has opened the following 12 Country/Regional representative offices. Here is the list of the countries: **Canada, China, Denmark, Hong Kong, Korea, Malaysia, Malaysia, Serbia, Singapore, Spain, Turkey, UAE, UK, USA.**

The 1st International Committee will be held with the participation of the 12 Country Chapters!

Tianjin University announced a 500-million-yuan venture capital fund for energy storage

Professor Kui Jiao, Tianjin University

The 4th Tianjin University Qilitai New Energy Technology and Industrial Development Forum (the Forum) was held in Tianjin on Oct. 1st, 2023. The forum invited domestic and international experts from both academia and industry in the field of energy storage. The main topics were how to seize the opportunity of energy storage, how to create value via energy storage deployment for renewables, and how to achieve the goal of “carbon peak and carbon neutrality.” On the forum, the Tianjin University Beiyang Haitang Venture Capital Fund for new energy and new materials at a scale of 500-million-yuan was officially announced.



The Forum, founded in 2018, has been successfully held three times. The theme this year was "New Era - New Opportunities - New Energy - New Power." Detailed topics included carbon neutrality, energy transition, integration of power sources, grid, load, and storage, hydrogen energy, the trend of other new technologies and industrial development. Professor Chengshan Wang, an academician of Chinese Academy of Engineering, Professor Tianshou Zhao, an academician of Chinese Academy of Sciences, and Professor Shizhang Qiao, a fellow of Australian Academy of Sciences, gave invited keynote speeches.

In the Forum, the latest research progress in new power distribution systems and power energy storage, carbon-neutral energy storage technology, and water decomposition technology for hydrogen production were discussed. The forum also covered the fields of lithium batteries, sodium batteries, hydrogen, wind, solar, and intelligent grid. Renowned experts and entrepreneurs from the industry also shared the latest R&D achievements from their laboratories and discussed directions of their enterprises' research and development. The Forum aims to build a cross-border platform for in-depth knowledge exchanges, promote close cooperation between industry and academia, form cross-border innovations and cooperations, and achieve the goal of "carbon peak and carbon neutrality."

Many outstanding alumni enterprises of Tianjin University have emerged and accumulated rich experience in the industry of renewable energy technologies and new materials. The launch of the first phase of Tianjin University Beiyang Haitang Venture Capital Fund for renewable energy technologies and new materials, through a completely market-oriented management and investment in enterprises with expected high growth, will further provide advantages such as underdisciplined and complementary resources to promote industrial development.

Accelerating the academia-industry cooperation of National Energy Storage Platform by Tianjin University

-- a ceremony unveiled academia-industry joint labs and celebrated donation

Professor Kui Jiao, Tianjin University

The united labs between the National Industry-Education Platform for Energy Storage by Tianjin University (the National Energy Storage Platform, or the Platform) and five enterprises were unveiled, and a ceremony celebrating the donations was held in the Weijin Road Campus, Tianjin University, on Oct. 1st, 2023.

In the welcome speech, Professor Chengshan Wang, director of the Platform, and academician of Chinese Academy of Engineering, pointed out that energy storage is an emerging industry in line with the national strategic needs in China, and it is of great significance to strengthen talent training and scientific and technological research in the field of energy storage technology. The Platform, as one of the first three national innovation platforms for industry-education integration of energy storage technology, gathers high-quality resources from both academia and industry and integrates interdisciplinary construction, scientific and technological research, and talent training. It also covers the whole spectrum of energy storage technologies such as electrochemical energy storage, fuel energy storage, and safety and operation of energy storage systems. The Platform is committed to providing strong talent and technological support for the development of China's energy storage industry. Professor Wang addressed that the Platform will focus on two characteristics of the cross-fusion of disciplines and the integration of industry, academia and research, play a full role to advantages of cross-disciplines, promote the integration of industry, academia and research, enhance scientific and technological innovation capabilities, accelerate the transformation of scientific and technological achievements, build a new ecology of the energy storage industry, and help China's energy science and technology to thrive.



At the ceremony, leaders of the university and enterprises jointly unveiled five joint labs: the State Grid Tianjin Electric Power Company-Tianjin University National Energy Storage Platform Training Base, Tianjin University-AlphaESS Energy Co. Joint Research Center for Energy Storage System Safety, Tianjin University National Energy Storage Platform-Pinggao Co. Joint Research Institute for Energy Storage Technology, Tianjin University National Energy Storage Platform-Xirui Control Co. Joint Research Institute for Energy Storage Technology, and Tianjin University National Energy Storage Platform-Cone Hydrogen Technology Co. Joint Research Center for Hydrogen Energy. The involved enterprises will invest at least 19 million yuan in Tianjin University in the next three years for scientific and technological research and achievement transformation in the field of energy storage technology. In addition, Mr. Jun Wang, the president of AlphaESS Energy Co., donated the AlphaESS Energy Talent Development Fund of 1 million yuan to Tianjin University on behalf of the enterprise. Mr. Qizhang Chen, the chairman of Sinocat Environmental Technology Co., an alumnus of Tianjin University, donated the Sinocat Energy Storage Fund of 1 million yuan on behalf of the enterprise. The funds will be used for scholarships and teaching awards on the Platform.

Professor Donghan Jin, the president of Tianjin University and academician of Chinese Academy of Engineering, welcomed the guests from these enterprises. He pointed out that Tianjin University focuses on the field of energy storage technologies, and the establishment of training bases, joint research centers and research institutes with the industry will address the beautiful vision of academia-industry collaboration. Tianjin University will continue to promote these cooperations to take advantage of the university's expertise, and jointly promote the scientific and technological achievements of joint research, co-creation and sharing. Professor Jin emphasized the three points that should be achieved to promote academia-industry cooperation and integration of production and education. The first point is to focus on the needs of the national energy strategy. Adhere to the principle of win-win cooperation to actively explore new paths for the integration and development of industry-university-research and strive to pass the last mile of scientific research results. Secondly, it is to strengthen the institutional mechanism innovation. A cooperative and efficient operation system between schools and enterprises will be established to promote the innovation of school-enterprise cooperation mode with new development concepts and make joint efforts to create a model of school-enterprise cooperation. The third is to accelerate the transformation of scientific and technological achievements. Gathering and cultivating high-level scientific and technological talents should be focused to actively promote the transformation of scientific and technological achievements into real productivity and push the content of cooperation to the middle and high end of the value chain.

World Fuel Cell Conference 2023 took place in London

Dr. Mengjun Gong, Imperial College London

With the support from the Fuel Cell Division of the International Association for Hydrogen Energy (IAHE) and under the auspices of IAHE Board of Directors, Professor Anthony Kucernak from Imperial College London and Dr Shangfeng Du from the University of Birmingham co-organized the World Fuel Cell Conference 2023 (WFCC2023). It was held in the Department of Chemistry at Imperial College London on 11-13 December 2023, attracting more than 120 attendees from academia and industry across 11 countries from Europe, North America, and Asia.

Workshop Day - December 10th

The WFCC2023 opened with an enriching workshop, offering attendees the access to invaluable expertise from four distinguished scientists. Participants were immersed in three comprehensive tutorials, each led by experts in their respective fields:

- **Electrochemical Impedance Spectroscopy (EIS) Study** was elucidated by Professor Jianbo Zhang from Tsinghua University, providing deep insights into this crucial aspect of fuel cell technology.
- Dr. Adam Holland from Horiba UK delved into **characterization techniques**, offering attendees a profound understanding of the methods used to analyze fuel cell and electrolyzer materials.
- The intricate domain of **high mass-transport electrochemical testing** was explored by Dr. Xiaoqian Lin and Michalis Metaxas from Imperial College London, shedding light on cutting-edge testing methodologies crucial for fuel cell advancements.

This comprehensive workshop set the stage for a conference brimming with innovative insights and expert knowledge in the field of fuel cell technology. Attendees were treated to a diverse spectrum of expertise, laying the foundation for an eventful and enlightening conference.



Day One - December 11th

The grand inauguration of the WFCC 2023 unfolded with a captivating opening ceremony, graced by the presence of luminaries Professor Anthony Kucernak and Professor Xianguo Li. Their illuminating talks set the tone for an intellectually charged day ahead. The morning sessions were enriched with three compelling plenary talks:

- Professor Katsuyoshi Kakinuma from the University of Yamanashi presented insights into polymer electrolyte fuel cells in heavy-duty transportation, shedding light on crucial advancements in this domain.
- Professor Kui Jiao from Tianjin University delved into modelling for fuel cell transport phenomena and design, offering a comprehensive understanding of the intricate modelling techniques in fuel cell development.
- Dr. Subhasish Mukerjee from Ceres Power discussed Ceres technology for clean power and green hydrogen, presenting innovative approaches toward cleaner energy solutions.

Post-lunch sessions witnessed a dynamic transition into two parallel sessions, featuring keynote talks by Professor Martin Freer and Professor Stefania Specchia, both delivering thought-provoking insights into fuel cell advancements. The day culminated with a captivating keynote lecture by Dr. Lewis George from Horiba UK, encapsulating the essence of the day's discussions.

A stimulating panel discussion, helmed by Professor Martin Freer, navigated the hydrogen landscape and its myriad applications. The panel, comprising experts Dr. Tony Duan, Dr. Mikhail Gironvich, and Dr. Subhasish Mukerjee, provided profound insights into the diverse applications of hydrogen technology. The day ended on a convivial note with the conference dinner, providing attendees with a platform for networking and further discussions, fostering an environment of collaboration and camaraderie.

Day Two - December 12th

The day commenced with an enlightening plenary talk by Professor Xianguo Li, who shared invaluable insights into the intricate design considerations of bipolar plates and flow fields for PEM fuel cells. His expertise set the stage for a day packed with engaging sessions and expert discussions.

Attendees were treated to a series of stimulating talks conducted in two parallel sessions, each exploring various dimensions of fuel cell and electrolyzer technologies. Adding to the spectrum of knowledge were two keynote presentations by luminaries in the field: Professor Joel Pauchet from CEA and Professor Sara Walker from Newcastle University, both offering unique perspectives and expanding on the frontiers of research.

The highlight of the afternoon was a thought-provoking panel discussion chaired by Professor Xianguo Li. The discussion revolved around the technical challenges obstructing the seamless implementation of hydrogen technology. A panel of esteemed experts, including Professors Kui Jiao, Katsuyoshi Kakinuma, Sara Walker, and Jianbo Zhang, convened to share their wealth of insights, fostering a robust exchange of ideas and solutions.

The day culminated in an electrifying session of 3-Minute Thesis (3-MT) presentations, a platform for concise yet impactful presentations by budding researchers. A distinguished panel of judges, comprising Dr. Merit Bodner, Professors Jianbo Zhang, Katsuyoshi Kakinuma, and Sara Walker, evaluated the presentations, acknowledging the exceptional talent and innovative research showcased during the event.

Day Three - December 13th

The conference's final day commenced with a compelling plenary talk by Dr. Alex Martinez, focusing on robust catalyst coated membrane (CCM) technology for automotive applications. His insights provided a significant understanding of advancements crucial for enhancing fuel cell technology's viability in the automotive sector.

The day continued with a keynote talk by Professor John Varcoe, discussing alkaline membranes for Anion Exchange Membrane (AEM) Fuel Cells. This presentation added depth to discussions about emerging technologies and their potential impact on fuel cell development. After that, attendees engaged in parallel presentations, exploring a diverse array of topics, allowing for a deep dive into various facets of fuel cell research and development.

The day reached its pinnacle with a captivating plenary talk delivered by Professor Jianbo Zhang, marking the conclusion of the formal sessions. Professor Zhang's insights served as a fitting conclusion to the conference, encapsulating the essence of the discussions and advancements presented throughout the event.

The closing ceremony was a celebration of innovation and excellence in fuel cell technology. Awards were presented to recognize outstanding oral presentations, poster presentations, and the enthralling 3-Minute Thesis (3-MT) competition. These acknowledgments honored exceptional talent and innovative contributions, inspiring attendees and reinforcing the conference's commitment to fostering advancements in the field of fuel cells.

The WFCC2023 provided a platform for groundbreaking research, insightful discussions, and recognition of outstanding contributions, leaving attendees inspired and enthusiastic about the future of fuel cell technology. The event's success served as a catalyst for further advancements and collaborations in the quest for sustainable energy solutions.



Call for Nominations – 2024 IAGE Awards

The International Association for Green Energy (IAGE) is pleased to announce the Call for Nominations for 2024 IAGE society level awards. For full consideration, nominations must be received by **March 31, 2024**. Award winners will be announced at the 16th International Green Energy Conference venue and will be listed after the conference on the IAGE website.

Nominations should be emailed to the Honours and Awards Committee Chair, Dr. Jing Shi at jing.shi@uc.edu. The entire nomination package (completed nomination form, and the required documents applicable to the award category) should be submitted in one single email. For more information about the awards, refer to the IAGE website: <https://www.iage-net.org/>.

The IAGE society level awards include the following categories:

- **Lifetime Achievement Award** recognizes an individual who has made extraordinary contribution to the advancement of green energy over his/her lifetime. The Lifetime Achievement Award is the highest honor bestowed upon an individual by IAGE.
- **Distinguished Service Award** is an honor bestowed to an individual who has provided exemplary service to the Association. It recognizes the individual's outstanding contribution to the IAGE, IGEC, IJGE, and the professional communities at large.
- **Outstanding Researcher Award** recognizes outstanding scientific work in green energy research by a world-leading scientist or engineer. The award recipient must have demonstrated exceptional contribution to the green energy research community.
- **Technology Innovation Award** recognizes and celebrates the researchers and/or inventors from the industry, academia, or individuals regarding their innovative ideas, products, or concepts. The Award is intended to encourage individuals or parties to think about "Technology Innovation" benefits.
- **Young Researcher Award** recognizes outstanding scientific work in green energy research by a young scientist or engineer. The award recipient must show exceptional promise as a developing leader and make outstanding and continuing contribution to green energy research.

Call for Bids

Call for bids to host the 18th International Green Energy Conference in 2026

The International Green Energy Conference (IGEC) is a multi-disciplinary conference on energy systems and technologies with no/reduced environmental, economic and social impact, and provides a forum for the exchange of technical information, for the dissemination of high-quality research results, and for the debate and shaping of future directions and priorities in energy sustainability and security. IGEC is held annually typically in July and is organized by International Association for Green Energy (IAGE).

IAGE Conference Committee (CC) is calling for bids to host the **18th IGEC in 2026**. For full consideration, bids should be submitted by email with subject line “Bid to host the 18th IGEC” to the CC chair SeongDae Kim (seongdae-kim@utc.edu) by **March 31, 2024**.

To be eligible to host the 18th IGEC,

- The proposed conference city should not have hosted the IGEC within the past 5 years.
- The organizer should have experience in conference organizing.
- The proposed conference city should be able to attract new participants and have good accessibility.

Bids should be brief and include the following information:

1. **Organizers.** List the following organizer(s) with contact info and affiliation:
 - a. Organizing committee chair(s)
 - b. Organizing committee members
 - c. Hosting institution
2. **Institutional support and commitments.**
 - a. Relevance of the organization to green energy
 - b. Letter(s) of support from upper administration with detailed commitments, such as release time, secretarial support, and financial commitment
 - c. Professional conference services that will be available and considered to execute the conference – general description of what is available and whether or not they have been contacted prior to submitting proposal.
3. **Conference site.** Provide the following:
 - a. Brief description of the conference city
 - b. Brief description of possible conference venues
 - c. Site access and travel options: air travel and/or ground transportations with associated cost estimates
 - d. Conference facilities
 - e. Weather/climate
 - f. Local attractions
 - g. Accommodation: lodging options and cost estimates
 - h. Tentative conference schedule
 - i. Technical tours
 - j. Conference finance: estimated revenue and expenses, plan for securing sponsorships
 - k. Plan for conference promotion

The winning bid is expected to be announced by **May 31, 2024**.

Bidders may contact any IAGE CC members before submitting the bid to discuss any aspect of the bid.

IAGE Conference Committee

Seong Dae Kim, Ph.D. (seongdae-kim@utc.edu)

Chong Wen Tong, Ph.D. (chong_wentong@um.edu.my)

Zhongchao Tan, Ph.D. (zhongchaotan@eias.ac.cn)

Zhibin Yu, Ph.D. (Zhibin.Yu@glasgow.ac.uk)

Rúnar Unnpórsson, Ph.D. (runson@hi.is)

Feature: Professor position at the University of Glasgow

An exciting position for Professor in Materials for Green Energy Technologies. The James Watt School of Engineering of the University of Glasgow is hiring!!!



We are seeking to fill a professorial position for an ambitious academic to join the Materials and Manufacturing Research Group based in the Division of Systems, Power and Energy. Specifically, applications in the broad area of Materials for Green Energy Technologies. Early application is encouraged, and our interview panel will convene at regular intervals to assess potential applicants.

More details can be found via: <https://www.gla.ac.uk/explore/jobs/appointments/116632/>

Feature: Lead Researcher/Senior Researcher/Researcher positions at the RSERC of Technology Innovation Institute

The Renewable and Sustainable Energy Research Center (RSERC) pushes the frontiers of technological research in energy storage, analysis, and solutions. RSERC is part of the Technology Innovation Institute (TII), a global scientific research center attracting the world's foremost scientists and researchers. We offer unique, resource-rich opportunities at our world-class laboratories to create and innovate without boundaries, collaborating across disciplines to generate real-world impact through both theoretical development and practical systems designed for tomorrow.

Bolstered by a well-resourced team of scientists and researchers, our core focus domains include bioenergy and fuel cells, energy storage, energy analysis and optimized systems design and modelling, and modernized energy solutions. Positions are opening now!

More details can be found via: <https://www.tii.ae/careers>

Feature:

There is also a list of openings in industry and academia on the IAGE website: <https://www.iage-net.org/careers-and-job-postings>

**Have openings related to green energy?
You can post them here for free!**

Please contact Dr. XiaoYu Wu (xiaoyu.wu@uwaterloo.ca)

IAGE BOARD OF DIRECTORS

Alper Dalkiran, Suleyman Demirel University, Turkey
 Kui Jiao, Tianjin University, China
 Hikmet Karakoc, Eskişehir Technical University, Turkey
 SeongDae Kim, University of Tennessee at Chattanooga, US
 Xianguo Li, University of Waterloo, Canada
 Samaneh Shahgaldi, Université du Québec à Trois-Rivières, Canada
 Jing Shi, University of Cincinnati, US
 Zhongchao Tan, University of Waterloo, Canada
 Chong Wen Tong, University of Malaya, Malaysia
 Qiuwang Wang, Xi'an Jiaotong University, China
 XiaoYu Wu, University of Waterloo, Canada
 Zhibin Yu, University of Glasgow, UK
 Jian Zhao, Mississippi State University, US

EXECUTIVE COMMITTEE

President	Xianguo Li	xianguo.li@uwaterloo.ca
Secretary	Jing Shi	shij3@ucmail.uc.edu
Treasurer	XiaoYu Wu	xiaoyu.wu@uwaterloo.ca

COMMITTEE CHAIRS

Bylaw and Operating-Guide Committee	Zhongchao Tan	zhongchao.tan@uwaterloo.ca
Communication Committee	Alper Dalkiran	alperdalkiran@sdu.edu.tr
Conference Committee	SeongDae Kim	seongdae-kim@utc.edu
Honours and Awards Committee	Jing Shi	shij3@ucmail.uc.edu
International Committee	Hikmet Karakoc	hkarakoc@eskisehir.edu.tr
Membership Committee	Zhibin Yu	zhibin.yu@glasgow.ac.uk
Nominating Committee	Xianguo Li	xianguo.li@uwaterloo.ca
Scientific Committee	Zhongchao Tan	zhongchao.tan@uwaterloo.ca

TECHNICAL DIVISION CHAIRS

Energy storage division	Kui Jiao	kjiao@tju.edu.cn
Fuel cell and Electrolyzer	Samaneh Shahgaldi	samaneh.shahgaldi@uqtr.ca

Website: <https://www.iage-net.org/>

Twitter: @the_IAGE

LinkedIn: <https://www.linkedin.com/company/the-iage/>



The IAGE Newsletter would like to acknowledge the supports from all the contributors



INTERNATIONAL ASSOCIATION FOR GREEN ENERGY