

FINAL ANNOUNCEMENT

21st EFCF Conference in Series with Tutorial, Exhibition and Application Market

6th EUROPEAN PEFC & Electrolyser Forum

4–7 July 2017

KKL Lucerne / Switzerland

Chaired by

Dr. Isotta Cerri, Toyota Motor Europe

Prof. Dr. Angelika Heinzl, ZBT GmbH Uni Duisburg-Essen



International FUEL CELL, ELECTROLYSER & HYDROGEN event including:
Car OEM status, H₂ Economy + Market Keynotes; All H₂, Direct Alcohol, Microbial FCs;
Redox Flow Battery comparison; Alkaline + PEM Electrolysis; PEC; H₂ storage, processing,
purification, compression; CO₂ Reduction; Green Salon, Grid Service Markets symposium

4 July 2017
FUEL CELL TUTORIAL
by Dr. Jan Van herle, EPFL
Dr. Günther G. Scherer, formerly PSI

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Convenient hotel rooms are blocked until 15 May 2017

Schedule of Events		Motto 2017: Fuel Cells & Reversible Technologies: From Materials & Components to Applications – Practical Inventions & Competitive Solutions
Tuesday – 4 July 2017	09:30 – 16:00	Tutorial by Dr. Günther G. Scherer & Dr. Jan Van herle (09:30 – 10:00 Registration, KKL, Clubroom, 2 nd Floor above Auditorium)
	09:00 – 17:00	Workshop on Monitoring, Diagnostics & Control for FC (by FCH-JU projects DIAMOND + HEALTH-CODE, KKL, Clubroom, 2 nd Floor)
	11:00 – 16:00	Exhibition set-up
	16:00 – 18:00	Poster pin-up (continued on following morning) / Opening of the exhibition, On-site Registration (continued on following days)
	18:00 – 19:00	Welcome gathering in the exhibition in the splendid KKL (ground floor)
Wednesday – 5 July 2017	08:00 – 16:00	On-site Registration (continued on following days); 08:00 – 09:00 Speakers' Breakfast (info at the registration desk)
	09:00 – 18:00	Conference sessions 1 – 5 with keynotes on Hydrogen Economy; Automotive OEM Status; Bridge to Products: Material to Cells Performance; Electrolysers & H ₂ : Concepts, production & costs; Poster presentation, networking & exhibition
	09:00 – 18:00	Poster area & exhibition open, 13:15 – 14.30 Poster Session I; "Green Salon" B2B mobility & energy systems meeting point & exhibits
	12:30	Press Conference by invitation only
	18:30 – 23:00	Swiss Surprise Evening – separate registration for 80 places to be booked on a first-come-first-served basis
Thursday – 6 July 2017	08:00 – 09:00	Registration continuation, Speakers' Breakfast
	09:00 – 18:00	Conference sessions 6 – 11 with keynotes on Green Power for Green Hydrogen; Technical FC, Electrolysers & H ₂ sessions; Poster presentation, networking & exhibition
	09:00 – 18:00	In parallel: European Grid Service Markets Symposium: Business with New Technologies like Electrolysers
	09:00 – 18:00	Poster area & exhibition open, 13:15 – 14.30 Poster Session II; "Green Salon" B2B mobility & energy systems meeting point & exhibits
	19:30 – 23:00	Great Dinner on the Lake
Friday – 7 July 2017	08:00 – 09:00	Registration continuation, Speakers' Breakfast
	09:00 – 16:15	Conference sessions 12 – 15: Science, Bridge to Products & Industrial Achievements, Inventions, Implementation & Expectations; SPECIAL Sessions: Electrochemical CO ₂ -Reduction (B12), PEC Water Splitting – Microbial & Direct Formic Acid Fuel Cells (C12), Similarities & Differences: FC-Redox Flow Batteries (C13+14); networking and exhibition
	09:00 – 12:30	Poster area & exhibition open; 12:30 – 14:00 Poster and exhibition removal
	15:00 – 16:15	Closing & Christian Friedrich Schoenbein Award Ceremony: Best poster, best scientific contribution & outstanding lifetime work; Keynote of Prof. Hubert Gasteiger , TU Munich: «New materials, methods & concepts for Hydrogen Fuel Cells»
	16:15 – 17:00	Goodbye coffee and travel refreshment in front of the Luzerner Saal

The promotion of **Fuel Cell**, **Electrolyser** and **Hydrogen** technologies through conference, literature and media, is the sole purpose of the European Fuel Cell Forum (EFCF). The Forum is a **high level exchange platform**, and provides technical sessions, keynotes from internationally renowned speakers, special symposium on grids and electrolyzers, an industry exhibition, a B2B market place "Green Salon", and a tutorial, as well as international project meeting support and recreational networking events at the very charming and inspirational area of Lake Lucerne.

The EFCF has a heritage of more than 20 years! Already in 1994, the 1st European Fuel Cell Forum attracted leading international speakers as well as a global audience. Over the years a high quality conference series has been established. The conference focus alternates yearly: In 2017 the 6th European PEFC & Electrolyser Forum covers "Hydrogen Fuel Cells, Direct Alcohol + Microbial + Enzymatic Fuel Cells" as well as "Hydrogen Processing, Purification, Compression, Storage + Infrastructure" and strongly growing "H₂-Production by Watersplitting e.g. Alkaline + Polymer Electrolysis and Photoelectrochemical Water Splitting (PEC)". In 2018 the focus will be: High Temperature FC and SOE i.e. in general electrochemical Reactors based on Solid Oxide membranes.

Also this summer the European Fuel Cell Forum invites more than 7000 stakeholders to participate in this internationally recognised event held on the shores of Lake Lucerne, in the heart of Switzerland. More than 200 contributions and posters will be presented in 27 partially parallel sessions over the course of 3 intensive and stimulating days. Based on the ever-expanding number of technical submissions, 250–300 participants from more than 30 countries are expected. In addition to the high level scientific content, plenary presentations will be given on "Hydrogen Economy", "Market partnership of Wind + Hydrogen" and "Status reports" from the leading automotive OEMs.

Additional highlights are: The workshop on "Monitoring, Diagnostics and Control for Fuel Cells" from FCH-JU projects DIAMOND & HEALTH-CODE the joint symposium on "European Grid Service Markets: Grid Flexibility & Business with new Technologies like Electrolysers" and the following SPECIAL Sessions: "Electrochemical CO₂-Reduction" (B12), "PEC Water Splitting – Microbial &

Direct Formic Acid Fuel Cells" (C12), "Similarities and Differences with Redox-Flow-Batteries" (C13+14). To recognise more than 60 excellent poster contributions, two poster sessions are held, and all posters are accessible throughout the entire conference. In the closing and awards ceremony, the audience will be privileged to hear a keynote given by the winner of the 2017 Gold Medal of Honour: Prof. Hubert Gasteiger from TU Munich. He will summarise major findings in new materials, methods & concepts for Hydrogen Fuel Cells. We also look forward to working with him and Prof. Aliaksandr Bandarenka as Chairmen of the EFCF 2019.

Over the years, many strong relationships and contacts have been established at the Forum thanks to a caretaking organisation. Dedicated advisors and conference chairs keep a watchful eye on scientific quality. Unlike many commercial conferences, this event is organised by fuel cell technologists and scientists. As active members of the European fuel cell and hydrogen community, they have been observing the trends and following the recommendations from the EFCF International Board of Advisors www.EFCF.com/IBoA. The conference organisers ensure that the stakeholder's needs are always the focus of the European Fuel Cell Forum.

With strong dedication, our goal is to continue to grow the European Fuel Cell Forum as one of the most prominent meeting places for the comprehensive exchange of scientific and technical information, for high-level networking and exchange between research and industry. All of this creates an environment that will enable scientific breakthroughs and their subsequent transfer into products. A very special thank you for this year's conference goes to the Chairladies: Prof. Dr. Angelika Heinzl from ZBT GmbH / Uni Duisburg-Essen and Dr. Isotta Cerri from Toyota Motor Europe. This common lead from academia and industry strongly reflects how EFCF builds the bridge from science to technology – from technology to applications! Together with them we are proud to offer a sound scientific programme, unforgettable side events, and invite you to the well-known and pleasant surroundings of Lucerne. Finally, we would like to thank all the authors, exhibitors and suppliers for their excellent contributions, and the Scientific Advisory and Organising Committees

www.EFCF.com/SAC ../SOC for their review work. Special thanks also go to Dr. Günther G. Scherer, for his fruitful inputs. Last but not least thanks to our staff members for fastidiously taking care of all the organizational details. Together with the numerous participants and exhibitors, the stage has been set for an exuberant 6th European PEFC & Electrolyser Forum 2017.

Thank you and we look forward to seeing you in Lucerne in July
Olivier Bucheli & Michael Spirig

European Fuel Cell Forum

www.EFCF.com



6th European PEFC & Electrolyser Forum

Chaired by:

Dr. Isotta Cerri Toyota Motor Europe Belgium

Prof. Dr. Angelika Heinzl ZBT GmbH Uni Duisburg-Essen Germany

The 2017 conference is represented by the motto:

Fuel Cells & Reversible Technologies

From Materials & Components to Applications – Practical Inventions & Competitive Solutions.

We are excited to chair the 6th European PEFC and Electrolyser Forum 2017, which provides an excellent opportunity for constructive interaction and valuable networking opportunities between researchers, engineers, academics, industry, businesses and potential end users.

International Board of Advisors

www.EFCF.com/IBoA

Of the **European Fuel Cell Forum**

The International Board of Advisors guides the European Fuel Cell Forum in technical and policy matters (18 countries; 6 continents; 14% women). The following 28 distinguished experts have accepted to serve on the International Board of Advisors.

Prof. Joongmyeon Bae, KAIST, Daejeon, Korea

Prof. Frano Barbir, University of Split, Croatia

Dr. Ulf Bossel, ALMUS AG, Switzerland

Dr. Niels Christiansen, NCCI innovation, Denmark

Dr. Karl Föger, formerly Ceramic Fuel Cells, Australia

Dr. Nancy L. Garland, Department of Energy, USA

Prof. Hubert A. Gasteiger, TU München, Germany

John Bøgild Hansen, Haldor Topsøe A/S, Denmark

Prof. Angelika Heinzl, ZBT, Uni Duisburg, Germany

Prof. John Irvine, University of St. Andrews, United Kingdom

Prof. Ellen Ivers-Tiffée, Karlsruhe Institute of Technology, Germany

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Prof. Vladislav A. Sadykov, Boreskov Institute of catalysis, Russia

Prof. Massimo Santarelli, Politecnico di Torino, Italy

The 6th European PEFC and Electrolyser Forum 2017 is a perfect exchange platform, which brings together know-how in the field of FUEL CELLS, ELECTROLYSIS and HYDROGEN technologies and solutions. It was possible to achieve a promising equilibrium between scientific research on material and cell level, development of components and systems, and industrial achievements and implementation. This is a vital bridge for the transfer from basics to products.

We have successfully attracted highly respected subject matter experts and keynote speakers, and received many excellent abstracts from the scientific community. We are proud to have worked alongside a high level Scientific Advisory Committee (www.EFCF.com/SAC), who evaluated the contributions with full independence in all scientific and technical matters. This provided the base for a high quality and challenging scientific programme. It was not possible to offer everyone an oral presentation, hence many good contributions are being presented as posters, which we will support and emphasise with extended poster sessions.

An added value is that all papers and posters presented at the 6th European PEFC and Electrolyser Forum 2017 will be made available to registered participants, as well as later being available for libraries, universities and research institutions. The International Journal of Fuel Cells will also publish selected contributions in a special edition.

The core conference programme is complete, and includes very attractive scientific and social events and an exhibition. For more details please view the technical programme and its description. We would like to take this opportunity to thank all of the speakers and presenters for their interesting contributions as well as the members of the Advisory Committee for their evaluation work. Finally, we are happy to invite you to this very interesting and exciting 4-day technical programme, giving a comprehensive State-of-the-Art overview, and providing fruitful networking activities in this very charming city in Switzerland.

We look forward to meeting you soon at the EFCF 2017
Angelika Heinzel Isotta Cerri

Prof. Kazunari Sasaki, Kyushu University, Japan
Dr. Günther G. Scherer, formerly PSI Villigen, Switzerland
Dr. Günter Schiller, DLR Stuttgart, Germany
Dr. Subhash Singhal, Pacific Northwest National Laboratory, USA
Prof. Robert Steinberger-Wilckens, Uni Birmingham, United Kingdom (Chair)
Prof. Constantinos Vayenas, University of Patras, Greece
Prof. Wei Guo Wang, NIMTE/PR, China
Dr. Christian Wunderlich, IKTS, Germany

Scientific Organizing Committee

www.EFCF.com/SOC

Of the 6th European PEFC & Electrolyser Forum 2017

Dr. George Bandlamudi, ZBT, Germany
Dr. Isotta Cerri, Toyota Motor Europe, Belgium/Japan (Chair)
Prof. Angelika Heinzel, ZBT, Uni Duisburg, Germany (Chair)
Dr. Jörg Karstedt, ZBT, Germany
Dr. Falko Mahlendorf, Lehrstuhl Energietechnik, Germany
Dr. Jürgen Roes, Lehrstuhl Energietechnik, Germany

A Scientific Organizing Committee has been formed to confirm the quality of the written contributions (papers/extended abstracts) and redact the proceedings of the 6th European PEFC & Electrolyser Forum. This panel has exercised full scientific independence in all technical matters.

Chaired by:

www.EFCF.com/Conference

Prof. Dr. Angelika Heinzel

ZBT GmbH, Uni Duisburg-Essen Germany

Prof. Dr. Angelika Heinzel received her PhD in Chemistry at Carl-von-Ossietzky University, Oldenburg. The next 15 years, she joined the Fraunhofer-Institute for Solar Energy Systems ISE in Freiburg, first as coworker later on as head of the department "Energy Technology" with research focus on PEM fuel cells, fuel processing, electrolyzers and Cr-Fe redox-flow batteries. In 2001, she accepted the offer of a chair in Energy Technology at University of Duisburg-Essen. The second offer for this position was the founding of ZBT, a center for fuel cell research in Duisburg, funded by the State of North-Rhine Westfalia. ZBT has meanwhile grown to an internationally well known center with about 100 co-workers.

Professor Heinzel acts as an expert for the EU and the AiF (German Federation of Industrial Research Associations). She is chairperson at Dechema for electrochemical processes, applied electrochemistry and VDI member of fuel cell group as well as of the steering committee of the Grove Fuel Cell Symposium. Numerous scientific publications on the topic of fuel cells have been published in the recent years.



Scientific Advisory Committee

www.EFCF.com/SAC

Of the 6th European PEFC & Electrolyser Forum 2017

Dr. Naveed Akhtar, AFC Energy plc., UK/USA

Dr. Antonino Arico, CNR-ITAE, Italy

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Prof. Andreas Friedrich, DLR, Germany

Dr. Günther G. Scherer, formerly PSI Paul Scherrer Institut, Switzerland

Dr. Graham Hards, Johnson Matthey Fuel Cells, UK

Prof. Angelika Heinzel, ZBT, Uni Duisburg, Germany (Chair)

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Prof. Joannis Kallitsis, University of Patras, Greece

Dr. Pertti Kauranen, Aalto University, Finland

Prof. Denis Kramer, Univ Southampton, UK

Prof. Ulrike Krewer, TU Braunschweig, Germany

Prof. Werner Lehnert, FZJ, Germany

Prof. Göran Lindbergh, KTH Royal Institute of Technology, Sweden

Prof. Karl J. J. Mayrhofer, MPI für Eisenforschung GmbH, Germany

Dr. Isotta Cerri

Toyota Motor Europe Belgium

Dr. Isotta Cerri worked as scientific researcher on catalytic processes at Politecnico di Torino after receiving a PhD in Chemical Engineering on catalytic combustions. She has been actively working in the field of fuel cell technologies for Toyota as from 2004 in the advanced technology department where currently she is leading the fuel cell, battery and robotics teams. In the area of fuel cells she has been developing innovative electrode membrane assemblies based on newly developed material, structures and manufacturing processes. For Toyota she has been involved in several bilateral cooperations in order to develop improved materials and production processes of the different components of the automotive fuel cell stack and high pressure hydrogen tanks to enable the commercialization of reliable and affordable fuel cell vehicles. She is the author of several publications and patents.



Prof. Mogens Mogensen, DTU, Denmark

Prof. Stephen Paddison, University of Tennessee Knoxville, USA

Dr. Jürgen Rechberger, AVL List GMBH, Austria

Prof. Thomas Schmidt, PSI Paul Scherrer Institut, Switzerland

Dr. Tom Smolinka, Fraunhofer ISE, Germany

Dr. Thomas Steenberg, DAPOSY, Denmark

Prof. Robert Steinberger-Wilckens, Uni of Birmingham, UK

Prof. Ifan Stephens, DTU, Denmark

Dr. Francesco Triulzi, Solvay Speciality Polymers, Italy

Dr. Manfred Waidhas, Siemens AG, Germany

Prof. Zhichuan Jason Xu, Nanyang Technological University, Singapore

Prof. Jianbo Zhang, Tsinghua University, China

A Scientific Advisory Committee has been formed to evaluate the contributions and to structure the technical programme of the 6th European PEFC & Electrolyser Forum. This panel has exercised full scientific independence in all technical matters.

The Tutorial is an excellent Kick-Start to the 6th European PEFC & Electrolyser Forum 2017

The Tutorial will provide the basic concepts required to address the general but also more specialised field of fuel cells. Fuel cell technology is interdisciplinary par excellence, and requires knowledge in electrochemistry, materials science, mechanical and electrical engineering, catalysis, corrosion, thermal management, systems engineering etc. The course will cover these different aspects as broadly as possible, illustrated by many examples. All fuel cell families will be addressed i.e. Hydrogen Fuel Cells (H_2FC) and High Temperature Fuel Cells (HTFC) as well as Hydrogen Production, Storage and Infrastructure (H_2PSI). Applications and examples will be mostly surrounding the two most popular fuel cell types, PEFC (G. G. Scherer = GGS) and SOFC (J. Van herle = JVh), this is due to the expertise of both lecturers in their respective specialties.



Dr. Günther G. Scherer



Dr. Jan Van herle

The Tutorial will be targeted to newcomers as well as those who have been working in the area of fuel cells for some time. Participants will gain, or revise, current understanding of the operation and key challenges of fuel cell technology, where considerable progress in recent years has been achieved and new insights gathered. The requirements for fuel cell market introduction will be discussed.

The Tutorial lecture topics are fuel cell operating principles, thermodynamics, kinetics, efficiencies, central notions such as electrolyte ionic conductivity, electrode overpotential, triple phase boundary, Nernst equation, fuel reforming, cell and stack architectures and design, fuels (both fossil and renewable) for different fuel cells including their treatment, all fuel cell families (SOFC, MCFC, PAFC, PEFC/DMFC, AFC).

Tutorial Schedule:

- 09:30 Registration, welcome refreshments
- 10:00 Lecture 1: Fundamentals of Electrochemical Energy Conversion (GGS)
- 10:45 Lecture 2: Characteristics of the Important Fuel Cell Technologies (GGS)
- 11:30 Coffee break
- 11:45 Lecture 3: Fuels for fuel cells, fuel processing (JVh)
- 12:30 Lunch break
- 14:00 Lecture 4: Applications of Polymer Electrolyte Fuel Cells PEFC (GGS)
- 14:45 Lecture 5: System aspects, applications of High Temperature Fuel Cells SOFC, ... (JVh)
- 15:30 Coffee break
- 15:45 Lecture 6: State-of-the-art, challenges, summary (JVh)
- 17:00 End of Tutorial, Possibility to visit the exhibition

The Tutorial language is English. Register online at - www.EFCF.com/TutReg

Each participant will receive a copy of all of the Tutorial lectures. The tutorial registration fee for all participants is CHF 500.—.

Date and Place

www.kkl-luzern.ch/en/

The 6th European PEFC & Electrolyser Forum 2017 will be held from 4 – 7 July, 2017 in the renowned Kultur- und Kongresszentrum Luzern (KKL) in Lucerne, Switzerland. The parallel lectures will be presented in the "Auditorium", "Convention Foyer". and in the "Club Rooms". The KKL is located next to the Railway Station on the shore of Lake Lucerne. Boat traffic, water front activities, as well as spectacular views of the old town and snow-capped mountains add to the charm of the venue. View Video on www.EFCF.com/Lucerne.

Technical Program

www.EFCF.com

This conference will deal exclusively with development and application of hydrogen-, direct alcohol-, microbial- and enzymatic-FUEL CELLS, as well as alkaline + PEM ELECTROLYSIS and the storage, processing, purification, compression and infrastructure of HYDROGEN. While the conferences mainly covers scientific and technical aspect, the key-notes will provide the entire frame for the topics, with science, technology, industry and markets with amongst others the following representations: Hydrogen Europe, the leading European industry association talking about "Who is building the bridge to the H₂-economy", Shell highlighting the "Expectations and Evaluation of the FCH Technologies", WindEurope, as voice of the wind industry, outlining "The market partnership with prospects between wind and FCH technologies" and completed by Prof. Hubert Gasteiger from TU Munich with a keynote on major findings in "New materials, methods & concepts for Hydrogen Fuel Cells".

The sessions are classified in:

- a) Science & Know-how for Membrane related Electrochemical Processes e.g. material/catalysis research, diagnostics, characterisation, transport phenomena, durability, degradation, modelling, testing;
- b) Bridge to Products, where (commercial) Component Performance and Operation are in the focus;

- c) Industrial Achievements & R&D Inventions, where the emphasis lies on Approaches & Design of Systems, Applications, Combinations & Implementations. Leading automotive OEMs present their Status and Outlook. Also presented are stationary applications and systems, concepts and costs in the field of Electrolysers and H₂ storage, processing, purification and compression;
- d) Exchange Platforms, including the following special sessions: Electrochemical CO₂-Reduction with Keynotes from Siemens and DTU, Photo-electrochemical Water Splitting – Microbial & Direct Formic Acid Fuel Cells.

Parallel special events, outlined here below and in separate announcements, complete the Forum's comprehensive State-of-the-Art overview.

- I. "Monitoring, Diagnostics & Control for FC"
A one day workshop co-organised with the FCH-JU projects DIAMOND + HEALTH-CODE
- II. "European Grid Service Markets: Business with New Technologies like Electrolysers"
A one day symposium co-organised with the FCH-JU project QualyGridS
- III. "Similarities & Differences: FC - Redox Flow Batteries"
Two extra sessions (C13 + C14) with integrated discussion

In an attractive, well balanced four-day programme, more than 200 contributions will be presented i.e. over 140 oral presentations in 27 sessions, and more than 60 posters in two extended poster sessions. The EFCF starts with a workshop and tutorial, offers technical lectures, poster presentations, exhibits, product presentations and demonstrations (Green Salon), and integrates valuable networking activities. All events are offered in the same building. Registration covers unrestricted admission to the conference, exhibition and networking events, as well as to some of the parallel events, which can also be booked separately. The Forum is designed to inform representatives of industry, trade, finance, utilities and users, as well as architects, engineers, technology brokers, and members of the research community. Implementation and application detail information are also available from the exhibitors. The 6th European PEFC & Electrolyser Forum 2017 will be the major European FUEL CELL, ELECTROLYSIS and HYDROGEN event in the year 2017.

Special Events

www.EFCF.com/SE

The following 3 parallel events complete the EFCF core conference programme. They are briefly described below. For more details and registration see the separate announcement and the links. These events use the EFCF as the perfect platform with many stakeholders already present and providing organisation and advertising support (see www.EFCF.com/FPM).

I. Monitoring, Diagnostics & Control for FC

4 July 2017, 9–18, one day workshop

organised by FCH-JU projects DIAMOND + HEALTH-CODE and EFCF

This workshop will focus on the implementation and use of the FC technology beyond the project duration. Its objective is to exploit the technology in commercial means after the project ends. The workshop will summarize the progress towards the exploitation by industrial partners and potential customers. Mid-term results achieved by HEALTH-CODE will be shown and discussed as well. The work of more than 30 scientists and engineers from 14 teams will be presented aiming at drafting a coherent scenario for the effective development of monitoring, control and diagnostics methodologies able to improve performance and durability of fuel cells.

More Info: www.EFCF.com/MDC; MDC@EFCF.com

II. European Grid Service Markets:

Business with New Technologies like Electrolysers

6 July 2017, 9–18, one day symposium

organised by FCH-JU project QualyGridS and EFCF

In this symposium international experts highlight the topics around the grid services market, with emphasis on pooling of unconventional equipment. It focuses on the market logic, business model experience, regulations, grid balancing, future trends and long term business plans. In the afternoon a short workshop setting will enable participants to share experiences and the knowledge of peers. The symposium aims at reaching an understanding of the differences

in the European grid service markets and at pinpointing prospects of flexible emerging technologies to contribute to grid services.

More Info: www.EFCF.com/GSM; GSM@EFCF.com

III. Similarities & Differences: FC - Redox Flow Batteries

7 July 2017, 10.30–15.30, Special sessions (C13-14), with expert discussion

organised by EFCF with Günther G. Scherer ex PSI

As electrochemical reactors, Redox Flow Batteries (RFB) display certain similarities with low temperature Polymer Electrolyte Fuel Cells (PEFCs), but also differences. The aim of this special session (C13–14) is to outline these similarities and differences. Leading stakeholders will present most recent progress in RFB-technologies and its scientific aspects. Participants will profit from this high-level exchange and can contribute their experiences in the field and propose expectations for future common R&D in intensive discussions.

More Info: www.EFCF.com/RFB; RFB@EFCF.com

Exhibition

www.EFCF.com/ByB

The technical exhibition will be held in the splendid Foyer Lucerne Hall. This event offers industry, suppliers, test equipment providers and research laboratories the opportunity to showcase their latest products and services, as well as allowing important face-to-face contact with potential new clients.

Exhibitors from all over the world are invited to participate.

In addition to fuel cell, electrolyser and hydrogen technology developers showing systems, related hardware and applications, suppliers can present new materials, stack and system components, control devices, production technology, qualification and test benches and diagnostic tools alongside research and development services.

For further information please contact the European Fuel Cell Forum or visit www.EFCF.com/Exhibition. The details of confirmed exhibitors are listed in the rear of this booklet.



Green Salon

www.EFCF.com/GS

Each year, EFCF organizes also regional (Switzerland & neighbouring countries) Energy and Mobility related events to increase public and political awareness and to provide dedicated information to targeted stakeholder groups. In continuation to the 2015 B2B Market Place for Sustainable Energy & Mobility Solutions, this year major car manufacturer will attend, presenting talks on their development status and intend to exhibit their latest FCV models to marvel and test drive. Together with the Symposium "European Grid Service Markets: Business with New Technologies like Electrolysers" and key-notes about "Who is building the bridge to the H₂-economy" from Hydrogen Europe, the leading European industry association, "Expectations and Evaluation of the FCH Technologies" from Shell and "The market partnership with prospects between wind and FCH technologies" from WindEurope, the "Green Salon" provides again an insight into the "well to wheel energy solution" and the "readiness and availability" of the FCH technologies.

Specially invited are decision makers from politics, economy and industry as well as investors, fleet operators, and persons interested in mobility, energy and infrastructure with ambitions for future undertakings.

International Project Meetings

wwwEFCF.com/FPM

As many international experts participate in the 6th European PEFC & Electrolyser Forum 2017, Monday and Tuesday of the conference week offer an ideal opportunity for international project meetings. Please feel free to use this time to schedule your meetings for your ongoing projects, setting-up of new projects, or for other topic related events such as the workshop on "Monitoring, Diagnostics and Control for Fuel Cells" from the FCH-JU projects DIAMOND + HEALTH-CODE or the symposium on "European Grid Service Markets" from FCH JU project QualyGridS.

To simplify project initiators' and organizers' life, the organisation of such events for registered participants and exhibitors are supported by our organization. Get more information at www.EFCF.com/FPM or send an e-mail to forum@efcf.com

Publication Offers: Proceedings (ISBN), Journals www.EFCF.com/PP

The complete proceedings will be available in electronic format and distributed to all conference participants for an optimal scientific exchange. In addition, EFCF offers three possibilities for publication of the works:

- 1.a. Authors may benefit from a publication of their contribution in the web-accessible proceedings, under the 2017 ISBN: 978-3-905592-22-1 (see www.EFCF.com/LIB:Proceedings with ISBN).
- 1.b. Authors can apply for inclusion of their contribution in a Special Issue of "FUEL CELLS – From Fundamentals to Systems" (Impact Factor 2012: 3.15; 2014: 2.08, www.fuelcells.wiley-vch.de). Selected papers will need to comply with the journal's guidelines, and go through a peer-review process.
2. Authors are also free to publish their work ELSEWHERE.

In the case of 1.b. and 2. only the title, contact and one page abstract will appear in the ISBN proceedings to prevent a clash of copyrights.

EFCF Online Library www.EFCF.com/Library

The EFCF online library offers fast and easy access to both free and purchased information. The library is constantly being updated, and currently contains Proceedings with ISBN dating back to 2011, with files from as far back as 1994 gradually being converted and uploaded.

In addition, the library offers access to the Programmes of the EFCF Conferences Presentation slides (see below), direct Links to the EFCF Special Issue Series and Impressions of all EFCFs. For all information on this valuable know-how resource go to www.EFCF.com/Lib

Presentation available with approved participant login

www.EFCF.com/Library

At the EFCF conferences, participants are not permitted to take pictures of the presentations (literary property). This allows presenters to show their latest results, which are, for example, intended for publication in a scientific paper at a later date. However, presenters usually indicate their willingness to share their presented and eventually copyedited slides to the conference registrants. Upon receiving the authors permission, presentations of the current and previous years will be made available in the online library www.EFCF.com/Lib for all registered participants of the European Fuel Cell Forum with an approved login. To obtain download rights after the conference, post-registration is possible by "filing Contact Data" on the www.EFCF.com/Lib on-line form.

Who should attend?

The conference with exhibition offers an attractive programme for potential users of fuel cells, decision makers, researchers and engineers in industry, laboratories, academic institutions, governments, investors, consultants and electric power engineers. The event provides many opportunities for informal exchanges between industry, market and academia, a platform for technology transfer and recruitment of qualified students and trainees. The 6th European PEFC & Electrolyser Forum 2017 combines the personal atmosphere of a workshop with the format of a scientific conference. This is the time and the place where decision makers meet politicians, inventors meet investors, engineers meet scientists, power & transport industry meet OEMs and users meet providers. Participants from all continents are invited and welcome to attend this prestigious event.

Session Program

6th European PEFC & Electrolyser Forum 2017

Special Events
4–7 July 2017

Session Overview					
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A04	Bridge to Product: Stack, system & manufacturing	16	B04	Pt-Catalysts and supports	16
A05	Durability, testing and degradation mitigation	17	B05	H ₂ from Electrolysers: Concepts & costs	17
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A07	Analysis & evaluation of system components	19	B07	H ₂ Storage: Concepts & systems	19
A08	Membranes & MEAs	20	B08	Modelling & Diagnostics of Pt-Catalysis	20
A09	Auditorium Foyer			Poster Session II covering All Oral Session Topics	30–35
A10	Characterisation of materials & degradation	21	B10	Electrolyser cell & stack performance	21
A11	Transport phenomena limitation	22	B11	Fuel processing, purification & compression	22
A12	Durability, testing & optimisation for operation	24	B12	Electrochemical CO ₂ -Reduction: Overview & potentials	24
A13	Diagnostics and Simulations	25	B13	Industrial achievements & inventions	25
A14	Bridge to Products: From material to cells & stacks	26	B14	Electrolysers & FCs - Implementation & Expectations	26
A15	P3: Closing Ceremony with Keynote by the Gold Medal of Honour Winner 2017	27	B15		

Legend: Px: = Plenary;

One-Day Workshop

Club Room

Tuesday 4 July 2017

Monitoring, Diagnostics & Control for Fuel Cells

Separate Announcement
www.EFCF.com/MDC

Parallel Symposium

Club Room

Thursday 6 July 2017

European Grid Service Markets: Business with New Technologies like Electrolysers

Separate Announcement
www.EFCF.com/GSM

Special Sessions/Workshop:

Club Rooms

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C13	Similarities & Differences: FC – Redox Flow Batteries (RFB) I	29
C14	Similarities & Differences: FC – Redox Flow Batteries (RFB) II	29

Morning

Wednesday, July 5, 2017

Morning

A 1	Auditorium
09:00	P1: Opening Session
	The bridge to the Hydrogen Economy (A01)
09:00	Welcome by the Organizers (A0101) Michael Spirig, Olivier Bucheli; European Fuel Cell Forum, Lucerne/Switzerland
09:05	Welcome by the Chairladies (A0102) Angelika Heinzl (1), Isotta Cerri (2); (1) ZBT GmbH, Duisburg/Germany, (2) Advanced Technology Division, Production Engineering Group, Toyota Motor Europe, Zaventem/Belgium
09:15	Welcome to Switzerland (A0103) Stefan Oberholzer, Rolf Schmitz, Benoît Revaz; Swiss Federal Office of Energy, Bern/Switzerland
09:30	Who is building the bridge to the hydrogen economy – update on industry status challenging next step (EU) (A0104) Jorgo Chatzimarkakis; Hydrogen Europe, Brussels/Belgium
10:00	Expectations - Evaluation of the FCH Technologies (A0105) Olivier Bishop; Shell (Switzerland) AG, Baar/Switzerland
10.30	Coffee Break – Ground Floor in the Exhibition

A2 Auditorium	B2 Convention Foyer
11:00 Automotive OEM Status (A02) 11:00 Toyota Vehicle Strategy and Development (A0201) Isotta Cerri; Advanced Technology Division, Production Engineering Group, Toyota Motor Europe, Zaventem/Belgium 11:30 FCV Development - Vision and Status (A0203) Jörg Wind; Daimler AG, Kirchheim unter Teck/Germany 11:45 New fuel cell stack and development method for the Fuel Cell System of the Honda CLARITY FUEL CELL and Honda's activity towards the Hydrogen Society (A0204) Mr. Takeshi Moriya (1), Mr. Nobuhiro Saito (1), Mr. Kenji Nagumo (1), Mr. Masakuni Yamamoto (1), Mr. Atsushi Hiraide (1), Mr. Masashi Sugishita (1), Mr. Hiroto Chiba (1), Mr. Thomas Brachmann (2); (1) Honda R&D Co., Ltd. Automobile R&D Center, Haga-gun/Tochigi/Japan, (2) Honda R&D Europe (Deutschland) GmbH, Offenbach/Germany 12:00 Engineering and validation of a cryo-compressed hydrogen storage system to maximize driving range in automotive zero emissions driving applications. (A0205) Christophe Schwartz; BMW Group, Powertrain, Hydrogen, Alternative Fuel Tanks, Munich/Germany 12:15 Audi h-tron Strategy (A0206) Petra Hackenberg-Wiedl, Jürgen Jablonski ; Audi AG, Ingolstadt/Germany	11:00 Non-precious metal catalysts (B02) 11:00 Oxygen Electrocatalysis on Transition Metal Spinel Oxides (B0201) Zhichuan (Jason) Xu (1,2,3); (1) School of Materials Science and Engineering, Nanyang Technological Uni., (2) Solar Fuels Lab., Nanyang Technological Uni., (3) Energy Research Institute@NTU, ERI@N, Interdisciplinary Graduate School, Nanyang Technological Uni., Singapore/Singapore 11:15 Elucidating active surface sites for improved electrocatalysts (B0202) Marcus D. Pohl (1), Federico Calle-Vallejo (2), David Reinisch (1), David Loffreda (3), Philippe Sautet (3), Aliaksandr S. Bandarenka (1); (1) Technical Uni. Munich, Faculty of physics, Working group ECS, Garching/Germany, (2) Leiden Uni., Leiden Institute of Chemistry, RA Leiden/The Netherlands, (3) Uni. Lyon 1, Laboratoire de Chimie, Lyon/France 11:30 Insights into Perovskite Nano-Catalysts as Oxygen Electrodes for the Electrochemical Splitting of Water (B0203) Emiliana Fabbri, Maarten Nachtegaal, Xi Cheng, Tobias Binner, Thomas J. Schmidt; Energy & Environment Division, Paul Scherrer Institut, Villigen/Switzerland 11:45 Polymer derived Fe-N/C Electrocatalysts for the Oxygen Reduction Reaction (B0204) Julia Melke(1,2), Patrick Elsässer (1), Felix Gerke (3), Laura Carolina Pardo(3), Anna Fischer (1,2); (1) Institute of Inorganic and Analytical Chemistry, Uni. Freiburg, Freiburg/Germany, (2) FMF – Freiburg Materials Research Center, Uni. Freiburg, Freiburg/Germany, (3) Dep. of Chemistry, Technical Uni. Berlin, Berlin/Germany 12:00 Graphene Hybrid Electrodes for PEM Fuel Cells (B0205) Lale İskel Şanlı (1), Sajjad Ghobadi (2), Melis Yetkin (2), Selmiye Alkan Gürsel (1,2); (1) Sabanci Uni., Nanotechnology Research and Application Center, Istanbul/Turkey, (2) Faculty of Engineering and Natural Sciences, Istanbul/Turkey 12:15 Graphene and Graphene Oxide in low temperature fuel cells for enhanced performance (B0206) Sirhan Al Batty, Baki Ozdincer, Maria Perez Page, Remy Sellin, Stuart Holmes; School of Chemical Engineering and Analytical Science, The Uni. of Manchester, Manchester/UK
12:30 Lunch – 2nd Floor on the Terrace, Coffee – Ground Floor in the Exhibition & in the Poster Session	

Afternoon

Wednesday, July 5, 2017

Afternoon

A3	Auditorium Foyer
13:15	Poster Session I covering All Oral Session Topics (A03)
A4	Auditorium
14:30	Bridge to Product: Stack, system & manufacturing (A04)
14:30	Mission accomplished – Auto-Stack Core delivers top of class FC technology (A0401) André Martin (1), Ludwig Jörissen (2); (1) André Martin Consulting, Idstein/Germany, (2) Centre for Solar and Hydrogen Research (ZSW), Ulm/Germany
14:45	Cathode Exhaust Gas Recirculation For Polymer Electrolyte Fuel Cell Stack (A0402) Florian Becker; German Aerospace Center (DLR) Inst. of Engineering Thermodynamics, Hamburg/Germany
15:00	Dry start-up performance of PEM fuel cell for pressurized operation (A0403) Young Sang Kim (1), Im Mo Kong (2), Min Soo Kim (3); (1) Dep. of Eco-Machinery System, Korea Institute of Machinery & Materials, Daejeon/Korea, (2) Korea Automotive Technology Institute, Gwangju/Korea, (3) Dep. of Mechanical and Aerospace Engineering, Seoul Nat. Uni., Seoul/Korea
15:15	Process Innovation in Electrochemical Power Generation Devices (A0202) Takuya Hasegawa; Nissan Motor Co., Ltd., Yokohama/Japan
B4	Convention Foyer
14:30	Pt-Catalysts and supports (B04)
14:30	Oxygen Reduction Activity and Durability of Nanoparticulate Pt Supported on Boron Carbide (B0401) Colleen Jackson (1), Graham T. Smith (1,3), David Inwood (2), Andrew S. Leach (2), Penny S. Whalley (2), Andrea E. Russell (2), Pieter B.J. Levecque (1), Denis Kramer (3); (1) Uni. of Cape Town, HySA/Catalysis Centre of Competence, Cape Town/South Africa, (2) Uni. of Southampton, School of Chemistry, Southampton/UK, (3) Uni. of Southampton, Engineering Sciences, Southampton/UK
14:45	Fabrication and characterization of electrospun nanofiber electrodes for PEFCs (B0402) Dechun Si (1), Shangshang Wang (1), Jun Huang (1), Cheng Wang (2), Jianbo Zhang (1,3); (1) Dep. of Automotive Engineering, State Key Lab. of Automotive Safety and Energy, Tsinghua Uni., Beijing/China, (2) Institute of Nuclear and New Energy Technology, Tsinghua Uni., Beijing/China, (3) Beijing Co-Innovation Center for Electric Vehicles, Beijing Institute of Technology, Beijing/China
15:00	Oxide-supported PEFC Electrocatalysts (B0403) Kazunari Sasaki (1-4), Masahiro Iwami (2), Makito Okumura (2), Yoshiki Nakazato (2), Shohei Matsumoto (2), Zhiyun Noda (3), Junko Matsuda (4), Akari Hayashi (1,2,3); Kyushu Uni., (1) Next-Generation Fuel Cell Research Center (NEXT-FC), (2) Dep. of Hydrogen Energy Systems, (3) InterNat. Research Center for Hydrogen Energy, (4) InterNat. Institute for Carbon-Neutral Energy Research (WPI-I2CNER), Fukuoka/Japan
15:15	Investigation of Carbon Nanofiber (CNF) Supported Platinum Electrocatalysts for the Use in PEM Fuel Cells (B0404) Ulrich Rost (1), Pit Podleschny (1), Michael Brodmann (1), Ivan Radev (2), Volker Peinecke (2), Angelika Heinzel (2); (1) Westfälische Hochschule Uni. of Applied Sciences, Gelsenkirchen/Germany, (2) The Fuel Cell Research Center ZBT, Duisburg/Germany

15.30	Challenges and solutions in the R2R manufacturing of fuel cell membranes (A0405) Thomas Kolbusch, Martin Busch, Klaus Crone, Nico Meyer; Coatema Coating Machinery GmbH, Dormagen/Germany	15.30	Carbon support modification for high performance low Pt loaded cathodes (B0405) Gregor Harzer (1), Alin Orfanidi (1), Pankaj Madkikar (1), Hany Elsayed (1), Tim Kratky (2), Hubert Gasteiger (1); (1) Technical Electrochemistry, Dep. of Chemistry and Catalysis Research Center, Technical Uni. of Munich, (2) Dep. of Chemistry and Catalysis Research Center, Technical Uni. of Munich, Garching/Germany
15.45	Experimental plant balancing and cell voltage analysis of a high temperature proton exchange membrane fuel cell stack with natural gas fuel processor (A0406) Elmar Pohl (1), Frank Beckmann (2), Carlo Tregambe (3); (1) OWI – Oel-Waerme-Institut gGmbH, Herzogenrath/Germany, (2) inhouse engineering GmbH, Berlin/Germany, (3) ICI Caldaie S.p.A., Frazione Campagnola di Zevio (Verona)/Italy	15.45	Recent Developments of Electrocatalysts and Membrane Electrode Assembly in DICP (B0406) Zhigang Shao; Fuel Cell System and Engineering Lab., Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Liaoning/China
16:00	Coffee Break – Ground Floor in the Exhibition		

A5 Auditorium		B5 Convention Foyer	
16:30	Durability, testing and degradation mitigation (A05)	16:30	H₂ from Electrolysers: Concepts & costs (B05)
16:30	Effects, damage characteristics and regeneration potential of traffic-induced nitric oxide emissions in PEM fuel cells under variable operating conditions (A0501) Ulrich Misz (1), Anja Talke (2), Angelika Heinzel (1), Peter Beckhaus (1); (1) ZBT GmbH, Duisburg/Germany, (2) Daimler AG, Kirchheim/Teck-Nabern	16:30	Large scale PEM electrolyzer cells based on hydraulic compression (B0501) Florian Wirkert, Ulrich Rost, Jeffrey Roth, Michael Brodmann; Westfälische Hochschule Uni. of Applied Sciences, Gelsenkirchen/Germany
16:45	A new approach to mitigation of membrane degradation caused by mechanical and chemical stressors (A0502) Marta Zato (1), Nicolas Donzel (1), Luca Pasquini (1), Sara Cavaliere (1), Jacques Rozière (1), Deborah Jones (1), Luca Merlo (2), Silvain Buche (3), Graham Hards (3); (1) ICGM Aggregates Interfaces and Materials for Energy, Montpellier/France, (2) Solvay Specialty Polymers, Bollate/Italy, (3) Johnson Matthey Fuel Cells, Reading/UK	16:45	Hydrogenics' MegaWatt PEM platform, operational monitoring data from prototype and 1.2MW units (B0502) D. Van Dingenen, P. Fawcus, J. Vaes; Hydrogenics Europe NV, Oevel/Belgium
17:00	Impact of the operation modes on the reversible and non-reversible degradation mechanisms of a PEMFC (A0503) Sylvie Escribano, Fabrice Micoud, Anais Finkler, Hortense Laforêt, Laure Guétaz, Marion Chanderis; CEA/LITEN, DEHT, Grenoble Cedex	17:00	Variation of the conditions for the reaction of indirect hydrogen evolution using V(II) as electron donor (B0503) Véronique Amstutz, Heron Vrabel, Alberto Battistel, Hubert Girault; Laboratoire d'Electrochimie Physique et Analytique (LEPA), EPFL Valais, Sion/Switzerland

Afternoon

Wednesday, July 5, 2017

Afternoon

17:15	EU Harmornised Test Protocols for Automotive Applications (A0504) Georgios Tsotridis; European Commission Joint Research Centre, Petten/The Netherlands	17:15	PEM water electrolysis: impact of cell design and porous components properties on mass transport limitation (B0504) F. Fouda-Onana (1), S. Chelghoum (1), G. Serre (1), K.Bromberger (2), T.Smolinka, M.Chandesris (1); (1) Univ. Grenoble CEA, LITEN, Grenoble/France, (2) Fraunhofer Institute for Solar Energy Systems, Freiburg/Germany
17:30	CO₂ Enrichment In Anode Loop And Correlation with CO Poisoning Of Low Pt Anodes In PEM Fuel Cells (A0505) Simon Erbach (1), Martin Heinen (1), Gabor Toth (1), Merle Klages (2), Donat Gaudreau (3), Michael Ages (3), Angelika Heinzel (4); (1) Daimler AG, Kirchheim unter Teck/Germany, (2) NuCellSys GmbH, Kirchheim unter Teck/Germany, (3) AFCC Automotive Fuel Cell Cooperation Corp., CA-Burnaby/Canada, (4) ZBT – Zentrum für BrennstoffzellenTechnik GmbH, Duisburg/Germany	17:30	Achieving Cost Reduction in PEM Electrolysis by Material Development (B0505) K. Andreas Friedrich, Philipp Lettenmeier, Asif S. Ansar, Li Wang, Aldo S. Gago, Johannes Arnold; German Aerospace Center (DLR) Inst. of Engineering Thermodynamics, Stuttgart/Germany
17:45	A Model Based Investigation of Nitrogen Cross-over for PEMFC Performance during Dead-Ended Operation (A0506) N. Kulkarni, Q. Meyer, P.R. Shearing, D.J.L. Brett; Electrochemical Innovation Lab, Dep. of Chemical Engineering, London/UK	17:45	Cost Break Down and Cost Reduction Strategies for PEM Water Electrolysis Systems (B0506) Tom Smolinka (1), Nikolai Wiebe (1), Magnus Thomassen (2); (1) Fraunhofer Institute for Solar Energy Systems ISE, Freiburg/Germany, (2) SINTEF - Materials and Chemistry, Trondheim/Norway
18:00	End of Sessions		
18:30	Swiss Surprise – Registered participants meet between KKL and railway station		



A 6	Auditorium
09:00 09:00	P2: Keynote: Green Power for Green Hydrogen (A06) Wind – Electrolysers – Hydrogen – Fuel Cells – Market partnership with prospects (A0601) Giles Dickson; WindEurope asbl/vzw, Brussels/Belgium
09.25	5 Min to change to Auditorium for B08 Session

A 7	Auditorium	B 7	Convention Foyer
09:30 09:30	Analysis & evaluation of system components (A07) Novel concept for evaporative cooling of fuel cells: an experimental study based on neutron imaging (A0701) M. Cochet, A. Forner-Cuenca, V. Manzi, M. Siegwarts, D. Scheuble, P. Boillat; Paul Scherrer Institut, Villigen/Switzerland	09:30 09:30	H₂ Storage: Concepts & systems (B07) Towards a hydrogen-free hydrogen economy – Catalytic challenges in the hydrogenation and dehydrogenation of Liquid Organic Energy Carrier Systems (B0701) Peter Wasserscheid (1,2), Andreas Bösmann (1), Patrick Preuster (1); (1) Lehrstuhl für Chemische Reaktionstechnik, Friedrich-Alexander-Uni. Erlangen-Nürnberg, Erlangen/Germany, (2) Forschungszentrum Jülich, „Helmholtz-Institut Erlangen-Nürnberg“ (IEK-11), Erlangen/Germany
09:45	Analysis of water distribution and evaporation rate in gas diffusion layers (A0702) Sreeyuth Lal, Adrien Lamibrac, Jens Eller, Felix N. Büchi; Electrochemistry Lab., Paul Scherrer Institut, Villigen PSI/Switzerland	09:45	Magnesium Oxide an Effective Non-Transition Metal Oxide Catalyst For Hydrogen Storage Improvement of Magnesium Hydrides (B0702) Mahmoud Reda; Canadelectrochim, Calgary Alberta/Canada
10:00	PEFC Catalyst Layer Modeling in CFD Simulations: From Interface to Agglomerate Models (A0703) Clemens Fink (1), Nejc Kosir (2), Reinhard Tatschl (1); (1) AVL List GmbH, Graz/Austria, (2) AVL-AST d.o.o., Maribor/Slovenia	10:00	Hydrogen storage by physisorption in nanostructured graphene-based materials: simulations and experiments (B0703) Igor A. Baburin, Gotthard Seifert; Technische Uni. Dresden, Theoretische Chemie, Dresden/Germany
10:15	Tailoring electrosprayed carbon layers (A0704) P. Ferreira-Aparicio, J. J. Conde, C. A. Maffiotte, M. J. Benito, M. A. Folgado, A. M. Chaparro; Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas, CIEMAT, Madrid/Spain	10:15	Solar Electrolysis for Hydrogen Production coupled to a Metal Hydride Hydrogen Compressor (B0704) Anis Houaijia (1), Emmanuel Stamatakis (2), Thanos Stubos (3); (1) German Aerospace Center (DLR), Institut of Solar Research, Koeln/Germany, (2) Diadikasia S.A., Athens/Greece, (3) Demokritos, Agia Paraskevi, Athens/Greece
10.30	Coffee Break – Ground Floor in the Exhibition		

Morning

Thursday, July 6, 2017

Morning

A 8	Auditorium	B 8	Convention Foyer
11:00 11:00 11:15 11:30 11:45 12:00 12:15	Membranes & MEAs (A08) PBI Membranes for Fuel Cells and Electrolyzers (A0801) Brian C. Benicewicz; Uni. of South Carolina, Columbia/USA Understanding the degradation of High-Temperature PEM Fuel Cells (A0802) Elisabeth Therese Ulrikkeholm, Hector Rodrigo Garcia, Hans Aage Hjuler, Thomas Steenberg; Danish Power Systems, Egeskovej/Kvistgaard A comparison of HT-PEM MEA performance within the German project QUALIFIX (A0803) Julian Büsselmann, Vietja Tullius, Wiebke Germer, Peter Wagner, Alexander Dyck; NEXT ENERGY - EWE Research Centre for Energy Technology at the Uni. of Oldenburg, Oldenburg/Germany Proton Conducting Ionic Liquids as Non-Aqueous Electrolytes in HT-PEFCs – Interaction with PBI-type Polymers and ORR Kinetics (A0804) C. Korte, K. Wippermann, J. Wackerl, S. Kuhri and W. Lehnert; Institute of Energy and Climate Research, IEK-3: Electrochemical Process Engineering, Forschungszentrum Jülich GmbH, Jülich/Germany Stable Aquivion® based MEAs: investigation on catalyst and ionomer (A0805) Irene Gatto (1), A. Carbone (1), A. Saccà (1), A. Aricò (1), V. Baglio (1), C. Oldani (2), L. Merlo (2); (1) Istituto di Tecnologie Avanzate per l'Energia "Nicola Giordano", Messina/Italy, (2) Solvay Specialty Polymers, Bollate/Italy Poly(arylene ether sulfone) containing spirobiindane moieties for electrode binder in solid alkaline exchange membrane fuel cells (A0806) Jieun Choi (1,2), So Young Lee (1), Sung Jong Yoo (1), Jong Hyun Jang (1), Yung-Eun Sung (2), Hyoung-Juhn Kim (1); (1) Fuel Cell Research Center, Korea Institute of Science and Technology (KIST), Seoul/Republic of Korea, (2) School of Chemical Biological Engineering, Seoul Nat. Uni., Seoul/Republic of Korea	11:00 11:00 11:15 11:30 11:45 12:00 12:15	Modelling & Diagnostics of Pt-Catalysis (B08) Water Phenomena in PEFC Catalyst Layers as the Origin of the Pt Loading Effect: A Modelling Study (B0801) Tasleem Muzaffar, Michael H. Eikerling; Simon Fraser Uni., Dep. of Chemistry, Burnaby/BC/Canada Dynamic Modelling of Surface Oxide Growth and Reduction at Platinum (B0802) Heather Baroody (1), Gregory Jerkiewicz (2), Michael H. Eikerling (1); (1) Simon Fraser Uni., Dep. of Chemistry, Burnaby/BC/Canada, (2) Queens Uni., Dep. of Chemistry, Kingston/ON/Canada How Theory and Simulation Can Drive Fuel cell Electrocatalysis (B0803) Mohammad J. Eslamibidgoli (1), Jun Huang (2), Thomas Kadyk (1), Ali Malek (1), Michael Eikerling (1); (1) Dep. of Chemistry, Simon Fraser Uni., Burnaby/BC/Canada, (2) Dep. of Automotive Engineering, Tsinghua Uni., Beijing/P.R. China Molecular Simulations of Oxygen Scattering and Surface Diffusion on Ionomer Surface (B0804) Masataka Nakauchi (1), Takuya Mabuchi (2), Takuma Hori (3), Yuta Yoshimoto (3), Ikuya Kinefuchi (3), Hideki Takeuchi (4), Takashi Tokumasu (2); (1) Graduate School of Engineering, Tohoku Uni., (2) Institute of Fluid Science, Tohoku Uni., Miyagi/Japan, (3) Dep. of Mechanical Engineering, The Uni. of Tokyo, Tokyo/Japan, (4) Dep. of Social Design Engineering, Nat. Institute of Technology, Kochi College, Nankoku Kochi/Japan Near-Optimal Jagged-Pt NanoWire Electrodes for Hydrogen Fuel Cells from Theoretical Simulations and Experiment (B0805) Alessandro Fortunelli (1,2), William A. Goddard (2), Tao Cheng (2), Boris Merinov (2), Mufan Li (3), Zipeng Zao (3), Yu Wang (3), Xiangfeng Duan (3); (1) Consiglio Nazionale delle Ricerche (CNR), Pisa/Italy, (2) California Institute of Technology, Pasadena(CA)/USA, (3) Uni. of California at Los Angeles (UCLA), Los Angeles(CA)/USA Pt-Ni Aerogels as Cathode Catalysts in Polymer Electrolyte Fuel Cells (B0806) Sebastian Henning (1), Hiroshi Ishikawa (2), Laura Kühn (3), Juan Herranz (1), Alexander Eychmüller (3), Thomas Schmidt (1,4); (1) Electrochemistry Lab., Paul Scherrer Institut, Villigen/Switzerland, (2) Fuel Cell Nanomaterials Center, Uni. of Yamanashi, Kofu/Japan, (3) Physical Chemistry, Technische Uni. Dresden, Dresden/Germany, (4) Lab. of Physical Chemistry, ETH Zürich, Zürich/Switzerland
12:30	Lunch – 2nd Floor on the Terrace, Coffee – Ground Floor in the Exhibition & in the Poster Session		

9_A	Auditorium Foyer
13:15	Poster Session II covering All Oral Session Topics (A09)
10_A	Auditorium
14:30	Characterisation of materials & degradation (A10)
14:30	A Systematic Approach for Fuel Cell Characterization (A1001) Yasser Rahim, Holger Janßen, Werner Lehnert; Institute of Energy and Climate Research (IEK-3), Jülich/Germany
14:45	EChallenges and Possibilities of EIS on PEMEC (A1002) Katrine Elsåe (1), Johan Hjelm (1), Torben Jacobsen (2) Laila Grahll-Madsen (3) Mogens B. Mogensen (1); (1) Dep. of Energy Conversion and Storage, Technical Uni. of Denmark, DTU, Roskilde/Denmark, (2) Dep. of Chemistry, Technical Uni. of Denmark, Kgs. Lyngby/Denmark, (3) EWII Fuel Cells A/S, Odense SØ/Denmark
15:00	Multilayer Coating for Aluminium Plates in Polymer Electrolyte Fuel Cells (A1003) Verena Lukassek, Thomas-Maik John (2), Jens Wartmann, Georg Dura, Angelika Heinzl; Zentrum für BrennstoffzellenTechnik, Duisburg/Germany
15:15	Performance analysis of lab-scale Polymer Electrolyte Fuel Cells at various operation parameters (A1004) Marcel Heinzmann (1), Jan Haußmann (2), André Weber (1), Ellen Ivers-Tiffée (1); (1) Institute for Applied Materials (IAM-WET), Karlsruhe Institute of Technology (KIT), Karlsruhe/Germany, (2) Schaeffler Technologies AG & Co. KG, SHARE am KIT, Karlsruhe/Germany
15:30	Electron Paramagnetic Resonance Spectroscopy Studies of Transition Metal Ion-Chelating Ordered Mesoporous Carbons for Oxygen Reduction Catalysis (A1005) Caroline Janson, Anders Palmqvist; Chalmers Uni. of Technology, Dep. of Chemistry and Chemical Engineering, Göteborg/Sweden
10_B	Convention Foyer
14:30	Electrolyser cell & stack performance (B10)
14:30	Structural Characterization of Porous transport layers for polymer electrolyte water electrolysis cells (B1001) Tobias Schuler (1), Thomas J. Schmidt (1,2), Felix N. Büchi (1); (1) Electrochemistry Lab., Paul Scherrer Institut, Villigen-PSI/Switzerland, (2) Lab. of Physical Chemistry, ETH Zurich, Zurich/Switzerland
14:45	Enhanced performance and durability of low catalyst loading PEM water electrolyser based on a short-side chain perfluorosulfonic ionomer (B1002) Antonino Salvatore Aricò (1), Stefania Siracusano (1), Vincenzo Baglio (1), Nicholas Van Dijk (2), Luca Merlo (3); (1) CNR-ITAE, Messina/Italy, (2) ITM Power (Research) Ltd, Unit H, Sheffield/UK, (3) Solvay Specialty Polymers Italy SpA, Bollate/Italy
15:00	Bypassing OER by chemical reaction with a reversible redox mediator (B1003) Hen Dotan, Avner Rothschild; Dep. of Materials Science and Engineering, Technion – Israel Institute of Technology, Haifa/Israel
15:15	Investigation on porous transport layers for PEM electrolyzers (B1004) Arne Fallisch, Jagdishkumar Ghinaiya, Kolja Bromberger, Maximilian Kiermaier, Thomas Lickert, Tom Smolinka; Fraunhofer Institute for Solar Energy System ISE, Freiburg/Germany
15:30	Towards understanding of component aging in dynamically operated polymer electrolyte water electrolyzers (B1005) Ugljesa Babic (1), Thomas J. Schmidt (1,2), Lorenz Gubler (1); (1) Paul Scherrer Institut, Villigen PSI/Switzerland, (2) Lab. of Physical Chemistry, ETH Zürich, Zürich/Switzerland

Afternoon

Thursday, July 6, 2017

Afternoon

15:45	Effect of Platinum Oxides on Reversible and Irreversible Degradation in Polymer Electrolyte Fuel Cells (A1006) Andrea Baricci (1), Matteo Zago (1), Thomas Jahnke (2), Andrea Casalegno (1); (1) Politecnico di Milano, Dipartimento di Energia, Milano/Italy, (2) German Aerospace Center (DLR), Stuttgart/Germany	15:45	Towards selective test protocols for accelerated in situ degradation of PEM electrolysis components (B1006) Thomas Lickert; Fraunhofer Institute for Solar Energy System ISE, Freiburg/Germany
16:00	Coffee Break – Ground Floor in the Exhibition		

A 11 Auditorium		B 11 Convention Foyer	
16:30	Transport phenomena limitation (A11)	16:30	Fuel processing, purification & compression (B11)
16:30	Understanding performance limitations in anion-exchange membrane fuel cells (A1101) Göran Lindbergh, Annika Carlson, Björn Eriksson, Henrik Grimler, Carina Lagergren, Rakel Wreland Lindström; Applied Electrochemistry, School of Chemical Science and Engineering, KTH Royal Institute of Technology, Stockholm/Sweden	16:30	Biorobur Plus: Advanced direct biogas fuel processor for robust and decentralized hydrogen production (B1101) Samir Bensaid, Debora Fino; Politecnico di Torino, Torino/Italy
16:45	Gas transport in PEFC gas diffusion layers and its analysis for upscaling (A1102) Dieter Froning (1), Junliang Yu (1), Uwe Reimer (1), Ingo Manke (2), Werner Lehnert (1,3); (1) Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research, IEK-3: Energy Process Engineering, Jülich/Germany, (2) Helmholtz-Zentrum Berlin GmbH, Institute of Applied Materials, Berlin/Germany, (3) Modeling in Electrochemical Process Engineering, RWTH Aachen Uni., Aachen/Germany	16:45	Demonstration of a Methanol Fuel Processor System for the Production of Pure Hydrogen (B1102) Ulrich Frenzel (1), Tobias Meijer (1), Michael Steffen (1), Tihamer Hargitai (2), Fredrik Silversand (2); (1) ZBT GmbH, Duisburg/Germany, (2) Catator AB, Lund/Sweden
17:00	Single cell study of water transport in PEMFCs with electrosprayed catalyst layers (A1103) M.A. Folgado, J.J. Conde, P. Ferreira-Aparicio, A.M. Chaparro; Dep. of Energy, CIEMAT, Madrid/Spain	17:00	Electrochemical Hydrogen Separation using HT-PEMFC (B1103) George Bandlamudi, Michael Steffen, Angelika Heinzl; Zentrum für Brennstoffzellen Technik - ZBT, Duisburg/Germany
17:15	Evidence of large heterogeneity in water distribution at the sub millimeter scale during PEMFC operation thanks to Neutron Scattering (A1104) A. Morin, N. Martinez, S. Lyonard, G. Gebel; CEA/Uni. Grenoble Alpes, Grenoble/France	17:15	Hydrogen production by reforming for industrial and transport applications (B1104) Isabel Frenzel (1), Florian Rau (1), Andreas Herrmann (1), Dimosthenis Trimis (2), Hartmut Krause (1); (1) TU Bergakademie Freiberg, Institute of Thermal Engineering, Freiberg/Germany, (2) Karlsruhe Institute of Technology, Engler-Bunte-Institute, Karlsruhe/Germany

Afternoon

Thursday, July 6, 2017

Afternoon

17:30	Impact of Microporous Layer Structural Properties on Oxygen Transport in PEM Fuel Cells (A1105) Christoph Simon, Dena Kartouzian, Joseph Endres, Benjamin Nefzger-Loders, Hubert A. Gasteiger; Technical Electrochemistry, Technical Uni. of Munich, Garching/Germany	17:30	Reliability of Reformer Gas-Facing Material for Safe Hydrogen Production Service (B1105) Seung-Wook Baek (1), Yun-Hee Lee (1), Bo Sik Kang (2), Eun Ju Song (1), Un Bong Baek (1), Seung Hoon Nahm (1); (1) Korea Research Institute of Standards and Science (KRISS), Daejeon/Republic of Korea, (2) Korea Institute of Machinery & Materials (KIMM), Daejeon/Republic of Korea
17:45	Porous binder: Contribution to gas transport in fuel cell gas diffusion layers (A1106) Adrien Lamibrac, Jens Eller, Felix N. Büchi; Electrochemistry Lab., Paul Scherrer Institut, Villigen PSI/Switzerland	17:45	Techno-economic Analysis of State-of-the-Art Electrochemical Hydrogen Compressors (EHCs) (B1106) Whitney G. Colella (1), Monjid Hamdan (2); (1) Gaia Energy Research Institute, Arlington/VA/USA, (2) Giner Inc., Newton/MA/USA
18:00	End of Sessions		
19:30	Dinner on the Lake Boarding 19.20 – Lake side of KKL pier 5/6 – back 23.15 (short stop in Brunnen 22.30 for early return by train)		



Morning

Friday, July 7, 2017

C12 – C14 Special Sessions see page 28/29

A12 Auditorium		B12 Convention Foyer	
09:00	Durability, testing & optimisation for operation (A12)	09:00	Electrochemical CO₂-Reduction: Overview & potentials (B12)
09:00	Direct Alcohol Fuel Cells – A Critical Overview (A1201) Ulrich Stimming; School of Chemistry, Newcastle Uni., Newcastle upon Tyne/UK	09:00	Scale-up of direct Electrochemical Reduction of concentrated CO₂ in Aqueous Systems (B1201) Maximilian Fleischer, Günter Schmid; Siemens AG, Corporate Technology, Research in Energy and Electronics, München/Deutschland
09:15	The Importance of Failure: Understanding degradation mechanisms in PEM electrolyzers (A1202) Nicholas van Dijk, James Dodwell, Rachel Backhouse; ITM Power (Research) Ltd, Sheffield/UK	09:22	Overview about Electrochemical CO₂ Reduction (V-Sustain) (B1202) Ifan Stephens; DTU Energy, Kopenhagen/Denmark
09:30	Current distribution in large-surface area PEM electrolysis cells (A1203) Verdin Baptiste (1,2), Fouda-Onana Frederic (1), Millet Pierre (2); (1) Uni. Grenoble, CEA-LITEN, Grenoble/France, (2) Uni. Paris-Saclay, Institut de Chimie Moléculaire et des Matériaux d'Orsay, Orsay/France		
09:45	Improved durability in DMFC: local optimization of catalyst layers (A1204) Claudio Rabissi (1), Matteo Zago (1), Madeleine Odgaard (2), Laila Grahl-Madsen (2), Andrea Casalegno (1); (1) Dep. of Energy, Politecnico di Milano, Milano/Italia, (2) EWII Fuel Cells A/S, Odense SØ/Denmark	09:45	Study of modified Cu thin films for electrochemical reduction of carbon dioxide (B1204) Anastasia A. Permyakova (1), Alexandra Patru (1), Juan Herranz (1), Thomas J. Schmidt (1,2); (1) Electrochemistry Lab., Paul Scherrer Institut, Villigen PSI/Switzerland, (2) Lab. of Physical Chemistry, ETH Zürich, Zürich/Switzerland
10:00	Durability Studies of High Temperature PEM Fuel Cells. Operational Parameters, Accelerated Testing and Acid Retention (A1205) Jens Oluf Jensen (1), Tonny Søndergaard (1), Lars N. Cleemann (1), Thomas Steenberg (2), Hans Aage Hjuler (2), Qingfeng Li (1); (1) Dep. of Energy Conversion and Storage, Technical Uni. of Denmark, Kgs. Lyngby/Denmark, (2) Danish Power Systems Ltd., Kvistgård/Denmark	10:00	Co-electrolysis of CO₂ and water in a polymer electrolyte membrane cell (B1205) Piero Negro (1), Francesca Niccoli (1), David Sebastián (2), Alessandra Palella (2), Sabrina Zignani (2), Lorenzo Spadaro (2) Vincenzo Baglio (2), Antonino S. Aricò (2); (1) Innovation Lab., Global Product Innovation, Italcementi s.p.a., Bergamo/Italy, (2) CNR-ITAE, Messina/Italy
10:15	Real time startup simulation of a high temperature PEM fuel cell for combined heat and power generation (A1206) Gregor Tavčar (1), Peter Urthaler (2), Christoph Heinzl (3), Ambrož Kregar (1), Tomaž Katrašnik (1), Reinhard Tatschl (2).; (1) Faculty of Mechanical Engineering, Uni. of Ljubljana, Ljubljana/Slovenia, (2) AVL List GmbH, Graz/Austria, (3) Elcore GmbH, München/Germany	10:15	Heat-treated Cobalt-Copper Electrodes for Formic Acid Production from Carbon Dioxide (B1206) Zhichuan (Jason) Xu (1,2,3); (1) School of Materials Science and Engineering, Nanyang Technological Uni., (2) Solar Fuels Lab., Nanyang Technological Uni., (3) Energy Research Institute@NTU, ERI@N, Interdisciplinary Graduate School, Nanyang Technological Uni., Singapore/Singapore
10:30	Coffee Break – Ground Floor in the Exhibition		

A 13	Auditorium	B 13	Convention Foyer
11:00 11:00 11:15 11:30 11:45 12:00 12:15	Diagnostics and Simulations (A13) Quantification of feature detectability of subsecond X-ray Tomographic Microscopy of PEFC (A1301) Hong Xu, Thomas J. Schmidt, Felix N. Büchi, Jens Eller; Electrochemistry Lab., Paul Scherrer Institut, Villigen PSI/Switzerland Extracting PEFC electrochemical properties from current interrupt measurement (A1302) Amir Niroumand (1,2), Motahareh Safiollah(1), Mark Olfert (1), Michael Eikerling (2); (1) Greenlight Innovation Corp., Burnaby/BC/Canada, (2) Dep. of Chemistry, Simon Fraser Uni., Burnaby/BC/Canada Understanding of PEMFC Conditioning Behaviors (A1303) Nana Zhao, Zhong Xie, Zhiqing (Ken) Shi; Energy, Mining & Environment, Nat. Research Council Canada, Vancouver/B.C. Canada Water Management In Alkaline Membrane Direct Methanol Fuel Cells (A1304) Ulrike Krewer, Christine Weinzierl; TU Braunschweig, Institute of Energy and Process Systems Engineering, Braunschweig/Germany A New Model of PEMFCs: Process Identification from Physics-based EIS Simulation (A1305) Georg Futter (1), Arnulf Latz (1,2), Thomas Jahnke (1); (1) German Aerospace Center (DLR), Stuttgart/Germany, (2) Helmholtz Institute Ulm for Electrochemical Energy Storage (HIU), Ulm/Germany Verification of PEMFC impedance model in different operating conditions (A1306) Ivan Pivac, Boris Šimić, Frano Barbir; FESB, Uni. of Split, Split/Croatia	11:00 11:00 11:15 11:30 11:45 12:00 12:15	Industrial achievements & inventions (B13) Scientific evaluation of efficiency losses due to installation and maintenance processes of CHP systems for residential applications by using high-resolution reference load profiles (B1301) Tobias Thomsen, Marco Zobel; NEXT ENERGY & EWE-Forschungszentrum für Energietechnologie e. V., Oldenburg/Germany Energy analyses of fuel cell electric vehicles (FCEVs) under European weather conditions and various driving behaviours (B1302) Benedikt Hollweck (1), Matthias Moullion (2), Michael Christ (2), Gregor Kolls (2), Jörg Wind (1); (1) Daimler AG, Kirchheim unter Teck/Germany, (2) NuCellSys GmbH, Kirchheim unter Teck/Germany PEMFC operation with reformat gas in a micro-CHP system based on membrane-assisted reformer (B1303) Stefano Foresti (1), Giampaolo Manzolini (1), Sylvie Escibano (2); (1) Politecnico di Milano, Dep. of Energy, Milano/Italy, (2) CEA, LITEN/DEHT, Grenoble Cedex/France Fuel cell electric vehicle-to-grid: emergency and balancing power for a 100% renewable hospital (B1304) Vincent Oldenbroek, Lennart Nordin, Ad van Wijk; Energy Technology Section, Dep. of Process and Energy, Delft Uni. of Technology, Delft/The Netherlands Long Term Field Testing of PEM Fuel Cell Backup Applications in the Field of Communication (B1305) Ulrike Trachte, Peter Sollberger; Lucerne School of Engineering and Architecture, Horw/Switzerland Advances in Non-Flow-Through PEM Fuel Cells for Aerospace Applications (B1306) William Smith; Infinity Fuel Cell and Hydrogen, Inc., Windsor/USA
12:30	Lunch & Coffee – 2nd Floor on the Terrace		

Morning

Friday, July 7, 2017

Morning

A 14 Auditorium	B 14 Convention Foyer
13:30 Bridge to Products: From material to cells & stacks (A14) 13:30 Opportunities and challenges for de-alloyed PtNi cathode catalysts for automotive applications (A1401) Geoff Spikes, Dash Fongalland, Jonathan Sharman, Alex Martinez; Johnson Matthey Technology Centre, Reading/UK 13:45 MATISSE – MANufacturing of Improved Stack with textured Surface Electrodes for Stationary and CHP applications (A1402) S. Escribano, C. Nayoze, J. Cren (1), J. Hunger, F. Wilhelm, A. Kabza (2), A. Rakotondrainibe, S. Besse (3), S. Theuring, C. Hildebrandt (4), C. VanAken (5); (1) Atomic Energy Commission (CEA), Grenoble/France, (2) Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg, Ulm/Germany, (3) AREVA Energy Storage, Aix-en-Provence/France, (4) inhouse engineering GmbH, Berlin/Germany, (5) Nedstack fuel cell technology B.V., ED Arnhem/The Netherlands 14:00 Concepts and Technologies for Production and Qualification of Automotive Fuel cells (A1403) Angelika Heinzl, Peter Beckhaus, Jörg Karstedt; The Fuel Cell Research Center, Duisburg/Germany 14:15 Durability Tests of PEM-Fuel Cell Stacks based on harmonized Test Procedures (A1404) Ludwig Jörissen, Alexander Kabza, Jürgen Hunger; Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg, Ulm/Germany 14:30 Customised solutions for LTPM MEA market requirements (A1405) Nabeel Hussain, Sharon Blair; HyPlat (Pty) Ltd, Cape Town/South Africa	13:30 Electrolysers & FCs – Implementation & Expectations (B14) 13:30 H2FUTURE – Hydrogen from Electrolysis for Low Carbon Steelmaking (B1401) Karl Anton Zach (1), Thomas Buegler (2), Klaus Scheffer (3), Irmela Kofler (4), Ronald Engelmaier (5), Marcel Weeda (6); (1) VERBUND Solutions GmbH, Vienna/Austria, (2) voestalpine Stahl GmbH, Linz/Austria, (3) Siemens AG, Erlangen/Germany, (4) K1-MET GmbH, Linz/Austria, (5) Austrian Power Grid AG, Vienna/Austria, (6) ECN, Amsterdam/The Netherlands 13:45 Application of Water Electrolyzers in the Swiss Ancillary Services Market (B1402) Christoph Imboden (1), Aby Chacko (2), Daniel Schneider (1); (1) Lucerne Uni. of Applied Sciences, Horw/Switzerland, (2) Swissgrid AG, Laufenburg/Switzerland 14:00 PEM Electrolyser-project Arzberg (Germany) and modular LOHC-Energy storage system (B1403) Carsten Krause; AREVA H2Gen GmbH, Köln/Germany 14:15 Impact of Dynamic Load from Renewable Energy Sources on PEM Electrolyzer Lifetime (B1404) Frans van Berkel (1), Arend de Groot (1), Sander ten Hoopen (2); (1) Energy Research Centre of The Netherlands ECN, Petten/The Netherlands, (2) Hydron Energy, Noordwijkerhout/The Netherlands 14:30 Hydrogen Mobility Europe (H2ME) – Creating the European Vision for Hydrogen Transportation (B1405) Lisa Ruf, Madeline Ojakovoh, Ben Madden; Element Energy, London/UK

14:45	Highly efficient and long-term stable fuel cell micro-energy systems based on ceramic multi-layer technology (A1406) Adrian Goldberg (1), Lars Röntzsch (2), Carsten Pohlmann (2), Christian Freitag (1), Ariel Thierry Tagne Saha (1), Steffen Ziesche (1), Uwe Partsch (1); (1) Fraunhofer IKTS, Dresden/Germany, (2) Fraunhofer IFAM, Dresden/Germany	14:45	Macro-economic benefits of development scenarios of hydrogen demand technologies (B1406) Dora Fazekas, Sophie Billington, Hector Pollitt; Cambridge Econometrics, Cambridge/UK
15:00	5 Min to change from B14 Session to Auditorium for A15 Session		

A 15	Auditorium
15:05	P3: Closing Ceremony with Keynote by the Gold Medal of Honour Winner 2017 A15
15:05	Summary by the Chairladies (A1501) Isotta Cerri (2), Angelika Heinzel (1); (1) ZBT GmbH, Duisburg/Germany, (2) Advanced Technology Division, Production Engineering Group, Toyota Motor Europe
15:20	Information on Next EFCE: 13th European SOFC & SOE Forum 2018 / 7th European Hydrogen Fuel Cell, Electrolyser & H₂ Forum 2019 (A1502) Olivier Bucheli (1), Hubert Gasteiger (2), Michael Spirig (1); (1) European Fuel Cell Forum, Lucerne/Switzerland, (2) Technical Electrochemistry, Dep. of Chemistry and Catalysis Research Center, Technical Uni. of Munich, Garching/Germany
15:30	Christian Friedrich Schönbein Award for the Best Poster, Best Science Contribution, Medal of Honour (A1503) Angelika Heinzel (1), Isotta Cerri (2); (1) ZBT GmbH, Duisburg/Germany, (2) Advanced Technology Division, Production Engineering Group, Toyota Motor Europe, Zaventem/Belgium
15:40	Gold Medal Winner Keynote 2017 – New materials, methods and concepts for Hydrogen Fuel Cells (A1504) Hubert Gasteiger; Technical Electrochemistry, Dep. of Chemistry and Catalysis Research Center, Technical Uni. of Munich, Garching/Germany
16:05	Thank you and Closing by the Organizers (A1505) Michael Spirig, Olivier Bucheli; European Fuel Cell Forum, Lucerne/Switzerland
16:15	End of Sessions – End of Conference – Goodbye coffee and travel refreshment in front of the Luzerner Saal

Special Sessions C

Friday, July 7, 2017

c12	Club Room	S-Chairs: Angelika Heinzel	Morning
09:00	Photoelectrochemical Water Splitting - Microbial & Direct Formic Acid Fuel Cells C12		
09:00	Photoelectrochemical Water Splitting in Separate Hydrogen and Oxygen Cells (C1201)		
	Avigail Landman (1), Hen Dotan (2), Gennady E. Shter (3), Gideon S. Grader (3), Avner Rothschild (2); (1) The Nancy & Stephen Grand Technion Energy Program (GTEP), Technion – Israel Institute of Technology, Haifa Israel, (2) Dep. of Materials Science and Engineering, Technion – Israel Institute of Technology, Haifa/Israel, (3) Dep. of Chemical Engineering, Technion – Israel Institute of Technology, Haifa/Israel		
09:15	Solar Water Splitting: Beating the Efficiency of PV-Electrolysis with Tandem Cell Photoelectrolysis (C1202)		
	Avner Rothschild, Hen Dotan; Dep. of Materials Science and Engineering, Technion – Israel Institute of Technology, Haifa/Israel		
09:30	The PECSYS Project: Demonstration of a solar driven electrochemical hydrogen generation system with an area > 10 m² (C1203)		
	Jack Left (1), Mike Middle (1), Peter Wright (2), S. Calnan (1), R. Schlatmann (1), A. Battaglia (2), M. Edoff (3), T. Edvinsson (3), S. Haas (4), M. Mueller (4), S. A. Lombardo (5), P. Neretnieks (6), L. Stolt (6); (1) PVcomb, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Berlin/Germany, (2) 3SUN SRL, Catania/Italy, (3) Uppsala Uni., Uppsala/Sweden, (4) Forschungszentrum Juelich GmbH, Juelich/Germany, (5) Consiglio Nazionale Delle Ricerche CNR-IMM, Catania/Italy, (6) Solibro Research AB, Uppsala/Sweden		
09:45	Enhanced Electron Transfer by a Magnetic Self-assembled Conductive Fe₃O₄/Carbon Nanocomposites in E. coli-Catalyzed Mediator-less Microbial Fuel Cells (C1204)		
	In Ho Park, Kee Suk Nahm; School of Chemical Engineering, Chobnuk Nat. Uni., Jeonju/Republic of Korea		
10:00	Bioelectrochemical systems as tools to steer anaerobic digestion processes (C1205)		
	Annemarie Schmidt (1), Anna Prokhorova (1), André Weber (2), Elena Kipf (3), Sven Kerzenmacher (3), Marc Gauert (4), Andreas Lemmer (5), Padma Priya Ravi (5), Johannes Gescher (1); (1) Institute for Applied Biosciences (IAB), Karlsruhe Institute of Technology (KIT), Karlsruhe/Germany, (2) Institute for Applied Materials (IAM-WET), Karlsruhe Institute of Technology (KIT), Karlsruhe/Germany, (3) Lab. for MEMS Applications, IMTEK - Dep. of Microsystems Engineering, Uni. of Freiburg, Freiburg/Germany, (4) B.R.A.I.N AG, Zwingenberg/Germany, (5) State Institute of Agricultural Engineering and Bioenergy, Uni. of Hohenheim, Stuttgart/Germany		
10:15	Microbial Fuel Cells: A Platform Technology for Multiple Applications (C1206)		
	Ioannis A. Ieropoulos, John Greenman; Bristol BioEnergy Centre, Bristol Robotics Lab, Faculty of Environment & Technology, Bristol/UK		
10:30	Coffee Break – Ground Floor in the Exhibition		

Special Sessions C

Friday, July 7, 2017

c13	Club Room	S-Chairs: Günther G. Scherer, Olaf Conrad	Morning
11:00	Similarities & Differences: FC – Redox Flow Batteries (RFB) I C13		
11:00	PEM Fuel Cells and Redox Flow Batteries – Differences, similarities and common problems (C1301) Rüdiger Schweiss; SGL Carbon GmbH, Meitingen/Germany		
11:30	Methods to limit shunt currents in the Vanadium-Redox-Flow-Batteries (VRFB) (C1302) Adam H. Whitehead; GILDEMEISTER energy storage GmbH, Wiener Neudorf/Austria		
12:00	Catalytic Properties of Carbon in the All-Vanadium-Redox-Flow-Batteries (aVRFB) (C1303) Jochen Friedl, Ulrich Stimming; School of Chemistry, Newcastle Uni., Newcastle upon Tyne/UK		
12:30	Lunch & Coffee – 2nd Floor on the Terrace		

c14	Club Room	S-Chairs: Günther G. Scherer, Jochen Friedl	Afternoon
13:30	Similarities & Differences: FC – Redox Flow Batteries (RFB) II C14		
13:30	All-Polymer-Redox-Flow-Batteries (aPRFB) (C1401) Olaf Conrad; JenaBatteries GmbH, Jena/Germany		
14:00	Progress in miniaturized redox flow batteries (C1402) Patrick Ruch (1), Neil Ebejer (1), Julian Marschewski (2), Lorenz Brenner (2), Kleber Marques Lisboa (2), Dimos Poulidakos (2), Bruno Michel (1); (1) IBM Research – Zürich, Zürich/Switzerland, (2) ETH Zürich, Zürich/Switzerland		
14:30	Electrolytes for bromine/bromide cathode in hydrogen-bromine Redox-Flow-Battery (RFB) (C1403) Michael Küttinger, Paulette Loichet, Emeline Meyer, Peter Fischer, Karsten Pinkwart, Jens Tübke; Applied Electrochemistry, Fraunhofer Institute for Chemical Technology, Pfaffzettel/Germany		
14:45	Local characterization and 3D simulation of mass transport issues in Vanadium-Redox-Flow-Batteries (VRFB) (C1404) Matteo Zago, Mirko Messaggi, Claudio Rabissi, Andrea Baricci, Riccardo Mereu, Fabio Inzoli, Andrea Casalegno; Politecnico di Milano, Dep. of Energy, Milan/Italy		
15:00	Design and upscaling of a AQDS-bromine based Redox Cell (C1405) Simone Amicabile (1), Matteo Testi (1), Luigi Crema (1, 2); (1) Fondazione Bruno Kessler, Trento/Italy, (2) Green Energy storage, Trento/Italy		
15:15	Summary and Discussion on future common Exchange-Activities FC-RFB (ca. 10min)		
15:25	5 min to change from C14 Session to Auditorium for participants of the EFCF conference Closing Session A15 with Keynote from Prof. Hubert Gasteiger TUM, Award Ceremony and Conference Closing		

Poster List		Auditorium Foyer	S-Chair: Angelika Heinzel, Isotta Cerri
A03	Poster Session I (with all Session Topics)	Wednesday, 5 July 2017	Afternoon 13.15 – 14:30
A09	Poster Session II (with all Session Topics)	Thursday, 6 July 2017	Afternoon 13:15 – 14:30

Bridge to Product: Stack, system & manufacturing A04

Operation Strategies for the Cold Start of Proton Exchange Membrane Fuel Cells (A0407)

Gema Montaner Rios;
German Aerospace Center (DLR), Hamburg/Germany

Durability, testing and degradation mitigation A05

Degradation Study of a Unitized Regenerative Fuel Cell (A0507)

Amit C. Bhosale, Reeshab Goenka, Prakash C. Ghosh;
Dep. of Energy Science and Engineering, IIT Bombay, Powai Mumbai/India

Membranes & MEAs A08

Investigation and Quantification of Acid Condensation and Cell Conductivity within HT-PEMFC (A0807)

Hans Becker (1), Lars N. Cleemann (1), Kasper Enemark-Rasmussen(2), Jens Oluf Jensen (1), Qingfeng Li (1);
(1) DTU Energy, Technical Uni. of Denmark, Kgs. Lyngby/Denmark,
(2) DTU Chemistry, Technical Uni. of Denmark, Kgs. Lyngby/Denmark

Effect of the spirobiindane group in sulfonated poly(arylene ether sulfone) as a polymer electrolyte binder for fuel cell application (A0808)

Ji Eon Chae, Hyoung-Juhn Kim, Sung Jong Yoo, Jong Hyun Jang, So Young Lee;
Fuel Cell Research Center, Korea Institute of Science and Technology (KIST), Seoul/Korea

Coating grid metallic contacts with electrospayed carbon layers (A0809)

J.J. Conde, M.A. Folgado, P. Ferreira-Aparicio, A.M. Chaparro;
Dep. of Energy, CIEMAT, Madrid/Spain

Non-precious metal catalysts B02

Composition-Stability Relations for Non-Noble Metal Catalysts for Polymer Electrolyte Fuel Cell Cathodes (B0207)

Juan Herranz (1), Thomas J. Schmidt (1,2);
(1) Electrochemistry Lab., Paul Scherrer Institut, Villigen PSI/Switzerland,
(2) Lab. of Physical Chemistry, ETH Zürich, Zürich/Switzerland

Noble metal based nanocatalysts at W based support for low temperature fuel cells application (B0208)

N.R.Elezovic(1), M.Krstajic Pajic(2), P.Zabinski(3), V.R.Radmilovic(4), P. Ercius(5), N.V. Krstajic(6);
(1) Institute for Multidisciplinary Research, Uni. of Belgrade, Belgrade/Serbia, (2) Institute for Chemistry Technology and Metallurgy Uni. of Belgrade, Belgrade/Serbia, (3) AGH Uni. of Science and Technology, Faculty of Non-Ferrous Metals, Krakow/Poland, (4) Innovation Centre of the Faculty of Technology and Metallurgy Uni. of Belgrade, Belgrade/Serbia, (5) Nat. Center for Electron Microscopy, LBNL Uni. of California, Berkeley/CA/USA, (6) Faculty of Technology and Metallurgy Uni. of Belgrade, Belgrade/Serbia

Effects of surfactant on the structure of nanomaterials for low temperature fuel cell application (B0209)

Njoku Chima (1,2), Patrick Ndungu (1,3);
(1) Uni. of KwaZulu-Natal, Durban/South Africa, (2) Durban Uni. of technology, Durban/South Africa,
(3) Uni. of Johannesburg, Johannesburg/South Africa

Pt-Catalysts and supports B04

Adhesion Behavior of Nafion Solution at Disperse Phase Boundaries (B0407)

Schulz Anne (1), Stähler Markus (1), Lühmann Nicole(2), Lehnert Werner (1,3);
(1) Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research IEK-3: Electrochemical Process Engineering, Jülich/Germany, (2) Forschungszentrum Jülich GmbH, Jülich Centre for Neutron Science JCNS-1/, Jülich/Germany,
(3) Modeling in Electrochemical Process Engineering, RWTH Aachen Uni., Aachen/Germany

Synthesis and Characterization of Modified κ -Carrageenan-Based Polymer Electrolyte Membrane (A0810)

Kee Shyuan Loh (1), Joy Wei Yi Liew (1), Azizan Ahmad (2), Kean Long Lim (1), Wan Ramli Wan Daud (1);
(1) Fuel Cell Institute, Uni. Kebangsaan Malaysia, Selangor/Malaysia,
(2) Faculty of Sciences and Technology, Uni. Kebangsaan Malaysia, Selangor/Malaysia

Multiblock Copolymers with Highly Sulfonated Poly(arylene sulfone) Blocks for PEMFC Applications (A0811)

Tae-Ho Kim (1), So Won Choi (1,2), Young Taik Hong (1);
(1) Korea Research Institute of Chemical Technology, Daejeon/South Korea, (2) Kyonggi Uni., Suwon/South Korea

Additive Effect in PFSA Electrolytes (A0812)

Je-Deok Kim (1,2);
(1) Hydrogen Production Materials Group, Center for Green Research on Energy and Environmental Materials, Nat. Institute for Materials Science, (2) Polymer Electrolyte Fuel Cell Group, Global Research Center for Environmental and Energy based on Nanomaterials Science (GREEN), NIMS, Ibaraki/Japan

Stability of Highly Sulfonated Polyphenylsulfone Membrane (I) (A0813)

Je-Deok Kim (1,2);
(1) Hydrogen Production Materials Group, Center for Green Research on Energy and Environmental Materials, Nat. Institute for Materials Science, (2) Polymer Electrolyte Fuel Cell Group, Global Research Center for Environmental and Energy based on Nanomaterials Science (GREEN), NIMS, Ibaraki/Japan

Characterisation of materials & degradation**A10****The water vapor equilibrium in the phosphoric acid – water system (A1007)**

Jürgen Wackerl (1), Fosca Conti (2,3), Carsten Korte (1), Werner Lehnert (1,4);
(1) Institute of Energy and Climate Research: Electrochemical Process Engineering, Jülich/Germany, (2) Uni. of Padova, Dep. of Chemical Sciences, Padova/Italy, (3) Institute of Innovative Mobility (MOREA), Technische Hochschule Ingolstadt, Ingolstadt/Germany, (4) Modelling in Electrochemical Process Engineering, RWTH Aachen Uni., Aachen/Germany

Investigation of PEMFC damage mechanisms due to cyclic freeze-thaw attack (A1008)

Stanislav Gorelkov, Susanne Palecki, Georg Dura, Jens Wartmann, Angelika Heinzl;
The Fuel Cell Research Center, Duisburg/Germany

Effect of mechanical degradation and chemical degradation on PEMFC stability (A1009)

Wei Song, Hongmei Yu, Zhigang Shao;
Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian/China

Ultra-Low Pt Content Stabilises Fe-N-C Catalysts in PEM Fuel Cell Cathodes (B0408)

Nastaran Ranjbar-Sahraie, Moulay Sougrati, Deborah Jones, Frédéric Jaouen;
Institut Charles Gerhardt Montpellier, Uni. de Montpellier, Montpellier/France

Hydrogen and Oxygen Evolution on Alloys of Transition Metals of Period 4 (B0409)

Alejandro N. Colli, Heron Vrubel, Hubert H. Girault;
Laboratoire d'Electrochimie Physique et Analytique Ecole Polytechnique Fédérale de Lausanne, Sion/Switzerland

Evaluation of binary catalyst performance by computational quantum mechanics (B0410)

Hung-Hsiao Liu (1), Kan-Lin Hsueh (2), Che-Wun Hong (1); (1) Dep. of Power Mechanical Engineering, Nat. Tsing Hua Uni., Hsinchu/Taiwan, (2) Dep. of Energy Engineering, Nat. United Uni., Miaoli/Taiwan

Engineered Carbons as Catalyst and Support Material for PEM Fuel Cell Application (B0411)

Gopinathan M. Anilkumar (1) Sreekuttan M. Unni (2) Takeo Yamaguchi (2); (1) R&D Center, Noritake Co. Ltd., Miyoshi/Aichi ken/Japan, (2) Lab. for Chemistry and Life Sciences, Tokyo Institute of Technology, Yokohama/Japan

Highly active heteroatom doped carbon supported palladium for oxidation of formate (B0412)

Sohaeng Kim (1), Myounghoon Choun (1), Jaeyoung Lee (1,2);
(1) Electrochemical Reaction and Technology Lab. (ERTL), School of Environmental Science and Engineering, Gwangju Institute of Science and Technology (GIST), Gwangju/South Korea, (2) Ertl Center for Electrochemistry and Catalysis, Gwangju Institute of Science and Technology (GIST),

Oriented Electrode for Polymer Electrolyte Fuel Cells (B0413)

Hongmei Yu; Laboratory of Fuel Cells, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian/China

H₂ from Electrolysers: Concepts & costs**B05****Vibration Disassociation of H₂O molecule (B0507)**

Sonya Davidson; H₂ Energy Now, Beer Sheva/Israel

Vanadium-assisted indirect hydrogen evolution (B0508)

Alberto Battistel, Christopher Raymond Dennison, Veronique Amstutz, Heron Vrubel, Hubert Girault;
Laboratoire d'Electrochimie Physique et Analytique (LEPA), EPFL Valais, Sion/Switzerland

Developments for Alkaline Electrolysis: From materials to Lab. electrolysers (B0509)

Wenbo Ju (1), Meike V. F. Heinz (1), Dariusz Burnat (1), Corsin Battaglia (1), Ulrich F. Vogt (1,2);
(1) Materials for Energy Conversion, Swiss Federal Laboratories for Material Science and Technology (EMPA), Dübendorf/Switzerland, (2) Faculty of Environment and Natural Resources, Freiburg/Germany

Hydrogen Production from Zinc Dissolution in Saline Formation Water (B0510)

M. A. Deyab; Egyptian Petroleum Research Institute (EPRI), Cairo/Egypt

Densification of gadolinium-doped ceria diffusion barriers for solid oxide electrolysis cells (B0511)

Hyun-Jong Choi, Doo-Won Seo, Sang-Kuk Woo, Sun-Dong Kim; Korea Institute of Energy Research, Daejeon/Republic of Korea

Transport phenomena limitation**A11****The effect of cation contamination the performance and lifetime of the MEA (A1107)**

Ahmad El-kharouf;

Centre for Fuel Cell and Hydrogen Research, Uni. of Birmingham, Birmingham/UK

Analysis of Roughness Induced Hydrophobicity in Electrospray Deposited Microporous Layer on Carbon Fiber Paper used in PEMFC Membrane Electrode Assembly (A1108)

Carmencita Lumban (1), Armando Somintac (1) (2), Manolo Mena (3), Henry Ramos (4);

Uni. of the Philippines, Diliman, (1) Materials Science and Engineering Program, College of Science, Quezon City/Philippines, (2) Nat. Institute of Physics, College of Science, (3) Dep. of Mining, Metallurgical and Materials Engineering, College of Engineering, (4) Technology Management Center

Novel approaches to tailoring the membrane catalyst layer interface for increased power density of PEMFCs (A1109)

Severin Vierrath (1,2), Matthias Breitwieser (1,2), Matthias Klingele (2), Carolin Klose (2), Roland Zengerle (1,2), Simon Thiele (1,2);

(1) Hahn-Schickard, Villingen-Schwenningen/Germany,

(2) Lab. for MEMS Applications, IMTEK Dep. of Microsystems Engineering, Uni. of Freiburg, Freiburg/Germany

Planar fuel cells arrays using interconnected traces on plastic substrates (A1110)

Jessica Thery, Vincent Faucheux, David Alincant, Olivier Blanchot, Philippe Capron;

CEA LITEN LMSE, Grenoble/France

Why an OCV of 1.23 Volt cannot be obtained (A1111)

Ulf Bossel;

Fuel Cell Consultant, Oberrohrdorf/Switzerland

Intermediate Temperature Direct Ethanol Fuel Cells (A1112)

Berthold B.L. Reeb (1), Ulrich Stimming (1,2);

(1) Bavarian Center for Applied Energy Research, Garching/Germany,

(2) School of Chemistry – Bedson Building Newcastle Uni., Newcastle upon Tyne/England

Durability, testing & optimisation for operation**A12****Physical modelling and analyses of catalyst degradation in PEM fuel cells (A1207)**

Heather Baroody (1,2), Drew Stolar (2), Thomas Kadyk (3) Michael H. Eikerling (1);

(1) Simon Fraser Uni., Dep. of Chemistry, Burnaby/BC/Canada, (2) Ballard Power Systems, Burnaby/BC/Canada,

(3) Institute for Energy and Process Engineering, Braunschweig Uni. of Technology, Braunschweig/Germany

Effect of ozone pretreatment on biohydrogen production from complex biomethanated distillery wastewater (B0512)

Sameena. N. Malik (1,3), Prakash. C. Ghosh (3), Atul. N. Vaidya (1), Vishal Waindeskar (2), Sandeep N. Mudliar (1);

(1) CSIR – Nat. Environmental & Engineering Research Institute, Maharashtra/India, (2) Ozone Research and Application (I) Pvt Ltd, Maharashtra/India, (3) Dep. of Energy Science & Engineering, Indian Institute of Technology, Maharashtra/India

H₂ Storage: Concepts & systems**B07****Hydrogen Blending into the Gas Distribution Grid: The Case Study of a Small Municipality (B0707)**

Marco Cavana, Andrea Lanzini, Pierluigi Leone; DENERG, Politecnico di Torino, Torino/Italy

Modelling and Simulation of a Two-dimensional Hydrogen Storage Reactor Including Effects of Expansion Volume (B0708)

Mahvash Afzal, Pratibha Sharma; Dep. of Energy Science and Engineering, Maharashtra/India

Evaluation of phenomena occurring in a Regenerative Solid Oxide Cell System for energy storage (B0709)

Bruno Conti (1,2), Marco Graziadio (1,3), Stephen John McPhail (1), Maurizio Carlini (3), Barbara Bosio (1);

(1) Dep. of Energetic technology, CR-ENEA, Casaccia(Rome)/Italy,

(2) Uni. of Genoa, Dept. Civil, Chemical and Environmental Engineering, Genoa/Italy, (3) Uni. of Tuscia, DAFNE/Italy

Modelling & Diagnostics of Pt-Catalysis**B08****Molecular Analysis of Oxygen Permeation Properties in Ionomer on Pt Surface in PEMFC (B0807)**

Yuya Kurihara (1), Takuya Mabuchi (2), Takashi Tokumasu (2);

(1) Graduate School of Engineering, Tohoku Uni., Miyagi/Japan, (2) Institute of Fluid Science, Tohoku Uni., Miyagi/Japan

Physical Modeling of the Proton Density in Catalyst Layer Nanopores of PEM Fuel Cells (B0808)

Tasleem Muzaffar, Michael H. Eikerling;

Simon Fraser Uni., Dep. of Chemistry, Burnaby/BC/Canada

Electrolyser cell & stack performance**B10****pH-dependent electrochemical activity and stability of electrodeposited amorphous MoS_x for the hydrogen evolution reaction (B1007)**

Daniel Escalera López (1,2), Richard E Palmer (2), Neil V Rees (2);

Uni. of Birmingham, (1) Centre for Hydrogen and Fuel Cell Research, School of Chemical Engineering,

(2) Nanoscale Physics, Chemistry and Engineering Research Lab., School of Physics and Astronomy, Birmingham/UK

Advanced Materials for High-Temperature PEM Fuel Cells (A1208)

Elisabeth Therese Ulrikkeholm, Hector Rodrigo García, Hans Aage Hjuler, Thomas Steenberg;
Danish Power Systems, Egeskovvej/Kvistgaard

Effect of operating temperature on low temperature PEMFC under aeronautical conditions (A1209)

Noluntu Dyantyi, Sivakumar Pasupathi, Adrian Parsons, Cordellia Sita;
HySA Systems, Uni. of the Western Cape, Bellville/South Africa

Long term Durability of High Temperature-Polymer Electrolyte Membrane Fuel Cells based on Acid Doped Polybenzimidazole (A1210)

Arvind Kannan, Lars N Cleemann, Qingfeng Li, Jens Oluf Jensen;
Dep. of Energy Conversion and Storage, Technical Uni. of Denmark, Kgs. Lyngby/Denmark

Diagnostics and Simulations

A13

Two-Dimensional, Non-Isothermal Simulation Model of an Alkaline Fuel Cell (AFC): Effect of Temperature on the Polarization Curve (A1307)

Felix A. E. Kunz (1), Angelika Heinzel (1), (2), Jürgen Roes (1);
(1) Dep. of Energy Technology, Uni. of Duisburg-Essen, Duisburg/Germany,
(2) Zentrum für Brennstoffzellen Technik (ZBT), Duisburg/Germany

Bridge to Products: From material to cells & stacks

A14

Alkaline Fuel Cell Stacks: Monopolar vs. Bipolar (A1407)

Naveed Akhtar; AFC Energy plc, Cranleigh/Surrey

Membrane Humidification and Water Management in Polymer Electrolyte Fuel Cell Networks (A1408)

Gunnar Preiß; German Aerospace Center (DLR), Hamburg/Germany

Pt Nanoparticles Supported by Various Graphenes as the Electrocatalysts for Polymer Electrolyte Membrane Fuel Cells (A1409)

Selmiye Alkan Gürsel (1,2), Lale I'ıkel sanlı (2), Sajjad Ghobadi (1), Begüm Yazar (1), Emre Biçer (2), Esaam Jamil (1), Veera Sadhu (2), César Merino (3), Elif Da' (4), Ay'e Bayrakçeken Yurtcan (4,5); (1) Sabanci Uni., Nanotechnology Research and Application Center, Istanbul/Turkey, (2) Faculty of Engineering and Natural Sciences, Istanbul/Turkey, (3) Grupo Antolin Ingeniería SA, Burgos/Spain, (4) Dep. of Nanoscience and Nanoengineering, Atatürk Uni., Erzurum/Turkey, (5) Dep. of Chemical Engineering, Atatürk Uni., Turkey

Fuel processing, purification & compression

B11

Fuel processing system for diesel fuel for APU applications (B1107)

Remzi Can Samsun, Joachim Pasel, Matthias Prawitz, Andreas Tschauder, Ralf Peters;
Forschungszentrum Jülich GmbH, Electrochemical Process Engineering (IEK-3), Jülich/Germany

Electrochemical Compression of Hydrogen to High Pressure Using a Protonic Ceramic Membrane Reactor (B1108)

W. Grover Coors (1), Robert J. Kee (2), Benjamin Kee (2), Sandrine Ricote(2);
(1) Hydrogen Helix, Villefranche-sur-Mer/France,
(2) Faculty of Mechanical Engineering, Golden/Colorado/USA

High Temperature Electrochemical Hydrogen Pumping (B1109)

Tomasz Rojek (1), Thomas J. Schmidt (1,2), Lorenz Gubler (1);
(1) Paul Scherrer Institut, Villigen PSI/Switzerland, (2) ETH Zürich, Lab. of Physical Chemistry, Zürich/Switzerland

Performance and Degradation Study of Pt-Ru Catalysts for Hydrogen Production from Commercial Diesel (B1110)

Jaemyung Lee, Jiwoo Oh, Joongmyeon Bae;
Dep. of Mechanical Engineering, Korea Advanced Institute of Science and Technology, Daejeon/Republic of Korea

Low Pressure Hydrodesulfurization Processes for Gaseous Fuels (B1111)

Thomas Optenhostert (1), Christian Spitta (1), Michael Steffen (1), Wolfgang Schmidt (2), Sissy Puthenkalam (2);
(1) ZBT GmbH, Duisburg/Germany,
(2) Max-Planck-Institut für Kohlenforschung, Mülheim an der Ruhr/Germany

Study on Start-up Control of Diesel Autothermal Reformer for 1 kW_e Solid Oxide Fuel Cell System (B1112)

Minseok Bae (1), Jiwoo Oh (1), Dongyeon Kim (1), Joongmyeon Bae (1), Sai P. Katikaneni (2);
(1) Dept. of Mechanical Engineering, KAIST, Daejeon/South Korea, (2) Research and Development Center, Saudi Aramco, Dhahran/Saudi Arabia

Electrochemical CO₂-Reduction: Overview & potentials

B12

Electrochemical conversion of CO₂ to liquid products on an electrodeposited CuCl catalyst (B1207)

Youngeun Park (1), Seunghwa Lee (1), Jaeyoung Lee (1,2,);
(1) Electrochemical Reaction and Technology Lab., School of Earth Sciences and Environmental Engineering, Gwangju Institute of Science and Technology, Gwangju/South Korea, (2) Ertl Center for Electrochemistry and Catalysis, Research Institute for Solar and Sustainable Energies, Gwangju Institute of Science and Technology, Gwangju/South Korea



Industrial achievements & inventions

B13

Investigation of 2 MW PEMFC power plant for hydrogen recovery from chlor-alkali industry (B1307)

Giulio Guandalini (1), Stefano Campanari (1), Stefano Foresti (1), Jorg Coolegem (2), Jan ten Have (3);

(1) Politecnico di Milano, Dep. of Energy, Milano/Italy,

(2) Nedstack Fuel Cell Technology B.V., Arnhem/The Netherlands,

(3) MTSA Technopower B.V., Arnhem/The Netherlands

Cost-efficiency of a CHP hydrogen fuel cell (B1308)

Andreas Herrmann (1), Fabian Rosenheimer (1), Corina Dorn (1), Christoph Hildebrandt (2), Hartmut Krause (1);

(1) TU Bergakademie Freiberg, Institute of Thermal Engineering, Freiberg/Germany,

(2) Inhouse engineering GmbH, Berlin Germany

Improved performance of modular HT-PEM based CHP systems considering seasonal effects and degradation effects (B1309)

Elmar Pohl, David Diarra;

OWI – Oel-Waerme-Institut GmbH, Herzogenrath/Germany

Fuel Cell Electric Vehicle-to-Grid: Experimental feasibility and operational performance (B1310)

Vincent Oldenbroek (1), Victor Hamoen (1), Samrudh Alva (1), Carla Robledo (1), Leendert Verhoef (2), Ad van Wijk (1);

(1) Energy Technology Section, Dep. of Process and Energy, Delft Uni. of Technology, Delft/The Netherlands,

(2) Green Office, Delft Uni. of Technology, Delft/The Netherlands

Increasing the efficiency of biogas CHP with simultaneous emission reduction (B1311)

Andreas Herrmann, Florian Rau, Hartmut Krause (TUBAF);

TU Bergakademie Freiberg (TUBAF), Institute of Thermal Engineering, Freiberg/Germany

Electrolysers & FCs – Implementation & Expectations

B14

QualyGridS – Standardized qualifying tests of electrolysers for grid services (B1407)

Regine Reissner, et. al.;

German Aerospace Center (DLR), Institute of Engineering Thermodynamics, Stuttgart/Germany

Innovative Approach for Nano-structured Electrode of Solid Oxide Cells (B1408)

Jae-ha Myung (1,2), Dragos Negue (2), John Irvine (2);

(1) Korea Institute of Energy Research, Daejeon/Korea,

(2) School of Chemistry, Uni. of St Andrews, St Andrews/UK



Photoelectrochemical Water Splitting – Microbial & Direct Formic Acid Fuel Cells

C12

Oscillating Direct Formic Acid Fuel Cell (DFAFC) using Pt/C (C1207)

Andressa Mota-Lima (1,2), Djalma Silva (1) Luiz H. S. Gasparotto (1), Ernesto R. Gonzalez (2);

(1) Institute of Chemistry, Uni. of Rio Grande do Norte, Natal-RN/Brazil,

(2) Institute of Chemistry of São Carlos, Uni. of São Paulo, São Carlos/SP/Brazil

Photoelectrochemical Biofuel Cells for Electric Generation and Hydrogen Production (C1208)

Chun-Ting Liu, Che-Wun Hong;

Dep. of Power Mechanical Engineering, Nat. Tsing Hua Uni., Hsinchu/Taiwan

Investigation of temperature and kinetic of irradiation on water splitting reactions in dynamic reactor (C1209)

Amirhossein Javadi (1), Hamid Esfahani (2), Parviz Nourpour (2);

(1) Engineering research institute, Tehran/Iran,

(2) Materials and energy research center (MERC), Karaj/Iran

Similarities & Differences: FC – Redox Flow Batteries (RFB) II

C14

Spatially resolved OCV distribution for studying flow behavior in Vanadium-Redox-Flow-Batteries (VRFB) (C1407)

Arjun Bhattarai (1), Nyunt Wai (1), Rüdiger Schweiss (2), Adam Whitehead (3), Günther G. Scherer (4),

Purna C. Ghimire (1), Huey Hoon Hng (1);

(1) Nanyang Technological Uni., Singapore/Singapore,

(2) SGL Carbon GmbH, Meitingen/Germany,

(3) Gildemeister energy storage GmbH, Wr. Neudorf/Austria,

(4) TUM CREATE, Singapore/Singapore

List of Exhibitors

www.EFCF.com/Exhibition

At the time of print of this Final Announcement the following developers, material, measurement tool and component supplies as well as research institution had registered for the exhibition.

*Additionally major car manufacturers will be present, give a talk about development status, and have announced the exhibiton of their latest FCV models to marvel at and test drive.

Company	Exhibits	Web
AVL List GmbH Hans-List Platz 1, 8020 Graz / Austria	AVL THDA Fuel Cell Diagnoses; AVL PEM System Platform	www.avl.com
balticFuelCells GmbH Hagenower Str. 73, 19061 Schwerin / Germany	quickCONNECTfixture	www.balticFuelCells.de
Bronkhorst (Schweiz) AG Nenzlingerweg 5, 4153 Reinach / Switzerland	Mass-flow-meters and -controllers, pressure sensors and -controllers (liquid & gas), evaporator	www.bronkhorst.com
Coatema Coating Machinery GmbH Roseller Strasse 4, 41539 Dormagen / Germany	Test Solution, Thin Film Coater, Easycoater, Smartcoater	www.coatema.de
Danish Power Systems Ltd. Egeskovvej 6C, 3490 Kvistgård / Denmark	Fuel Cells (MEAs), Test Cells, et al.	www.daposy.com
HyPlat Rondebosch UCT, 7701 Cape Town / South Africa	PEFC catalysts and MEAs	www.hyplat.com
SAES Pure Gas, Inc. 4175 Santa Fe Road, 93401 San Luis Obispo (CA) / United States	Semiconductors	www.saespuregas.com
Swagelok Switzerland c/o ARBOR Fluidtec AG Loonstrasse 10, 5443 Niederrohrdorf / Switzerland	Fluid & gas system components and services	www.arbor.swagelok.com
Thermo Fisher Scientific (Schweiz) AG Neuhofstrasse 11, 4153 Reinach / Switzerland	FTIR-Spectrometer	www.thermofisher.com

Westfälische Hochschule Westfälisches Energieinstitut / Neidenburger Str. 43, 45897 Gelsenkirchen / Germany	Novel system design for PEM-electrolyzers and -fuel cells based on hydraulic compression	www.energie.w-hs.de
Daimler AG* Neue Str. 95, 73230 Kirchheim/Teck-Nabern / Germany	Mercedes-Benz GLC F-CELL	www.daimler.com
Honda R&D Europe (Deutschland) GmbH* Carl-Legien-Strasse 30, 63073 Offenbach / Germany	Honda FCX Clarity	world.honda.com/FCXClarity
Hyundai Motor Europe GmbH* Kaiserleipromenade 5, 63067 Offenbach / Germany	Hyundai ix35 Fuel Cell	www.hyundai.com/worldwide/en
Toyota Motor Europe* Hoge Wei 33, 1930 Zaventem / Belgium	Toyota Mirai	www.toyota-global.com

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13th European SOFC & SOE Forum

3 – 6 July 2018

Chaired by: Prof. Ellen Ivers-Tiffée & Dr. André Weber, KIT Karlsruhe Institute of Technology

7th European HYDROGEN FUEL CELL, ELECTROLYSER & H₂ Forum

2 – 3 July 2019

Chaired by: Prof. Hubert Gasteiger &
Prof. Aliaksandr Bandarenka, Technische Universität München

Special Networking Events

www.EFCF.com/NWP

Welcome Gathering

Tuesday, 4 July: 18:00, in the exhibition, ground floor: Meet old friends, find new contacts, and enjoy the splendid view of lake and historic town – a perfect start to the conference.

Swiss Surprise (optional, limited to 80 participants)

Wednesday, 5 July: 18:30, place to be announced. A special surprise is offered in an unusual place close to Lucerne: An enjoyable evening with Swiss folklore, music, drinks, and dinner. Tickets are sold on a first-come-first-serve-basis for CHF 120 per person. During your on-line registration (www.EFCF.com/Registration) please select the option to purchase tickets in advance for you and your guests.

Dinner on the Lake

Thursday, 6 July: 19:30 Pier 6 ("Brücke 6") next to Congress Center: A very special pleasure-boat (flagship of the fleet) will take us on a tour of the lake past a magnificent landscape to the "Rutli" glade, birthplace of Switzerland (1291). Enjoy the unique blend of music, drinks, and a candle-light dinner while gliding past beautiful scenery. Live music contributes to this unforgettable evening. This event is included in the registration fee. Please choose this option during your on-line registration on www.EFCF.com/Registration or use the registration form at www.EFCF.com/Download to purchase additional tickets for your guests (CHF 120 per person).

Entertainment for Accompanying Persons

During the European Full Cell Forum your guests and yourself have the possibility to explore the beautiful region of Lucerne together with an experienced local guide. Bucher Travel Inc. and the Lucerne Tourist Office are able to organize for you and your guests entertaining trips

around local attractions. It is possible to take a tour of Lucerne visiting the medieval part of the city, followed by a tour of the picturesque surrounding area e.g. Mount Pilatus, the Glass Factory & Mount Stanserhorn, etc. The excursions are arranged locally on a daily basis depending on weather conditions and requests. To get more information about the programmes and to book an activity, please visit www.EFCF.com – Registration – Spouse Programmes or contact in advance Bucher Travel Inc., Larissa Schelbert, larissa@buchertravel.ch, +41 41 418 55 46 and/or visit www.luzern.com. The EFCF team can support you on-site at the registration desk in finding further offers and opportunities, except during the main registration time (Tuesday afternoon, Wednesday morning). Accompanying persons may participate in the "Swiss Surprise" and "Dinner on the Lake" for CHF 120.– per person as well as in the lunches on the terrace of the KKL. Please purchase guest tickets as long as they are available during your on-line registration. Additional lunch tickets are only sold on site until fully booked. The exhibitions can always be visited for free.

Tutorial Registration

www.EFCF.com/Tutorial

The registration for the Fuel Cell, Electrolyser and H₂ Tutorial, given by Dr. Günther G. Scherer (former PSI Villigen) and Mer Dr. Jan Van Herle (EPF Lausanne), covers the lectures with complete documentation of the six-hour programme, a starter, a business lunch, sweets, coffees, and refreshments. You can register for the Tutorial without participating at the Scientific Conference.

Please indicate your choice during your on-line registration on www.EFCF.com/TutReg or on the registration form at www.EFCF.com/Download. Tutorial Fee is CHF 500.–

Conference Services

www.EFCF.com/Services

All participants enjoy full conference privileges. Accompanying persons and guests are kindly asked to buy tickets for meals and social events at the registration desk. The following conference privileges are included in the conference package:

- Participation in the conferences, access to the poster area, the exhibition and also to
 - Special sessions on: "Electrochemical CO₂-Reduction" (B12) with Keynotes from Siemens and DTU; "Photoelectrochemical Water Splitting – Microbial & Direct Formic Acid Fuel Cells" (C12)
 - Extra sessions on: "Similarities & Differences: FC - Redox Flow Batteries" (C13 + C14, they can also be booked separately, www.EFCF.com/RFB)
 - One day workshop "Monitoring, Diagnostics & Control for FC" (free, but registration is required, www.EFCF.com/MDC)
 - Green Salon exhibition and events, which are free
- Access to on-line electronic proceedings, agenda and bag inserts
- Download rights after the conference at www.EFCF.com/Lib of
 - presentations accessible with author permission
 - proceedings from this year and former years
- Participation in all networking events:
 - Tuesday: Welcome Gathering with drinks and snacks
 - Thursday: Dinner on the Lake on the historical paddle wheel steamers
- Three business lunches (Wednesday to Friday)
- Refreshments during intermissions, breaks and goodbye close.

Not included:

Tutorial (can be booked separately), Swiss Surprise on Wednesday night (tickets to be ordered, when registering for the conference www.EFCF.com/Registration), Symposium on "European Grid Service Markets: Business with New Technologies like Electrolysers" (small additional fee, registration is required, www.EFCF.com/GSM)

Conference On-line Registration

www.EFCF.com/Registration

Please register on-line at www.EFCF.com/Registration for all Forum events – conference, tutorial, side events – and pay by Credit Card or via bank, if sufficiently in advance. Please use the on-line registration option also for your hotel reservation. Credit cards are only needed to reserve your hotel room, but hotel bills are paid when you leave Lucerne.

In case you cannot register on-line, please obtain the off-line Registration Form and the Hotel Reservation Form from www.EFCF.com/Download or from forum@EFCF.com. Complete these forms and return them by e-mail or fax to the address shown on the bottom of each form.

Exhibition Registration

www.EFCF.com/ExReg

Companies wishing to participate in the exhibition can register on-line at www.EFCF.com/ExReg or download the Exhibition Package including the Exhibition Registration Form from www.EFCF.com/Download. Please complete and return the form to the address shown on the bottom of the form.

Any questions: Please contact exhibition@efcf.com, Leandra Spirig +41 79 622 02 27

The following admission fees* apply:

www.EFCF.com/Fee

Students, Trainees, Unemployed

Full-time students (age 26 or younger), trainees and no-income persons

Student fee (with valid identification) CHF 700.–

Academic Staff, Government, Consultants

Admission of academic staff etc. CHF 1 400.–

Industry, Trade and Commerce

Fuel cell developers, manufacturers and distributors pay an extra CHF 600.– to support the participation of students and trainees. The 6th European PEFC & Electrolyser Forum 2017 will provide an excellent platform for recruitment. Participants from industry and commerce benefit from the student support contribution.

Admission of industry etc. CHF 2 000.–

Rebates

Interesting rebates are possible for group reservation (one bill), for exhibitors (up to 55%) and agreed long-term promotion activities. Applications to be sent to forum@efcf.com

Surcharge on current fee* for Late Registration

Extra fee for late registration after 29 May 2017 CHF 100.–

Extra fee for on-site registration after 2 July 2017 CHF 250.–

One-Day Tickets

Registration includes full access to on-line conference proceedings and one Forum Agenda, as well as all conference privileges of the day, plus download of presentations accessible with author permission. Please register on-line at www.EFCF.com/Registration in advance, or at the registration desk (extra fee for late registration only applies). CHF 700.–

Tutorial

Incl. lectures, documents, lunch, refreshments, exhibition, Green Salon CHF 500.–

Extra Ticket for Dinner on the Lake

Additional guests tickets for the "Dinner on the Lake" evening event on Thursday (6 July 2017) are sold on a first-come-first-serve basis. Please order your guests tickets on-line at www.EFCF.com/Registration during your registration for the 6th European PEFC & Electrolyser Forum 2017 or ask on-site. CHF 120.– pp incl. 8 % VAT

Swiss Surprise Night (optional)

Tickets for the entertaining evening event "Swiss Surprise" on Wednesday (5 July 2017) night are sold on a first-come-first-serve basis. Participation is limited to 80 persons and is not included in the conference fee. Please order your and your guests tickets on-line at www.EFCF.com/Registration during your registration for the 6th European PEFC & Electrolyser Forum 2017 or ask on-site. CHF 120.– pp incl. 8 % VAT

* Fees valid from 1. March 2017. Early bird fees from before are no longer valid

Payment of the Registration Fee

Bucher Travel Inc. handles all On-line conference registrations and hotel reservations. The registration fee can be paid by credit card or via bank transfer if sufficiently ahead of time. Payments are confirmed in writing, institutions and companies may request invoices for registration of employees on company stationery. Please accept all bank charges related to the transfer expenses to your payment. All payments must be made in Swiss Francs (CHF). Foreign currency exchange rates for March 2017: 1 CHF ≈ 0.93 EUR ≈ 1.00 USD ≈ 113 JPY ≈ 0.82 GBP. Registrations are accepted as long as space is available.

Cancellation of Registration

Written cancellations of confirmed registrations should reach Bucher Travel Inc. before 31st May 2017. Fees already paid will be refunded, however a charge of CHF 300.– is applicable to cover administration expenses and the cost of the Electronic Proceedings that will be mailed to the registrant after the event. No refunds can be made for cancellations received after 31st May 2017. Withdrawing registrants will receive the Electronic Proceedings of the 2017 conference.

Free Project Meeting Support Enquiry

www.EFCF.com/FPM

Stakeholders interested in the free Organisational Support Service for their project, set-up, or other issue-meetings can get more information at www.EFCF.com/FPM or via email to forum@efcf.com.

Samples of successful collaborations are: www.EFCF.com/MDC, www.EFCF.com/GSM.

Hotel Reservation

www.EFCF.com/Hotel

The hotel can also be booked On-line: www.EFCF.com/Registration Button "Hotels". Bucher Travel Inc. handles all hotel bookings and will confirm the hotel reservations by email and send you information about Lucerne. Hotel expenses can be paid at the hotel to the hotel management. All on-line hotel **bookings made by 15 May 2017** and pre-paid by credit card via Bucher Travel will get an **early booking discount of 5%** on the room rate excl. taxes. Therefore choose the credit card option in the on-line booking / registration form. Pre-paid hotel bookings are non-refundable.

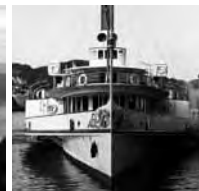
If there are further needs contact Larissa Schelbert, larissa@buchertravel.ch, Phone: +41 41 418 55 46 and/or visit alternative common hotel booking portals. The European Fuel Cell Forum is not responsible for hotel accommodations. Please make sure to book and register **ONLY ONCE!**

Lucerne (view video clip)

www.EFCF.com/Lucerne

Lucerne is located in the heart of Switzerland on the Lake of Lucerne admired for its beauty and tranquillity. Nostalgic paddle wheel steamers connect the romantic town to charming sites. From there you may ascend picturesque "Mount Rigi" and steep "Mount Pilatus", or reach the high regions in the Alps of Switzerland. Cogwheel mountain trains, cable cars or aerial tramways take you past alpine scenery to breath-taking panoramic views of the Top of Switzerland. Most of the places can be reached between 1 – 3 hours travel.

Lucerne itself is built along the "Lake of Lucerne" and the "Reuss River", outflow of the lake. The medieval part is closest to the waterfront. Bridges connect both banks. The famous wooden "Kapellbrücke" has been perfectly rebuilt by local artisan after total destruction by a catastrophic fire in 1993. Lucerne is located in the heart of Western Europe and is an ideal start location for further travels around the continent before or after the conference.



The event is endorsed by

ALPHEA

Rue Jacques Callot.
FR-57600 Forbach/France

Bundesverband Mittelständische

Wirtschaft, Unternehmerverband
Deutschlands e. V. / Landesverband Schweiz
Baarerstrasse 135, 6301 Zug
www.bvmw-schweiz.ch – www.bvmw.de

EUresearchCH Head Office

Effingerstrasse 19
3001 Bern/Switzerland

FUEL CELLS 2000

1625 K Street NW, Suite 725
Washington, DC 20006/USA

IHEA – International Hydrogen Energy Association

P.O. Box 248294
Coral Gables, FL 33124/USA

SIA (Berufsg. Technik und Industrie)

Selnaustrasse 16
8039 Zurich/Switzerland

Swiss Academy of Engineering Sciences

Seidengasse 16
8001 Zurich/Switzerland

Swiss Gas and Water Industry Association

Eschengasse 10
8603 Schwerzenbach/Switzerland

UK HFC Association

c/o Synnogy, Church Barn
Fullers Close Aldwinkle
Northants NN14 3UU/United Kingdom

Vätgas Sverige

Drottninggatan 21
SE-411 14 Gothenburg/Sweden

VDI Verein Deutscher Ingenieure

Graf-Recke-Strasse 84
DE-40239 Düsseldorf/Germany

Wiley – VCH Publishers

Boschstrasse 12
DE-69469 Weinheim/Germany



Travel Arrangements

www.swiss.com/Travel



Travel Information

Swiss International Air Lines are proud to be the Official Carrier for the 6th European PEFC & Electrolyser Forum 2017, and is offering special Congress Fares to all participants. These Congress Fares offer reductions of up to 10% depending on the fare type, route, and space availability.

Congress Fares are valid on the entire SWISS route network for flights to Switzerland, including flights operated by partner airlines under an LX flight number. These fares are now bookable for the travel period 14 days prior to and 14 days after the event.

Only registered congress participants and exhibitors can take advantage of this offer. After successful on-line registration at www.EFCF.com/Registration your EVENTCODE will be provided for an easy and convenient booking through SWISS.com via the following link www.swiss.com/event Please enter your email address and the given EVENTCODE.

The special SWISS congress fares are marked with a white triangle. They may not necessarily be the lowest fare, but they offer greater flexibility in the event of rebooking or cancellation.

How to get to Lucerne

www.EFCF.com/Lucerne

By car, train or bus:

The Gotthard trans-alpine **autobahn and railway pass through Lucerne**, and provide easy access by car, train or bus from north or south. Lucerne is ca. 1 hour from Zurich.

EFCF also offers info and support, if you would like to get picked up by a taxi or bus, preferable when you travel in groups, and/or intend to **add a business or private trip** possibly with accompanying persons, please send your requests to forum@efcf.com.

By airplane:

Zurich is the gateway for the annual fuel cell conference of the 6th European PEFC & Electrolyser Forum 2017. Choose **Zurich as your destination**. The Official Carrier SWISS offers special conference rates for convenient direct flights to Zurich from all major locations. From Zurich airport you can take a direct **train to Lucerne**. The train station is below the airport terminal complex, and direct trains leave at 47 minutes past the hour. There are three more trains per hour that require easy changing in Zurich. The pleasant train journey takes a little over 1 hour. Most hotels are within walking distance from the Lucerne train station and the conference location at the KKL.

**We hope you have a pleasant journey and
we look forward to welcoming you in Lucerne!**



European Fuel Cell Forum

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 **SWISS**
Official Carrier

FCH-JU projects DIAMOND & HEALTH-CODE organise

Monitoring, Diagnostics & Control for Fuel Cells

One-Day
Workshop

KKL, Lucerne, Switzerland
July 4, 2017, 9.00-18.00

This workshop will focus on the implementation and use of the technology beyond the project duration. Its objective is to exploit the technology in commercial means after the project ends. The workshop will summarize the progress towards the exploitation by industrial partners and potential customers. In addition, mid-term results achieved by HEALTH-CODE will be shown and discussed as well. The work of more than 30 scientists and engineers from 14 teams will be presented aiming at drafting a coherent scenario for the effective development of monitoring, control and diagnostics methodologies able to improve performance and durability of fuel cells.

Free - Registration required

www.EFCF.com/MDC

MDC@EFCF.com

Supported by

6th European PEFC & ELECTROLYSER Forum





www.diamond-sofc-project.eu



www.fch-ju.eu



www.pemfc.health-code.eu

One Day Workshop on Monitoring, Diagnostics and Control for Fuel Cells

Improving fuel cells performance through innovative diagnosis and control

4 July 2017 – Lucerne (CH)

KKL - European Fuel Cell Forum 2017

venue: www.efcf.com/SE
registration: www.efcf.com/MDCreg
info: MDC@efcf.com

The workshop presents the current status and the most recent advancements concerning research on monitoring, diagnostics and control of both PEMFC and SOFC systems. It is jointly organized by the projects DIAMOND* and HEALTH-CODE.

DIAMOND aims at a substantial improvement of the current performance of SOFC systems for CHP applications to boost their market deployment. Advanced monitoring tools are developed to integrate diagnostic and control functions with the objective of having meaningful information on the current state-of-the-health of the entire system.

HEALTH-CODE focuses on developing advanced monitoring and diagnostic tool for μ -CHP and backup PEM fuel cell systems equipped with air and O₂-fed stacks, respectively. Such a tool is based on the measurement of the electrochemical impedance spectroscopy (EIS) while the stack is running in real configurations. Particularly, EIS allows the identification of FC current status to support the detection of five stack failure modes, as well as inferring on its remaining useful life.

Both projects implement a holistic view over stack and system, enabling advanced management and providing a comprehensive solution to the problem of achieving improved performance and maintenance scheduling, higher reliability and, thus, increased lifetime of PEMFC and SOFC.

The workshop gathers engineers and researchers from industry, academia and research institutions interested in the most recent advancements on monitoring, diagnostics and control tools. A comprehensive overview and the exploitation potential of the projects results are offered to the interested stakeholders and users at various academia, industry and research levels. Emphasis is given to methodological approaches for monitoring and diagnostics that can help achieving reliable performance of both stacks and BoP components. Control techniques, along with their applications for SOFC performance optimization, are also presented.

The workshop will start with an overview of the projects; then, main results will be reported on the experimental activity and on various approaches for monitoring, diagnostics and advanced control. The work of more than 40 scientists and engineers from 14 teams will be presented aiming at drafting a coherent scenario for the effective development of monitoring, control and diagnostic methodologies to improve performance and durability of fuel cells. Guests from industry will bring their knowledge, expertise and perspectives. At the end, an open discussion among the attendants will be set to share experience and draft future paths towards FC improvements via advanced diagnostics and control.

Registration is free of charge; coffee, beverages and lunch will be offered to all guests.

* The project DIAMOND (Diagnosis-aided control for SOFC power systems) has received funding from the EU Seventh Framework Programme (FP7/2007-2013) for the Fuel Cells and Hydrogen Joint Technology Initiative under grant agreement n° 621208.

The project HEALTH-CODE (Real operation pem fuel cells HEALTH-state monitoring and diagnosis based on dc-dc Converter embedded EIS) has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking under grant agreement No 671486. This Joint Undertaking receives support from the EU Horizon 2020 research & innovation programme.



www.diamond-sofc-project.eu



www.fch-ju.eu



www.pemfc.health-code.eu

One Day Workshop on Monitoring, Diagnostics and Control for Fuel Cells

Improving fuel cells performance through innovative diagnosis and control

4 July 2017 – Lucerne (CH)

KKL - European Fuel Cell Forum 2017

venue: www.efcf.com/SE

registration: www.efcf.com/MDCreg

info: MDC@efcf.com

PROGRAM

9.00 – 9.10	Welcome	
9.10 – 9.30	Diagnostics and Control for FC – motivations, challenges and main issues	C. Pianese, UNISA
9.30 – 9.50	Description of project DIAMOND	R. Makkus, HYG
9.50 – 10.10	Description of project HEALTH-CODE	C. Pianese, UNISA
10.10 – 10.30	EIS Characterization of O ₂ -fed PEMFC under fault operations	M.C. Péra, UFC
10.30 – 10.50	Influence of operating and faulty conditions on the EIS spectra of PEMFC-based μ -CHP systems	S. Araya, AAU; P. Moçotéguy, EIFER
10.50 – 11.10	Scaling-up technique for PEMFC EIS, from single cell to stack	P. Polverino, UNISA
11.10 – 11.30	Operation results for DIAMOND advanced configuration, Standard control versus Advanced control	R. Makkus, HYG
11.30 – 11.50	Testing and validation of advanced control and diagnostics for SOFC - not quite business as usual	A. Pohjoranta, VTT
11.50 – 12.10	Model-based design of diagnostic tools for conventional and advanced SOFC systems	D. Marra, UNISA
12.10 – 12.30	Total Cost of Ownership reduction of fuel cell systems thanks to diagnosis and prognosis algorithms	S. Faivre, H2SYS
12.30 – 14.00	Lunch break	
14.00 – 14.20	Health-based control and optimisation of SOFC stack operation	Đ. Juričić, IJS
14.20 – 14.40	State-of-health estimation and prognosis of the remaining useful life in SOFC systems	B. Dolenc, IJS
14.40 – 15.00	EIS and soft computing techniques for the diagnosis of O ₂ -feed PEMFC	M.C. Péra, UFC
15.00 – 15.20	Equivalent Circuit Model-based diagnosis of PEMFC via EIS	P. Polverino, UNISA
15.20 – 16.00	Hardware/software design for on-board fuel cell EIS	G. Petrone, W. Zamboni, UNISA; E. Bianconi, BIT
16.00 – 16.20	Advanced control, diagnostics and monitoring for SOFC, the industry perspective	Industry representative TBC
16.20 – 16.40	Discussion among guests, partners, participants	

Affiliation: AAU, Aalborg University (DK); BIT, Bitron Industrie S.p.A. (I); EIFER, European Institute for Energy Research (D); H2SYS, Hydrogen to System (F); HYG, Hygear (NL); IJS, Jožef Stefan Institute (SI); UFC, University of Franche-Comté (F); UNISA, University of Salerno (I); VTT, technical Research Centre of Finland (FI).

* The project DIAMOND (Diagnosis-aided control for SOFC power systems) has received funding from the EU Seventh Framework Programme (FP7/2007-2013) for the Fuel Cells and Hydrogen Joint Technology Initiative under grant agreement n° 621208.

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Symposium on European Grid Service Markets

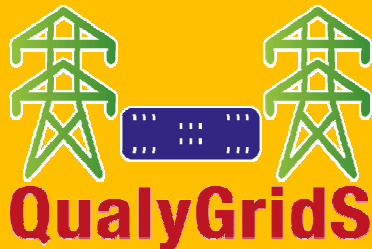
Grid Flexibility & Business

with new Technologies such as Electrolysers
Control reserves, direct marketing, dynamic load
management, virtual power plant, ...

July 6, 2017

9.00-18.00 KKL

Lucerne, Switzerland



The way in which the **electrical energy market** is organized in Europe is changing, opening opportunities for more flexibility in generation and consumption. **New sustainable technologies** for storage and conversion of energy such as water electrolysers, fuel cells, batteries, thermal and compressed air storage systems meet the needs of the **future transmission and distribution grid**.

Registration*

www.EFCF.com/GSM; GSM@EFCF.com

* 50.- CHF for EFCF participants

Symposium only: 350.- CHF incl. refreshments, business lunch, documents, access to exhibition & poster area

Organised by QualyGridS &

6th European PEFC & ELECTROLYSER Forum



Announcement

European Grid Service Markets

Symposium



6th July 2017

KKL, Lucerne Switzerland

**Grid Flexibility & Business
with new Technologies**

**Control reserves
Direct marketing**

Dynamic load management

Virtual power plant

The way how the **electrical energy market** is organized in Europe is changing, opening opportunities for more flexibility in generation and consumption. **New sustainable technologies** such as water electrolyzers, fuel cells, batteries and others meet the needs of the **future transmission and distribution grid**. Flexibility, virtual power plant, dynamic load management, direct marketing, control reserves, grid services are few of the key words addressing this challenge.

08.30	Registration	Prof. Dr. Christoph Imboden, Head Research Group Power Economy, Lucerne University of Applied Sciences HSLU, CH
09.00	Welcome & Introduction	Dr. Regine Reißner, Project coordinator QualyGridS, DLR

Regulations & Markets

09.15	A journey towards pan-European ancillary services	Dr. Bastian Schwark Head of TSO Markets, Swissgrid
10.00	Impact of renewable energies on the balancing market in Belgium	Bob Hebb Head of Ancillary Services, Elia
10.30	Networking Coffee Break	
11.00	Demand side response in the GB market	Thomas Maidonis Storage & Flexibility Expert, National Grid
11.30	Opportunities of water electrolyzers in the European flexibility markets. A report from the FCH ELYntegration research project	Lara Lück Research engineer, RWTH Aachen, DE
12.00	The role of demand side management in the Scandinavian and Baltic countries	Thomas Elgaard Jensen, Dir. Strategic Business Development, Energi Danmark
12.30	Business Lunch on the Terrace of KKL, Coffee in the exhibition & in front of the Club Rooms	

Experience with Business Model

14.00	Chances with Wind in the Grid: How to meet the needs	Giles Dickson CEO at WindEurope asbl/vzw, Brussels BE
14.30	The commercialization of demand side flexibility: A customer journey	Thomas Kudela, Regulatory Manager, Sen. Commercial Developer, DONG Energy, DK
15.00	Application of a Li-ion battery in the frequency containment reserve market	Dr. Marina González Vayá Smart Grid Specialist, EKZ, CH
15.30	Networking Coffee Break	
16.00	Explicit Demand Response in Europe	Jayson Dong, Policy Officer, Smart Energy Demand Coalition Brussels BE
16.30	Economic operation of a water electrolyser - a field report	Dr. Hans Kaspar Scherrer CEO, IBAarau AG
17.00	Summary	Prof. Dr. Christoph Imboden
17.15	Grid-Apéro & FCH JU project exchange meeting	
19.30	Networking Dinner on the Lake (optional, together with EFCF) Boarding 19.20, lake side of KKL pier 5/6 – back 23.15; 22.30 short stop in Brunnen for early return by train	

Registration

On-line: www.EFCF.com/GSMreg

Family Name, First Name:

Institution:

Email:@..... E-mail to: GSM@efcf.com or Fax: +41 43 508 0622

Select: Day Programme	☐ CHF 350.-	} Total CHF -
Dinner on the Lake	☐ Number of tickets at CHF 120.-	



Under the umbrella of the FCH JU project "QualyGridS" www.QualyGridS.eu, by Lucerne University of Applied Science & Arts www.HSLU.ch & European Fuel Cell Forum, high-level event for Fuel Cell, Electrolyser & Hydrogen with tutorial www.EFCF.com.

Similarities & Differences

Fuel Cells - Redox Flow Batteries

Keynotes & Expert Discussions in
Special Session

KKL, Lucerne, Switzerland
July 7, 2017, 10.00-16.00

As electrochemical reactors, Redox Flow Batteries (RFB) display certain similarities with low temperature Polymer Electrolyte Fuel Cells (PEFCs), but also differences. The aim of this special session is to outline these similarities and differences. Leading stakeholders will present their most recent progress in RFB-technologies and its scientific aspects. Participants will profit from this high-level exchange and can contribute their experiences in the field and propose expectations for future common R&D in intensive discussions.

Registration*

www.EFCF.com/RFB; RFB@EFCF.com

* Free for EFCF participants

Special Session only: 250.- CHF incl. refreshments, business lunch, documents, access to exhibition & poster area;



Programme/Speakers - July 7, 2017

Similarities & Differences: FC - Redox Flow Batteries I+II

Chaired by:

Günther G. Scherer (ex PSI)

Olaf Conrad & Jochen Friedl

11.00	PEM Fuel Cells and Redox Flow Batteries Differences, similarities and common problems	Rüdiger Schweiss	SGL Carbon GmbH, Meitingen/Germany
11.30	Methods to limit shunt currents in the Vanadium-Redox-Flow-Batteries (VRFB)	Adam H. Whitehead	GILDEMEISTER energy storage GmbH, Wiener Neudorf/Austria
12.00	Catalytic Properties of Carbon in the All-Vanadium-Redox Flow Batteries (aVRFB)	Jochen Friedl, Ulrich Stimming	School of Chemistry, Newcastle Uni., Newcastle upon Tyne/UK
13.30	All-Polymer Redox Flow Batteries (aPRFB)	Olaf Conrad	JenaBatteries GmbH, Jena/Germany
14.00	Progress in miniaturized Redox Flow Batteries	Patrick Ruch (1), Neil Ebejer (1), Julian Marschewski (2), Lorenz Brenner (2), Kleber Marques Lisboa (2), Dimos Poulidakos (2), Bruno Michel (1)	(1) IBM Research - Zurich, (2) ETH Zürich, Zuerich/Switzerland
14.30	Electrolytes for bromine/bromide cathode in hydrogen-bromine Redox Flow Battery (RFB)	Michael Küttinger, Paulette Loichet, Emeline Meyer, Peter Fischer, Karsten Pinkwart, Jens Tübke	Applied Electrochemistry, Fraunhofer Institute for Chemical Technology, Pfintztal/Germany
14.45	Local characterization and 3D simulation of mass transport issues in Vanadium Redox Flow Batteries	Matteo Zago, Mirko Messaggi, Claudio Rabissi, Andrea Baricci, Riccardo Mereu, Fabio Inzoli, Andrea Casalegno	Politecnico di Milano, Dep. of Energy, Milan/Italy
15.00	Design and up scaling of a AQDS-bromine based Redox Cell	Luigi Crema (1, 2), Simone Amicabile (1), Matteo Testi (1)	(1) Fondazione Bruno Kessler, (2) Green Energy storage, Trento/Italy
15.40	New materials, methods & concepts for Hydrogen Fuel Cells	Hubert Gasteiger	Technical Electrochemistry, Technical University of Munich, Garching/Germany

Summary & Discussion on future common Exchange-Activities FC-RFB

www.EFCF.com/RFB

