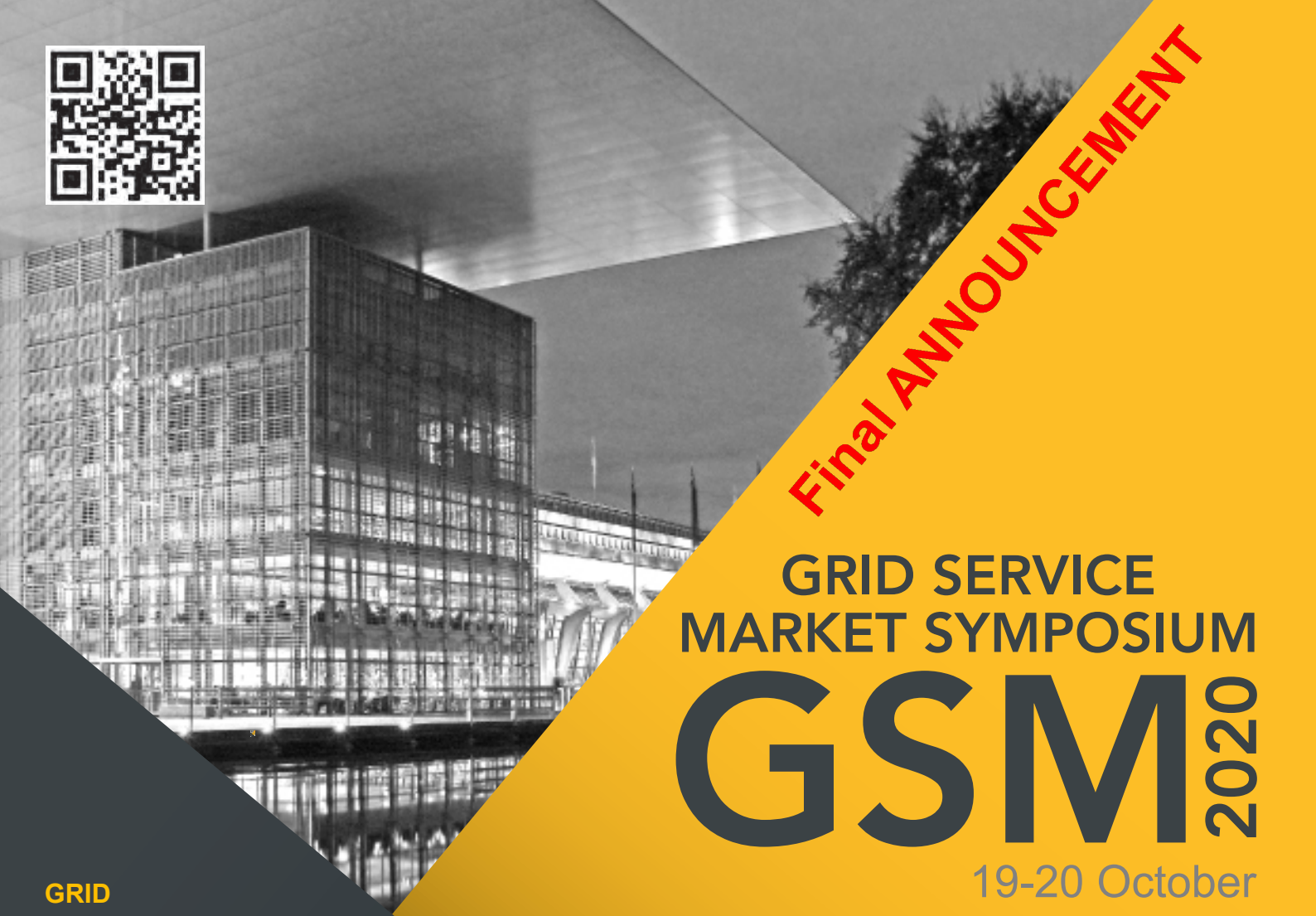


Final ANNOUNCEMENT

GRID SERVICE MARKET SYMPOSIUM GSM 2020

19-20 October
KKL Lucerne, Switzerland

GRID
FLEXIBILITY & BUSINESS

Featuring
Operation & Enabling Technologies
Advanced Technologies providing Flexibility
Market Developments & International Collaborations
VPP joint with PACE
Extended Poster Sessions covering all topics

Networking
GSM Grid Apéro, GSM Network Dinner, EFCF Dinner on the Lake
EFCF - Electrolyser & Fuel Cell Forum conference, exhibition, tutorials

Participating among others
50Hertz Transmission, AG Regenerative Energien Institut für Statik, Amprion, ARERA, Austrian Institute of Technololgy, Austrian Power Grid, CEA Liten, Consentec, Danish Intelligent Energy Alliance, Delta-EE, DENA, Dept. of Energy Politecnico di Milano, DLR - German Aerospace Center, Easy Smart Grid, ENEA, Energinet, Energy Risk Solutions, Entso-E, ETIP SNET, EU FCH Joint Undertaking, EWE NETZ, Forschung Burgenland, Fraunhofer Institute for Manufacturing Engineering and Automation IPA, Fraunhofer Institute for Solar Energy Systems ISE, HEP Trade, INNIO Jenbacher, Lucerne Uni of Applied Sciences & Arts, Nanoenergies, Next Kraftwerke, Offenburg University of Applied Sciences, Politecnico di Milano, PONTON, SOLIDpower, Swiss Federal Inst. of Technology Lausanne, Swiss Federal Office of Energy, Technical Uni of Denmark, Technical University Vienna, Technische Universität Braunschweig, Tennet, The Weather Company, TIWAG-Tiroler Wasserkraft, University of Strathclyde, Verbund Hydro Power, ...

Register with no Risk or participate VIRTUALLY
In case of no show due to Covid restrictions
Reimbursement of the Fees

www.GridServiceMarket.com

GSM 2020

new 19 - 20 October
KKL Lucerne Switzerland

4th Grid Service Market Symposium featuring grid flexibility & business

Chaired by: **Prof. Christoph Imboden HSLU, Lucerne/Switzerland**

GSM SCOPE

www.GridServiceMarket.com/Scope

The electricity market is changing, opening opportunities for more flexibility in generation, storage and consumption. The integration of a large amount of new renewable energy sources poses great challenges for the European electricity grids & markets. Network reinforcement, market harmonisation and integration are solutions and challenges for the various players in the electricity industry. New technologies such as Power to X, Batteries, Demand Side Response DSR, Water Electrolysers, Fuel Cells and others compete or complement each other in terms of technical capabilities and economic performance. The integration of such new technologies and methods, to provide grid services and optimise the use of existing infrastructure, is changing the face of the electricity industry in the long term.

GSM AIM

The 4th GSM-Symposium aims to outline recent developments in the European grid service markets, to highlight advancements and challenges in international cooperation and to reflect the technological progress. In addition, it reports on experiences and success stories, which support a rating of the performance, and future potential of new sustainable technologies.

GSM STAKEHOLDERS

The 4th GSM-Symposium addresses grid and technology experts, scouts and managers from the electricity industry, administration bodies and researchers interested in the commercial aspects of grid services and new technologies. Experts present their contributions to technological advances and propulsive business solutions. The international audience will exchange on market logic, regulations and harmonization activities, future trends, operations, technology capabilities, and long term business plans and other business related aspects of European grid service markets.

Session Program

KKL auditorium

Monday, 19 October

09:00 On-site GSM registration

09:30 G01 OPENING & WELCOME

	G0102	**Welcome by the symposium chair**	Christoph Imboden	Lucerne Uni of Applied Sciences & Arts, Switzerland
	G0103	**Welcome by SFOE**	Stefan Oberholzer	Swiss Federal Office of Energy, Switzerland

09:50 **G02 Market developments and international collaborations I** — Session-chair: **Christoph Imboden**

Key-note	G0201	**EU energy transition – the ETIP SNET roadmap for flexibility Active demand, flexible generation, conversion and storage of energy carriers, network technologies**	Guido Guida	ETIP SNET and Entso-E, Belgium
	G0202	**DSO TSO cooperation: field report from the GOPACS project**	Klaas Hommes	Tennet, Nederland

10:40 Coffee break & poster visit

11:05 **G03 Market developments and international collaborations II** — Session-chair: **NN**

	G0301	**Renewables and their financial risk landscape**	Thomas Kammann	Energy Risk Solutions, Switzerland
	G0302	**Future-proofing the EU energy system towards 2030**	Johannes Henkel	50Hertz Transmission, Germany
	G0303	**Update on the implementation of the European balancing platforms**	David Steber	Amprion, Germany
	G0303	**Loop-flows, redispatch and bidding-zone splits: What's the part of German Energiewende in it?**	Thaddäus Kreisig	Consentec, Germany

12:45 Lunch break and coffee in the poster area

13:30 G04 POSTER SESSION - ALL TOPICS — Session-chair: **Christoph Imboden**

14:15 **G05 Market developments and international collaborations III** — Session-chair: **NN**

	G0501	**Balancing markets and DERs in the Italian regulatory framework: Insights on the UVAM case study**	Arianna Rossi (1), F. Bovera (1), G. Rancilio (1), D. Falabretti (1), A. Galliani (2), M. Merlo (1)	(1) Dept. of Energy, Politecnico di Milano; (2) ARERA, Italy
	G0502	**Flexibility aggregation for ancillary services in the Czech Republic**	Stanislav Chvala	Nanoenergies, Czechia
	G0503	**Implementing better framework conditions for new players in the flexibility market**	Helle Juhler-Verdoner	Danish Intelligent Energy Alliance, Denmark
P	G0504	**Impact of COVID-19 on the demand curves of Croatia and region**	Igor Vidić, Matija Melnjak, Davor Bošnjak	HEP Trade, Croatia
P	G0505	**Integration of voluntary Flexibility at Runtime**	Philipp Graf, Jan Jurczyk, Klaus Nagl	Consolinno Energy, Germany
P	G0506	**Integration of dezentralized flexibility resources in the Austrian electricity market**	Christian Pugl-Pichler, Vaska Dimitrova, Markus Riegler, Christian Todem	Austrian Power Grid AG, Austria

15:25 Coffee break & poster visit

15:50 **G06 Operation and enabling technologies I** — Session-chair: **NN**

	G0601	**Accelerating the European energy transition with digital**	Maher Chebbo	ETIP SNET, Belgium
	G0602	**Impacts of peer-to-peer trading on wind energy curtailment in constrained distribution networks**	Ivana Kockar, Mark Jenkins	University of Strathclyde, United Kingdom
	G0603	**Active distribution grid management: A decentralized approach for the management of flexibility options**	Michael Merz	PONTON, Germany
	G0604	**Simple and efficient implementation of local energy markets**	Thomas Walter	Easy Smart Grid, Germany

17:20 **G07 Operation and enabling technologies II** — Session-chair: **NN**

	G0701	**Options for the implementation of fast control reserves in the Continental European power system**	Alexander Stimmer, Marin Lenz, Manuel Froschauer, M. Leonhardt (1), W. Gawlik, C. Alacs, C. Corinaldesi, G. Lettner (2), A. Anta (3), K. Oberhauser (4)	(1) Austrian Power Grid; (2) Technical University Vienna; (3) Austrian Institute of Technololgy; (4) Verbund Hydro Power, Austria
	G0702	**Improving grid networks operational decision support & vege-tation management practices using Hi-resolution weather models**	Mark Stephens-Row	The Weather Company, an IBM business, United Kingdom
P	G0703	**Benefits of multi-voltage-level grid control in future distribution grids**	Wolfgang Biener (1), Thomas Erge (1), Thomas Kumm (2), Bernhard Wille-Haussmann (1)	(1) Fraunhofer Institute for Solar Energy Systems ISE, Germany; (2) EWE NETZ, Germany
P	G0704	**Forecasting and optimization approaches utilized for simulating a hybrid district heating network**	Lukas Gnam, Christian Pfeiffer, Markus Schindler, Markus Puchegger	Forschung Burgenland, Austria
P	G0705	**Readiness of short-term load forecasting methods for their deployment on company level**	Thilo Walser (1), Martin Reisinger (1), Niklas Hartmann (2), Christian Dierolf (1), Alexander Sauer (1)	(1) Fraunhofer Institute for Manufacturing Engineering and Automation IPA, (2) Offenburg University of Applied Sciences, Germany

18:00 End of sessions

19:30 GSM network dinner (included, guest tickets for 120.- CHF pP available)

Tuesday, 20 October

08:30 On-site GSM registration

09:00 G08 VPP and advanced technologies I — Session-chair: **NN**

Key-note	G0801	**The European market monitor for demand side flexibility**	Phillipa Hardy	Delta-EE, Scotland
	G0802	**How virtual power plants enable renewable grid integration**	Aleksandra Radwanska, Felix Jedamzik, Felix Lober, Jan Aengenvoort	Next Kraftwerke, Germany
	G0803	**Trade with local flexibility to resolve transmission bottlenecks in Denmark**	Thomas Dalgas Rasmussen	Energinet, Denmark
	G0804	**Quartierstrom: a local energy market in practice**	Liliane Ableitner	Exnaton, Switzerland

10:35 Coffee break& poster visit

11:05 G09 VPP and advanced technologies II — Session-chair: **NN**

	G0901	**Converting wastes efficiently and flexibly for grid-balancing services and sector coupling**	Ligang Wang (1), Mar Perez-Fortes (1), Yi Zong (2), Vincenzo Motola (3), Stefan Diethelm (4), Alessandro Agostini (3), Olivier Bucheli (4), Jan Van Herle (1)	(1) EPFL Swiss Federal Inst. of Technology Lausanne, Switzerland; (2) Technical Uni of Denmark, Denmark; (3) ENEA, Italy; (4) SOLIDpower, Italy
	G0902	**SOFC's, fuel flexible, easy to modulate, reversible and future proof!**	Jan-Willem Tolkamp	SOLIDpower, Italy
	G0903	**Opportunities and challenges for water electrolysers to participate in grid services**	Stéphanie Crevon, Valérie Seguin	CEA Liten, France
	G0904	**Panel discussion: business-potentials & technology-challenges**	Speakers & Audience, Moderator	
P	G0905	**Dispatchable renewable distributed power**	Klaus Payrhuber	INNIO Jenbacher, Austria

12:30 Lunch break and coffee in the poster area

13:15 G10 POSTER SESSION - ALL TOPICS — Session-chair: **Christoph Imboden**

14:00 G11 Advanced technologies providing flexibility — Session-chair: **NN**

	G1101	**Perspectives for flexibility in the German electricity system**	Stefan Mischinger	DENA, Germany
	G1102	**Water electrolysers for electricity grid services – dynamics, advantages and disadvantages of different types of electrolysers**	K. Andreas Friedrich, Regine Reissner, Syed Asif Ansar	German Aerospace Center, Instit. of Engineering Thermodynamics, Electrochemical Energy Technology, Germany
	G1103	**Frequency control by run-of-river hydropower: a case study on energetic and economic potentials**	Bastian Hase (1), Christian Seidel (2)	(1) Technische Universität Braunschweig, Germany; (2) AG Regenerative Energien, Institut für Statik, Germany
	G1104	**Hydro storage as enabler of energy transition**	Peter Bauhofer, Michael Zoglauer	TIWAG-Tiroler Wasserkraft, Austria
	G1105	**Opportunities for CHP plants providing flexibility**	Filippo Bovera	Politecnico di Milano, Dipartimento di Energia, Italy
P	G1106	**Renewables delivering capacity reserves in Denmark**	Thomas Dalgas Rasmussen	Energinet, Denmark
P	G1107	**Flexibility options through coupling of electric waste collection vehicles and waste treatment plants**	Lina Taube, Florian Biedenbach, Fabian Schmid, Jenny Rieck, Frank Behrendt	Technische Universitaet Berlin, Germany

15:55 CLOSING

	G1108	**Fuel cells and hydrogen on the path to service market**	Bart Biebuyck, Mirela Atanasiu tbc	EU FCH Joint Undertaking, Belgium
	G1109	**Summary & GSM award "Audience Award"**	Christoph Imboden (1), Michael Spirig (2), Olivier Bucheli (2)	(1) Lucerne Uni of Applied Sciences & Arts, (2) European Fuel Cell Forum AG, Switzerland

17:00 End of sessions & end of official part of GSM Symposium

Networking possibilites on Thesday evening
17:00 GSM grid apéro in the EFCF exhibition area, optional booth visits (free)
18:00 EFCF welcome reception free, offered by EFCF
19:30 GSM+EFCF joint dinner tickets for 90.- CHF, to be booked in advance by email to Info@GridServiceMarket.com

Fees:

		Participation live in Lucerne	Virtual
All Days* :	Students, Trainees, Unemployed	**400.- CHF**	**170.- CHF / 160.- €**
	Academic Staff, Government, Industry, Trade	**800.- CHF**	**350.- CHF / 320.- €**
Single Day*:	19 October 2020 (Mo)	**490.- CHF**	--- book All Days
	20 October 2020 (Tu)	**390.- CHF**	--- book All Days
	VPP Panel only (20 Oct, incl. Lunch)	**200.- CHF**	**85.- CHF / 80.- €**
	*From 1 Sept	+100.- CHF	

www.GridServiceMarket.com/**Registration**

Register with **No Risk:** In case of no show due to CoVid restictions the full reimbursement of the onsite fee is guaranteed.

VAT is included, where applicable. 1CHF =1.1$ =0.92€ =115Yen

Special offers** to join EFCF 2020 on Wednesday, 21 October

08:00 on-site registration open
09:00 EFCF 2020: first morning session block >>>>>>>>>>>>>>>>>> A01+A02: **Opening, Overviews of EU, US, Japan, China**
10:30 networking coffee break — A03: **Technology status at industry & major groups I**
12:30 lunch on KKL Terrace — A04: **Poster session & exhibition visit** (free)
13:15 EFCF 2020: afternoon session block >>>>>>>>>>>>>>>>>> A05: **Technology status at industry & major groups II**
16:00 networking coffee break — A06: **Products & demonstrations**
18:30 EFCF Swiss surprise night (registered participants meet at station-side KKL entrance, to be booked by email in advance)

	Participation live in Lucerne	Virtual
half Day 150.- CHF	mornig session block A01-A03, lunch not included	--- book All Days
full Day 500.-CHF	all sessions A01-A06, F+B, networkings, documents	--- book All Days

all 3 days 21-23 October

08:00 on-site registration open
09:00 EFCF 2020: conference, poster area & exhibition incl. breaks, documentation, lunch, dinner on the lake
Find all program & event details in the **final announcement** on: www.EFCF.com/FA

Complete EFCF event	Participation live in Lucerne	Virtual
Students, trainees, unemployed	**700.-CHF**	**300.- CHF / 280.- €**
Academic staff, government, consultant	**1'200.-CHF**	**520.- CHF / 480.- €**
Industry, trade & commerce	**1'800.-CHF**	**520.- CHF / 480.- €**

VAT is included, where applicable.
Requests: www.EFCF.com/Services, Info@GridServiceMarket.com

**Only for GSM participants are special tickets available. Book them on-line or on-site (--> on-site fee applies)

www.GridServiceMarket.com

EFCF

www.EFCF.com

The European Fuel Cell Forum is an international reference conference with exhibition & tutorials in the emerging field of "fuel cells, electrolysers & H_2 processing".
Since 1994 it took 24th times place in Lucerne/Switzerland.

Figures participants:

> **GSM/VPP** panel this year up to 200 participants expected;
> **EFCF between 350-550 participants and 25-35 exhibitors**
> **EFCF tutorial 30-40** participants:
- **FCH** fuel cells, electrolysers & hydrogen (kick-start) 20
- **EIS** electrochem. impedance spectroscopy (advanced) 25

The GSM symposium is supported by funds from the **European FCH program**, www.PACE-energy.eu and the **Swiss Federal Office of Energy SFOE** www.bfe.admin.ch

GSM 2020

NEW DATE

KKL Lucerne, 19-20 Oct

Grid Service Market Symposium

featuring: Grid Flexibility & Business

Invited Speakers

&

Presentations

with special VPP Panels

EU ENERGY TRANSITION: THE ETIP SNET ROADMAP FOR FLEXIBILITY

Keynote G0201

(active demand, flexible generation,conversion and storage of energy carriers, network technologies)

Guido Guida, *Chairman, ETIP SNET c/o Zabala Innovation Consulting, Belgium*

www.ZABALA.eu

In order to ensure an affordable, secure, effective and cost-efficient transition of the European energy system, a System of Systems View of all sectors in the European economy must be applied and a strong coordination of policy initiatives both at EU and at Member States level is essential. Moreover, a sustainable energy transition requires renewed efficient energy markets that provide a level playing field for all stakeholders involved, non-discriminatory open access and preclude cross-subsidies.

In this framework, an increase of flexibility of the system should be ensured through policies, measures and regulations compatible with further market integration and increased competition in order to achieve climate and energy objectives. In order to rely on much higher balancing capacities, the future energy system will be coupled and optimised as one overall “Integrated Energy System”. In this new overall context, digitalization will play a key role as enabler.

The ETIP SNET R&I roadmap 2020-2030 is based on a consolidated and balanced stakeholders’ view for the future R&I needs of the Integrated Energy System with electricity as its backbone. It considers the encompassing interaction among the different energy vectors (i.e. electricity, gas, heating and cooling, transport, water, communication etc.), addressing the flexibility needs and the related conversion and storage technologies and solutions towards integration and decarbonisation.

Guido Guida is chairman of the European Technology and Innovation Platform for Smart Networks in Energy Transition (ETIP SNET). He is also Head of Terna Office in Brussels, the Italian Transmission System Operator (TSO) for electricity, is Member of ENTSO-E’s Board of Directors since July 2019 and Chair of the Digital committee. A prominent figure in the energy sector, with an experience of more than 25 years, he has been, till July 2018 the Head of Italian Dispatching Department of Terna, a company in which he has covered several key positions. During this period, he managed several projects aimed to contribute to the integration of Renewable Energy Source within the Italian electrical system, strength TSO-DSO cooperation and the development of Storage Systems. He has been involved in ENTSO-E activities since its creation. He was Member of the Market Committee representing Terna since the beginning of ENTSO-E and the Chair of the Research Development & Innovation Committee till July 2019.

DSO TSO COOPERATION: FIELD REPORT FROM THE GOPACS PROJECT

G0202

Klaas Hommes, *Business Developer System Operations, TenneT TSO B.V., The Nederlands*

www.TENNET.eu

GOPACS - Grid Operators Platform for Congestion Solutions - is a unique cooperation between Dutch TSO and DSO's to solve congestions in the electricity grid. GOPACS is an important step to mitigate capacity shortages in the electricity grid(congestion) and thus contribute to keeping the Dutch grid reliable and affordable.
The energy transition and economic growth require capacity increase of the electricity grid. The grid operators are working hard on increasing this electricity grid capacity to be able to meet the growing demand. However, this cannot be realised overnight. Making use of flexible power from the market can contribute to solving (expected) congestion in the electricity grid. This is where the new GOPACS platform comes in.

GOPACS works in a way that is consistent with key European directives that relate to market-based mitigation of grid congestion and offers large and small market parties an easy way to generate revenues with their available flexibility and contribute to solving congestion situations. The collaboration among the grid operators also prevents congestion in one part of the electricity grid from causing problems elsewhere in the electricity grid at one of the other grid operators.

Klaas Hommes (1967) is an expert on the Dutch utility sector, he has over 25 years of experience in a broad variety of (management)functions. He has joined TenneT TSO B.V. twelve years ago and joined the System Operations Department (International Developments) as Business Developer.

In 2008 he was one of the participants in developing the congestion management sceme in Westland, which has been used from December 2008 until July 2010. Since 2008 Klaas is working as Business Developer and has been involved in issues as Smart Grids, European Market Design, Data Exchange, Integration of Renewables, Electrical vehicles and more innovative issues. Currently Klaas is working on international projects on Frequency Products and data Governance in the Netherlands.

Previously Klaas worked as a manager for Essent, RWE and NUON. Before joining TenneT Klaas worked for Capgemini as Managing Consultant.

RENEWABLES AND THEIR FINANCIAL RISK LANDSCAPE G0301

Thomas Kammann, *Managing Director, Energy Risk Solutions, Switzerland,* www.ENERGY-RISK-SOLUTIONS.com

Financing renewable investments is often highly leveraged and thus depending on predictable cash flows. Cash flows are a product of energy price and produced volume. In the past price was a quite predictable component and volume could be hedged with weather derivatives. This stable constellation granted also investment security for grid infrastructure. Meanwhile on the price side mandatory auctioning systems, cannibalization effects and currently overloaded grids present a challenge for renewable investors whom however are required to reach ambitious European targets. A more stringent alignment of generation and grid investments is absolutely necessary.

Almost 30 years' experience in European and global energy industry. Covered segments:

- *Founding Energy Risk Solutions in 2016*
- *Director of global financial power, gas and weather markets at Swiss Reinsurance with focus on renewables*
- *Head of European gas and coal markets trading at Alpiq*
- *German and Eastern European gas markets origination at Wintershall*

Future-proofing the EU energy system towards 2030 G0302

Johannes Henkel, *Head of Energy Market Development, 50Hertz Transmission, Germany* www.50HERTZ.com

In the presentation, a new amendment for market design is presented. The development is based on market simulations for 2030. The simulation also allows for investigating the impacts of this new market design amendment.

Dr. Johannes Henkel had studied Energy & Process Engineering at Berlin University of Technology until 2006. He completed his PhD in Energy Economics also at Berlin University of Technology. He collected professional experience at Institute of Energy and Environmental Research, Heidelberg/Germany, Instituto de Planificación y Promoción de Soluciones Energeticas, Bogotá/Colombia as well in the Analysis and Consulting Company Energy Brainpool, Berlin/Germany. In the later he worked as an advisor for companies, institutes & political institutions of the German & international Energy Sector.

UPDATE ON THE IMPLEMENTATION OF THE EUROPEAN BALANCING PLATFORMS ACC. TO THE ELECTRICITY BALANCING GUIDELIN

G0303

David Steber, *Expert for Control Reserves and Balancing, Amprion, Germany* www.AMPRION.net

The presentation provides a detailed view of the target model for European balancing markets. In particular, it focuses on the different balancing processes and briefly describes the legal framework of the European balancing target model. The presentation gives an overview of the implementation of the EB Regulation with regard to the European Balancing Platforms and report on the progress made concerning the integration of balancing markets in Europe.

Dr. David Steber studied Business Administration & Engineering with specialization in electrical power engineering at the RWTH in Aachen. After that he started his doctorate in the field of simulation of energy systems at University Erlangen-Nürnberg. His dissertation was about the 'Integration of Decentralized Battery Energy Storage Systems into the German Electrical Power System' by aggregating residential PV-Storages and offering them on the FCR market. In late 2019 he started working as an Expert for Control Reserves and Balancing in the Transmission System Operation Department of Amprion GmbH.

LOOP-FLOWS, REDISPATCH AND BIDDING-ZONE SPLITS: WHAT'S THE PART OF GERMAN ENERGIEWENDE IN IT?

G0304

Thaddäus Kreisig, *Consultant, Consentec, Germany* www.CONSENTEC.de

Germanys Energiewende increases necessary electricity transmission in the power system, which leads to additional loop flows through neighboring bidding zones. Loop flows also effect market-based and physical flows on neighboring interconnectors, thus, raising the question of which flows should be allocated. European regulation addresses the conflict of priority access of RES electricity on the one hand and non-discrimination of international trade on the other hand within the Clean Energy Package (CEP).

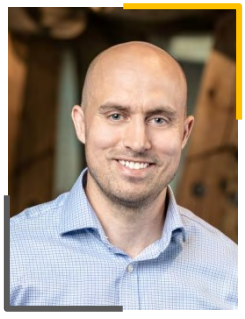
Mr. Kreisig will discuss instruments of the CEP relevant in this context, such as minRAM, cross-border redispatch and bidding zone configuration.

Thaddäus Kreisig joined Consentec in 2017. He holds a M.Sc. in Business Administration and Engineering from RWTH Aachen, with a particular emphasis on Electrical Energy Technology. At Consentec he was engaged with model-based studies regarding the European power market design including capacity allocation pursuant to the CEP as well as future system adequacy.

FLEXIBILITY AGGREGATION FOR ANCILLARY SERVICES IN THE CZECH REPUBLIC

G0502

Stanislav Chvala, *CEO, Nanoenergies, Czechi* www.NANOENERGIES.cz



Nano Energies together with Czech TSO, Czech Technical University and municipality of Prague are building a framework for flexibility aggregation for ancillary services in the Czech Republic. The concept is tested on the demand-response type of flexibility providers, both industrial and public.

Stanislav Chvala is CEO of Czech company Nano Energies. Since 2018 he has directed the company towards accomplishing its vision of shared sustainable energy through creating new products for retail customers, expanding activities of the company to new markets and establishing partnerships across all industries. He has previously worked in the energy sector in Czechia and the UK and in banking.

IMPLEMENTING BETTER FRAMEWORK CONDITIONS FOR NEW PLAYERS IN THE FLEXIBILITY MARKET

G0503

Helle Juhler-Verdoner, *Managing Director, Danish Intelligent Energy Alliance, Denmark* www.DANSKENERGI.dk

Implementing the EU Clean Energy Package (CEP) enhances the role of the independent aggregator. In the Danish context we have developed models for aggregators to improve framework conditions for commercial players including the independent aggregators, beginning before the CEP. The CEP is speeding up implementation of the Danish models which also includes other elements that will influence the value stream of demand side flexibility in the flexibility business case. Hence, the presentation will focus on implementing the independent aggregator in the Danish market models, but also address impact of Danish development of time-of-use tariffs and development of local flexibility markets.

Helle Juhler-Verdoner has more than 25 years' experience within advocacy towards policy-makers and other stakeholders, including public affairs activities. Since 1998 focussing on Energy and Climate change.
2014 – today: Managing the Danish Intelligent Energy Alliance. The main strategic focus of the Intelligent Energy Alliance is to improve framework conditions for business activities which activate flexibility /demand response in electricity consumption, and pave the way for optimal use of resources across the utilities providing power, heat, gas, Water and Waste/Waste Water treatment in Denmark

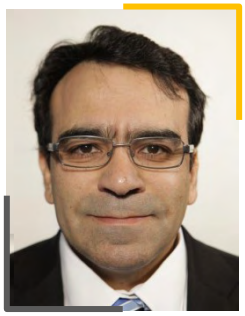
December 2008 – 2013: Vice President, Global Affairs, Alstom Power. Engaging pro-actively with stakeholders, thereby building a position for ALSTOM in different international fora with particular focus on UNFCCC negotiations, the annual climate summits (the COPs), incl. climate finance, carbon market development and technology transfer.

December 1998 – November 2008: Head of unit, Energy and Climate change, Confederation of Danish Industries. Managing the unit responsible for CDI's advocacy activities within climate change and energy policies on national and EU level.

ACCELERATING THE EUROPEAN ENERGY TRANSITION WITH DIGITAL

G0601

Maher Chebbo, *Co-Chair, ETIP SNET, Belgium* www.CTECHNOLOGYS.com



- Role of the Digitalization in accelerating the Energy transition roadmap towards a decarbonized EU 2050
- Digital technologies required and use cases across the energy value chain, generation, grid, retail and customers.
- Role of Digital platforms in the democratic, simple & usable access to Energy for all customers.

- *Co-Chair of the ETIP SNET Digital Energy Group*
- *Chair of the ETIP Batteries Europe Digital Task Force*
- *Chair of the Board of REEEP (Renewable Energy & Energy Efficiency Partnership)*
- *30 years' Digital Energy & Industries Senior Executive experience at Cap Gemini (6), SAP (21) & GE (3)*
- *Founder & President of Chebbo Technology Services, supported by GE & focusing on advising fast growth technology companies & Strategic Digital Energy Ventures*

SIMPLE AND EFFICIENT IMPLEMENTATION OF LOCAL ENERGY MARKETS G0602

Thomas Walter, *Founder & Managing Director, Easy Smart Grid, Germany* www.EASYSG.de

Short Energy flexibility of prosumer equipment like CHP, heat pumps and electric vehicles can provide low cost storage (virtual batteries) to compensate for growing RE volatility and reduce grid congestion. Combining the well-known principles of the Walrasian Auctioneer (Economics) and Georg Kirchhoff (Physics) enables dynamic tariffs that are both economically efficient and reflect grid needs. We will report on first results of a pilot project and other areas of application. text

Dr.-Ing. Thomas Walter studied Electrical Engineering (specialization Telecommunications) at TH Karlsruhe (now KIT) and the University of Essex (1982), later earned a PhD on automation from RWTH Aachen (1989).
From 1983-89 he worked for Cambridge Consultants (Cambridge/UK and Offenburg/D) developing innovative technology for various sectors, followed by a role as product manager digital video recorders and assistant to the CEO at Philips BTS in Darmstadt (1989-93).

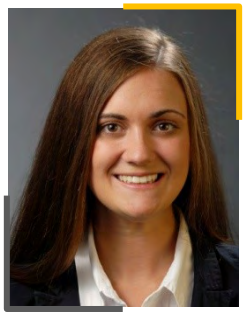
1994-2000 he managed a team at the in-house consulting company of Dresdner Bank (Frankfurt) on company restructuring in former Soviet Union and Bank support services.

2000-2011 he worked in Business Development at Altran Technologies (Frankfurt) developing business in high technology and the automotive industries with >25 direct reports and a role as Associate Director of the group.

2011-2014 he founded and led Wirsol Integrated PV Solutions (Wsghäusel/D) as a subsidiary of Wirsol Solar AG. Due to the PV crisis in 2014 he left Wirsol and founded Easy Smart Grid, which in 2014 was voted one of 3 Top smart Energy companies in Europa by EIT Digital, and has been running this company since.

QUARTIERSTROM: A LOCAL ENERGY MARKET IN PRACTICE G0703

Liliane Ableitner, *Co-Founder & CEO, Exnaton, Switzerland* www.EXNATON.com



Local energy markets are a widely-discussed approach to managing distributed energy supply. They allow households to buy renewable electricity directly from their neighbors' energy sources (e.g. solar panels) in times when these have surplus electricity available. The talk presents lessons learned from the real-world field test of Switzerland's first local energy market. In the Quartierstrom research project, we designed, developed and deployed such a market in the town of Walenstadt, SG. We report on the technical infrastructure required, the market mechanism behind Quartierstrom and on the users' readiness for local energy markets.

Dr. Liliane Ableitner studied information systems and holds a PhD from ETH Zurich. Her research focus was on consumer technology that promotes energy efficiency. She contributed to the success of the Quartierstrom project with the user experience design, front-end development, and user testing. Today, she is a co-founder of the startup Exnaton specialized on software for distributed energy.

THE EUROPEAN MARKET MONITOR FOR DEMAND SIDE FLEXIBILITY

Keynote G0801

Phillipa Hardy, *Principal Analyst, Delta-EE, Scotland*

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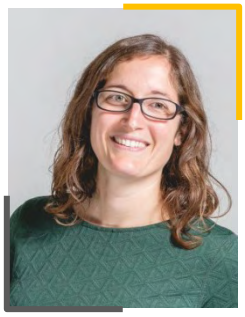


The European Market Monitor for Demand Side Flexibility, published in 2019 in association with SmartEn, provides a holistic and independent view of the progress of Demand Side Flexibility across 21 European markets. The findings from our primary research in each market provides a high-level summary of the current market activity. This will enable industry to benchmark disparate markets against each other and track their progress on demand side flexibility.

Philippa has been working in the low carbon energy sector for over 10 years. She is passionate about demand-side flexibility as a key technology to enable the energy transition. This led to her creating the Flexibility Research Service at Delta-EE, which provides clients with primary research and advice on demand side flexibility markets, business models, technology, competitors and key issues impacting this space.

Philippa currently leads the development of Delta-EE's Flexibility & Energy Storage Research Services, working with the team to develop our knowledge area, support our clients and continuously improve our services. She is responsible for managing current client relationships and leading business development for both services. Philippa holds a PhD in Engineering (specialising in Solar PV), and has a background in science and engineering with a MSc (Distinction) in Low Carbon Technologies, and a MSc (Distinction) in Energy and Environmental Engineering, from the University of Leeds.

TRADE WITH LOCAL FLEXIBILITY TO RESOLVE TRANSMISSION BOTTLENECKS IN DENMARK

G0803

RENEWABLES DELIVERING CAPACITY RESERVES IN DENMARK

Poster **G1106**

Thomas Dalgas Rasmussen, *Energy Engineer, Energinet, Denmark*

www.ENERGINET.dk

G0803: The Danish TSO Energinet must be able to handle the expansion of new renewable capacity and electrification of consumption. In 2019 the wind-share of the total Danish electricity consumption was 47 %, while PV's covered 3 %. In 2030 the RE-share of the electricity consumption must be 100 %. RE on market conditions makes it difficult to predict and plan the development of the energy system. Currently, grid enhancement is the basic solution as the Danish balancing markets don't allow for efficient internal congestion management. Energinet is working towards enabling trade with local flexibility to enable short term congestion management to resolve local bottlenecks and give longer term incentives to invest in controllability and optimal grid locations for new production and consumption units. The concept for trade with local flexibility in Denmark is currently being tested in a pilot project.

G1103: The Danish TSO Energinet procures reserves to be able to handle significant outages and to balance the power system. To ensure balance and stability in the grid at reasonable cost, Energinet is investigating the possibility for RE to deliver capacity reserves on equal terms as i.e. power plants and consumption. In 2019 the wind-share of the total Danish electricity consumption was 47 %, while PV's covered 3 %. In 2030 the RE-share of the electricity consumption must be 100 %. Hence, the capacity and hours of operation of the conventional providers, thermal power plants, are rapidly decreasing. Procurement for availability of reserves is performed the day before operation. If RE is to deliver reserves, it will require high quality forecasts to ensure available capacity to the reserve markets. Hence, Energinet is currently testing the regulating functionalities of RE and the certainty of forecasts and developing baselines for audit of the actual reserve delivery.

M.Sc. Energy Engineer at Energinet in the department of Flexibility & Ancillary Services since 2016.

- *Developing technical requirements and markets for reserves based on the needs of the synchronous areas.*
- *Implementing EU requirements in national codes, testing, prequal. and monitoring of units.*
- *Leading Danish TSO-DSO collaboration to enable trade with local flexibility to resolve local bottlenecks.*
- *Enabling flexible consumption and RE to provide ancillary services.*

SOFC'S, FUEL FLEXIBLE, EASY TO MODULATE, REVERSIBLE AND FUTURE PROOF! G0902

Jan-Willem Tolkamp, *Business Development Manager, SOLIDpower, Italy* www.SOLIDPOWER.com

Buildings account for 30% of total carbon emissions. Electrification is thought to be one of the best ways to tackle this, but will we have enough renewable power to pull this off? With about 1000 hours of sun and 3000 to 4000 hours of wind we can only cover half of the year's real time electric demand in western European countries. The other half of the year, renewable power needs to come from storage. Batteries are a partial solution, but Hydrogen is likely to be the best answers to this large seasonal challenge and can be stored in our already available, slightly adapted, gas-infrastructure. To make this all happen, we will need the most efficient conversion technologies available. Solid Oxide Fuel cells will play a major role in this cycle of renewable storage in Hydrogen, and turning it back to power again the moment we need it. At the same time this will allow power grid-operators to manage congestion and imbalance issues, whilst gas-grid operators will keep their high value to society and their jobs. In this presentation all benefits of SOFC technology will be elaborated with practical examples taken from the challenges described above.

Jan Tolkamp is responsible for business development and sales in the UK, Benelux and potential new EU markets for SOLIDpower Fuel cells. He started to build up a distribution- and sales network there since June 2012. With his degree in automotive engineering and business- administration he has held several commercial positions at mostly high-tech OEM companies.

Renewable energy has always been a leading topic in his career, starting with engine-driven generator sets, automotive- alternative fuels CNG- and Hydrogen applications, via Solar-PV, back into Fuel cells again (now stationary SOFC and SOE).

After leading the international Sales team for Building integrated PV at the Dutch Solar-PV manufacturer Scheuten Solar, he decided to continue his renewable energy career with Ceramic Fuel cells, now SOLIDpower. With its offices in Heinsberg (G), Mezzolombardo (IT), Yverdon (Sz) and Melbourne (AU) it perfectly fit's the international environment Jan likes to work in.

PERSPECTIVES FOR FLEXIBILITY IN THE GERMAN ELECTRICITY SYSTEM G1101

Stefan Mischinger, *Team Leader Electricity Grids, DENA German Energy Agency, Germany* www.DENA.de

Flexibility is a key to reach the climate goals. The presentation will give an overview why Energy Transition needs flexibility, where flexibility potentials in the electricity grid arise due to Energy Transition, why grid-friendly flexibility use makes economic sense and where the regulatory framework in Germany need to be adapted in order to motivate grid-friendly flexibility use.

Stefan Mischinger is leading the electricity grids team of the German Energy Agency (dena) since 2017. In this context he is managing multi-stakholder projects regarding grid planning, grid operation and regulation. Actual projects are the dena Grid Study III, the dena Ancillary Services Plattform and the Netzflex Initiative.

Before Stefan Mischinger started working as an expert at dena in 2013 he was working from 2010 to 2013 as an research associate at the Chair for Sustainable Energy Networks and Sources of Energy of TU Berlin.

WATER ELECTROLYSERS FOR ELECTRICITY GRID SERVICES – DYNAMICS, ADVANTAGES AND DISADVANTAGES OF DIFFERENT TYPES OF ELECTROLYSERS G1102

K. Andreas Friedrich, *Professor at Uni Stuttgart, Head of Electrochemical Energy Technology Department, German Aerospace Center (DLR), Germany* www.UNI-STUTTGART.de www.DLR.de

Water electrolysers are expected to play an important role in the strategy of EU for decarbonization. With an increasingly renewable-energy fed grid they can produce hydrogen for application in transport and industry replacing in these sectors CO2-emitting technologies. They can also help stabilizing the grid and provide energy storage via hydrogen production and electricity production from hydrogen.

The mature and robust technology of alkaline electrolysis, used up to megawatt size for decades, is often believed to be ill suited for fast dynamics. Just approaching systems commerciality in the megawatt size is the technique of PEM (polymer electrolyte membrane) water electrolysis which is characterized by its capability of dynamic operation. Still with the demonstration in 100s of kilowatt size is the technique of high temperature solid oxide electrolysis. It may reach very high electrical efficiency and has been demonstrated for reversible operation, i.e. the option of either consuming electricity and producing hydrogen (electrolysis) or consuming hydrogen and producing electricity (fuel cell).

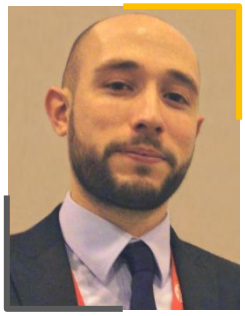
Grid services as supplied to TSO (transmission system operators) and DSO (distribution system operators) were investigated in the project QualyGridS and transferred into testing protocols for electrolysers performing grid services. In this application the electrolyser offers its operational flexibility as a power consuming load to achieve improved revenues. The properties of the different electrolyser technologies are reviewed in this contribution. Modern alkaline electrolysers show their suitability even for fast grid services. They as well as PEM electrolysers need an update in their control system to adapt them to grid services requirements. Based on the lessons learned from QualyGridS this contribution will discuss also the suitability of high temperature SOEC technology for grid service based on present knowledge and technology.

Dr. K. Andreas Friedrich is a Professor of Mechanical Engineering at University of Stuttgart and the Head of the Electrochemical Energy Technology Department at the German Aerospace Center (DLR) in Stuttgart, Germany. His research areas are electrochemical energy conversion and storage, in particular polymer electrolyte fuel cells and electrolysis, solid oxide cells, system design and optimization.

Dr. Friedrich has authored and coauthored about 220 reviewed papers. He received the Fischer medal (Dechema) in 2009 and the Ertl prize 2014 for his scientific work. In 2004 he joined the DLR and University of Stuttgart heading the group at DLR focusing on electrolysis, fuel cells and advanced batteries. Priorities are polymer membrane and solid oxide technology as well as "beyond Li-ion" technology in batteries. The activities of the group have received the f-cell Award in Silver 2016 for electrolysis components, the Clean Tech Media Award 2012 (Aviation) and the f-cell Award in Silver 2008 (DLR with Airbus).

OPPORTUNITIES FOR CHP PLANTS PROVIDING FLEXIBILITY G1105

Filippo Bovera, *Politecnico di Milano, Dipartimento di Energia, Italy* www.ENERGIA.POLIMI.it

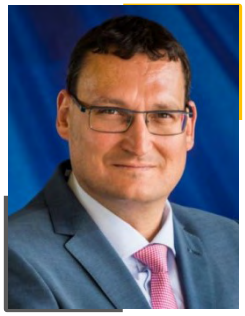


Assessing the economic opportunities coming from the Ancillary Service Market (ASM) participation for Distributed Energy Resources (DERs) is a key aspect to orientate private investments in an economically and environmentally sustainable way within the future energy framework. The presentation will highlight the influence that the Italian dispatching reform currently in place could have on the sizing and operation phases of a Combined Cooling, Heat and Power plant in an industrial context. It will be shown how operators can give a value to flexibility services through market data analysis and which is the technical and economic impact on power plants operations.

Filippo Bovera is a Ph.D. student in Electrical Engineering at Politecnico di Milano, where he obtained a M.Sc. in Energy Engineering cum laude focusing on sustainability and distributed generation. His research activity involves optimization models for distributed energy resources management and statistical models for energy market simulation.

FUEL CELLS AND HYDROGEN ON THE PATH TO SERVICE MARKET G1106

Bart BIEBUYCK, *Executive Director, EU FCH Joint Undertaking, Belgium, tbc* www.FCH.europa.eu



The Fuel Cells and Hydrogen Joint Undertaking (FCH JU) is a unique public private partnership supporting research, technological development and demonstration (RTD) activities in fuel cell and hydrogen energy technologies in Europe. Its aim is to accelerate the market introduction of these technologies, realising their potential as an instrument in achieving a carbon-clean energy system.
Fuel cells, as an efficient conversion technology, and hydrogen, as a clean energy carrier, have a great potential to help fight carbon dioxide emissions, to reduce dependence on hydrocarbons and to contribute to economic growth. The objective of the FCH JU is to bring these benefits to Europeans through a concentrated effort from all sectors.
Hydrogen can be produced from a broad range of renewable energy sources, acting as a unique energy hub providing low or zero emission energy to all energy consuming sectors. Technically and efficiently producing hydrogen from renewable sources is a key enabler for these developments.
The way how the electrical energy market is organised in Europe is changing, opening opportunities for more flexibility in generation and consumption. New sustainable technologies such as water electrolysers, 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.

Bart Biebuyck is since 16th May 2016 the Executive Director of the Fuel Cells and Hydrogen Joint Undertaking (FCH JU), a public-private partnership aiming at facilitating the deployment of fuel cells and hydrogen technologies in Europe. Under his leadership, a strong emphasis on cooperation with cities and regions led to the creation of the European Hydrogen Valleys partnership with around 40 European regions. Dissemination of project results, building technology awareness and enhanced basic research became his key focusing points.

Before the FCH JU, Bart Biebuyck was at the Fuel Cell department of Toyota Motor Europe where he held the position of Technical Senior Manager. His expertise in the automotive industry includes extensive knowledge related to the deployment of new technologies in the European market. It is as part of the Clean Energy Partnership (CEP) program in Berlin that Bart worked at reinforcing European trials for the Toyota Fuel Cell Vehicle. He also had the opportunity to develop and expand his expertise in Japan, where for two years he worked on the development of Toyota and PSA's small vehicle.

In addition to his industrial experience, Bart has been politically active in his local town since 2006. In 2013 he became the vice president of the City Council, responsible, among others, for the local economy and education. Bart's term as the Executive Director of the FCH - JU was extended for four years until 15 May 2023.

CHAIR of the GSM symposium

Prof. Christoph Imboden

Lucerne University of Applied Sciences www.HSLU.ch
Institute for Innovation and Technology Management
Competence Center for Power Economy

Christoph is professor for product innovation at the Lucerne University of Applied Sciences HSLU and Head of Research at the Institute for Innovation and Technology Management. He is engaged in several research projects focusing on power economy.
He studied electrical engineering at the ETH Zurich, received his doctorate in 1995 and an executive MBA at the University of Zurich in 2006. He looks back to more than twenty years of industrial experience in different application areas of the energy, communication and information technologies.

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GSM VPP Panel has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking under grant agreement No 700339. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme.

Organised by

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