INVITATION

Session Program

Physical & Virtual Access

Invited Speakers

# GRID SERVICE MARKET SYMPOSIUM

# GSM 2022

**KKL, Lucerne 4 – 5 July**

**SWITZERLAND**

## GRID FLEXIBILITY & BUSINESS

Featuring

G01 **International Collaboration**

G03-G04 **Flexibility Provision & Exchange I + II**

G05 **Advanced Technologies providing Flexibility**

G06 **Future of Grid Service Markets**

G08 **Enabling Technologies**

www.GridServiceMarket.com

# GSM 2022

Lucerne 4 - 5 July

Switzerland

# INVITATION

## 6th Grid Service Market symposium featuring Flexibility & Business

**Chaired by: Prof. Dr. 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 6th 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 6th 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, 1st floor**

### Monday, 4 July

| | | | | |
|---|---|---|---|---|
| **11:00** | **On-site GSM Registration** | | | |
| **12:00** | **G01** | **Opening & Welcome** | **Presenter** | **Organisation** |
| | G0101 | **Welcome by the Symposium Chair** | Christoph Imboden | Lucerne Uni of Applied Sciences & Arts, Switzerland |
| | G0102 | **Welcome by SFOE** | Michael Moser | Swiss Federal Office of Energy, Switzerland |
| **12:20** | **G01** | **International Collaboration** | | **Session-chair: Bastian Schwark** |
| | G0103 | **Learnings from ISGAN and Future Power Systems** | Charmalee Jayamaha | Energy Systems Catapult, UK/ISGAN |
| | G0104 | **The Contribution of Smart Energy to Stable Grids** | Stefan Doerig | SmartEn, Belgium |
| | G0105 | **Comparison of European Electricity Market Designs** | Kirstin Ganz, Luca Neumann, Michael Hinterstocker, Patrick Dossow | Forschungsgesellschaft für Energiewirtschaft mbH, Germany |
| 13:40 | **G02** | **Coffee Break** in the **Poster Session I** (all topics, in the Poster Area of Auditorium Foyer) | | |
| **14:20** | **G03** | **Flexibility Provision & Exchange I** | | **Session-chair: Andreas Svendstrup-Bjerre** |
| | G0304 | **RE-organising Power Systems for the Transition** | Emanuele Bianco (virtually) | IRENA, UAE |
| | G0301 | **Crosbow (EU Project) and Trinity: XB Collaboration Between TSOs in the Balcan Region** | Stelios Kromlidis | SEleNe, Greece |
| | G0302 | **The Development of Local Flexibility Markets in Europe** | Elies Lahmar | EPEX SPOT, France |
| | G0303 | **A Cloud Based Whole Building Energy Management Platform as an Enabler of Decentralized Flexibility** | Christoph Ospelt | EK Energiekonzepte AG, Zürich, Switzerland |
| 16:00 | | **Coffee Break** (in the Auditorium Foyer) | | |
| **16:15** | **G04** | **Flexibility Provision & Exchange II** | | **Session-chair: Davor Bošnjak** |
| | G0401 | **Flexibility Shares in a Low-voltage Distribution Grid** | Teo Brigljevic | Groupe E SA, France |
| | G0402 | **Distributed Ledger Technology for Smarter Grids** | Ümit Cali | Norwegian University of Science and Technology, Norway |
| | G0403 | **Capacity Reserves from Renewables and Consumption** | Jesper Wonsbek Buck (virtually) | Energinet, Fredericia, Denmark |
| | G0404 | **Embedded Flexibility: Optionality in Electrolyser Assets** | Werner Trabesinger | Pexapark Ltd , Switzerland |
| **18:00** | **End of the First Day** | | | |
| **19:30** | **GSM Network Dinner** (included, guest tickets for 120.- CHF pP available) | | | |

# GSM 2022 — 6th Grid Service Market symposium

## Session Program

**KKL, Auditorium, 1st floor**

### Tuesday, 5 July

**08:30** On-site GSM Registration

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|---|---|---|---|---|
| **09:30** | **G05** | **Advanced Technologies Providing Flexibility** | | **Session-chair: Michael Moser** |
| | G0501 | **Flexibility Needs, Solutions and Relevance of Sector Coupling – European Perspective** | Norela Constantinescu (virtually) | Entso-E, Brusselles, Belgium |
| | G0502 | **Use of Storage Systems in Energy Communities** | Fabio Napolitano (virtually) | Uni Bologna, Bologna, Italy |
| | G0503 | **Multiple Benefits of behind the Meter Batteries** | Jacques Le Bleis | EDF, France |
| P | G0504 | **Evaluating the Market Attractiveness for Fuel Cell Micro-Cogeneration** | Marco Kunz | Lucerne Uni of Applied Sciences & Arts, Switzerland |
| P | G0505 | **Grid Services as Byproducts of Water Electrolyser** | Tanaka Mbavarira | Lucerne Uni of Applied Sciences & Arts, Switzerland |

11:00 **Coffee Break**

| | | | | |
|---|---|---|---|---|
| **11:30** | **G06** | **Future of Grid Service Markets** | | **Session-chair: Thomas Kudela** |
| | G0601 | **80% by 2030; Ireland's Renewable Ambition & the Need for Grid Flexibility** | Robert O'Rourke | Center for Energy Regulations, Irland |
| | G0602 | **Introduction of the "Syste(M)arket" – A Systemic View on Market and Grid** | Peter Lopion (virtually) | Amprion GmbH, Germany |
| | G0603 | **Effects of Variable Grid Fees on Distribution Grids with Optimized Bidirectional Battery Electric Vehicles** | Yannic Blume | Forschungsstelle für Energiewirtschaft e.V., Germany |
| | G0604 | **Regulatory Support Measures for Smart Grids and Promoting Flexibility** | Mihai A. Mladin | Romanian Energy Center, Sectoral Association, România |
| P | G0606 | **Distribution Level Flexibility Market Concepts** | Domagoj Badanjak, Hrvoje Pandžić | Faculty of Electrical Engineering and Computing University of Zagreb, Coratia |

13:00 **G07** **Lunch Break** (on the KKL Terrace) & **Coffee** in the **Poster Session II** (all topics, in the Poster Area of Auditorium Foyer)

| | | | | |
|---|---|---|---|---|
| **14:30** | **G08** | **Enabling Technologies** | | **Session-chair: Ivana Kockar** |
| | G0801 | **Bridge Between Meteorology, Climatology and the Energy Sector (tbc)** | Alberto Troccoli (virtually) | World Energy & Meteorology Council (WEMC), UK |
| | G0802 | **Project SoLAR Demonstrates Real-time Pricing Based on Grid State Variables in Grid Cells** | Stefan Werner | Easy Smart Grid GmbH, Germany |
| | G0803 | **Dynamic Dimensioning of Balancing Reserves** | Thomas Dalgas Fechtenburg | Energinet, Fredericia, Denmark |
| P | G0805 | **Digital Assets Mining Hardware as a Novel Business Model for System Operators in the Energy Markets** | Ivan Ostheimer, Marko Vukobratović | Base58 d.o.o., Croatia |

**15:50** **CLOSING**

**16:00** **End of Symposium** & **End of official part of GSM Symposium 2022**
**Good bye coffee** & **travel refreshment**
**exhibition area** (ground floor, free booth visits)

### Networking possibilites on Thesday evening

**18:00** **GSM Grid Apéro joint with EFCF Welcome Reception** (free, offered by EFCF)
(free, offered by EFCF)

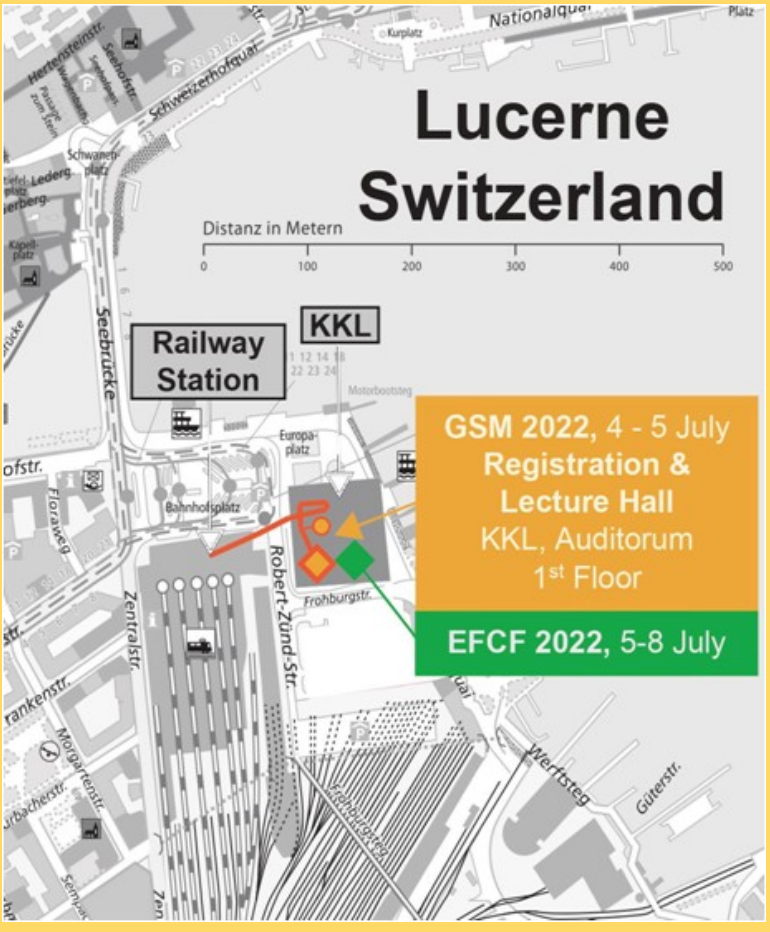
**19:30** **Possibility for a Joint Dinner**
(ca. 90.- CHF, to be reserved in advance by email to Info@GridServiceMarket.com)

### Fees & Registration

**www.GridServiceMarket.com/Registration**

### Physical & Virtual Access

**www.GridServiceMarket.com/Access**

GSM 2022

KKL Lucerne, 4 – 5 July

# Grid Service Market Symposium

featuring: Grid Flexibility & Business

# Invited Speakers & Presentations

G0103

**Dr. Charmalee Jayamaha, Senior Manager, Energy Systems Catapult, UK**

https://es.catapult.org.uk

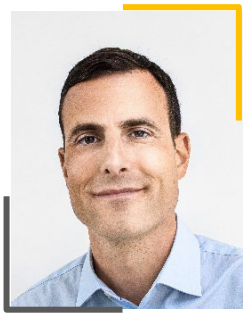
*International knowledge sharing is a powerful tool to find solutions to issues around flexibility market design. Understanding the implications of design decisions is greatly enhanced by access to insights from the widest possible range of existing markets; the sharing of lessons learned from different pilots being conducted globally; and the ability to capture the whole spectrum of different market contexts, which will help generate a body of evidence that is rich and diverse in scope. This talk by the Energy System Catapult in the UK will feature learnings from the national programme 'Future Power Systems Architecture' and the international work conducted with ISGAN Working Group 9 on Flexibility Markets -development and implementation.*

Dr. Charmalee Jayamaha is a Senior Manager at the Energy Systems Catapult, UK. She focuses on system integration and whole system solutions for energy system transition with a specific focus on international energy systems. Charmalee has recently returned from a secondment to the UK's Department for Business, Energy and Industrial Strategy as the UK lead for Mission Innovation–Green Powered Future Mission. She is keen to engage with the international community and be involved in research and innovation, capacity building and knowledge sharing activities to accelerate the global energy system transformation. Charmalee also holds a PhD in Electrical and Electronic Engineering from the University of Nottingham, UK.

G0104

**Stefan Dörig, Head of Regulatory and Public Affairs, tiko Energy Solutions, Switzerland**

https://tiko.energy



*As evidenced by the second edition of the smartEn report on the implementation of the Electricity Market Design, after more than two years, key articles for demand-side flexibility of the EU Electricity Market Design are still weakly implemented in Member States. This includes market-based procurement of all Decentralised Energy Resources (DER) by System Operators and non-discriminatory participation of all DERs in all markets and mechanisms. Such weak transposition is seriously limiting consumers to stack the benefits of the activation of their flexible consumption and generation. This is not only a major obstacle to the European Green Deal, but also limiting the EU's capability to respond to the issues of high energy prices and energy independence.*

Stefan Dörig is Head of Regulatory and Public Affairs at tiko Energy Solutions and Chair of smartEn. He studied history, economics and Russian literature at the University of Zurich and launched his professional career at the Swiss Federal Office of Energy. Later, Stefan held a position as an energy economist in BKW, and from2013-2017 he worked at the Mission of Switzerland to the European Union in Brussels, where he oversaw the energy dossier. After his return to Switzerland, Stefan joined the software startup enersis, before entering tiko in spring 2020.

G0301

**Yannis Kabouris, Chairman of the BoD, SEleNe, Greece (tbc)**

https://www.selene-cc.eu

Yannis Kabouris was born in Athens in 1962. He holds a Diploma on Electrical Engineering (1985) and a PhD (1992), both from the National Technical University of Athens. From 1991 until 2001 he was working in the Public Power Corporation (PPC) - System Studies Department.
He joined the Hellenic Transmission System Operator (HTSO) in 2001 and the Independent Power Transmission Operator of Greece (IPTO) in 2011. He was an associate professor at the University of West Attica (2002 to 2011)
He has served in various positions in the electricity sector:

- Head of Development Studies Section HTSO S.A. (2001-2005)
- Assistant Director for System Planning Department HTSO S.A. (2005 – 2006)
- Director for System Planning Department HTSO S.A. (2006 – 2012)
- Director at the CEO office IPTO S.A. (2012 – 2015)
- Director of the Transmission System Planning Dept. IPTO S.A. (2015 – 2017)
- Chief Executive Officer (CEO) IPTO S.A. (Feb 2017 – June 2017)
- Member of BoD of IPTO S.A. (2017 – 2020)
- Chief Officer for Operation, Infrastructures and Market IPTO S.A (2017 – 2020)
- Member of BoD of HEnEX S.A.(2018)

He participated in several entso-e bodies and activities (2000 to present):

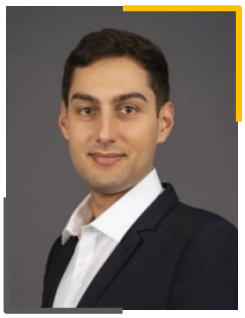
- Member of SDC, SOC & RDIC
- Convenor of RG-SEE
- Member of Grid Codes Working Groups; etc.
- Member of Ten Year Network Development Planning Group,
- Investigation of 4th November 2006 event (head of study team for SEE)

Currently, he is Director for Foreign Affairs in IPTO, BoD Chairman and CEO of SEleNe CC and Vice President of MeD-TSO. His main fields of expertise include Power System studies and Analysis (static and dynamic), Generation and Transmission Planning, Integration of renewables into power systems, Development of Interconnectors, Generation adequacy, Market development and operation, Energy Management systems and Control Centers, National and International Electricity Market Regulation and Research & Development strategies. He has published more than 150 papers on the above-mentioned topics. He has also participated in more than 40 international research projects. He is the Chairman of the CIGRE National committee of Greece. He is a member of CIGRE and IEEE. He gained the SWAN PREMIUM AWARD (2002).

G0302

**Elies Lahmar, Senior Market Design Analyst, European Power Exchange EPEX SPOT, France**

www.epexspot.com



*The energy system will integrate more RES. This will pass mainly through the integration of RES better. Local flexibility markets are developing across Europe as a tool to tackle increasing local constraint challenges on both transmission and distribution levels. What are their key design features, benefits, opportunities and challenges?*

Elies Lahmar is Senior Market Design analyst at the European Power Exchange EPEX SPOT. Elies holds a degree in mechanical engineering from MINES Paristech (2016), where he also studied energy economics and power markets. Elies joined the Product Development team of EPEX SPOT in 2017. He is in charge of business development, exploring and assessing innovative ideas, products and concepts that will shape tomorrow's power markets.

G0402

**Dr. Umit Cali, Associate Professor, Department of Electric Power Engineering Faculty of Information Technology and Electrical Engineering, Norway**

www.ntnu.edu/ie

*Modern power systems are evolving towards decarbonization and digitalization phases leading to Transactive Energy Systems (TES). Application of emerging technologies like Artificial Intelligence (AI) and Distributed Ledger Technology (DLT) to develop a TES is not an unheard topic of research. The use of DLT is providing various new opportunities and business models where smart contracts can play an enabler role to amalgamate interconnected systems like power systems and digital infrastructure and services. Furthermore, the current global environmental and political climate accentuates the need for clean energy sources combined with the need for deregulation, decentralization, decarbonization, digitalization, and democratization in the energy ecosystem. This session aims to demystify the potential of DLT as enabler technologies for the Digital Green Transition of the energy industry from a TES perspective. Besides the importance of standardization will also be elaborated.*

Dr. Umit Cali has more than 20 years of international experience in the fields of energy systems, data science, blockchain technologies, ICT, energy markets and economics as a professor, entrepreneur, researcher and CTO. Dr. Cali is also co-founder of US (NSF SBIR funded) and Europe based technology startup companies that are active in advanced energy informatics and blockchain. He is working as an associate professor of Energy Informatics (AI & blockchain) at the Norwegian University of Science and Technology.
He is serving as Vice Chair of IEEE blockchain in Energy Standards WG (P2418.5) and Chair of IEEE TEMS Special Interest Group on Energy DLT. Umit is the leading author of the “Digitalization of Power Markets and Systems using Energy Informatics” book.

G0403

**Jesper Wonsbek Buck, Engineer, Systemydelser, Denmark (tbc)**

https://energinet.dk

*The demand for reserves to maintain balance in the grid is increasing proportionally to the growth of renewable production capacity. The conventional providers of reserve capacity are slowly being phased out; hence they must be replaced. Energinet, the Danish TSO, has implemented a methodology to allow variable renewables and consumption to provide capacity reserves based on probabilistic forecasting of available flexibility. The capacity reserves are procured the day before operation; hence the available flexibility must be forecasted at the time of bidding.*
*The identified 10 % quantile of the forecasted available flexibility at the time of operation can at maximum be bid into the market. This quantile is found to be a good trade-off, as firmness to the TSO is ensured but the providers can still achieve significant volumes of reserve capacity and therefore have an incentive to participate in the reserve markets.*

Jesper Wonsbeck Buck holds an M.Sc. in Energy Technology, Engineer at Energinet in the department of Ancillary Services. He is the point of contact for potential and existing market participants.
He develops current technical market requirements and forthcoming requirements and implements EU requirements in national codes, testing, prequalification and monitoring of units.

G0501

**Norela Constantinescu, Head of Section Innovation, European Network of Transmission System Operators for Electricity (ENTSO-E)**

http://www.entsoe.eu

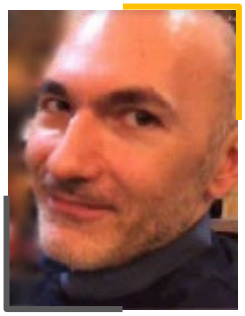
*The energy system will integrate more RES. This will pass mainly through the integration of RES into the electricity system. At the pan European level, it will represent 10 times the capacity of today's wind and solar. While the energy efficiency measures will drive the energy consumption down, the final electricity consumption will increase, mainly driven by the transport sector.*
*Flexibility needs, services, products, use and development of the infrastructure, integration of a large share of centralized and decentralized RES, new demands, and sector coupling will be the focus of innovation actions this decade, The electricity grid should become the focal point of future developments and sector coupling, being transport, industrial consumption, heating and cooling, hydrogen will represent a paradigm shift.*

Norela Constantinescu is an energy engineer and holds an MBA. She presently is Head of Section Innovation with the European Network of Transmission System Operators for Electricity, and Vice Chair of ETIP SNET. She was previously working with the European Commission DG Energy on research and innovation.

G0502

**Fabio Napolitano, Associate Professor, Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi", University Bologna, Italy**

https://www.unibo.it



*The transposition of the Clean Energy Package directives in the various EU member states may differ in the practical and regulatory aspects left to the various implementing decrees. The implementation of energy communities can also vary significantly because it is part of an often well-established system of incentives for production from renewable sources. The presentation aims to illustrate the technical rules for the operation and remuneration of energy communities in Italy and the results obtained within the framework of two projects on collective self-consumption carried out in collaboration with University of Bologna.*

Dr. Fabio Napolitano is associate professor at the Department of Electrical, Electronic and Information Engineering of University of Bologna. From the same University, he received the M.S. degree and the Ph.D. degree in electrical engineering. His research interests are the analysis of power systems transients, in particular those due to indirect lightning, and lightning protection.

**G0503**

**Jacques Le Bleis, Chief Technology Officer, EDF Renewables Storage, France**

**www.sciencedirect.com**

*The battery storage (BESS) behind the meter is a real Swiss knife...not only for the owner of the factory but also for the TSO and the DNO. Based on real data from the site in operation, we will demonstrate how BESS contribute, via pooling, to stabilize the network as efficiently as a grid-scale project (FCR/AFRR). BESS improve deeply the flexibility capabilities of the factory; firstly by performing peak shaving, especially during "on-peak hours" as defined by the DNO. BESS reduce drastically the stress on the targeted time window. Where the Grid reaches its own limits, BESS can avoid the retrofit / extension of the DNO delivery substation. When the factory plans additional loads (factory extension, EV-charging points,...) the very low response time of BESS allows extended ancillary transient stability services for the DNO/TSO, such as for example providing support during network fault or stabilizing the voltage level at the network connection point*

Jacques Le Bleis studied electrical engineering at Supelec (Paris Saclay University) in France and at the TU Munich in Germany (dipl. 2009). He started his career by taking part in the lifetime extension of the power plant in France and then moved to the technical team in charge of project owner support for international projects for the EDF group. Involved in battery projects for more than 6 years, together with the technical team he defines the critical choices for EDF assets in order to optimize the quality, performance and safety of the BESS. With the aim of always offering more services to the customers, they are also developing new offers complementary to storage such as load shedding, PV and EV-charging capabilities.

**G0601**

**Robert O'Rourke, Senior Manager Electricity Networks, Commission for Regulation of Utilities, Ireland**

**www.cru.ie**

*Ireland has an ambitious renewable energy target of 80% by 2030, requiring the grid to be powered almost completely by wind and solar at times.*
*This represents a unique challenge and will require increased flexibility from the market, system operators, and end-users. The CRU, the Irish regulator, has put in place initiatives to facilitate and incentivize this needed flexibility.*

Robert O'Rourke is the senior manager for Electricity Networks at the Commission for Regulation of Utilities in Ireland and is responsible for the economic regulation of the transmission and distribution network companies, and the integration of renewables onto the Irish system, including the design of a new ancillary services market. The CRU's "PR5" Decision sets the regulatory framework for the network companies for the next five-year period (2021-2025), which set out the ambitious targets and flexible investment mechanisms needed to achieve the transition to a low-carbon system by 2030.

G0801

**Alberto Troccoli, Co-founder and Managing Director of WEMC, UK**

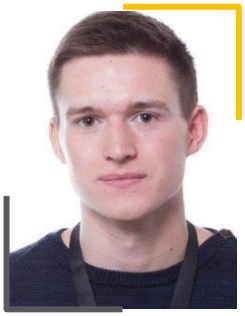
https://energinet.dk

Prof. Alberto Troccoli is the co-founder and Managing Director of WEMC and a visiting professor at the University of East Anglia (UK). He has over 25 years of experience in the fields of meteorology and climate, and in the last 10+ years has been exploring their applications in the energy, and other, sectors. His career includes time at several leading institutions such as NASA, ECMWF (UK), the University of Reading (UK) and CSIRO (Australia). He is the main author of the UN-led Global Framework for Climate Services (GFCS) Energy Sector implementation plan and the leader of the C3S Energy operational service. In addition, he has published extensively and is also the chief editor and an author of four books. Recently, he has led the development of the Teal tool (tealtool.earth), a user-friendly free interactive visualisation tool which allows global historical climate and carbon emissions data (and soon climate projections too) to be easily visualised, understandable and accessible. Its design is distinctive and modern incorporating the teal colour that gives the tool its name. It is conceived to both raise awareness about our changing climate and to be used to assist with decision making by the industry and policy makers. Alberto holds a PhD in Physical Oceanography from the University of Edinburgh (UK).

G0804

**Thomas Dalgas Fechtenburg, Senior Ingenieur, Systemydelser, Denmark**

https://energinet.dk



*As a TSO, Energinet is responsible for maintaining balance in the grid to ensure security of supply. The demand for reserves to maintain balance in the grid is increasing proportionally to the growth of renewable production capacity due to an increase in forecasting errors. The intermittent nature of variable renewables leads to large variations in the operational scenarios. To always ensure an identical level of security of supply, Energinet is developing a model to daily perform dynamic dimensioning of balancing reserves based on the forecasted operational scenario for the coming day. As the share of wind power in Denmark is large, and hence the demand for balancing reserves is varying a lot, Denmark is an ideal place to implement advanced machine learning models to optimize the procurement of balancing reserves.*

Thomas Dalgas Fechtenburg holds an M.Sc. Energy Engineer. He is at Energinet in the department of Flexibility & Ancillary Services since 2016. He is developing technical requirements and markets for reserves based on the needs of the synchronous areas, and implementing EU requirements in national codes, testing, prequalification and monitoring of units. Thomas is leading the Danish TSO-DSO collaboration to enable trade with local flexibility to resolve local bottlenecks, and enabling flexible consumption and RE to provide ancillary services.

## International Advisory Board (IAB)

www.**GridServiceMarket**.com/**IAB**

| | | | |
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## *CHAIR of International Advisoriy Board & GSM Conference Series

**Prof. Christoph Imboden**
Institute for Innovation & Technology Management
CC for Business Engineering
Lucerne University of Applied Sciences, www.HSLU.ch

Christoph is professor for product innovation at the Lucerne University of Applied Sciences and Arts HSLU and Head of Research at the Institute for Innovation & 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. After working in different positions in the industry, he started working for HSLU in 2012.
Christoph has been the chair of GSM since 2017. He looks back to more than twenty years of industrial experience in different application areas of the energy, communication and information technologies.

## RECOGNITION OF THE SUPPORTING PARTNERS

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# GSM 2022

## 6th Grid Service Market symposium

featuring: Grid **Flexibility** & **Business**

**4-5 July, KKL Lucerne, Switzerland**