



WCRE

World Council for Renewable Energy

International
Renewable
Energy
Storage
Conference

IRES



EUROSOLAR
The European Association
for Renewable Energy

EUROSOLAR and the World Council for Renewable Energy (WCRE)
invite you to attend the

8th International Renewable Energy Storage Conference and Exhibition (IRES 2013)

November 18 – 20, 2013

bcc Berlin Congress Center, Berlin /Germany



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WCRE

World Council for Renewable Energy



8th International Renewable Energy Storage Conference and Exhibition (IRES 2013)

Increasing shares of fluctuating renewable energies in our supply systems mean a rising complexity of the interplay between energy sources, power grids and grid management modes, accommodating the needs of renewable energy generation. The storage of electricity and heat for different timescales, performance levels and uses plays a central role in this.

Ground breaking opportunities and prospects for technological innovations and the industries and businesses involved are emerging. Energy storage for electricity, heat and mobility enables the dynamic exploitation of renewable energy in ever more diverse forms: for enterprises, in residential and commercial construction, residential development, cities, regions and countries. The ground for an increased interaction between those sectors is being prepared.

The IRES series was started by EUROSOLAR and the World Council for Renewable Energy (WCRE) in 2006. Over these past years it has emerged as the central platform for sharing knowledge and exchanging ideas on a

key issue of future energy supply. The event is an international gathering of all relevant stakeholders: leaders from the energy storage industries, renewable and conventional energy businesses, grid operators and utilities, from the hybrid and electric vehicle sector, the building trades, science, associations, politics and the financial industry. These leaders assemble in Berlin in November 2013 to access and discuss fresh insights into the state of the art in energy storage, the need for storage capacity and outstanding examples of success.

IRES 2012 was attended by 600 delegates from more than 40 countries, thus underscoring the significance of the conference in the global context. The IRES series has attracted well over 3,000 participants to date.

We are delighted to welcome you at IRES, now in its eighth consecutive year, November 18 – 20, 2013.

In light of the particular situation in Germany a one-day user forum will be organized as a side event (in German language) on November 19th.

Scientific Steering Committee:

- Prof. Peter Droege, President EUROSOLAR, Vaduz, Liechtenstein
- Prof. Dr. Dirk Uwe Sauer, RWTH Aachen University, Aachen, Germany (Scientific Conference Chair)
- Dr. Wim van Helden, Renewable Heat, Schagen, The Netherlands
- Dr. Bernhard Riegel, EUROBAT, Brilon, Germany
- Dr. Peter Schossig, Fraunhofer ISE, Freiburg, Germany
- Prof. Dr. Ingo Stadler, Cologne University of Applied Sciences, Cologne, Germany
- Prof. Dr. Michael Sterner, Regensburg University of Applied Sciences, Regensburg, Germany



Prof. Peter Droege



Prof. Dr. Dirk Uwe Sauer



Dr. Wim van Helden



Dr. Bernhard Riegel



Dr. Peter Schossig



Prof. Dr. Ingo Stadler



Prof. Dr. Michael Sterner

Conference language: English

Organizers: EUROSOLAR, World Council for Renewable Energy (WCRE)

Conference managers: Irm Scheer-Pontenagel (Managing Director EUROSOLAR), Corinna Kolks (Project coordinator IRES 2013)
IRES2013@eurosolar.de

Day one Monday, November 18, 20138:00 **Registration****9:00****Opening and welcome**

- Peter Droege, President EUROSOLAR, Vaduz, Liechtenstein
- Johannes Rimmel, Minister for Climate Protection, Environment, Agriculture, Nature Conservation and Consumer Protection of the State of North Rhine-Westphalia, Düsseldorf, Germany
- Peter Altmaier, Federal Minister for the Environment, Nature Conservation and Nuclear Safety, Berlin, Germany (solicited)
- Johanna Wanka, Federal Minister for Education and Research, Berlin, Germany (solicited)

10:00**Plenary session****Introductory lectures**

- **Energy storage technologies on the way to the global market**
Eicke Weber, President German Energy Storage Association (BVES), Berlin, Germany
- **The role of storage in an energy system based 100% on renewable energies**
Harry Lehmann, German Federal Environment Agency, Dessau, Germany
- **Energy storage: techniques and perspectives**
Ulrich Wagner, German Aerospace Centre (DLR), Cologne, Germany
- **The role of long term heat storages in the Danish energy system**
Per Alex Sørensen, PlanEnergi Nordjylland, Skørping, Denmark
- **The role of energy storage for the Southern Italian energy system**
t.b.a

13:00 – 14:30 **Lunch break / Poster exhibition / Exhibition****14:30****Session B 1
Storage Demand A**

- **Future electric energy storage demand - Results from the IEA ECES 26 project**
Christian Doetsch, Fraunhofer UMSICHT, Oberhausen, Germany
- **Optimizing storages for transmission system operation**
Jonas Eickmann, RWTH Aachen University, Aachen, Germany
- **Synergies between storage, transmission and balancing across a fully renewable pan-European power system**
Martin Greiner, Aarhus University, Aarhus, Denmark
- **Global energy storage demand for a 10% renewable electricity supply**
Guido Pleßmann, Reiner Lemoine Institut, Berlin, Germany

14:30**Session B 2
Flow Batteries**

- **The development and test results of the world's first MW HR iron-chromium redox flow battery**
Craig Horne, EnerVault Corporation, Sunnyvale, USA
- **HBr flow batteries as a source for bulk energy storage**
Itai Karelic, EnStorage Inc., Yavne, Israel
- **Operational experiences of using a 500kWh zinc-bromine flow battery system in an industrial scale wind autoproduction application**
Raymond Byrne, Dundalk Institute of Technology, Dundalk, Ireland
- **Lessons learned from 3 years of testing of a redox flow vanadium battery**
Marion Perrin, CEA, Le Bourget du Lac, France

14:30**Session B 3
Flexibility options**

- **The value of flexibility in a European power system with high shares of renewable energies**
Farid Comaty, ETH Zurich - Power Systems Laboratory, Zurich, Switzerland
- **Assessing the impact of EV mobility patterns on renewable energy oriented charging strategies**
Alexander Schuller, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany
- **Impact assessment of future flexibility options**
Christian Linnemann, RWTH Aachen University, Aachen, Germany

14:30**Session X
Innovative Products**

- **The Power Gap Filler**
Heinrich Gärtner, GP JOULE GmbH, Reußenköge, Germany
- **A study on power production from Pathor Kuchi leaf (Bryophyllum Pinna-tum leaf) for practical utilization in Bangladesh**
Md. Kamrul Alam Khan, Jagannath University, Dhaka, Bangladesh

Exhibitor slots16:00 – 16:30 **Coffee break**

16:30

Session C 1 Storage Demand B

- **Optimal allocation and capacity of energy storage systems in a future European power system with 100 % renewable energy generation**
Christian Bußar, RWTH Aachen University, Aachen, Germany
- **Future storage and balancing demand – ranges, significance and potential improvements of estimations**
Bert Droste-Franke, Europäische Akademie GmbH, Bad Neuenahr-Ahrweiler, Germany
- **Storage demand to support the integration of large amounts of renewable electricity generation in Germany**
Niklas Hartmann, Fraunhofer Institute for Solar Energy Systems (ISE), Freiburg, Germany
- **Storage demand in 100% renewable energies scenarios by 2050**
Harry Lehmann, German Federal Environment Agency, Dessau, Germany
- **Usage of electrochemical storage systems in the electricity grid in comparison with alternative technologies**
Hein Wenzl, TU Clausthal, Clausthal-Zellerfeld, Germany

16:30

Session C 2 Batteries

- **Mitigating solar intermittency using FIAMM NaNiCl₂ energy storage on a utility distribution system**
Mario Vona, FIAMM Energy Storage Solutions, Montecchio Maggiore, Italy
- **Nickel metal hydride batteries for grid energy storage applications**
Michael Zelinsky, BASF, Rochester Hills, USA
- **Clean production of lithium ion storage systems**
José Etcheverry, York University, Toronto, Canada
- **Lead-Carbon technology - the new generation of storage batteries of the ALABC**
Boris Monahov, ILZRO Inc., Durham, USA
- **Advanced vanadium redox flow batteries and applications for renewable integration**
Andreas Luczak, Vanadis Power GmbH, Nuremberg, Germany

16:30

Session C 3 Power to Heat and Co-Generation

- **Cold storage devices for smart grid integration**
Jörg Waschull, Institute of Air Handling and Refrigeration (ILK), Dresden, Germany
- **Thermal energy storages in the context of the power supply system**
Florian Kagerer, Fraunhofer Institute for Solar Energy Systems (ISE), Freiburg, Germany
- **Minewater 2.0 project in Heerlen the Netherlands: transformation of a geothermal mine water pilot project into a full-scale hybrid sustainable energy-infrastructure for heating and cooling**
René Verhoeven, TriSkill BV, Landgraaf, The Netherlands
- **Provision of balancing power and storage capacity by flexible CHP systems**
Christoph Pels Leusden & Silke Köhler, Beuth University of Applied Sciences, Berlin, Germany

16:30

Session X Innovative Products

- **The business case for Multi-Megawatt battery parks – with 20 year performance guarantees**
Ina Hahndorf, Younicos GmbH, Berlin, Germany
- **The stationary "Ultra Battery™" for smart grid applications**
Wataru Tezuka, Furukawa Battery Co. Ltd., Yokohama, Japan

Exhibitor slots

18:45 End of day one

Day two Tuesday, November 19, 2013

8:30

Session D 1 Economics / Legal / Politics / Barriers A

- **Market-based redispatch in distribution grids – incentivizing flexible behavior of distributed energy resources**
Carsten Wissing, OFFIS – Institute for Information Technology, Oldenburg, Germany
- **Deployment support for stationary electricity storage – implications for**

8:30

Session D 2 PV-Home Storage Systems A

- **The market incentive programme for battery storage systems – first experiences**
Mark Wimmer, Ecologic Institut gGmbH, Berlin, Germany, Olaf Weber, KfW Group, Frankfurt, Germany
- **Field performance and technology review of**

8:30

Session D 3 Sensible and latent thermal energy storage

- **Thermal energy storage, storage capacity and economics – some basic considerations**
Andreas Hauer, ZAE Bayern, Garching, Germany
- **The first structure integrated cold storages in Germany – state of the project**

8:30

Session X Innovative Products

- **Hydraulic hydro storage system for self-sufficient cities**
Eduard Heindl, Furtwangen University, Furtwangen, Germany

Session D 1 (continued)

policy makers from techno-economic modeling of stationary batteries
Benedikt Battke, ETH Zurich, Zurich, Switzerland

- **The identification of barriers for deploying battery electrical storage systems in current distribution grid**
Grietus Mulder, VITO NV, Mol, Belgium
- **The cost of storage - How to calculate the Levelized Cost of stored Energy (LCOE) and applications to renewable energy generation**
Ilja Pawel, Gildemeister Energy Solutions, Wiener Neudorf, Austria
- **Assessing the impact on grid energy balance from residential storage and the needed incentives to achieve it**
João M. Santos, University of Coimbra, Coimbra, Portugal

Session D 2 (continued)

400 installed Li-ion home storage systems S10
Andreas Piepenbrink, E3/DC GmbH, Osnabrück, Germany

- **Project results for PV battery systems for self-consumption in households**
John Sievers, IdE Institute decentralised Energy Technologies, Kassel, Germany
- **Sizing and grid integration of residential PV battery systems**
Johannes Weniger, HTW Berlin - University of Applied Sciences, Berlin, Germany
- **Dimensioning of decentralized photovoltaic storages with limited feed in power and their impact on the distribution grid**
Eberhard Waffenschmidt, Solarenergie-Förderverein Deutschland e.V., Aachen, Germany

Session D 3 (continued)

Thorsten Urbaneck, Chemnitz University of Technology, Chemnitz, Germany

- **Smart use of stratified hot water storage through coupling to adsorption heat pump cycle**
Ferdinand Schmidt, Karlsruhe Institute of Technology, Karlsruhe, Germany
- **Comparison of two different latent heat storage concepts**
Philipp Wiesauer, Johannes Kepler University Linz, Leonding, Austria
- **Heat flux analysis of a latent heat storage**
Ludger Josef Fischer, Lucerne University of Applied Sciences and Arts, Horw, Switzerland

Session X (continued)

Exhibitor slots

10:30 – 11:00 Coffee break

11:00

Session E 1 Power-to-Gas: Innovations and Visions

- **Study of the energy efficiency of a high-temperature power-to-gas process**
Myriam De Saint Jean, CEA/LITEN, Grenoble, France
- **Large-scale hydrogen storage for photovoltaic power plants: modelling and simulation with real production and forecast data**
Gabriele Zini, Amplio Energy Europe, Bologna, Italy
- **Power-to-chemistry® - providing flexibility by dynamic acetylene production**
Georg Markowz, Evonik Industries AG, Hanau, Germany
- **Sail energy: harvesting wind base load as fuels by energy ships (power-to-gas 2.0)**
Michael Sterner, Regensburg University of Applied Sciences, Regensburg, Germany

11:00

Session E 2 PV-Home Storage Systems B

- **System analysis: stationary storage systems in distribution grids**
Aleksandra-Sasa Bukvic-Schäfer, SMA Solar Technology AG, Niestetal, Germany
- **Capacity-dependent tariffs as an incentive for a grid-benefiting storage operation in private households**
Michael Schreiber, Fraunhofer IWES, Kassel, Germany
- **Optimized operation strategies for PV storage systems - yield limitations, optimized battery configuration and the benefit of a perfect forecast**
Armin Schmiegel, Bosch Power Tec GmbH, Hamburg, Germany
- **Operational strategies for battery systems in low-voltage grids to limit the feed-in power of roof-mounted solar power systems**
Alexander Zeh, Technical University of Munich, Munich, Germany

11:00

Session E 3 High temperature and thermochemical energy

- **High temperature rock-bed TES system suitable for industrial-scale CSP plant - CFD analysis under charge/discharge cyclic conditions**
Simone A. Zavattoni, University of Applied Sciences and Arts of Southern Switzerland (SUPSI), Manno, Switzerland
- **Development of a closed sorption heat storage prototype**
Benjamin Fumey, Swiss federal laboratories for materials science and technology (EMPA), Dübendorf, Switzerland
- **Thermochemical energy storage as an element for the energy turnaround**
Barbara Mette, University of Stuttgart, Stuttgart, Germany
- **The CellFlux storage concept for cost reduction in parabolic trough solar thermal power plants**
Christian Odenthal, German Aerospace Center (DLR), Stuttgart, Germany

11:00

Session X Innovative Products

- **Decentralized grid-integrated Battery-Energy-Storage (BESS) for self-consumption of electrical energy from PV: application, cost and perspective**
Rainer Bußar, Exide Technologies GmbH, Büdingen, Germany
- **Renewable solar energy: a key to alternative power solution of Bangladesh for sustainable development**
Haragobinda Baidya, Minority Self Empowerment Foundation, Dhaka, Bangladesh

Exhibitor slots

Session E 1 (continued)

- **Economic aspects of Power-to-Gas concepts for power storage and grid load compensation**
Carl Berninghausen, sunfire GmbH, Dresden, Germany

Session E 2 (continued)

- **Analysis and comparison of battery charge control algorithms for increased grid compatibility of decentralized PV systems**
Benjamin Matthies, Centre for Solar Energy and Hydrogen Research Baden-Württemberg (ZSW), Stuttgart, Germany

Session E 3 (continued)

- **High temperature thermochemical heat storage: operation modes of a 10kW pilot reactor based on CaO/Ca(OH)₂**
Matthias Schmidt, German Aerospace Center (DLR), Cologne, Germany

13:00 – 14:30 Lunch break / Poster exhibition / Exhibition

14:30

Session F 1 Applications & Case Studies A

- **Dimensioning and operation of thermal energy storages in district heating systems**
Hans Christian Gils, German Aerospace Centre (DLR), Stuttgart, Germany
- **The SUNSTORE concept for storing fluctuating electricity production from wind and solar**
Per Alex Sørensen, PlanEnergi Nordjylland, Skørping, Denmark
- **Energy storage installation in a distribution network: a case study**
Roger Lin, A123 Systems, Westborough, USA
- **SmartRegion Pellworm – Integration of residential batteries into a central operated storage system**
Tobias Blank, E.ON, Essen, Germany

14:30

Session F 2 Round Table

- **Discussion on PV-storage systems for increasing the self consumption and unloading the grid**

Possible topics for the discussion:
 - First experiences with the German Market Introduction Programme
 - Proposals for improving the incentive scheme
 - Proposals for improving the unloading of the grid
 - Does it make sense to support individual small battery storage systems?
- Further details on this session will be defined later.

14:30

Session F 3 Large scale storage systems and other technologies

- **An evaluation of seawater pumped hydro storage for regulating the export of renewable energy to the national grid**
Eoin McLean, Dublin Institute of Technology, Dublin, Ireland
- **A canal buffer for the federal waterways – Application and simulation of a regional storage system**
Jens Storjohann, Leuphana University of Lüneburg, Lüneburg, Germany
- **POWERTOWER – Innovative solution for decentralized hydraulic energy storage**
Valerie Neisch, University of Innsbruck, Innsbruck, Austria
- t.b.a

14:30

Session X Innovative Products

- **Political framework, status quo and future market trends for stationary storage applications in Germany**
Tobias Rothacher, Germany Trade & Invest (GTAI), Berlin, Germany

Exhibitor slots

November 19, 2013



The IRES user forum is a side event in German language. Practical examples from energy storage sites will be presented and the role of regional energy suppliers and framework conditions in the German political and economic context will be discussed.

The programme is available online: www.energiespeicherkonferenz.de

The user forum is free for IRES 2013 participants.

16:30

Poster award ceremony The best posters of the IRES 2013 poster exhibition will be honoured

16:50

Panel discussion: Where and how will Energy Storage be taken in account in future energy markets?

Moderator: Hanne May, Head of Energy Communication, Ergo Kommunikation, Berlin, Germany

Panelists:

José Etcheverry, WCRE Chairman, York University, Toronto, Canada
Dörte Fouquet, Director of the European Renewable Energies Federation (EREF), Brussels, Belgium
Christine Lins, Executive Secretary of Renewable Energy Policy Network for the 21st Century (REN21), Paris, France
Uwe Leprich, Spokesman of the Renewable Energy Research Association (FVEE), Berlin, Germany
Claudia Kemfert, Head of the Department Energy, Transportation, Environment at the German Institute for Economic Research, Berlin, Germany
Ingo Stadler, Steering Committee IRES 2013, Cologne University of Applied Sciences, Cologne, Germany
t.b.a. Representative from politics (Member of Federal or European Parliament)

19:00

Evening reception / Get together

22:00 End of day two

Day three Wednesday, November 20, 2013

9:00

Session G 1
Applications & Case Studies B

- **Challenges in the integration of fluctuating renewables into the grid – a utility perspective**
Oliver Weinmann, Vattenfall Europe Innovation GmbH, Hamburg, Germany
- **Economic efficiency of mobile latent heat storages**
Marco Deckert, Fraunhofer UMSICHT, Sulzbach-Rosenberg, Germany
- **Solving the renewable+ battery business case in a robust way: use of operational data and dedicated modeling tool**
Michael Salomon, Clean Horizon, Paris, France
- **Results from the development and test operation of a large-scale battery storage system for control power**
Dennis Gamrad, Evonik Industries AG, Marl, Germany

9:00

Session G 2
Economics / Legal / Politics / Barriers B

- **The role of local energy markets as a means to increase the participation of electricity storage**
Anthony Price, Swanbarton Ltd., Malmesbury, UK
- **Grid-scale energy storage: global market drivers, emerging opportunities and real-world ICAES technology**
Richard Brody, CSustainX Inc., Seabrook, USA
- **The current legal framework for Power-to-Gas in Germany: marketing options – electricity supply fees – permits and authorizations**
Martin Altrock, Becker Büttner Held, Berlin, Germany
- **Using system LCOE concept to build business strategies for decentralized energy generation**
Christian Müller-Elschner, Apricum GmbH, Berlin, Germany
- **Public policy and energy storage: a case study of the United States and Germany**
Eric Borden, Alexander von Humboldt Foundation, Berlin, Germany

9:00

Session G 3
Power-to-Gas: Industrial implementation

- **The 2 MW Power-to-Gas plant in Falkenhagen, Germany**
Andrei Zschocke, E.ON Innovation Center Energy Storage, Essen, Germany
- **Large wind-hydrogen plants in Germany: the potential for success**
Klaus Stolzenburg, PLANET GbR, Oldenburg, Germany
- **PEM electrolyzer – a promising technology to handle fluctuating renewables**
Andreas Reiner, Siemens AG, Erlangen, Germany
- **Power-to-Gas: biological methanization; first field-project at a municipal sewage plant**
Ulrich Schmack, MicrobEnergy GmbH, Schwandorf, Germany
- **Power-to-Gas: experience with demo and pilot plants, up to 99% methane**
Ulrich Zuberbühler, Centre for Solar Energy and Hydrogen Research Baden-Württemberg (ZSW), Stuttgart, Germany

9:00

Session X
Innovative Products

- **Innovative storage solutions for increasing the self-consumption of PV systems**
Bernhard Riegel, HOPPECKE Batterien, Brilon, Germany
- **Smart grid on existing infrastructure of mini grids**
Thomas Walter, Wirsol Integrated PV Solutions GmbH, Waghäusel, Germany

Exhibitor slots

11:00 – 11:30 Coffee break

11:30

Final Plenary Session

- **Synopsis of the conference for electricity storage**
Dirk-Uwe Sauer, Scientific Conference Chair, RWTH Aachen University, Aachen, Germany
- **Synopsis of the conference for thermal storage**
Peter Schossig, Member of the IRES Steering Committee, Fraunhofer ISE, Freiburg, Germany
- **Closing Words**
Peter Droege, President EUROSOLAR, Vaduz, Liechtenstein

13:00 Lunch break and end of conference

14:00

Excursions (optional)

- **Excursion Yunicos:** Yunicos AG demonstrates the operation of grids using up to 100% renewable energy sources – by using real power flows in Berlin-Adlershof
- **Excursion Durion:** Two different storages in the daily routine of the new power supply business, Berlin Alt-Treptow

approx. 17:15 End of excursions

8th International Renewable Energy Storage Conference and Exhibition (IRES 2013)

November 18 – 20, 2013, bcc Berlin Congress Center, Berlin / Germany

Conference Registration Form

I hereby submit my binding registration

Registration fee for the IRES 2013

if registering **before October 1, 2013**

_____ € 980

EUROSOLAR/WCRE members _____ € 600

(Membership number _____)

Registration fee for the IRES 2013

if registering **after October 1, 2013**

_____ € 1,100

EUROSOLAR/WCRE members _____ € 700

(Membership number _____)

Other registration fees

Special tariff for the second and any further delegate of the
same company _____ € 980

Excursion Younicos _____ € 32

Excursion Durion _____ € 32

User forum (in German language) _____ € 350

(November 19, free attendance for IRES 2013 participants)

Please complete the registration form and send it to:

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www.energystorageconference.org

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Venue:
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Alexanderstr. 11
10178 Berlin

Online registration and further information: www.energystorageconference.org

Registration terms and conditions: The registration fee includes all panel and parallel sessions of IRES 2013, as well as conference materials, lunch + beverage breaks + evening reception. Once we have received your registration fee, we will send you a confirmation. If you need to cancel your registration (only accepted in written form), we will charge a handling fee amounting to 30% (until 4 weeks before the conference) and afterwards amounting to 50% of the registration fee. No-shows or registrants who cancel on the day of the conference will be charged for the full registration fee. You may transfer the registration to a substitute attendee without additional cost. The organizers reserve the right to change the programme should circumstances so require. Please note: The conference fee does not contain any VAT and is not subject to VAT.