CD-Rom der 5. Internationalen Konferenz zur Speicherung Erneuerbarer Energien (IRES 2010)

Herausgegeben von EUROSOLAR, Erschienen im Februar 2010, CD-Rom mit den Beiträgen der 5. Internationalen Konferenz zur Speicherung Erneuerbarer Energien, Berlin 22.-24. November 2010, Sprache: Englisch

Mit fast 600 Teilnehmern aus 41 Ländern ist die International Renewable Energy Storage Conference (IRES) zur größten Informationsveranstaltung dieser Art geworden. IRES wird von EUROSOLAR e.V. und dem Weltrat für Erneuerbare Energien (WCRE) in Kooperation mit der EnergieAgentur.NRW organisiert.

Experten aus dem In- und Ausland diskutierten unter der wissenschaftlichen Leitung von Prof. Dirk Uwe Sauer (RWTH Aachen) drei Tage lang im Konferenzzentrum des Seminaris CampusHotels über die technischen Möglichkeiten und Entwicklungsfortschritte der Speicherung aus regenerativen Quellen erzeugter Energie. Neben 90 Referaten fand ein reger Informationsaustausch über die rasanten Fortschritte statt, die auf dem Gebiet der Speichertechnik weltweit gemacht werden.

Die fünfte IRES-Konferenz stand im Zeichen der drei Themengruppen Elektrische Speichertechnologien, Wirtschaftliche Aspekte der Speicherung Erneuerbarer Energien und Wärmespeicherung. Hierzu wurden zahlreiche Fachvorträge von Forschern und Wissenschaftlern, Unternehmensvertretern und Energieexperten gehalten.

Bestellung:

Ich möchte die CD-Rom zur "5. Internationalen Konferenz zur Speicherung Erneuerbarer Energien (IRES 2010)" bestellen...

Inhaltsverzeichnis(Da fast alle Beiträge der Konferenz in englischer Sprache gehalten sind, ist auch das Inhaltsverzeichnis hier nur auf Englisch verfügbar.)

Introductory lectures

Thermal Storage: state-of-the-art, current questions, IRES 2010 conference themes
Wim van Helden, Renewable Heat, Schagen, The Netherlands
Presentation

Electrical storage: state-of-the-art, current questions, IRES 2010 conference themes
Dirk Uwe Sauer, RWTH Aachen University, Germany
Presentation

Lessons from nature for energy storage
Helmut Tributsch, Pontebba, Italy
Presentation

Parellel session A: The demand for storage capacities in Renewable Energy scenarios

Deducing the necessary storage capacities and market framework regulations based on the SRU scenarios for a 100 % RE electricity supply in Germany by 2050
Holger Höfling, The German Advisory Council on the Environment (SRU), Berlin, Germany
Presentation

Dimensioning transport and storage capacities
Clemens Hoffmann, Siemens AG, Corporate Technology, Munich, Germany
Paper and Presentation

Comparing PV and CSP at different solar grid penetration levels: influence on demand, storage requirements and levellised electricity costs (LEC)
Paul Freunscht, Lahmeyer International GmbH, Bad Vilbel, Germany
Paper and Presentation

The impact of electricity storage on wholesale electricity prices: a case study of Ireland
Batsaikhan Nyamdash, Trinity College Dublin, Ireland
Presentation

Economic and ecological effects of flexibility in the German electricity supply systems

Dierk Bauknecht Öko-Institut e.V., Institute for Applied Ecology, Freiburg, Germany
Paper

The great transformation: 1 – 40 – 100 % Renewable Energy supply for industrialized countries
Harry Lehmann, Federal Environment Agency, Dessau, Germany
Presentation

Parallel session B: Storage systems and smart management for grid stability

Prospects and limits for the integration of decentralized power systems into low voltage distribution grids with regard to smart grid technologies and energy storage
Stephan Meyer, Cologne University of Applied Sciences, Germany
Paper and Presentation

Smart grid control using a redox flow battery – applications and experience
Steffen Nicolai, Fraunhofer Institute of Optronics, System Technologies and Image Exploitation, Ilmenau, Germany
Presentation

Storage as a component of a decentralized energy management system
Florian Noll, IZES gGmbH – Institut für ZukunfsEnergieSysteme, Saarbrücken, Germany
Paper and Presentation

Supporting offshore wind energy generation through biogas power plants
Jörg Bendfeld, University of Paderborn, Germany

Presentation

Hydrogen pipelines for wind energy storage – technical and economic assessment in case studies
Florent Montignac, CEA/ Laboratoire d’Innovation pour les Technologies des Energies Nouvelles et les nanomatériaux, Grenoble, France
Paper

Thermal storage to integrate a high share of energy from wind and PV into the electricity supply
John Sievers, University of Kassel, Germany
Presentation

Excess electricity used for heat generation: the case of Denmark
Preben Maegaard, Vice President EUROSOLAR, Hurup Thy, Denmark
Presentation

Day two, Tuesday, November 23, 2010 (three parallel sessions)

Parallel session C: Electrical storage technologies I

Low cost modular kinetic energy storage systems for grid scale non-mobile applications
Bill Gray, Velkess, San Francisco, USA
Presentation and Paper

Electrochemical double-layer capacitors: electrical behaviour, applications and lifetime
Julia Drillkens, RWTH Aachen University, Germany
Paper and Presentation

Application of a long-life VRLA battery to Renewable Energy systems
Ichiro Shimoura, Shin-Kobe Electric Machinery Co., Ltd, Nabari, Japan
Presentation

Storage integrated PV systems with high-class NiMH battery technology
Mike Zelinsky, Energy Conversion Devices, Inc., Rochester Hills, USA
Paper and Presentation

Performance analysis of a 1 kW vanadium redox flow battery system
Martin Dennenmoser, Fraunhofer Institute for Solar Energy Systems ISE, Freiburg, Germany
Presentation

Parallel session D: Economic aspects and operation models

Optimized storage operation in virtual power plants in the electricity market
Patrick Hochloff, Fraunhofer Institute for Wind Energy and Energy System Technology, Kassel, Germany
Paper and Presentation

Swarm power and at home power plant – the decentralized power plant becomes reality
Gero Lücking, Lichtblick AG, Hamburg, Germany
Presentation

The business model for electrical energy storage within the regulatory framework of the power system
Anthony Price, Swanbarton Limited, Malmesbury, United Kingdom
Paper and Presentation

Implementing batteries in electrical grids: possible operating schemes for efficient business models
Barnabas Kittlaus, Lahmeyer International GmbH, Bad Vilbel, Germany
Paper and Presentation

Evaluation framework for large-scale electricity storage in case of wind curtailment
Sandu-Rodica Loisel, European Commission, DG Joint Research Centre, Institute for Energy, Petten, The Netherlands
Paper and Presentation

Parallel session E: Thermal storage – sensible

Results of and experience with an aquifer thermal energy storage used for heating and cooling
Johan Van Bael, VITO – The Flemish Institute for Technological Research, Mol, Belgium
Paper and Presentation

The multi-functional heat storage in Hamburg-Bramfeld – innovative extension of the oldest German solar energy housing estate
Thomas Schmidt, Solites – Steinbeis Research Institute for Solar and Sustainable Thermal Energy Systems, Stuttgart, Germany
Paper and Presentation

Demand side energy efficiency: experience with the Chemnitz large-scale cold water storage
Thorsten Urbaneck , Chemnitz University of Technology, Germany
Presentation

A modular concept for large-scale hot water storage systems
Stephan Bachmann, Stuttgart University, Germany
Presentation

A new ground heat exchanger for efficient solar underground thermal energy storage
Peter Platell, Uponor, Sweden
Presentation

Parallel session F: Electrical storage technologies II

Applications of the NaS battery energy storage system
Kenji Tanaka, NGK Insulators, Ltd., Nagoya, Japan
Presentation

Competitiveness of the Samsung LIB-ESS (Lithium Ion Battery-Energy Storage System) and its wide applications for RE & utilities
Andrew Kwon, Samsung SDI Co., Seoul, South Korea
Presentation

The GRID Surfer project: integration of electric vehicles into existing energy systems
Ralf Dittmann, NEXT ENERGY, EWE Research Center for Energy Technology, Oldenburg, Germany
Presentation

Concepts for pumped hydro storage facilities in former opencast mining facilities
Detlef Schulz, Helmut Schmidt University, University of the Federal Armed Forces Hamburg, Germany
Paper and Presentation

Parallel session G: Energy storage systems for off-grid power supply

Technical and financial assistance to implement RE technology in Afghanistan
Andre Moeller, German Technical Cooperation, Eschborn, Germany
Presentation

Comparison of different energy storage approaches in micro-grids with wind farm for energy balance
Shuang Yu, University of Bath, United Kingdom
Presentation

Batteries in remote systems: experience and results
Georg Bopp, Fraunhofer Institute for Solar Energy Systems ISE, Freiburg, Germany
Presentation

Integrating a large photovoltaic power plant with storage systems into an island grid in West Africa
Achim Schreider, Lahmeyer International GmbH, Bad Vilbel, Germany
Paper and Presentation

Parallel session H: Thermal storage systems – PCM

Thermal and rheological property characteristics of PCM microcapsule slurries
Chang-Ying Zhao, University of Warwick, United Kingdom
Presentation

Dimethyl terephthalate (DMT) as a candidate PCM for high temperature thermal energy storage
Engin Küçükaltun, SaSA Polyester San. A.S., Turkey
Paper and Presentation

High temperature PCM based on inorganic salts and carbon nanomaterials
Dong Zhang, Tongji University, Shanghai, China
Paper and Presentation

Innovative and energy efficient space heating + cooling through intelligent storage management
Antoine Dalibard, Stuttgart University of Applied Sciences, Germany
Paper

PCM for heating and cooling – demonstration project Landgericht (regional court) Düsseldorf
Bernd Boiting, Münster University of Applied Sciences, Münster, Germany
Presentation

Parallel session I: Electrical storage technologies III

Swedish pumped hydroelectricity for peak power generation
Sverker Lindbo, Mariestads Kraftverks AB, Sweden
Presentation

The ADELE project: development of an adiabatic CAES plant
towards marketability
Mathilde Bieber, GE Global Research, Garching, Germany
Presentation

The storage of electricity from intermittent renewable energy sources –
what is the role of hydrogen?
Hubert Landinger, Ludwig-Bölkow-Systemtechnik GmbH, Ottobrunn, Germany
Presentation

Hydrogen energy storage
Erik Wolf, Siemens AG, Energy Sector, Technology & Innovation, Erlangen, Germany
Presentation

Analysis of a geothermal hydrogen storage project in Hawaii
Marc Melaina, National Renewable Energy Laboratory, Golden, USA
Paper

Hybridisation of lithium batteries in stationary applications in an intermittent operation mode
Kristian Nikolowski, HOPPECKE Advanced Battery Technology GmbH, Zwickau, Germany

Presentation

Parallel session J: Field installations of electrical storage systems

Ultrabattery utility-scale Renewable Energy storage trials
Peter Coppin, CSIRO Energy Transformed Flagship, Canberra, Australia
Presentation

Entering the MW class: development of large-scale lithium-ion energy storage systems
Michael Lippert, Saft Industrial Battery Group, Bagnolet, France
Presentation

The redox flow battery technology for electricity storage
Huamin Zhang, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian, China Presentation

Report on large-scale installations with redox flow batteries
Hugh Sharman, Prudent Energy, Aalborg, Denmark
Presentation

Connecting large lithium-ion storage batteries to the grid: experience in design, installation and operation of MW size energy storage systems
Tomas Larsson, ABB FACTS, Västerås, Sweden
Presentation

Business aspects of an autarkic grid supply
Matthias Roß, Younicos, Berlin, Germany
Presentation

Stationary battery systems: activities and test procedure development in Japan
Hironori Iwasaki, Mitsubishi Research Institute, Inc., Tokyo, Japan
Presentation

Parallel session K: Thermal storage systems – chemical and high temperature

Using MgCl2.6H2O for thermochemical seasonal solar heat storage
Marco Bakker, ECN, Energy Research Centre of the Netherlands, Petten, The Netherlands
Paper

New developments in thermochemical energy storage
Henner Kerskes, Stuttgart University, Stuttgart, Germany
Presentation

New sorbent materials and their limits
Stefan Henninger, Fraunhofer Institute for Solar Energy Systems ISE, Freiburg, Germany
Paper

A method of evaluating the economic feasibility of sorption heat storage
Herbert Zondag, ECN, Energy Research Centre of the Netherlands, Petten, The Netherlands
Paper

High temperature thermal storage systems for solarthermal power plants, process industry and combined heat and power systems
Wolf-Dieter Steinmann, German Aerospace Center (DLR), Stuttgart, Germany
Presentation

Day three, Wednesday, November 24, 2010

Technical workshop: Grid-connected PV with energy storage to optimize self-consumption

Workshop session one

The current German feed-in-tariff-law – legal, economic and technical interpretation of the Renewable Energy Sources Act, regulations in other countries
Martin Altrock, Becker Büttner Held, Berlin, Germany
Presentation

Increasing BIPV self-consumption through electrical storage – feasible demand-coverage and dimensioning the storage system
Johannes Kathan, Austrian Institute of Technology, Vienna, Austria
Paper

Presentation

Workshop session two

Grid-friendly local consumption of PV energy
Martin Braun, Fraunhofer Institute for Wind Energy and Energy System Technology, Kassel, Germany
Presentation

Redox flow batteries: how innovative business models contribute to increase the economic feasibility of stationary storage systems – potential, opportunities, risks
Benedikt Römer, Center for Digital Technology and Management (CDTM), Munich, Germany
Paper

Presentation

Technical realization with li-ion batteries, the Sol-ion systems: a stationary PV battery system
Armin Schmiegel, voltwerk electronics GmbH, Hamburg, Germany
Paper

Presentation

Technical and economic aspects of storing electricity from PV to increase the share of self-consumption
Volker Wachenfeld, SMA Solar Technology AG, Niestetal, Germany
Presentation

Workshop session three

Storage systems for grid-connected PV battery systems: lead-acid batteries – technical characteristics, costs, lifetime, the potential for cost reduction through mass production
Bernhard Riegel, HOPPECKE Batterien GmbH & Co KG, Brilon, Germany
Presentation

Break-even Analysis of PV-Battery Self-consumption systems
Bert Claessens, VITO - Flemish Institute for Technological Research NV, Boeretang, Belgien
Presentation

The impact of installation size, household size, storage dimensioning and consumer behaviour on the level of self-consumption, return on investment and feed-in tariff costs for private households
Mark Bost, Institute for Ecological Economy Research (IÖW), Berlin, Germany
Presentation

Proceedings of the Poster exhibition of the IRES 2010

Optimization of a remote photovoltaic system coupled to storage in an island context
Sophie Avril, CEA-DEN, Gif-sur-Yvette, France
Paper

Sustainable Fast Charging Stations for Electric Vehicles
Ralf Benger, Institute of Electrical Power Engineering (IEE), Clausthal University of Technology, Germany
Paper and Poster

Klimaerdspeicher – Speichern nach dem Vorbild der Natur
Kristina, Bognar, TU Berlin, Germany
Poster

Biogas/photovoltaic hybrid power system
Manuel Ranges Borges Neto, Federal University of Ceará, Brazil
Poster

A Technical and Economic Model of Tidal Current Energy Conversion coupled with a Storage System
Edward Barbour, University of Edinburgh and Grant Wilson, University of Strathclyde, United Kingdom
Poster

Advanced energy management for decentralized power supply units
Thilo Bocklisch, TU Chemnitz, Germany
Poster

Lifetime of lithium-ion batteries for PV applications
Martin Brand and Andreas Jossen, TU München, Germany
Poster

Simulation of an adsorption chiller with heat and mass recovery
Douglas Bressan Riffel Federal University of Sergipe, Brazil
Poster

Vanadium Redox Flow Batteries
Birgit Brosowski, Fraunhofer UMSICHT, Oberhausen, Germany
Poster

Self-consumption enhancement with storage system and demand-side management: Gedelos-PV system
M. Castillo-Cagigal, E.T.S.I.T., Universidad Politecnica de Madrid, Spain
Paper and Poster

The potential of battery storage and photovoltaics for small island states
Joseph Cilia, ABERTAX, Paola, Malta
Poster

Non-Aqueous Redox Flow Batteries
Christian Dötsch, Fraunhofer UMSICHT, Oberhausen, Germany
Poster

Vacuum evacuated thermal storage in Sengenthal
Benjamin Fuchs, Georg-Simon-Ohm-Hochschule Nuremberg, Germany
Paper and Poster

Renewable energy in Columbia
Alexander Gómez, Universidad Nacional de Colombia, Bogotá, Colombia'
Poster

Electricity storage technologies from Canada
Waleska Guerrero Lemus, Canadian Embassy, Berlin, Canada
Poster

Electrochemical double layer capacitors (EDLC): technology overview and reference materials
David Gutiérrez-Tauste, LEITAT Technological Center, Barcelona, Spain
Poster

Hydraulischer Lageenergiespeicher
Eduard Heindl, Hochschule Furtwangen University, Germany
Poster

Drive energy though buoyancy force: Concentration, storage and fast release of energy
Hartwig Irps, Vechelde, Germany
Paper and Poster

Scheduling and Dimensioning Optimization of Electric Energy Storages with GOMES
Annedore Kanngießer, Fraunhofer UMSICHT, Oberhausen, Germany
Poster

A revised integrated computational algorithm for the optimum sizing of stand-alone hybrid energy systems
Kosmas Kavadias, The Soft Energy Application Laboratory, Mechanical Engineering Department,
TEI PIRAEUS, Greece
Paper and Poster

New trends in the design of advanced materials for solar cells and energy storage
Kakha Tsereteli, Tbilisi State University, Tbilisi, Georgia
Poster

Planning tool for optimized storage
Jasper Lemmens, KEMA Nederland BV, Arnhem, The Netherlands
Poster

Evaluation of the economy of energy storage or grid enforcement in low-voltage distribution grids with a high degree of decentralized generation
Martin Lödl, TU München, Germany
Paper and Poster

Suitable roof types for the support of solar panels
J.K. Makunza, University of Dar es salaam, Tanzania
Poster

Smart integration of electric vehicles into European power grids
Michael Metz, Fraunhofer UMSICHT, Oberhausen, Germany
Paper and Poster

Characterisation tests for the comparison of energy storage systems for stationary and vehicular application
Enrica Micolano, RSE S.p.A., Milano, Italy
Poster

Overview on solar energy in Vietnam
Nguyen Minh Tan, Hanoi University of Technology, Vietnam
Poster

Application of sustainable energy sources by ProPlan Parterns in Uganda
Davy Mugamba, ProPlan Partners, Kampala, Uganda
Poster

Intelligent PV: smart grid storage pv panels
Grietus Mulder, VITO - Flemish Institute for Technological Research NV, Boeretang, Belgium
Poster

A multi-source hybrid system with Li-Ion storage
Giuseppe Napoli, Consiglio Nazionale delle Ricerche (CNR), Istituto di Tecnologie Avanzate per l'Energia "Nicola Giordano" (ITAE), Messina, Italy
Paper and Poster

Integratives Energiemanagement, Nutzung der Flexibilität aktiver Komponenten im Verteilnetz
Astrid Nieße, OFFIS, R&D Division Energy, Oldenburg, Germany
Poster

Controlling photovoltaic power generation with a Vanadium Redoxflow Energy Storage System (ESS)
Marion Perrin, CEA-INES, Le-Bourget-Du-Lac, France
Poster

Testing and modelling of zebra batteries for grid-connected PV applications
Marion Perrin, CEA-INES, Le-Bourget-Du-Lac, France
Poster

A Mobile PV-Wind-Battery-Diesel Hybrid System Prototype for isolated electrification
Boonyang Plangklang, Rajamangala University of Technology Thanyaburi, RMUTT, Thailand
Poster

Storage for a secure power supply from wind and sun
Matthias Popp, Wunsiedel, Germany
Paper and Poster

High Temperature Thermal Energy Storage for Isobaric Adiabatic Compressed Air Energy Storage – Combined Cycle (ISACOAST-CC)

Dawei Qi, TU Braunschweig, Germany
Poster

Cost-saving potentials using demand side management in households and electric mobility
Steffen Schinz, TU Darmstadt, Germany
Paper and Poster

Approach for determining the economic maximum amount of energy storage in a future German energy supply system
Steffen Schinz, TU Darmstadt, Germany
Paper and Poster

Energy balancing demand: How much is needed and where?
Aline Schnur, Fraunhofer UMSICHT, Oberhausen, Germany
Poster

Speicherung regenerativer Energien in Bundeswasserstraßen
Hubertus Schulte, Jürgen Nölke, Matthias Barg, Leuphana Universität Lüneburg, Elektrizitätswerk Dahlenburg Bleckede AG, Germany
Poster

Power grid stabilization by hydrogen pipe network, a new idea
Karl-Heinz Tetzlaff, H2-Patent GmbH, Bad Iburg, Germany
Paper and Poster

Application oriented design of adiabatic CAES
Daniel Wolf, Fraunhofer UMSICHT, Oberhausen, Germany
Poster

Development of support schemes for the promotion of bulk energy storage systems in Greece
Dimitris Zafirakis, The Soft Energy Application Laboratory, Mechanical Engineering Department, TEI PIRAEUS, Greece
Paper and Poster

Renewable energy in Ethopia
Adil Zekaria, Addis Ababa University, Ethopia
Poster

Development of very low temperature PCM for storage of cold energy from LNG regasification
Dong Zhang, Tongji University, Shanghai, China
Paper and Poster

DERlab Workshop Series: Grid-Interfaces of Storage Systems

3rd DERlab workshop: Grid-Connected Storage Systems, 24th November 2010, 08:30-12:30 at the 5th International Renewable Energy Storage Conference IRES2010, SEMINARIS CampusHotel Berlin, Science & Conference Center, Berlin (Germany)

European White Book on Grid-Connected Storage
Elisabeth Lemaire,CEA
Presentation

Definition of application categories
Elisabeth Lemaire, CEA
Presentation

Criteria for the different applications
Per Norgaad, RISOE
Presentation

Assessment of these application criteria
Jos van der Burgt, KEMA
Presentation

Economic aspects
Efstathia Kolentini, NTUA
Presentation

Economic aspects
E. Rikos, CRES; S. Tselepis, CRES; N. Martin, CEA and M.Perrin, CEA
Presentation

The DERri project and Joint Research Activity on Grid-Connected Storage Testing
Enrica Micolano, RSE
Presentation

The DERri project and Joint Research Activity on Grid-Connected Storage Testing (1010.68 KB)
Daniel Wolf, Fraunhofer UMSICHT
Presentation

DERlab presentation (510.24 KB)
Sini Numminen, DERlab e.V.
Presentation

Discussion paper for the workshop: European White Book on Grid-connected Storage (DRAFT paper)