



*Final programme*

*Storage for  
renewable energies*



*Monday 20<sup>th</sup> of October*

**09:00** Opening address: P. Moseley ALABC USA / P. Malbranche CEA-GENEC France

**Session 1**

**Needs of storage systems for RES (Renewable Energy Sources)**  
Chairman Per LUNDSAGER, RISOE, Denmark

**9:30** Storage for RES applications: new market opportunities; Alain COMTE, EDF, France

**9:50** The need for energy storage systems with a high ratio of power output to energy content, H. Wenzl, BBE, H.-P. Beck, , Technical University of Clausthal, IEPE; Germany

**10:10** Estimation of storage added value for wind energy in the Dutch liberalised market, Y.-M. Saint Drenan, CEA-GENEC, France

**10:30-10:50** Coffee break

**10:50** RAPS Peru Project: PV-Hybrid system, P. Moseley, ALABC, USA

**11:10** Storage for rural electrification in developing countries, P. Jourde, CEA-GENEC, France, I. Cyphelly, Alternativas-CMR, Spain

**11:30** Components in renewable energy systems with similar operating conditions – categories of similar usage of lead-acid batteries H. Wenzl, BBE, Germany; D.-U. Sauer, I. Baring-Gould, N. Wilmot, F. Mattera, S. Tselepis, F. Nieuwenhout, C. Rodrigues, A. Perujo, A. Ruddell, P. Lundsager, V. Svoboda, BENCHMARKING project

**Session 2**

**Design and integration of Advanced Storage Systems**  
Chairman Christos PROTOGEROPOULOS

**11:50** Development of an Energy Management System for optimal combination of storage and Renewable Energy, J. De Meij-Braber, J. Raadschelders, TNO, The Netherlands

**12:35-14:00 Free time for LUNCH in Aix en Provence**

**14:00 Nickel-zinc batteries for energy storage, R. Rouget, SCPS, France**

**14:10 Rechargeable lithium batteries for renewable energy systems- State of development, applications, operation experience, A Jossen, G. Sarre, P. Dan, ZSW, Germany**

**14:30 New Low-Cost Li-ion Technology For Renewable Applications, S. Martinet, D. Marsacq, CEA-LSEM, France**

**14:50 Double layer capacitors: use in RES applications and R&D needs, B. Willer, ISET, Germany**

**15:10 Electrolysis / hydrogen storage / fuel cell: Thierry ALLEAU, president of the French Hydrogen Association**

**15:30 - 15:50 Coffee break**

**15:50 High temperature electrochemical storages (NaS, LiFeS); Jean Marc Vinson, CEA-DEN, France**

**Session 5**

**Environmental, economic impacts and perspectives of storage for RES  
Chairman Erik LYSEN, Utrecht University, The Netherlands**

**16:00 Compared costs of storage technologies in different applications, L. Beurskens, ECN, the Netherlands**

**16:20 R&D needs for energy storage to increase RES penetration into power systems, D. Mayer, R. Metkemeier, J. Labbé, ARMINES / Cenerg, France**

**16:40 Round table**

- **Perspectives of storage technologies and systems in Europe**
- **Recommendations for the next EC research programmes**

**17:30 Lessons learned during the conference**

**17:50 Closing session**

**18h00 Soirée Aixoise: Departure from the conference location, Palais des Congrès Aix en Provence (visit of the city, reception, concert)**

**12:10 Properties of interactions between intermittent wind power, energy storage and load management, M. Black, G. Strbac, UMIST, UK**

**12:30-14:00 Free time for LUNCH in Aix en Provence**

**14:00 Principle of a hybrid Compressed Air and Supercapacitors Energy Storage system with Maximum Efficiency Point Tracking, S. Lemofouet, A. Rufer, P. Barrade, F. Grasser, EPFL, Switzerland**

**14:20 Grid connected PV systems with battery, T. Shimada, K. Kurokawa, T. Yoshioka, Tokyo University of Agriculture and Technology, Japan Storage Battery Co., Japan**

**14:40 “Multibat” manager for renewable energy systems, L. Torcheux, J. Alzieu, G. Schweitz, EDF R&D, France**

### **Session 3**

#### **Advanced Storage systems: Test, modelling and standardisation**

**Chairman Andreas JOSSEN, ZSW, Germany**

**15:00 Performance analysis of solar home systems in Mongolia, A. Adiyabat, K. Kurokawa, Tokyo University of Agriculture and Technology, Japan**

**15:20 Test procedures of storage systems based on lead-acid batteries, E. Lemaire-Potteau, P. Malbranche; CEA-GENEC, France**

#### **15:40-16:00 Coffee break**

**16:00 Standard for Battery Testing, M. Real, Alpha Real, Switzerland; F. Wouters, R. Kay, P. Varadi, P. Malbranche, A. Perujo**

**16:20 Specification of test procedures for charge controller, state-of-charge indicator and state-of-health indicator for photovoltaic applications, B. Willer, ISET, Germany; M. Dahlen, E. Lemaire-Potteau, U. Hupach, STAR-BMS project**

**16:40 Development of battery lifetime models for energy storage systems in renewable energy systems P. Lundsager, and H. Bindner, Risoe National Laboratory, Denmark; D.-U. Sauer, R. Kaiser, H. Wenzl, I. Baring-Gould, N. Wilmot, F. Mattera, S. Tselepis, F. Nieuwenhout, C. Rodrigues, A. Perujo, A. Ruddell, V. Svoboda, BENCHMARKING project**

**17:00 Battery ageing: detailed analysis of ageing effects, lifetime tests and simulation of lifetimes, F. Mattera, CEA-Genec, France; D. U. Sauer, P. Fischer, H. Döring, B. Fricke, M. Fernandez, P. Lailler, G. Schmidt-Lukasch, ACTUS project**

**17:20 Adjournment first day**

**19:30 Departure for the Gala Dinner by bus from Place du Général de Gaulle ( so called Rotonde) Front of hotel St Christophe**

*Tuesday 21st of October*

**Session 4: Storage technologies for RES**

**9:00 Exciting Opportunities for Distributed Energy Storage Using Batteries, J. Garche, ZSW, Germany**

**Session 4a**

**Lead acid batteries for RES applications  
Chairman Laurent TORCHEUX, EDF, France**

**9:25 Temperature dependence of the oxygen recombination in valve-regulated lead-acid batteries, A. Kirchev, D. Pavlov, B. Monahov, A. Gigova, CLEPS, Bulgaria**

**9:40 High power lead-acid batteries: today's performance and potential for future decentralised electricity networks, M. L. Soria, J. Sáinz, J. Valenciano, EXIDE-Tudor, Spain**

**9:55 Influence of the current collector/PAM interface on the performance of VRLA batteries in the PsoC duty, B. Monahov, D. Pavlov, G. Papazov, A. Kirchev, M. Stoycheva, S. Vasilev, M. Cherneva, CLEPS, Bulgaria**

**10:10 - 10:30 Coffee break**

**10:30 Advanced lead-acid battery for PV systems: design and integration of novel BMS concepts into the battery, X. Vallvé, J. Merten, J. Grau, TTA, Spain; E. Lemaire-Potteau, N.J.C.M. Van der Borg, J.-F. Sarrau, ABLE project**

**10:45 Lead-acid battery charging by current pulses. Does it help reduced sulphation? A. Perujo, K. Douglas, JRC ISPRA, Italy**

**11:00 Optimisation of photovoltaic recharge, D. Benchetrite, F. Mattera, O. Bach, M. Le Gall, CEA-GENEC, France**

**Session 4b**

**Other technologies for RES applications  
Chairman Juergen GARCHE, ZSW, Germany**

**11:15 Flywheel energy storage in renewable energy systems, A. Ruddell, CCLRC, UK**

**11:35 Thermal energy storage technologies for advanced adiabatic compressed air energy storages, S. Zunft, DLR, Germany**

**11:55 Uncooled Compressed Air Storage in Decentralised Energy Networks, T. Kentschke, H.-J. Barth, Institute for Tribology and Energy Conversion Machines, Technical University of Clausthal, Germany**

**12:15 The use of industrial nickel cadmium batteries in renewable energy systems, A. Green, SAFT, France**