

Tuesday 7th June – Industry Day				
Time	Subject	Speakers	Company & Position	Page No
08:30	Check-in at Information Desk. Refreshments served.			
09:45	Session 1 - Introduction			
	Welcome and introduction	Anthony Price	IFBF Secretary	
	Introduction	Jens Tubke	Fraunhofer ICT	
	Welcome to Karlsruhe	Dr. Frank Mentrup	Oberbürgermeister Karlsruhe	
	The importance of the energy storage industry for the State of Baden Wurtenburg	Günther LeßnerKrauss	Secretary of the Ministry of Economic Affairs, Baden-Württemberg	
	The German energy transition: investment opportunities for energy storage systems	Heiko Staubitz	GTAI	
	Flow battery and long duration energy storage opportunities	Michael Salomon	Clean Horizon	62
	Questions & Answers			
11:20	Refreshments			
11:40	Session 2 - Case Studies		Chairman: Jens Tubke	
	Case studies for deployment of flow batteries	Gary Yang	UET	
		Stefan Schauss	Gildemeister	68
		Toshikazu Shibata	Sumitomo	74
		Craig Horne	RES	
13:00	Lunch			
14:00	Session 3 – Regulatory, legal and commercial aspects of long-duration energy storage		Chairman: Professor Helmut Ehrenberg	
	European issues for energy storage	Victoria Gerus	Policy Officer, EASE	
	Legislative aspects of energy storage in Germany	To be confirmed		
	Can the industry deliver? Panel session with:	Dr Bjorn Peters Frank Wiegandt Paul Sibling Scott McGregor Albrecht Winter	Deutsche Asset and Wealth Management (Finance) WWF Solar (Projects) Vizn (Opportunities) REDT (Manufacturing) Schmalz (Production)	
				76
				93
	Session 4 - Commercialising flow batteries and long duration energy storage			
	Commercialising flow batteries:			
	a) What is helping flow battery deployment?	Enrique Serrano	PVH	72
	b) What is stopping or limiting flow battery deployment?	Arnon Blum	Enstorage	
	c) What is the competition?	Bruce Ebzery	Redflow	30
	d) What can the industry do about it?	Mark Smith Claudia Weidlich	Largo Resources Dechema	
	Summary of Day 1 – briefing on visit to ICT	Peter Fischer	Fraunhofer ICT	
16:45	Session 5 - Visit			
	Visit to the Flow Battery Installation at Fraunhofer ICT and networking reception			

Wednesday 8th June

Time	Subject	Speaker Name	Company & Position	Page No
08:30	Check-in at Information Desk. Refreshments served.			
09:00	Introduction to Day 2	Anthony Price	IFBF Secretary	
	Session 6 - Operational Experiences & Applications		Chairman: Arnon Blum	
	Advanced vanadium redox flow batteries and applications for renewable integration	Andreas Luczak	Vanadis Power	54
	Flow Battery Technology: Latest Progress and Application	Huamin Zhang	Dalian Institute of Chemical Physics	88
	FleXtore: The first Hydrogen Bromine Flow Battery in an office building	Wiebrand Kout	Elestor B.V.	44
	Demonstration of the synergies between hydrogen generation and redox flow battery	Véronique Amstutz	EPFL	12
	Evaluating 6 year VRB operational experience in Vierakker, Netherlands (2010 - 2015)	Jeroen de Veth	Trinergie	82
10:40	Refreshments			
11:10	Session 7 - Continued		Chairman: Gary Yang	
	New Flow Battery Design Concepts for Increasing Power Density and Market Penetration	Chris Menictas	UNSW Mechanical and Manufacturing Engineering	56
	Use Case Analysis and Value Optimization of Redox Flow Batteries	Vincent Sprenkle	Pacific Northwest National Laboratory	84
	Comparison of high voltage inverter system designs used to connect flow batteries to the grid	Thomas Leuth	Trumpf	52
	Economics of the vanadium flow battery for home and community storage	Sebastian Koenig	KIT	110
13:00	Lunch			
14:00	Session 8 - Materials and Manufacturing		Chairman: Terry Perles	
	Recycling vanadium from boiler ash.	Gaku Oriji	Showa Denko K.K.	58
	Redox Flow "X-Battery" for Large-scale Energy Storage	Qing Wang	National University of Singapore	86
	Understanding the flow behaviour in all- vanadium redox flow battery using spatially resolved in-situ voltage distribution	Arjun Bhattarai	School of Material Science and Engineering, Nanyang Technological University (NTU)	18
	Electroless aging of graphite-polypropylene composite bipolar plates in vanadium redox flow battery electrolyte	Barbara Satola	NEXT ENERGY - EWE Research Centre for Energy Technology at the University of Oldenburg	66
	Session 9 - Posters		Chairman: Victoria Price	
	Poster Commercial – selected poster presenters introduce their work			
	Poster session – with concurrent refreshments			
18:30	Transport to Evening Reception and Conference Dinner at Hofgut Scheibenhardt, Karlsruhe			

	Thursday 9th June			
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Time	Subject	Speaker Name	Company & Position	Page No
08:15	Refreshments served			
08:45	Introduction to Day 3	Anthony Price	IFBF Secretary	
09:00	Session 10 - New Concepts		Chairman: Jens Noack	
	Recent Progress in Aqueous Organic Flow Batteries	Michael Aziz	Harvard University	16
	Ionic Liquids-Mediated Aqueous Electrolytes for Redox Flow Batteries	Ruiyong Chen	KIST Europe	22
	Zinc-Air-Flow-Batteries for grid storage applications	Michael Lanfranchi	Westfalian University of Applied Sciences	48
	Toward Symmetric All-Organic Flow Batteries	James Saraidaridis	University of Oxford	64
	Investigation and operation of a 40 cm ² hydrogen-bromine redox flow battery with and without organic bromine complexation agents	Michael Kuettinger	Fraunhofer Institute for Chemical Technology ICT	46
10:40	Refreshments			
11:10	Session 11 - Improving Performance		Chairman: Hubert Girault	
	The effect of felt compression on the performance and efficiency of all-vanadium redox flow batteries	Leon Brown	Electrochemical Innovation Lab, University College London	20
	The Importance of Cell Compression Pressure for Redox Flow Battery Performance	Trevor Davies	University of Chester	26
	Research & Development of Zinc Bromine Flow Battery	Xianfeng Li	Dalian Institute of Chemical Physics, Chinese Academy of Sciences	50
	Materials selection and chemistry development for novel redox flow batteries	Vincent Sprenkle	Pacific Northwest National Laboratory	90
	Performance Benchmarking of Novel Bromine Sequestration Agents for Zinc/Bromine Flow Battery Applications	Martin Schneider	School of Chemical & Biomolecular Engineering, University of Sydney	70
12:50	Lunch			
13:50	Session 12 - Practical Issues - Electrodes		Chairman: Christian Ruediger	
	X-ray Tomography of Redox Flow Battery Materials	Rhodri Jervis	University College London, Chemical Engineering	40
	Chemical aging and electrochemical degradation of carbon felt electrodes in all-Vanadium Redox Flow Batteries	Igor Derr	Freie Universitat, Berlin	28
	Porous carbon based 3D electrocatalysts for positive half-cell reaction in all-vanadium redox flow batteries	Mark Hartmann	Martin-Luther University, Halle Wittenberg	36
	How resistive are your bipolar plates and terminal plates?	Bjorn Hage	University of Sydney	34
15:05	Refreshments			
15:15	Session 13 - Practical Issues Electrolytes & Membranes		Chairman: Adam Whitehead	
	High Temperature Bromine Complexing Agents for Bromine Based Flow Batteries	Ronny Costi	ICL-IP R&D	24
	Optimization of the Cerium/Hydrogen Redox Flow Cell	Michael Tucker	Lawrence Berkeley National Laboratory	80
	The Reaction Environment In The Zinc-Cerium Redox Flow Battery	Luis F. Arenas Martínez	Electrochemical Engineering Laboratory, Faculty of Engineering and the Environment, University of Southampton	14
	Investigating the solubility of vanadium ions in Vanadium Redox Flow Battery	Sukriti Gupta	Nanyang Technological University	32
	Characterization of state-of-the-art membranes in a hydrogen-bromine RFB: a key to the understanding the mechanisms for proton and bromide-species transports in membranes	Yohanes Antonius Hugo	Elestor B.V.	38
	Session 14 - Close			
	Closing discussions & presentations of awards for posters and papers			
17:00	Conference Closes			

