

IFBF 2025 List of Conference Papers

Print ISBN: 978-1-9162004-5-6

Using Galvani potential difference in biphasic flow batteries

Page 16

Vahid Abbasi, Pekka Peljo

Materials Engineering Department, University of Turku, Turku, Finland

Department of Chemistry, Aalto University, Espoo, Finland

Oxygen and nitrogen plasma surface engineering of carbon felts for improved flow battery electrode performance

Page 18

Ahmad Alem, Yining Huang, Dominik Wickenhauser, Bernhard Marius, Christine Band, Stefan Spirk

Chair of Chemistry of Polymeric Materials, Technical University of Leoben, Leoben, Austria Ecolyte GmbH, Graz, Austria

Institute of Bioproducts and Paper Technology, Graz University of Technology, Graz, Austria

Iron salt battery for grid scale applications

Page 20

John P. Alper

VoltStorage GmbH, Germany

Business cases for flow batteries

Page 22

Jan grosse Austing, Andreas Linhart, Uwe Bögershausen

VANEVO GmbH, Oldenburg, Germany

AQUABATTERY - The implementation of the salt battery

Page 24

Yorick Baljeu

AQUABATTERY, Eikenlaan 255C, 2404BP Alphen aan den Rijn, The Netherlands

Vanadium redox flow batteries perspective from an energy investor and operator

Page 26

Christian Barba Rodulfo

Senior Director of Energy Storage for Europe at EDP

Fully automated continuous flow electrosynthesis of high-performance organic FB active materials at multi-ton scale

Page 28

Eugene Beh, Meisam Bahari, Peter Symons

Quino Energy, Inc., San Leandro, CA, USA Electrosynthesis Company, Inc., Lancaster, NY, USA

Theoretical and experimental modelling of a vanadium flow battery system considering self-discharge

Page 30

Richard Beyer, Thilo Bocklisch

Chair of Energy Storage Systems, TU Dresden, Dresden, Germany

AQUABATTERY use case at Deltares: scaling sustainable, cost-effective, behind-the-meter energy storage using water and table salt

Page 32

Jiajun Cen,

AQUABATTERY, Eikenlaan 255C, 2404BP, Alphen aan de Rijn, the Netherlands

Design and implementation of a test stand for temperature-dependent performance analysis of iron/iron redox flow batteries

Page 34

Sai Venkata Akhil Kumar Challuri, Arghyadeep de, Jens Tubke, Jens Noack

Applied Electrochemistry, Fraunhofer Institute for Chemical Technology ICT, 76327 Pfinztal, Germany.

Degradation of VFB - Limits of operation for laboratory cell and battery stack

Page 36

Jiří Charvát, Jaromír Pociďič, Jiří Vrána

New Technologies – Research Centre, University of West Bohemia, Plzeň, Czech Republic

Pinflow energy storage, s.r.o., Plzeň, Czech republic

Effective partnerships for utility scale VFB deployments

Page 38

Jean-Louis Cols

VP Global Partner Development, Invinity Energy Systems, Bathgate, Scotland, UK

UK R&D support for flow batteries and LDES

Page 40

Andrew Deadman

The Faraday Institution, Harwell Campus, Didcot, UK

Ionically crosslinked highly sulfonated poly ether ether ketone membranes for iron-chromium flow batteries

Page 44

Johannes Petrus du Toit, Maximilian Wagner, Vladimir Atanasov, Jochen Kerres, Hyeonrae Cho, Henning Manfred Krieg

*Chemical Resource Beneficiation, North-West University, Potchefstroom, South Africa
IKTS, Fraunhofer, Forchheim, Germany*

Polymer and Membrane Technology, University of Stuttgart, Stuttgart, Germany

Polymer Membrane Synthesis, Helmholtz-Institut Erlangen, Erlangen, Germany

Enlarging solutions for flow batteries (FB) with hydrocarbon-based ionomers

Page 46

Matthias Gebert, Elvira Pagano, Luca Merlo

Green Hydrogen Platform, Syensqo Specialty Polymers Germany GmbH, Dusseldorf, Germany Green Hydrogen Platform, Syensqo Specialty Polymers Italy S.p.A, Bollate, Italy

Economic model predictive control of vanadium flow batteries for power arbitrage

Page 48

Shail Godiwala, Lai Wei, Jie Bao, Maria Skyllas-Kazacos

School of Chemical Engineering, University of New South Wales, Sydney, Australia

FB potential and competitiveness in the soaring market of long duration energy storage

Page 50

Massimo Guarnieri

Department of Industrial Engineering, University of Padua, Padova, Italy

Optimization of a high performance nonaqueous organic redox flow battery via machine learning

Page 52

Thomas Guarr, Andrii Varenikov, Sharmila Samaroo, William Kruper, Madison Shaffer, Emmanuel Yankson, David Hickey

Jolt Energy Storage Technologies, Holland, MI USA Chemical Engineering Department, Michigan State University, East Lansing, MI USA

Long-term cycling performance of organic flow batteries in kWh-Scale FBs

Page 54

Amir-Sina Hamed, Veenasri Vallem, Eugene Beh, Meisam Bahari

Quino Energy

Development and scale up of Fe-V flow battery for applications in Middle East

Page 56

Ahmad Hammad; Issam Thaher Amr; Shilong Xu, Jingbo Wu, Shan Jiang, Shiyu Wang; Gary Yang Saudi

Arabian Oil Company (Saudi Aramco), Dharan, KSA

RongKe Power Ltd. Inc. (RKP), Dalian, China KyRoGreen LLC, WA, USA

Advanced CNN-LSTM collaboration model for improving the SOH estimation accuracy of VRFB

Page 58

Byeongjik Han, Changseong Kim, Yunsun Kim, Deokhee Yun, Deawon Chung, Joonhyeon Jeon

Department of Advanced Battery Convergence Engineering, Dongguk University-Seoul, Korea Division of Electronics & Electrical Engineering, Dongguk University-Seoul, Korea Innovative Battery Cube INC. – Seoul, Korea

Why is California investing in LDES and flow batteries?

Page 60

David Hochschild

Chair, California Energy Commission, 715 P Street, Sacramento, CA 95814, USA

Carbon felt made of recycled aircraft parts for ample supply, quality assured, unit cost savings, and performance enhancement

Page 64

Han James, Hoshino Jim

R&D Division, ACM, Tokyo, Japan

1MW/8MWh vanadium flow battery project installed in Spain

Page 66

Jeehyang Huh, Shin Han

H2, Inc., Daejeon, Republic of Korea

Suppression of hydrogen evolution reaction in aqueous all-iron redox flow batteries

Page 68

Changseong Kim, Changseop Kim, Yunsun Kim, Deokhee Yun, Deawon Chung, Joonhyeon Jeon

Department of Advanced Battery Convergence Engineering, Dongguk University-Seoul, Korea Division of Electronics & Electrical Engineering, Dongguk University-Seoul, Korea Innovative Battery Cube INC. – Seoul, Korea

Micellar solubilization for high-energy-density aqueous organic redox flow batteries

Page 70

Youngsu Kim, Giyun Kwon, Sung-O Park, Heechan Kim, Jihyeon Kim, Kyoungoh Kim, Jaekyun Yoo, Donghwan Lee, and Kisuk Kang

Seoul National University, Seoul, Republic of Korea

Development and validation of a flexible, low-cost, small volume flow cell platform for high-throughput flow battery research, development, and deployment

Page 72

Nathan D. Kirchhofer, Maarten A. Rutgers, Colin L. Hilkemeyer, Alexander L. Hendin, Christopher K. Walsh, Seamus D. Jones

BioZen Batteries, Inc., Santa Barbara, CA, USA Materials Engineering Department, California Polytechnic State University, San Luis Obispo, CA, USA

Advancing Vanadium Flow Battery Technology for Grid Scale Markets

Page 74

Andy Klassen, Brian Adams

Invinity Energy Systems, Vancouver, Canada

Aqueous redox flow batteries using iron complex materials as redox couple

Page 76

Yongchai Kwon, Mingyu Shin, Sungmin Park

Department of Chemical and Biomolecular Engineering, Seoul National University of Science and Technology, Seoul, Republic of Korea

Commercialization of the 2nd generation Fe-Cr complex flow battery: Return of Investment Analysis

Page 78

Liyu Li, Qingtao Luo

Cougar Creek Technologies, LLC. Kirkland, WA 98034 USA

Minimizing Shunt Currents and Pressure Loss in High-Power Flow Battery Stacks: A Scalable Design from J. Schmalz GmbH

Page 80

Georg Lieser, Killian Klumpp, Jürgen Haungs

J. Schmalz GmbH, Energy Storage Division, Glatten, Germany

Modified Graphite Felt Electrodes for Iron-Chromium Redox Flow Batteries

Page 84

Yan-Ru Liu, Yu-Xuan Ding, Yi-An Chen, Ching-Chen Wu, Jeng-Kuei Chang

Department of Materials Science and Engineering, National Yang Ming Chiao Tung University, 1001 University Road, Hsinchu 30010, Taiwan

Green Energy and Environment, Industrial Technology Research Institute, 360 Gaofa 2nd Road, Tainan 71101, Taiwan

Generation 2.0 Zip-like membrane with stability improvement

Page 86

Joseph Epoupa Mengou, Riccardo Barbieri, Simone Canzonieri, Gabriele Bianchi, Angelo Lombardi, Rosamaria Marrazzo, Giovanni Angelo Riva

Eni S.p.A., Renewable Energy, Magnetic Fusion, and Material Science Research Center, Istituto Eni Donegani, 28100 Novara, Italy.

Scaling Zn-Mn flow batteries: performance & economic assessment

Page 88

Eleonora Natale, Federico Lissandrello, Luca Magagnin

Department of Chemistry, Materials and Chemical Engineering 'Giulio Natta', Politecnico di Milano, Milano, 20131, Italy

State of flow battery technologies, markets and future demand for long duration energy storage

Page 90

Conrad Nichols

Energy Storage, IDTechEx, Cambridge, United Kingdom

Flow batteries in Australia with a focus on Queensland

Page 92

Jens Noack, Caroline Stott, Shane Scarinci, Bin Luo

Department of Applied Electrochemistry, Fraunhofer Institute of Chemical Technologies, Pfaffenhofen, Germany

School of Mechanical and Manufacturing Engineering, University of New South Wales (UNSW), Sydney, Australia

Australian Institute for Bioengineering and Nanotechnology, The University of Queensland (UQ), Brisbane, Australia

The University of Queensland, St. Lucia, Queensland, Australia
Faculty of Electrical Energy Systems and Information Technology (EIT), University of the Bundeswehr, Munich, Germany
Energy Storage Industries Asia Pacific, Brisbane, Queensland, Australia

Central Asian production for VFB

Page 94

Svetlana Novikova

Research, Development & Investment Centre, Buston, Tajikistan / Adamant CTC LTD, Larnaca, Cyprus

Biobased membranes for redox flow batteries

Page 96

Lukas Pachernegg-Mair, Alexa Scheer, Janis Zoder, Dominik Wickenhauser, Julian Selinger, Jonas Lins, Torsten Gutmann, Ulrich Hirn, Stefan Spirk

Ecolyte GmbH, Graz, Austria

Institute of Biobased Products and Paper Technology, University of Technology Graz, Graz, Austria

Eduard-Zintl-Institute for Inorganic and Physical Chemistry, Technical University Darmstadt, Darmstadt, Germany

Vanadium market supply and demand

Page 98

Terry Perles

President, TTP Squared, LLC, Pittsburgh, Pennsylvania, USA

High-performance vanadium flow battery (VFB) electrolyte and cell stacks are the key to low cost VFB systems

Page 102

Mike L. Perry

Storion Energy, Alpharetta, GA and Wilmington, MA, USA

Vanadium-backed renewables: cost effective & resilient energy storage for mining

Page 104

Shaun Vagne, Arata Doi, Jeremy Peters

Renewables, Idemitsu Renewable Developments, Brisbane, Australia

Energy Systems Division, Sumitomo Electric Industries, Osaka, Japan

Energy Storage, Veeco Group, Brisbane, Australia

All-iron flow battery coupled with room temperature hydrogen production

Page 108

Mikhail Petrov, Albert O.E. Hohn, Oliver H. Danielsen, Jes V. Ethelberg, Anders Bentien

Department of Biological and Chemical Engineering, Aarhus University, Aarhus, Denmark

Performance modelling and testing of an all-iron flow battery for electrified airport operations

Page 110

Andreas Podias, Alessio Lodge, Steven Wilkins

Powertrains Department, Mobility & Built Environment Unit, Netherlands Organisation for Applied Scientific Research - TNO, Helmond, the Netherlands

Nanostructured carbon electrodes for enhanced performance and cost efficiency

Page 112

Gerardo Maria Pagano, Simone Fiorini Granieri, Pooria Poormehrabi, Fabio Di Fonzo, Laura Giorgia Rizzi

Flow-nano s.r.l.

VFB electrolyte: performance & durability

Page 114

Alasdair P. M. Robertson

Invinity Energy Systems, Bathgate, EH14 2FG, UK

Laboratory test methods for vanadium flow battery electrolyte: towards the development of standards for vanadium electrolyte

Page 116

Nataliya Roznyatovskaya, Jens Noack, Matthias Fühl, Yannick Seiler, Florian Geier

Applied Electrochemistry, Fraunhofer ICT, Pfinztal, Germany

READER project: Applying AORFB to decoupled electrolysis for hydrogen production

Page 118

Eduardo Sánchez-Díez, Anu Jacob, Paramaconi Rodriguez

Centre for Cooperative Research on Alternative Energies (CIC energiGUNE) Basque Research and Technology Alliance (BRTA) Alava Technology Park, Albert Einstein 48, 01510 Vitoria-Gasteiz, Spain

IKERBASQUE, Basque Foundation for Science. Plaza Euskadi, 5, 48009 Bilbao, Spain.

From lab to grid application: 5 kW/12 kWh aqueous organic flow battery in project HIGREEW

Page 120

Michael Schäffer, Aitor Beloki, Sergio Macias, Antonio Riesco, David Bähr, Peter Fischer, Eduardo Sanchez

Department of Applied Electrochemistry, Fraunhofer Institute for Chemical Technology, Pfinztal, Germany

Centre for Cooperative Research on Alternative Energies (CIC EnergiGUNE), Basque Research and Technology Alliance (BRTA), Vitoria-Gasteiz, Spain Department of Nuclear and Fluid Mechanics, University of the Basque Country (UPV/ EHU), Vitoria Gasteiz, Spain

Siemens Gamesa Innovation & Technology, Valladolid, Spain

Past, present and future of the vanadium-redox-flow battery (VRFB) system at Fraunhofer ICT embedded into EU-Horizon project SMHYLES

Page 122

Yannick Seiler, Michael Schäffer, Jens Tübke, Jens Noack

Department of Chemical Engineering, Karlsruher Institute of Technology, Karlsruhe, Germany
Department of Applied Electrochemistry, Fraunhofer Institute of Chemical Technologies, Pfintal, Germany

Department of Mechanical and Manufacturing Engineering, University of New South Wales (UNSW), Sydney, Australia

Australian Institute for Bioengineering and Nanotechnology, The University of Queensland (UQ), Brisbane, Australia

Department of electrical energy systems and information Technology (EIT), University of the Bundeswehr, Munich, Germany

Stacks for large-scale flow batteries: what is the optimum stack size?

Page 124

Thorsten Seipp, Damian Pandel, Philipp Schröder, Martin Bayer

Volterion GmbH & Co. KG, Dortmund, Germany

The virtues and limitations of redox-flow batteries, a utility perspective

Page 126

Philippe Stevens

EDF Llab Renardières, EDF R&D, Moret Loing Orvanne, FRANCE

Sealing materials and extrusion production of tubular flow battery cells

Page 128

Thorsten Struckmann, Fabian Brandes, Max Poxleitner, Andreas Arlt, Simon Fischer, Alexander Gunesch,

Heinrich Blasius Institute, HAW Hamburg, Hamburg, Germany

CC4E – Comp. Center for Renewable Energies and Energy Efficiency, HAW Hamburg, Hamburg, Germany

WEVO-CHEMIE GmbH, Ostfildern-Kemnat, Germany

UNIWELL Rohrsysteme GmbH & Co. KG, Ebern, Germany

Development and modeling of a 300 kW/2400 kWh vanadium flow battery

Page 130

Daisaku Taguchi, Kazuhiro Fujikawa, Takashi Kanno, Katsuya Yamanishi

Redox Flow Battery System Division, Sumitomo Electric Industries, Ltd, Osaka, Japan

A Digital Twin approach to vanadium redox flow batteries for real-time analysis and multi-horizon predictive simulations

Page 132

Balázs Tóth, Dr. Dávid Raisz

Department of Power Engineering, Budapest University of Technology and Economics, Budapest, Hungary

Potential extended ferrocyanide-based aqueous flow batteries

Page 134

Ali Tuna

University of Turku, Department of Chemistry, Henrikinkatu 2, FI-20014 Turku, Finland.

Evaluation of flow properties in the vanadium oxygen fuel cell

Page 136

Robert Turney, Jiangzhou Xie, Maria Skyllas-Kazacos, Chris Menictas

School of Mechanical and Manufacturing Engineering, UNSW, Sydney, Australia

School of Chemical Engineering, UNSW, Sydney, Australia

A systematic study on the performance and stability of hydrogen-manganese flow battery

Page 138

Erlantz Villar, Rakel Wreland Lindström, Amirreza Khataee

Applied Electrochemistry, KTH Royal Institute of Technology, Stockholm, Sweden

Full state extended Kalman filter for vanadium flow batteries under concentration imbalance condition

Page 140

Lai Wei, Shail Godiwala, Jie Bao, Maria Skyllas-Kazacos

School of chemical Engineering, UNSW, Sydney, Australia

State-of-charge monitoring methods for VFB: amperometry

Page 142

Claudia Weidlich, Felix Lulay, Meiser Valencia

Applied Electrochemistry, DECHEMA-Forschungsinstitut, Frankfurt, Germany

The economics of state-of-health management for the VFB

Page 144

Adam H. Whitehead, Martin Harrer, Jie Sun, Peter Pokorny

CellCube Energy Storage GmbH, Wiener Neudorf, Austria

Views on improving flow battery manufacture and operation

Page 146

Rick Winter

Enduro Corp, Seattle, USA