

**Tuesday 9<sup>th</sup> July**

**Name**

**Affiliation**

**Session 0 - Introduction**

Welcome

Energy storage challenges and opportunities for flow batteries

Cécile Barrere-Tricca

IFP Energies nouvelles

**Session 1 - Panel Session: Recent progress in the flow battery industry – the corporate view**

Applications and markets: large scale, small scale, mobile and emerging

Panel session

Andy Klassen

Avalon

Jeehyang Huh

H2 Inc

Xu Shuang

VRB Energy

Ben Sheppard

Redflow

**Session 2 - Recent news of flow battery installations**

Thorsten Seipp

Volterion GmbH

Joseph Epoupa Mengou

Eni SPA

Toshikazu Shibata

SEI - Sumitomo

Lockheed Martin

Guillaume Chazelet,

Kemiwatt

Market opportunities

Ali Davoodi

Iran

Russia

Mexico

**Session 3 - Panel session:**

**Promoting the business case for flow batteries and long duration energy storage**

Gary Yang

UET

Kevin Bradley

BSEF

Scott McGregor

redT

Henrik Buschmann

Schmid Energy Systems

**Evening drinks reception – sponsored by Oxkem**

Our platinum sponsors:



**Wednesday 10<sup>th</sup> July**

**Name**

**Affiliation**

**Session 4 – Reducing costs of materials and components**

|   |                  |                                       |
|---|------------------|---------------------------------------|
| The circular economy for flow batteries         | Juan Pérez       | Environbat                            |
| Raw material for vanadium electrolyte           | Jens Burfeind    | Fraunhofer UMSICHT                    |
| Performance enhancing stack geometry            | Chris Menictas   | UNSW School of Mechanical Engineering |
| Extruded bipolar plates                         | Mario Gillmann   | Centroplast Engineering Plastics      |
| Advancement of Nafion™ Membrane                 | Ruidong Yang     | The Chemours Company                  |
| Cost reductions enabled by membrane innovations | Gregory Newbloom | Membrion                              |

**Session 5 – flow battery operation and flow battery systems**

|  |                |  |
|--|----------------|--|
| Inverter based compensation of decreasing rotating mass in energy distribution systems | Jens Kaufmann  | TRUMPF Hüttinger                             |
| Influence of mass transport processes at dynamic loading conditions                    | Mikhail Pugach | Skolkovo Institute of Science and Technology |
| Hydrogen formation in flow batteries   | Thomas Rabbow  | AvCarb Material Solutions                    |
| The effects of current ripples on vanadium redox flow batteries                        | Yifeng Li      | UNSW School of Mechanical Engineering        |

**Session 6 – Novel systems**

|   |                    |   |
|---|--------------------|---|
| Low cost zinc-iron rechargeable flow battery with high energy density | Alessandra Accogli | Politecnico di Milano                     |
| Hybrid hydrogen-vanadium cell   | Trung Nguyen       | University of Kansas                      |
| Tubular cell designs  | Simon Ressel       | Hamburg University of Applied Sciences    |
| Activation of graphite felts using ozone/heat treatment               | Hansung Kim        | Yonsei University                         |
| Optimization of felt compression                                      | Jiří Charvát       | UCT Prague                                |
| Bonded carbon felt electrode-bipolar plate assemblies                 | Gaurav Gupta       | DLR Institute of Networked Energy Systems |

**Poster session**

**Evening dinner cruise – separate registration required**

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**Thursday 11<sup>th</sup> July**

**Name**

**Affiliation**

**Session 7 - Materials properties and supply**

|  |                    |                                     |
|--|--------------------|-------------------------------------|
| BCA catholyte and cell performance in H <sub>2</sub> /Br <sub>2</sub> flow batteries                                     | Michael Kuettinger | Fraunhofer ICT                      |
| Crossover -tolerant platinum catalysts in H <sub>2</sub> /Br <sub>2</sub> flow batteries                                 | Kobby Saadi        | Bar-Ilan University                 |
| Failure analysis of the membrane electrode assembly in hydrogen-bromine flow batteries after accelerated cycling testing | Yohanes Hugo       | Elestor                             |
| Thermally regenerative copper redox-flow battery coupled with slurry electrodes  | Sunny Maye         | EPFL                                |
| A high-energy-density long-life aqueous chalcogenide-iodide redox flow battery   | Zhejun Li          | The Chinese University of Hong Kong |
| Estimating membrane lifetimes for vanadium flow batteries with Ce(IV)  | Fabio Oldenburg    | Paul Scherrer Institut              |
| Carbon felt electrode materials  | Barbara Gonczi     | Zoltek                              |

**Session 8 - Technology panel on organic flow battery systems**

|  |                  |   |
|--|------------------|---|
| The use of organic electrolytes in flow battery systems                      | Michael Aziz     | Harvard University                              |
| EnergyKeeper smart grid: Organic RFB in a practical application              | Tobias Janoschka | JenaBatteries                                   |
| Electrochemical stability of selected quinone and viologen derivatives       | Petr Mazur       | University of Chemistry and Technology, Prague  |
| Quinone based slurry electrodes in flow cell batteries                       | Fathima Fasmin   | Qatar Environment and Energy Research Institute |
| Enhanced organic flow battery with solid boosters                            | Elena Zanzola    | EPFL  |
| Performance and stability of electrolytes for aqueous organic flow batteries | David Pasquier   | IFP Energies nouvelles                          |

**Session 9 - Reports from the field**

|   |                   |  |
|---|-------------------|--|
| Characterisation of a 200 kW/400 kWh vanadium flow battery                                  | Leonard Berlouis  | University of Strathclyde                                |
| Purification of copper-contaminated vanadium electrolytes                                   | Danick Reynard    | EPFL   |
| Modelling and analysis of mechanical behaviour, reliability and electrochemical performance | Ao Tang           | Institute of Metal Research, Chinese Academy of Sciences |
| Real-time reservoir balancing and leak-free nonaqueous cell design for flow batteries       | Kirk Smith        | University of Oxford                                     |
| Material, cell and stack characterization   | Melanie Schroeder | J Schmalz  |
| High temperature stabilization of electrolyte for vanadium flow battery                     | Baoguo Wang       | Tsinghua University                                      |
| Design of flow fields for a large area cell of a VRFB                                       | Sreenivas Jayanti | Indian Institute of Technology                           |

**Presentations and closing comments**

**The conference is expected to conclude by 16:30**

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