

# INTERNATIONAL FLOW BATTERY FORUM 2024



# IFBF 2024

## THE PROGRAMME

25 - 27 JUNE 2024 GLASGOW, UK

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**08:30** | **WELCOMING COFFEE** - Foyer and Exhibition Area

**09:15** | **Welcome:**

- **Anthony Price**, *IFBF*, **Kees van de Kerk**, President of *Flow Batteries Europe*, and **Beata Virsumirska**, Policy Officer of *Flow Batteries Europe*

**09:30** | **Flow Batteries in Scotland**

- **Sponsor's Keynote Address: Invinity Energy Systems: Larry Zulch**, *Invinity Energy Systems*: Our view of the world of flow batteries from our home in Scotland
- **Ed Brightman**, *University of Strathclyde*: Flow battery activities at the University of Strathclyde
- **Gavin Park**, *StorTera*: The development and deployment of the lithium sulphur flow battery
- **Ray Arrel**, *Regen*: The role of electrical energy storage in UK's future energy system

**11:00** | **COFFEE BREAK** - Foyer and Exhibition Area

**11:30** | **Project Reports**

- **Johannes Häntzschel**, *Prolux Solutions*: The deployment of domestic flow battery storage systems in the DACH region.
- **Thomas Lüth**, *CellCube*: Recent progress at CellCube, Austria
- **Toshikazu Shibata**, *Sumitomo Electric Industries*: The Kashiwazaki City, Japan long-duration flow battery energy storage project
- **Philip Krause**, *Rongke Power*: Construction and operation of a 100 MW / 400 MWh flow battery systems
- **Sponsor's Keynote Address: US Vanadium: Mark Smith and Alicia Enslin**, *US Vanadium*: Achieving growth in the supply chain
- **Kees van de Kerk**, *Volterion*, *Flow Batteries Europe*: Achieving growth in the commercialisation of flow batteries

**13:00** | **LUNCH BREAK** - Foyer and Exhibition Area

**14:00** | **Panel Discussion on Electrolyte Supply**

- **Terry Perles**, *US Vanadium*
- **Jana Plananska**, *Norge Mineraler AS*
- **Jack Bedder**, *Project Blue*

**14:25** | **International Markets for Flow Batteries**

- **Yutong Zhu**, *Jena Flow Batteries*: Insights into China's flow battery and energy storage market
- **Jeehyang Huh**, *H2, Inc*: Recent developments in vanadium flow battery systems in South Korea
- **Gary Yang**, *KyRoGreen*: Applications and markets of vanadium flow batteries in MENA
- **Jill Caine**, *Erne Energy*: The Australian Battery Strategy

**15:30** | **TEA BREAK** - Foyer and Exhibition Area

**16:00** | **What policies would help develop flow batteries?**

- **Lelde Kiela-Vilumsone**, Team Leader, Energy Efficiency Policy Development, DG ENER, *European Commission*
- **Mike Gravely**, Research Program Manager, *California Energy Commission*

A panel discussion with industrial representatives will follow.

**19:00** | **CONFERENCE DINNER** - Glasgow Science Centre

**IMPORTANT:** A separate ticket is needed for the IFBF Conference Dinner. If you have any questions, please contact us at the reception desk. There is a shuttle bus between the Hilton Hotel and the Glasgow Science Centre, first departure at 18.20.

The conference dinner is sponsored by AvCarb.



# DAY TWO - WEDNESDAY 26 JUNE

08:30

WELCOMING COFFEE - Foyer and Exhibition Area

09:00

## Vanadium Systems

- **Adam Whitehead**, *CellCube*: Vanadium flow battery - a field performance study proving a success story and technological advances
- **Pablo A. Prieto-Diaz**, *University Carlos III Madrid*: Capacity decay due to imperfect electrolyte mixing inside VFB tanks
- **Alasdair Robertson**, *Invinity Energy Systems*: The low-temperature stability of vanadium electrolyte
- **Monja Schilling**, *Helmholtz Institute Ulm - KIT*: Fiber shapes of electrodes for VFBs
- **Christian Stolze**, *Friedrich Schiller University Jena*: Chronoamperometric State-of-Charge Measurements in Flow Battery Electrolytes
- **Jiří Charvát**, *Pinflow*: Detailed investigation of VFB stack with a focus on single cell
- **David Reber**, *Empa*: On the role of energy density for grid-scale batteries

10:45

COFFEE BREAK - Foyer and Exhibition Area

11:15

## Other Inorganic Systems

- **Ewan Fraser**, *University of Southampton*: The development and characterisation of a kW scale soluble lead flow battery
- **Fengjing Jiang**, *CIC energiGUNE*: The advantages and challenges of the iron-lead single-flow battery for large-scale energy storage.
- **David Gráf**, *UCT Prague*: Flow batteries with zinc electrode – deposition and battery operation in various pH
- **Eleonora Natale**, *Politecnico di Milano*: Demonstration of an aqueous Zn Mn flow battery
- **Zakaria El Koura**, *Green Energy Storage*: Empowering LDES: GES Disruptive Hydrogen Flow Battery
- **John Alper**, *VoltStorage*: Iron salt battery: challenges and advances
- **Liyu Li**, *Cougar Creek Technologies*: Commercialization of a Fe-Cr complex long-duration flow battery

13:00

LUNCH BREAK (SPONSORED BY QUINO ENERGY) - Foyer and Exhibition Area



14:00

## Hybrid and Organic Systems

- **Sponsor's Keynote Address: QUINO ENERGY: Eugene Beh**, *Quino Energy*: Ton-scale electrosynthesis of quinone negolytes and their cycling performance in commercial flow battery hardware
- **Tobias Janoschka**, *Jena Flow Batteries*: From lab to megawatts: The evolution of TEMPO-based organic flow batteries
- **Norbert Bartetzko**, *CMBlu Energy*: Organic solid flow technology - combining flow and solid state battery systems
- **Xinjie Guan**, *University of New South Wales*: A coupled hydraulic and electrochemical stack and system model for aqueous organic flow battery: the MV/TEMPTMA system
- **Kathryn Toghill**, *Lancaster University*: The dual flow hybrid flow battery system
- **Alberto Quintero**, *B5tec*: Membraneless micro flow battery operating with inorganic and organic redox species
- **Cristina Flox**, *Iberian Center for Research in Energy Storage*: Pathways to high energy / power density flow battery

16:00

## Poster Speed Pitch "Just a minute!"

As a prelude to the IFBF Poster session, invited poster presenters will talk for "just a minute" about their work. Listen to their pitches as you hear about the latest research and new ideas in the industry before the poster and exhibition networking session.

16:30

## IFBF POSTER SESSION AND NETWORKING RECEPTION

Our popular IFBF poster session is back! We will be featuring 50 posters on the latest R&D in the world of flow batteries. Pick up your refreshments and talk to the poster presenters, visit our exhibition stands and discuss the latest developments with experts, colleagues and friends!

The Poster Session and Networking Reception is sponsored by Pinflow.



# DAY THREE - THURSDAY 27 JUNE

08:30

WELCOMING COFFEE - Foyer and Exhibition Area

09:00

## Manufacturing, Performance and Reliability

- **Takashi Kanno**, *Sumitomo Electric Industries*: Reliability testing of redox flow battery cell stacks
- **Elisha Martin**, *Invinity Energy Systems*: Accelerating the development of non-PFAS options for VFB membranes
- **Martin Bayer**, *Volterion*: Testing and evaluation of membranes for flow batteries
- **Hartmut Gross**, *Schunk*: Cost engineering for key stack components (bipolar plate, electrode) in the GW scaled LDES market
- **Maximilian Fischer**, *Centroplast*: Continuously produced bipolar plates via extrusion - challenges & opportunities in mass-production
- **Uwe Bögershausen**, *Vanevo*: Gaining scale, climbing the learning curve and lowering flow battery costs

10:30

NETWORKING COFFEE BREAK - Foyer and Exhibition Area

11:00

## Business Opportunities for Flow Batteries

- **Massimo Guarnieri**, *University of Padua*: Techno-economic investigation on vanadium flow battery future profitability
- **Hamid Zareipour**, *Arcus Power*: An AI-enabled platform for energy storage value maximization
- **Wei Wang**, *PNNL*: Data-driven material discovery and development for flow batteries
- **Arjun Bhattarai**, *VFlowTech*: A new role for fuel oil tanks
- **Zamien Sumich**, *VSUN Energy*: Case study of a remote Western Australian utility VFB installation

12:30

## Conference Closing Summary and Presentation of Awards

Our short summary of the proceedings will follow the presentation of awards for the poster session.

13:00

LUNCH BREAK - Foyer and Exhibition Area

14:00

## IFBF Site visit – Invinity Manufacturing Tour (Please bring your ticket with you).

Bathgate, Unit 1, 10 Easter Inch Rd, Bathgate EH48 2FG, UK

Invinity has been building vanadium flow batteries in the UK, previously as redT Energy, since 2013 and today ships energy storage systems to a global customer base from its factory in Scotland. The company is pleased to invite our guests to join us on a tour of a working vanadium flow battery manufacturing facility.

Invinity's product is a modular VFB, designed to ship to customer site fully factory tested and loaded with electrolyte. This allows the quick deployment of batteries to site in a range of sizes and configurations. Visitors will get a fascinating look at how this technology comes together in Invinity's ISO-certified factories and processes.

**IMPORTANT:** A separate ticket is needed for the IFBF Site Visit. Your ticket will have the information on your assigned group and bus times for departure from the Hilton Glasgow. If you have any questions, please contact us at the reception desk.

