

## Tentative Programme

### Workshop in High Temperature Batteries for Energy Storage

Venue: Scandic Lerkendal, Klæbuveien 127, Trondheim

#### Monday September 18<sup>th</sup> 2017

19.00 Welcome reception in the Skybar at Scandic Lerkendal (the workshop hotel). A welcome drink and a light meal is served.

#### Tuesday September 19<sup>th</sup> 2017

08.30 **Registration and Coffee**

09.00 **Jostein Mårdalen** Head of Department at Materials Science and Engineering, NTNU

**Nina Dahl** Vice President at Industrial Process Technology, SINTEF

*Opening of workshop*

#### Session 1: Battery Concepts

Session chair:

09.10 **Donald Sadoway** MIT

*Keynote: Innovation in Stationary Storage: the Liquid Metal Battery*

09.55 **Hojong Kim** Pennsylvania State University

*Thermodynamic Properties of Alkaline-earths (Ca, Ba, and Sr) in Liquid Metals (Bi and Sb) Determined by Electromotive Force (EMF) Technique*

10.20 **Coffee break and snack**

10.35 **Toshiyuki Nohira** Kyoto University

*Intermediate Temperature Sodium-Ion Batteries Using Amide Ionic Liquids*

11.05 **Jonas Pampel** Fraunhofer Institute for Material and Beam Technology

*Development of Sodium-Sulfur Batteries Operating at Room Temperature*

11.30 **Lunch**

## Session 2: Battery Concepts continued

### Session chair:

12.30 **Geir Martin Haarberg** NTNU

*A Liquid Sodium-Zinc and Molten Chloride Battery*

12.55 **Camilla Sommerseth** SINTEF Materials and Chemistry

*Title to be decided: Na-Zn battery*

13.20 **Ann Mari Svensson** NTNU

*Title to be decided: What are we up against - Li batteries*

13.45 **Coffee break with snack**

## Session 3: Fluid Dynamics

### Session chair:

14.15 **Douglas Kelley** University of Rochester

*Transitions between Electromagnetic Flow States in Liquid Metal Batteries*

14.35 **Valdis Bojarevics** University of Greenwich

*Large Scale Liquid Metal Batteries*

15.00 **Tom Weier** Helmholtz-Zentrum Dresden-Rossendorf

*Electromagnetically Excited Flows and Instabilities in Liquid Metal Batteries*

15.25 **Andrejs Tucs** University of Greenwich

*Long Waves Instability Due to MHD Mode Coupling in Liquid Metal Batteries*

18.00 **Dinner** at Kommandanten, Kristiansten festning (The historical fortress in Trondheim)



## Wednesday September 20<sup>th</sup> 2017

### Session 4: Battery Concepts

#### Session chair:

09.00 **Maria Broglia** RSE

*A New Monocell for Na-beta High Temperature Batteries*

09.25 **Meike Heinz** EMPA

*Recent Advances in  $\beta''$ -Alumina Ceramics for Na-Batteries*

09.50 **Benjamin Schüßler** Fraunhofer Institute for Ceramic Technologies and Systems IKTS

*Sodium Nickel Chloride Research Activities and Cathode Development*

10.15 **Michael Schreieder** Younicos

*Project TILOS – a Joint Effort for Future Energy Systems*

10.25 **Coffee break with snack**

### Session 5: Policies, grid considerations and discussions

#### Session chair:

10.55 **Discussion session 1**

*How far are these battery technologies from being commercialised?*

*What are the main challenges with these technologies and how can they be solved?*

11.25 **Brittney Becker** European Association for Storage of Energy (EASE)

*EASE Presentation on RD&D Policy and Regulatory Frameworks to Support All Energy Storage Technologies*

11.50 **Michael Belsnes** SINTEF Energy

*The Role and Opportunity of Energy/Electricity Storage in the Future Electricity System*

12.15 **Discussion session 2**

12.45 Wrap up of workshop

13.00 **Lunch**

14.00-16.00 **Laboratory tour at NTNU/SINTEF facilities**

## Thursday September 21<sup>st</sup> 2017

### Trip to Hydro Aluminium AS, Sunndalsøra

07.45 Meet at lobby Scandic Lerkendal

08.00 Bus will leave Scandic Lerkendal. There will be snacks available on the bus.

11.00 Plant visit at Hydro Aluminium including lunch

14.00 Leave Hydro

17.00 Arrive Scandic Lerkendal