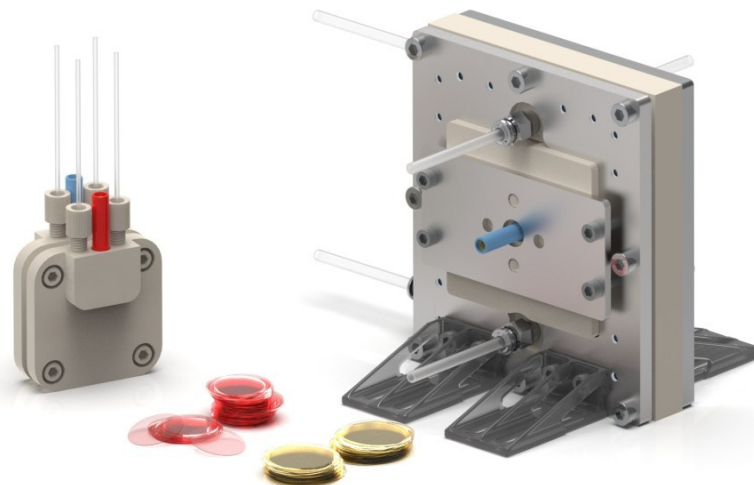


WIRA SET

WISE Industry
Research Arena
Sustainable
Electrochemical
Technologies



WISE Networking Day
28th January 2025

Liam R. Carroll, PhD

The logo for Alleima, featuring a stylized orange and red 'A' symbol followed by the word 'Alleima' in a black sans-serif font.

Alleima

The logo for Linköping University, consisting of the letters 'li.u' in a bold, black, lowercase sans-serif font, with 'LINKÖPING UNIVERSITY' in a smaller, black, uppercase sans-serif font below it.

li.u
LINKÖPING
UNIVERSITY

The logo for ipcs, with the letters 'ipcs' in a red, lowercase, sans-serif font. The 'i' and 'p' are connected, and the 'c' and 's' are also connected.

ipcs

The central logo for WIRA SET, with 'WIRA' and 'SET' stacked vertically in a large, white, uppercase, sans-serif font, centered within a teal circle.

**WIRA
SET**

The logo for redox.me, with 'redox.me' in a bold, black, lowercase sans-serif font, and 'Center for Electrochemical Flow Systems' in a smaller, black, lowercase sans-serif font below it.

redox.me
Center for Electrochemical
Flow Systems

The logo for the Knut and Alice Wallenberg Foundation, with the text 'Knut and Alice Wallenberg Foundation' in a blue, cursive script font.

*Knut and Alice
Wallenberg
Foundation*





Alleima

Jörgen Westlinder
Sebastian Proch



li.u

Reverant Crispin
Ulf Helmersson

Magnus Svensson
Director of WIRA

**WIRA
SET**



Moyses Araujo



ipcs

Cherryleen Garcia-Lindgren
Anders Bodin



Mathilde Luneau



redox.me

Pawel Wojcik
Liam Carroll
Matilda Palmqvist

*Knut and Alice
Wallenberg
Foundation*

Sustainable Electrochemical Technologies

PFAS

Per and Polyfluoroalkyl
Substances

CRM

Critically Raw
Materials

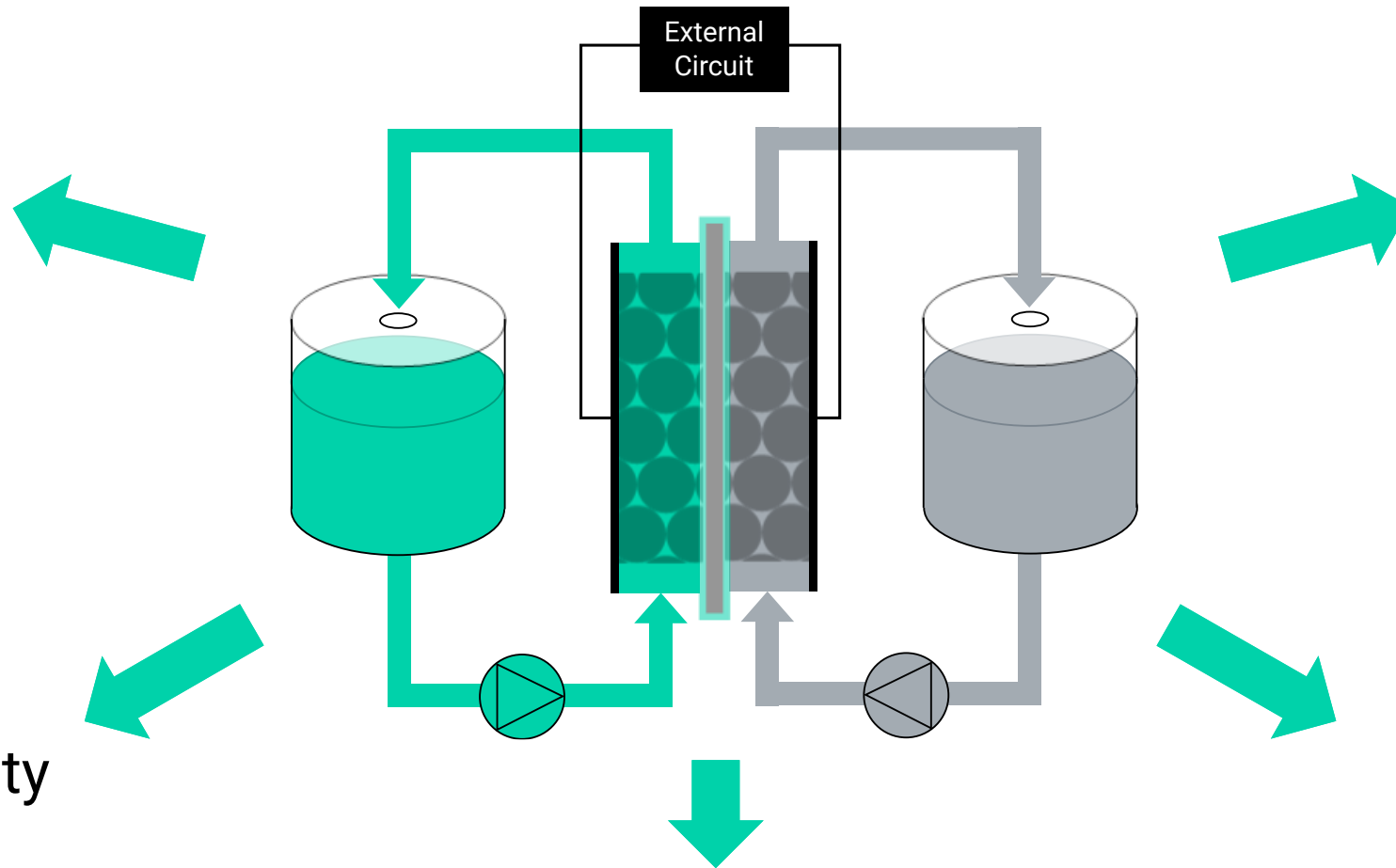
Sustainable Electrochemical Technologies

- Upcoming regulation of PFAS and CRM is a **concern for sustainable electrochemical technologies**
- Developing and optimising materials and processes, but also **navigating these regulatory challenges**
- Research will focus on **substituting materials** with non-CRM/PFAS materials of **maintained or improved functionality**.
- WIRA-SET will focus on reducing or eliminating the use of CRM and PFAS in **electrochemical flow cell-based technologies**.

Electrochemical Flow Systems

PEM Electrolysers
electrolysis of water into H_2 and O_2

Flow Reactors
electrochemical synthesis of chemical compounds

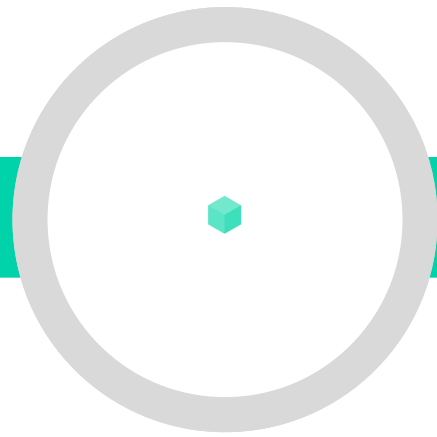


Flow Capacitors
storing electrical energy on semi-liquid electrodes

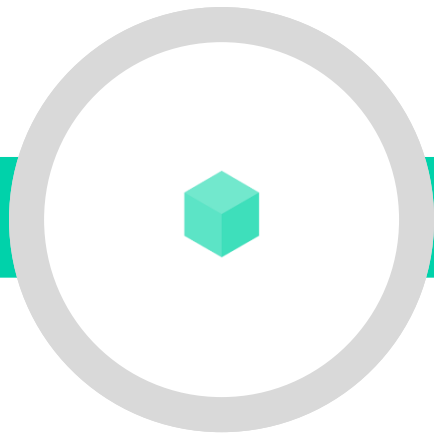
Fuel Cells
generate electricity by a chemical reaction

Redox Flow Batteries
storing electrical energy as chemical energy

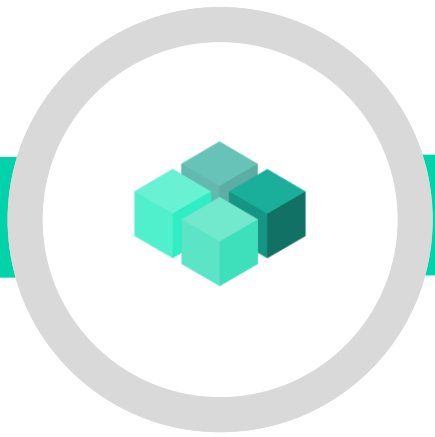
Scalable Access to Technology



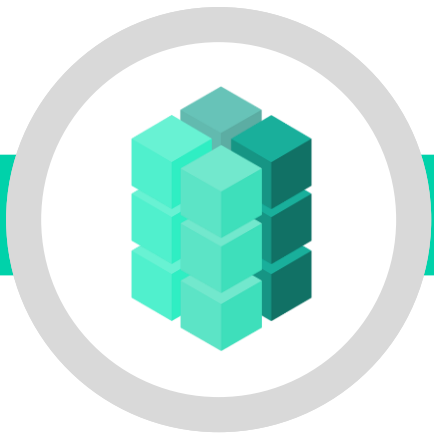
Microfluidics



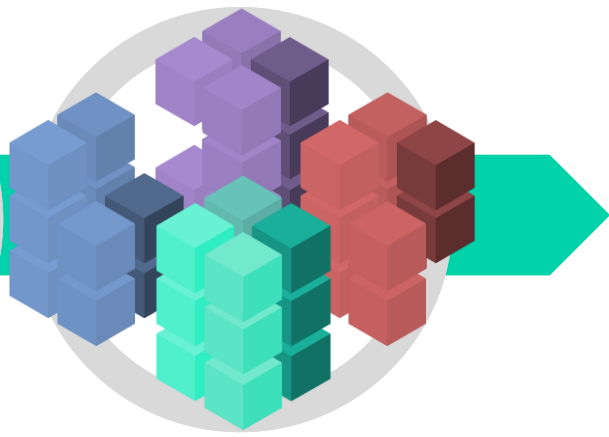
1 cm²



Several cm²



Tens of cm²
In a Stack



Pre-Industrial
Demonstrator

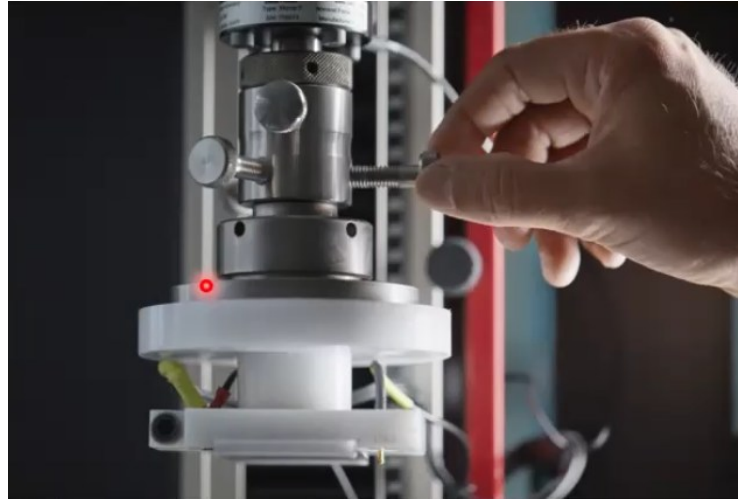
Alleima Testbed



PVD COATING DEPOSITION

Deposit metal or metal oxide coatings on various substrates

Maximum size: 500 mm diameter



CONTACT RESISTANCE

Measure the resistance of bipolar plates and other components

Multiple instruments for different sample configurations



PEM WATER ELECTROLYSIS

Fraunhofer ISE standard 4cm² electrolysis test cell

IPCO Testbed



THERMOPRESS SYSTEMS

Single/double belt film casting technology

ThermoPress TB 1200

ThermoPress SB 1000



SCATTERPRO SYSTEMS

Various scattering systems for powders, granules and fibres.

Systems also available as rental units.

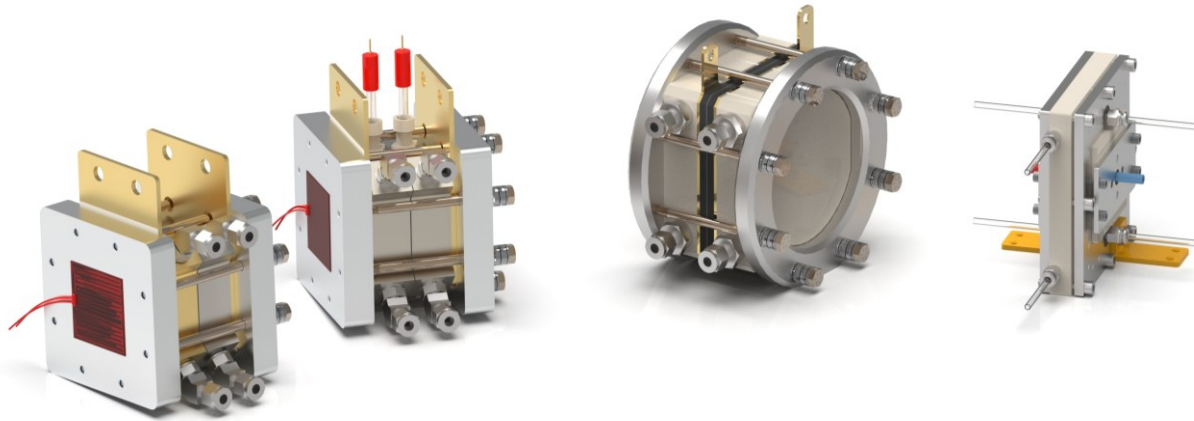


STATIC PRESS

Siempelkamp press equipped with a hydraulic system and water cooling system

Static laboratory press for feasibility studies.

redox.me Testbed



THE CENTRE FOR ELECTROCHEMICAL FLOW SYSTEMS

Experiments ranging from microfluidics to pre-industrial demonstrators

Access to all products developed by redox.me, (~1500 products)

- PEM Electrolysers
- Redox Flow Batteries
- Flow Reactors
- Fuel Cells
- Flow Capacitors

RAPID EXPERIMENT DESIGN

Access to scientists, engineers, and manufacturing facilities for rapid cell prototyping and fabrication

Testbed Locations



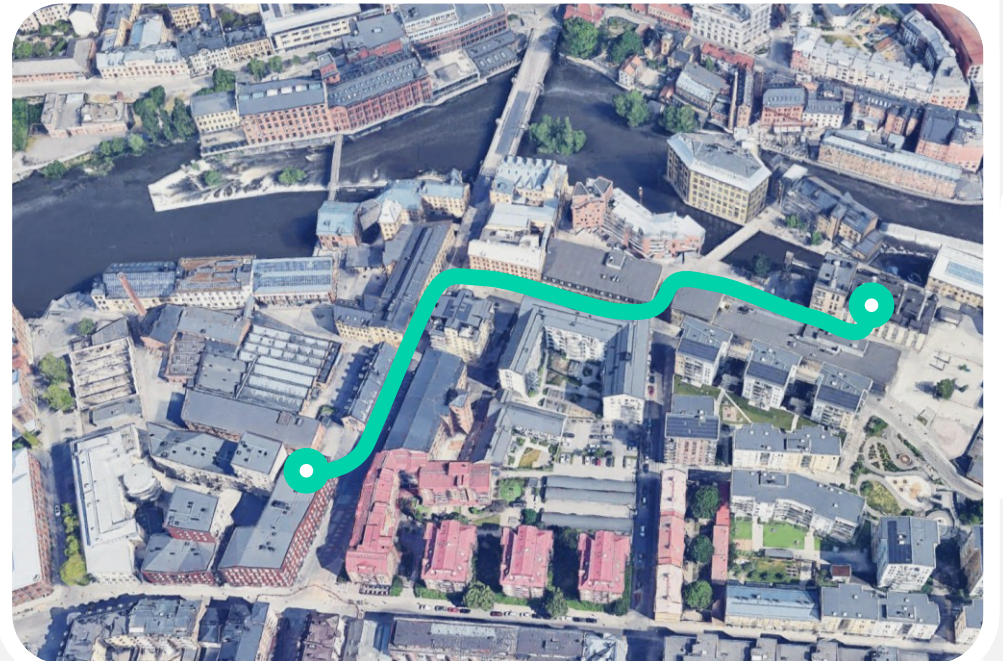
Fellbach, Germany



Sandviken, Sweden



Norrköping, Sweden



Accepted Projects

WISE Network Projects: 5

Other Academic Projects: 4

Start-Up Projects: 1

Industrial Projects: 1

Flow EC
Photoelectron
Spectroscopy

Vanadium Redox
Flow Batteries

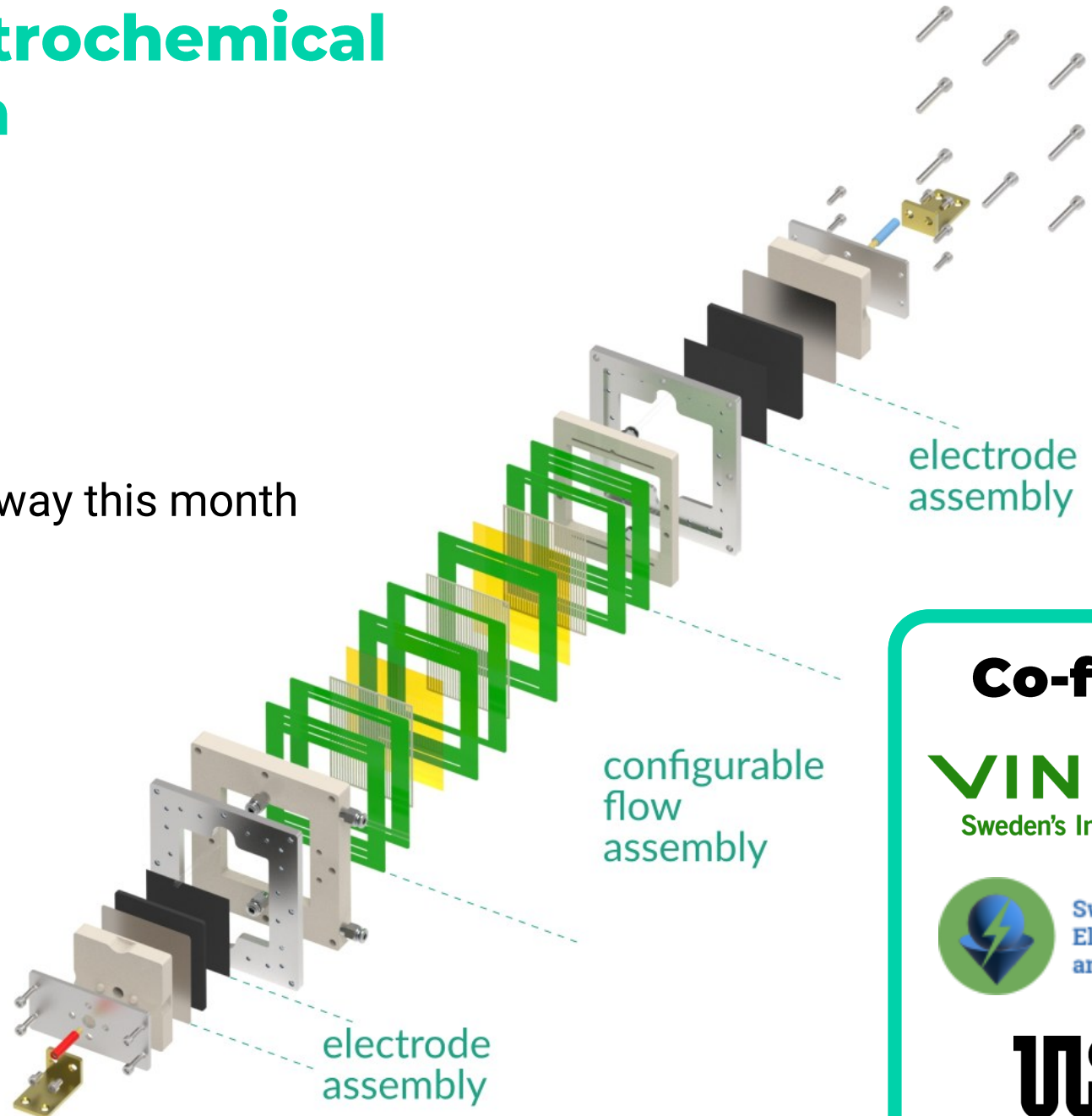
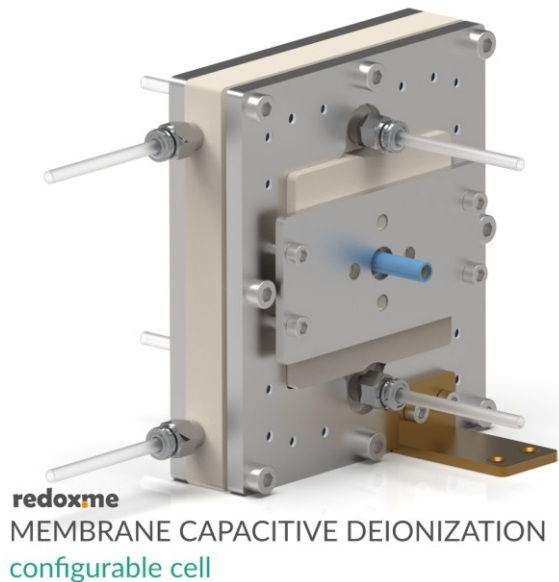
PFAS-Free
Membranes

Flow
Electrosynthesis
Reactors

Liquid
Electrode Flow
Capacitors

Demonstrator of Electrochemical Water Deoxygenation

- Redox.me testbed
- Development of a new cell
- Installation and testing are underway this month



Co-funded

VINNOVA
Sweden's Innovation Agency

 Swedish
Electricity Storage
and Balancing Centre

UWS

Other Initiatives

- Two proposals for PhDs
 - WISE/WASP-NEST
- One proposal for a Postdoc
 - WISE-IP2
- Five Horizon Europe proposals submitted

Funding acquired from:



Partnerships and Collaborations

PFAS

EURODIA,
Tokuyama Corp.
France/Japan

Cellfion AB
Sweden

Ecolyte GmbH
Austria

Ångstrom
Electrochemistry
Initiative, UU
Sweden

Lundberg Group
KTH
Sweden

Rivus Batteries
Sweden

CRM

VSParticle B.V.
Netherlands

Ionnautics AB
Sweden

QuanVerge Inc
United States

Smoltek
Nanotech
Holding AB
Sweden

What WIRA-SET can do for you

You're applying for the chance to
collaborate with us and enhance your research.

Instead of monetary funds or free products, we provide support through technical guidance, problem-solving, and hands-on experimentation using our equipment

We provide our time, expertise, and technical resources

More Information

WIRA
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We are WISE research arena on Sustainable Electrochemical Technol

We specialize in advancing and deploying electrochemical flow systems, with a strong f
challenges of scaling materials from laboratory prototypes to pre-industrial demonstrati

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WIRA-SET

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Email: info@wira-set.se

Web: <https://wira-set.se>

LinkedIn: <https://linkedin.com/company/wira-set/>