Project Title: International Joint Research on Redox Flow Batteries Using Ubiquitous Elements (2024-2027*) *scheduled

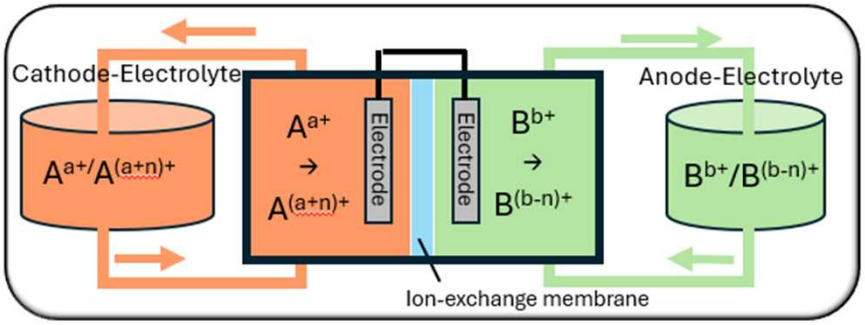
Entrusted party: National Institute of Advanced Industrial Science and Technology (AIST)

Outline of the Project

Background: In order to build a zero-emission society, it is necessary to use power derived from renewable energy such as solar and wind as base power sources, but this in turn means the development of Long Duration Energy Storage (LDES) technology is essential.

Objective: Redox flow batteries hold great promise for large-scale, long-duration power storage. The development of new active materials and high-efficiency flow systems using ubiquitous elements will dramatically improve their performance.

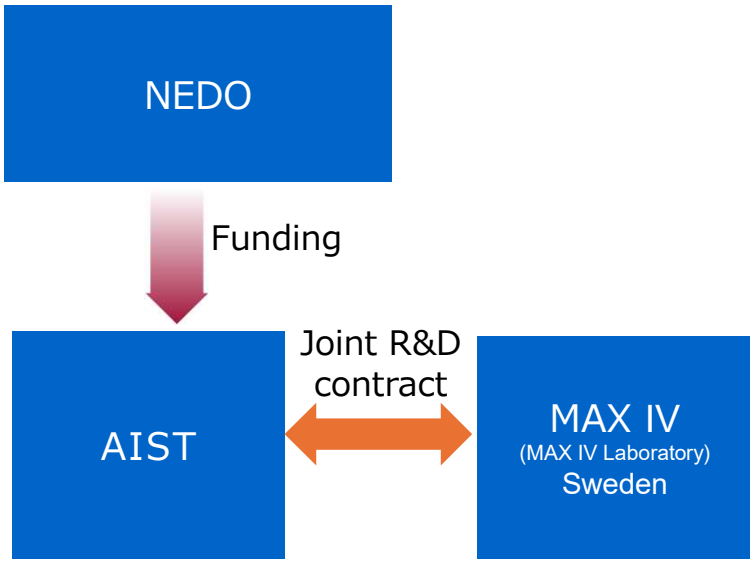
Research and Development: The goal is to develop active materials using ubiquitous elements (organic elements and inexpensive metallic elements such as iron.) Organic and complex synthesis, chemical engineering, electronic structure analysis, and first-principles molecular dynamics calculations will be utilized.



Significance of International R&D

- MAX IV Laboratory in Sweden will perform cutting-edge synchrotron radiation experiments.
- AIST has put forth a theory-based design strategy for materials development using analysis of first-principles molecular dynamics calculations, which will lead to the development of innovative active materials and dramatic improvement in the performance of redox flow batteries.

Project Scheme



Expected Outcomes

- Low-cost, high-performance redox flow batteries with high energy density and high cycle stability will be developed
- Amount of renewable energy available will increase through widespread adoption of high-performance redox flow batteries
- Reduced CO_2 emissions of an estimated 4.63 million tons per year
- Progress toward a low-carbon society through LDES market expansion from 2040 on