

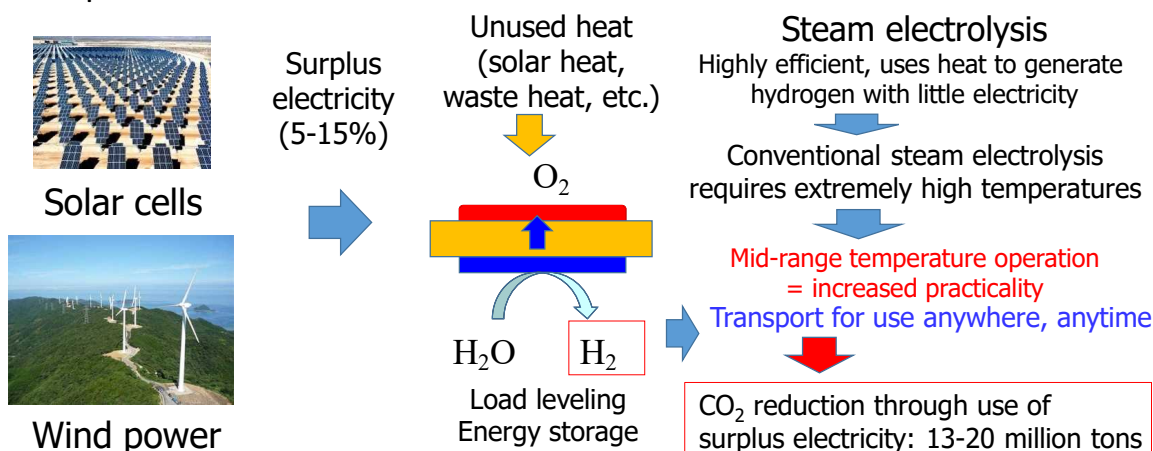
Project Title: International Joint Research on Intermediate Temperature Solid Oxide Electrolysis Cell Based on Innovative Cells Design (2024-2027*) *scheduled

Entrusted Parties: Kyushu University and Noritake Co., LTD.



Outline of the Project

Hydrogen, is expected to be a clean energy carrier like electricity, and will likely be used in technologies such as fuel cell vehicles. Widespread adoption of hydrogen can decrease carbon emissions; but at present, it is produced from fossil fuels. Renewable power fluctuates and has low energy density, so it needs to be stored in order to use it efficiently. In this study, we will develop mid-range temperature solid oxide electrolysis cells to effectively convert excess renewable power to hydrogen for storage, particularly through the development of innovative cells.

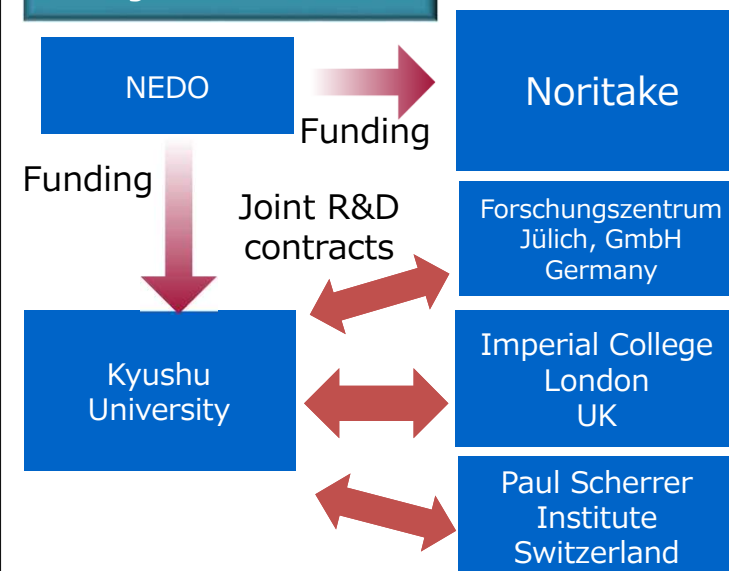


Significance of International R&D

Joint research will be conducted in collaboration with three international institutions:

- Forschungszentrum Jülich: production of thin electrolyte film by tape casting
- Imperial College London: improving performance of active air electrode
- Paul Scherrer Institute: preparing the functional interfacial layer and exploring application of the developed cell

Project Scheme



Expected Outcomes

- Hydrogen production for storage of renewable energy
- Production of low-cost hydrogen
- Estimated reduction in CO₂ emissions: 13 to 20 million tons per year
- Economic effects:
 - Expected amount of hydrogen produced from surplus electricity with renewable energy = 12 billion normal cubic meters (Nm³)
 - Cost of hydrogen = 20 JPY/Nm³ (upper estimate)
 - Expected scale = 24 billion JPY