

Korea-EU Horizon Europe Researchers Networking Forum on Energy & Advanced Mobility

• **Suk Won Cha**

• **Professor**

• **Seoul National University**

• **Hydrogen Fuel Cell,
Water Electrolysis,
and Energy System**



1. Short Introduction of your Organization

Seoul National University

- **Location:** Seoul, Korea
- **World Ranking by QS (2026)**
 - **38th** in Overall ranking (**1st** in Korea)
 - **21st** in Mechanical Engineering (**1st** in Korea)



서울대학교
SEOUL NATIONAL UNIVERSITY



1. Short Introduction of your Organization

Renewable Energy Conversion Lab.



- **Director:** Suk Won Cha, Ph.D.
- **Affiliation:**
 - Department of Mechanical Engineering (SNU)
 - Institute of Advanced Machines and Design (SNU)
- **Members:**
 - Ph.D. Student: 14
 - M.S. Student: 3



1. Short Introduction of your Organization

Renewable Energy Conversion Lab.

- **Research Field:**
 1. Hydrogen Fuel Cells and Water Electrolysis
 2. Fuel Cell Hybrid Electric System: Modelling, Simulation, Pre-diagnosis
- **Key Research Facilities:**



Sputtering System



PEALD System



Cell Test System
(SOFC/EC, PEMFC/WE)



Slurry-based Ceramic
Processing Equipment



Modeling and Simulation
Software



1. Short Introduction of your Organization

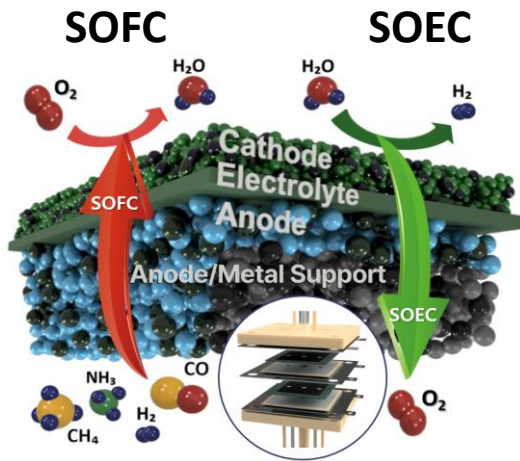
Renewable Energy Conversion Lab.

- Recent Research Projects (Last 3 Years):
National R&D Projects: 6 / Industry-funded Project: 4

Project Title	Funding Agency	Project Period
Research of Multi-scale Low Temperature Reversible Cell for Direct Operation of Flexible-Fuel	National Research Foundation of Korea (NRF)	2022 ~ 2027
Unit-Cell Experiment and Big-Data Analysis of Short-Period Power Response Behavior	National Research Foundation of Korea (NRF)	2020 ~ 2023
Development of high-capacity, high-efficiency smart fuel cell system for ships	HD Korea Shipbuilding & Offshore Engineering	2022 ~ 2025
Development of Targets for Deposition of Thin Film Proton Conducting Electrolyte and Its Deposition Process	National Research Foundation of Korea (NRF)	2021 ~ 2025
Development of Metal-supported SOFC Cell and Stack based on Ferritic Stainless Steel	Korea Institute of Energy Technology Evaluation and Planning (KETEP)	2021 ~ 2025
High-efficiency Carbon Fuel Cell Based Cogeneration for Smart Farm	Korea Institute of Planning and Evaluation for Technology in Food, Agriculture and Forestry(IPET) and Korea Smart Farm R&D Foundation(KosFarm)	2021 ~ 2023
In-Situ Voltage Distribution Analysis within the Cell for Identifying Degradation Factors of PEMWE Components	Hyundai NGV	2023 ~ 2025
Development of Artificial Intelligence Algorithms for Battery Diagnostics	MONA	2024 ~ 2025
Design Analysis and Testing Support of Hydrogen Fuel Cell Stacks and Operating Systems	Hanwha Aerospace	2024 ~ 2025
Global Human Resources Program for Core Technology of Future Mobility	Korean Institute for Advancement of Technology(KIAT)	2024 ~ 2027

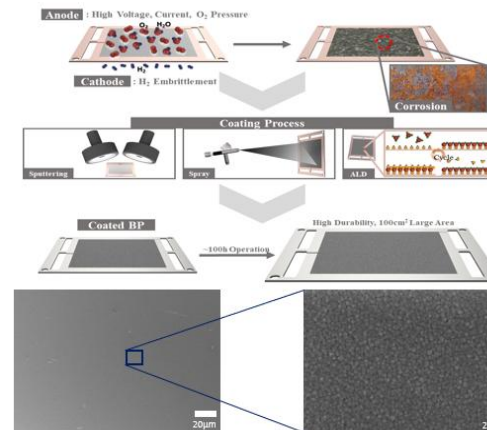


2. Expertise



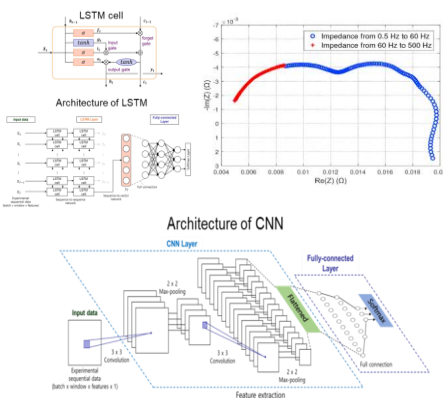
Low-temperature SOFC/EC

- Development of Nanostructured SOFC and SOEC
- Development of Carbon-fueled SOFCs



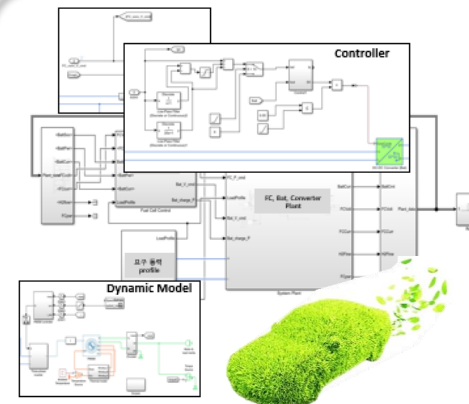
PEMFC/WE

- Analysis of PEMFC Stack Performance and Modeling
- Development of Advanced Low-cost PEMWE Bipolar Plate



Fuel Cell System Pre-diagnosis

- Pre-diagnosis of Condition of FC Energy System Using Fast EIS and AI

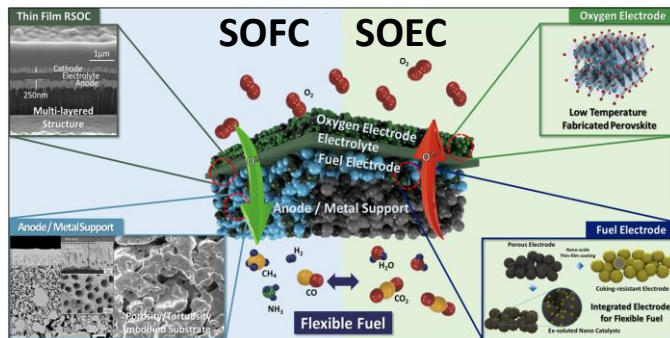


Fuel Cell Hybrid Electric System

- Energy Management for FCHEV
- Hybrid Power System Control and Energy Optimization

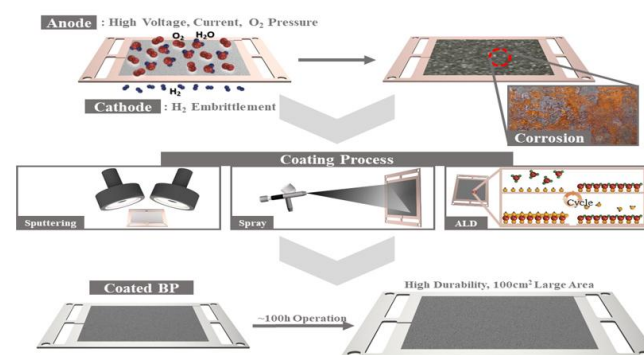
3. Your Project Idea

For the call: Hydrogen / Energy System



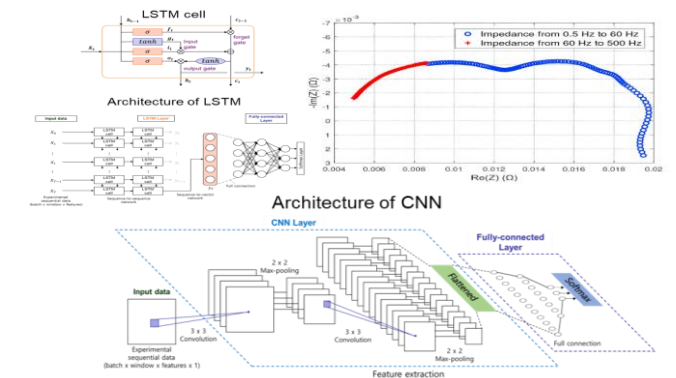
Low-temperature SOC

Development of
Low-temperature
SOFC and SOEC



Low Cost PEMWE

Development of
Advanced Low-cost
PEMWE Bipolar Plate



Fast EIS

Fuel Cell Hybrid
Electric System
Condition Monitoring,
Modeling, and Prognosis



4. Profile You are Seeking and Why

Hope to be a part of CONSORTIUM with experience of:

- Hydrogen Fuel Cells / Water Electrolysis Research
- Fuel Cell Hybrid Electric System: Modelling, Simulation, Pre-diagnosis Research

Hopely in Cooperation with Experts:

- Hydrogen Fuel Cell
- Water Electrolysis
- Electrochemical Analysis
- Energy System Management
- Any Related Fields



5. Contact Details

Suk Won Cha



E-mail: swcha@snu.ac.kr

Professor
Department of Mechanical Engineering
Institute of Advanced Machines and Design
Seoul National University

