AZIZ LAB.

[Advanced Production and Utilization of Secondary Energy Sources Toward Energy Sustainability]

Department of Mechanical and Biofunctional Systems

Energy and Process Integration Engineering

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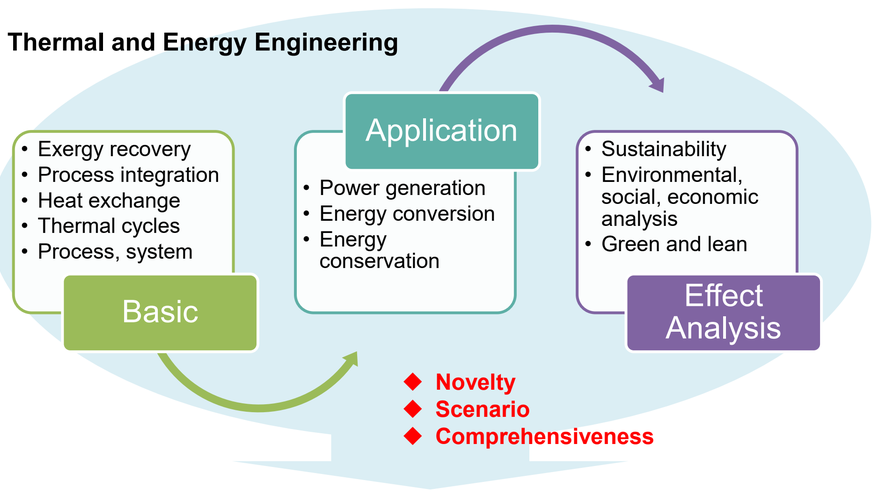
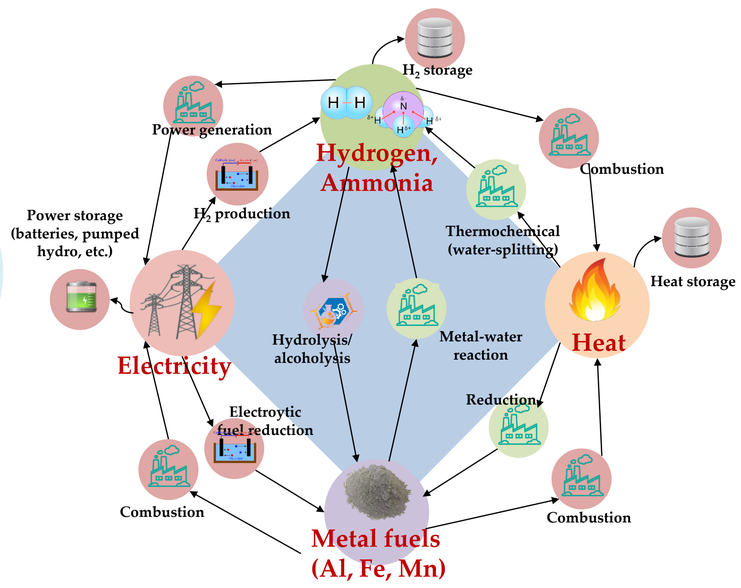
A highly efficient and clean energy system is developed toward the realization of sustainable society. Analysis and modeling of micro- to macro-scales for each individual energy conversion process and elemental technology are performed, together with the effort to integrate them efficiently. In addition, a mutual relationships (conversion, utilization, and storage) among the electricity, chemical energy, and other carbon-free secondary energy sources is also studied.

Integration of carbon-free secondary energy sources

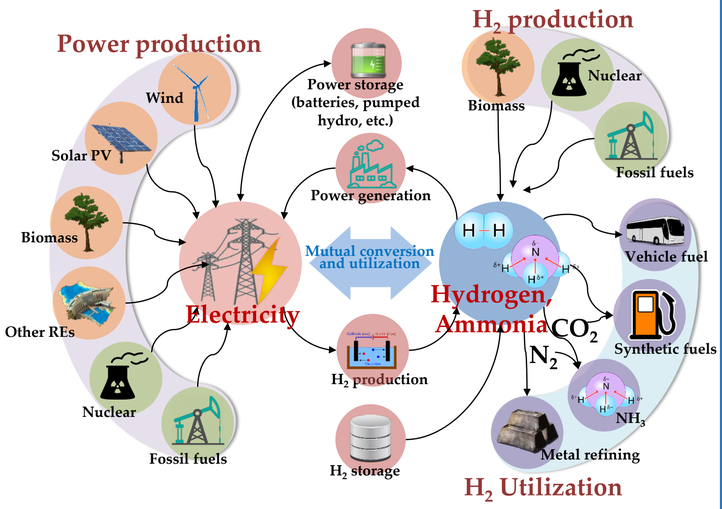


Toward comprehensive knowledge creation

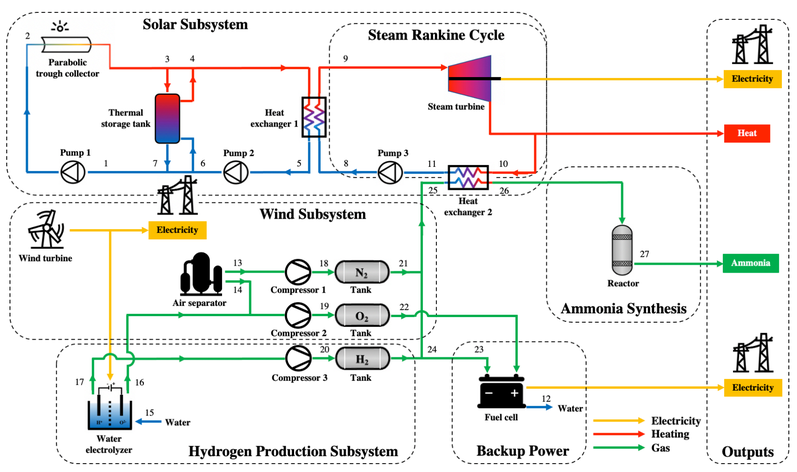
Research area and vision



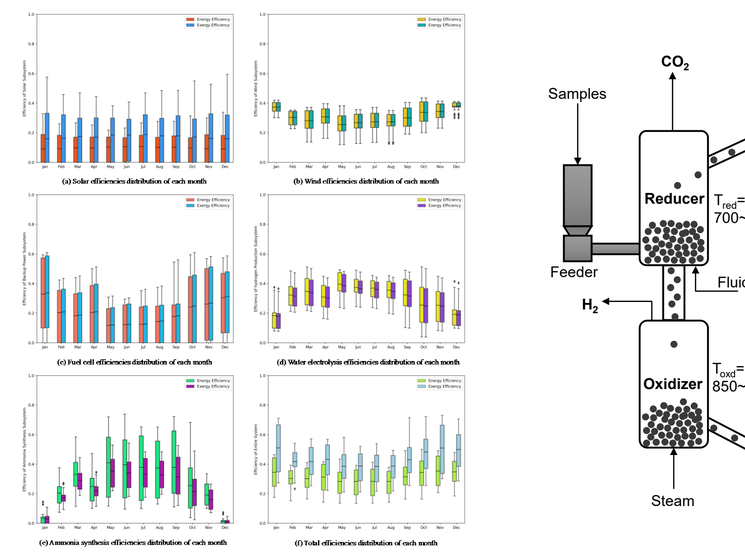
Relationships of carbon-free secondary energy sources



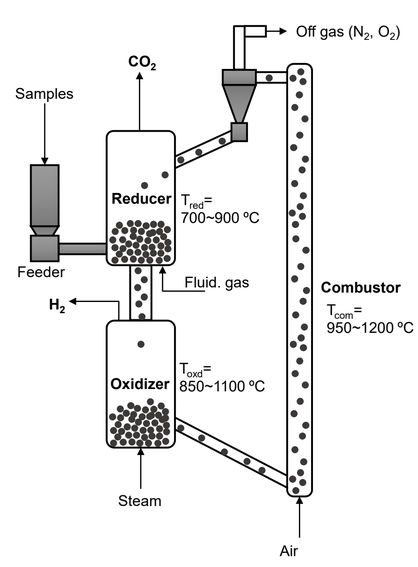
Mutual utilization of electricity and hydrogen-based fuels toward zero-carbon



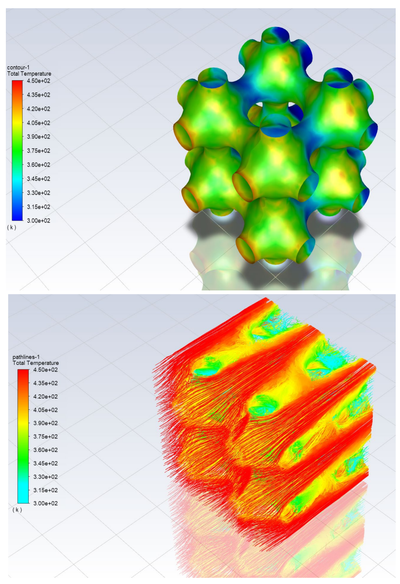
Schematic of the integrated renewable multi-generation system



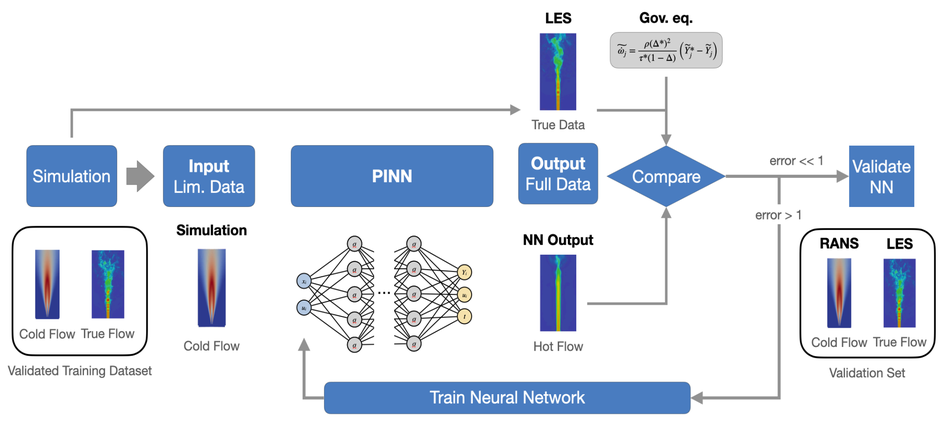
Energy, exergy, and techno-economic analyses



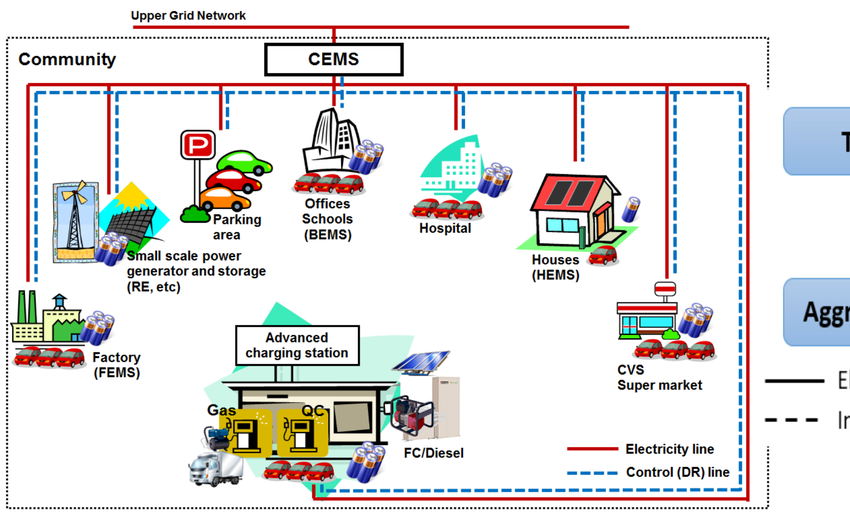
CO2-free chemical looping hydrogen production system



TPMS-based metal hydride hydrogen storage



Advanced combustion modeling and prediction



Advanced utilization of electric vehicles for grid ancillary services