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Top -level research and data

Comprehensive research that contributes to the construction of new environmental energy systems (Representative papers)

A. Lubis, N. Giannetti, S. Yamaguchi, K. Saito, N. Inoue, Experimental performance of a double-lift absorption heat transformer for manufacturing-process steam generation, Energy Conversion and Management, Vol. 148, pp. 267-278, September 2017.

Deployment targets (sites, materials, etc.)

Conduct research and analysis of user needs and product technologies, which will lead to policy recommendations and international expansion, while collaborating with related companies in the electric power, gas, electrical, air conditioning, and cooling and heating industries and with the Consortium for the Research Strategy of Next-generation Heat Pump Technology as the parent organization.

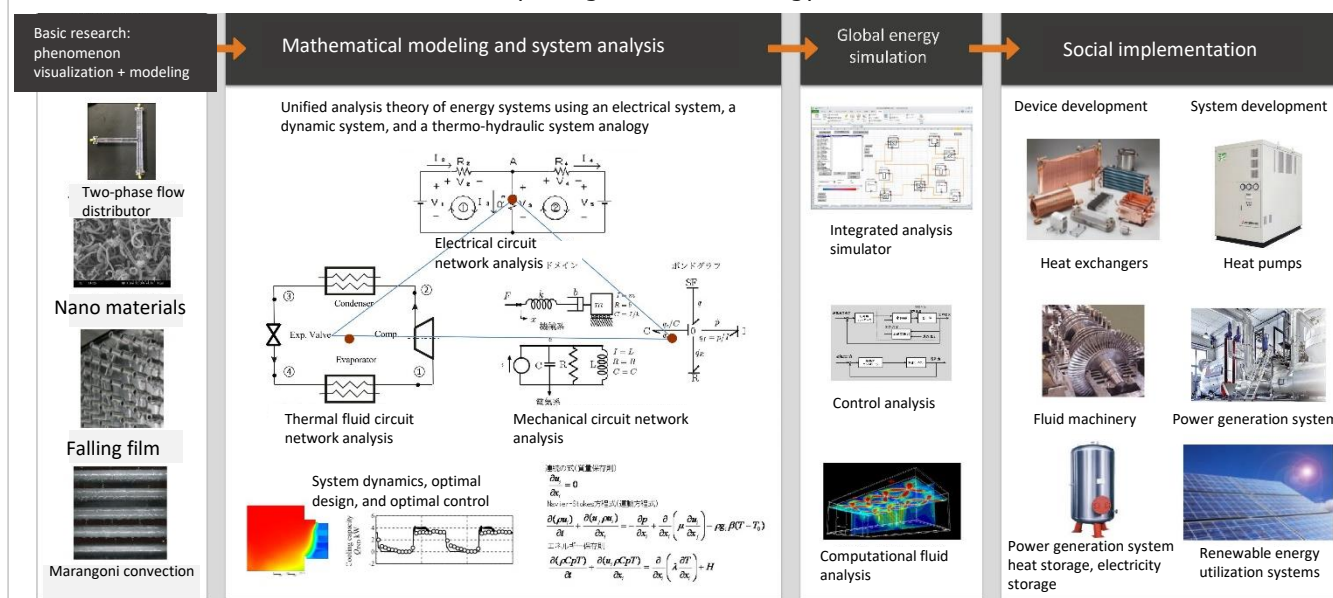
Features (implementation means, etc.)

Keywords

- Energy conservation
- Thermal system
- Environmental engineering
- Decarbonization
- Environmental energy
- Heat pump

Promotion of leading research on environmental energy technologies, from basic research to social implementation. (main research themes below)

1. Construction of a unified energy system analysis theory that is common to the analysis of electrical systems, mechanical dynamics systems, and thermal energy systems
2. Development of a general-purpose energy simulator "Energy flow+M"
3. Construction of hydrogen energy society
4. Optimization of heat pump technology
5. Optimization of microchannel heat exchanger technology
6. Elucidation of the thermal fluid phenomena by non-equilibrium thermodynamics
7. Optimization of various energy devices that make use of two-phase flow phenomena
8. Digitalization of energy systems through AI and IoT
9. Construction of a decarbonized society using renewable energy



Associated proprietary technologies

Innovative energy conservation technologies centered on heat pumps: wide-ranging applications to heat utilization technologies. Refrigerators, air conditioning, vending machines, hot water supply, washing machine clothes drying, snow melting, etc. With electric vehicles becoming widespread, increased mileage is expected to increase demand for vehicle heat pump technologies. This technology can also be applied to deal with the heat island phenomenon.

Expected outcome/ applications

Energy supply chain: hydrogen energy supply chain, locally produced energy for local consumption, and renewable energy
Energy demand side: living space, manufacturing technologies, heat utilization technologies, and agricultural and food management

Associated SDGs

