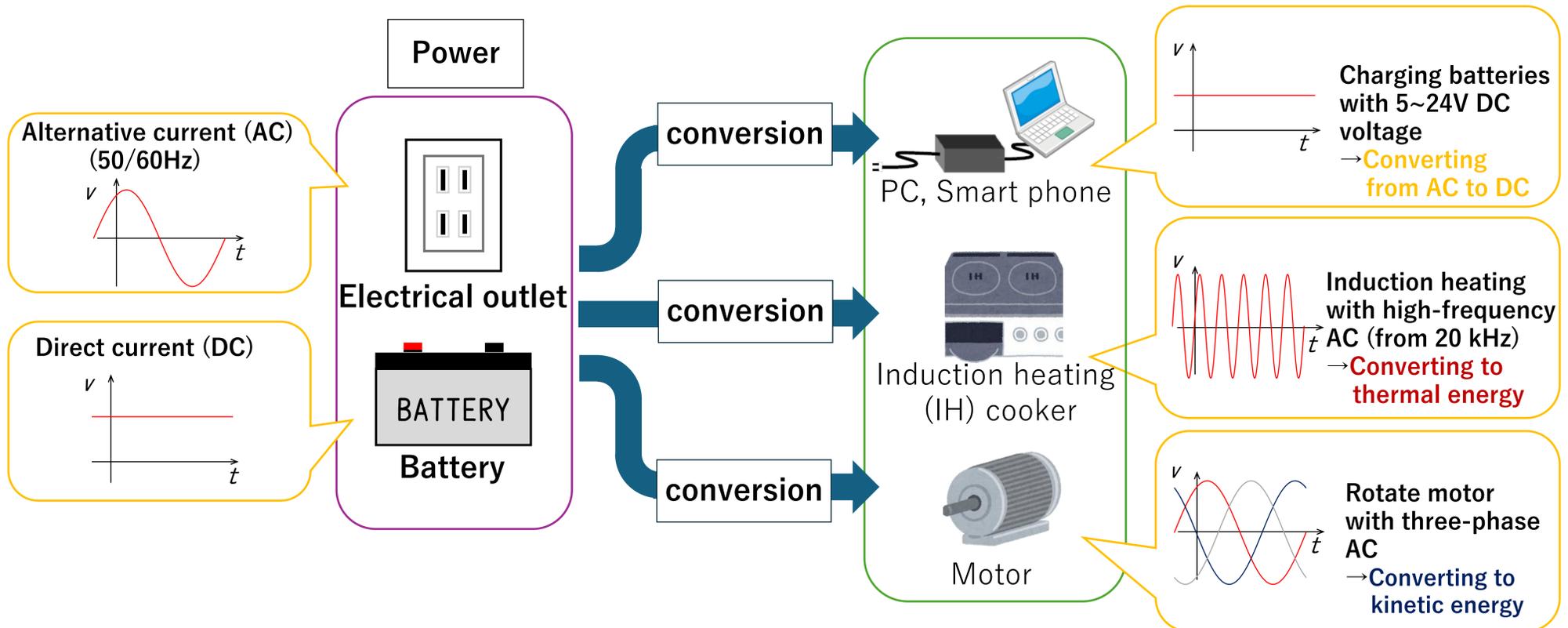
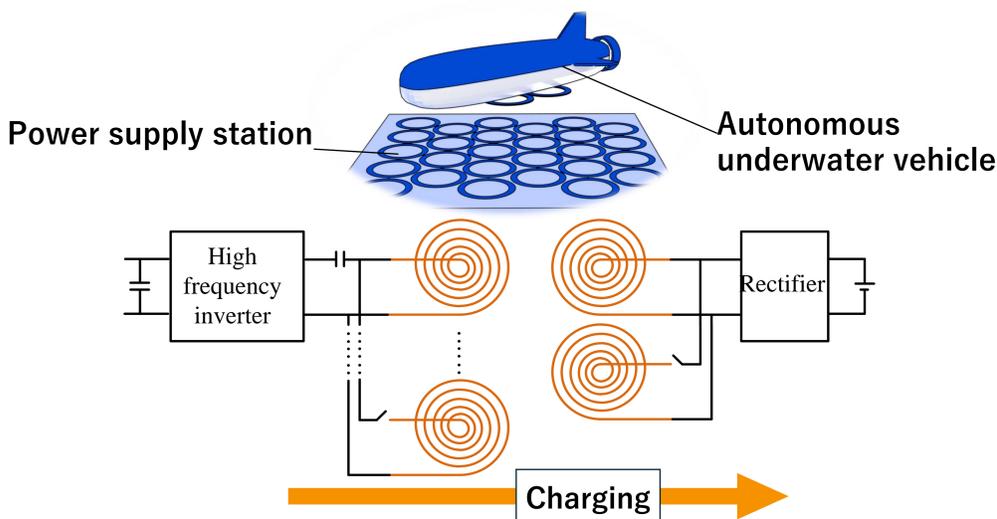


## What is Power Electronics?

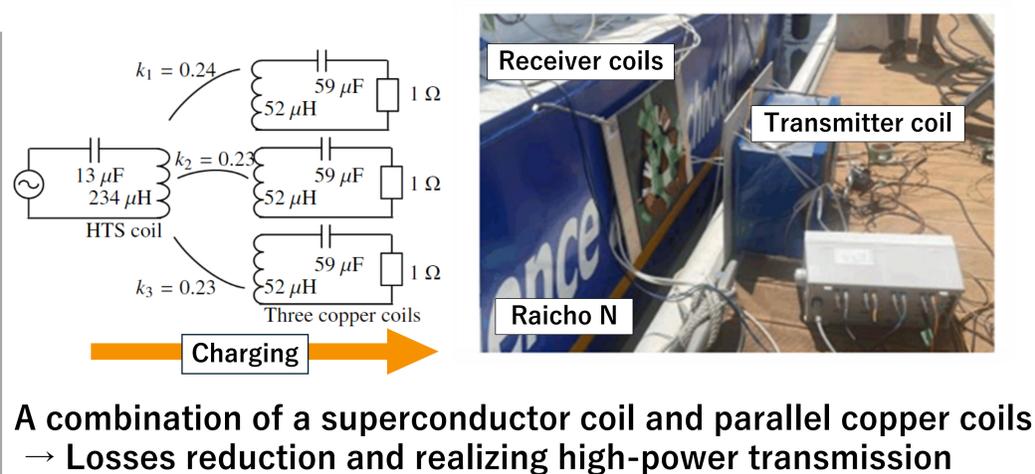
**Electric power** supports our lives in various forms. **Power electronics** is technology of controlling and converting the electric power. Nowadays, with electric-powered devices around us, this technology is an indispensable part of our daily lives.



## Research Introduction



A study of high-frequency inverters and their control methods suitable for underwater wireless power transfer systems



A study of high-power wireless power transfer systems for marine vessels using a combination of superconductor and copper technology

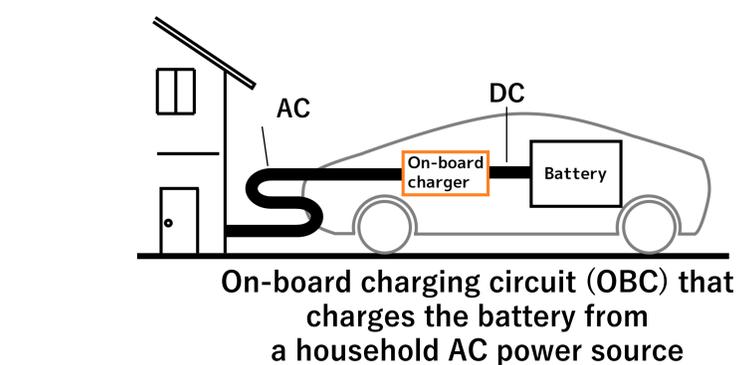
**Converters**, **Word coils**, and **Iron plate** are shown. The heat distribution is controlled by using two different modes:

- Synchronous mode (No phase shift):** Heat map shows a central hot spot. **MAX: 83.0°C, MIN: 19.1°C, 14:35**
- 120-degrees phase shift mode:** Heat map shows three distinct hot spots. **MAX: 82.9°C, MIN: 18.0°C, 14:15**

Phase-shift control between coil currents  
 ⇒ Magnetic field interference changes  
 ⇒ Heat distribution changes

Controlling heat distribution by using two different modes

A study of induction heating systems with controllable heat distribution



Aiming to develop a new type of charging circuit with smaller size, higher efficiency, and higher energy density than conventional circuits

A study of on-board battery charge/discharge circuits for electric mobility