

東京工業大学 環境エネルギーイノベーション棟

**ENVIRONMENTAL ENERGY INNOVATION BUILDING,
TOKYO INSTITUTE OF TECHNOLOGY**

This research building houses many diverse disciplines. The CO₂ emission from the building, which had much energy consumption, were reduced by 60% . The building was designed to be nearly self-sufficient at producing the electricity it consumes by using 650 kw solar cell panels and cogeneration system of phosphoric acid fuel cell. The original smart grid system called as “Ene-Swallow” make the energy supply/demand visualized, and can control the electricity consumption depending on weather conditions, the balance of energy supply/demand, etc.

The exterior structure is designed to absorb seismic energy and withstand seismic event of upper 6 intensity functionally intact. Buckling Restricting Brace members are distributed in a spiral to protect main structural members from damage.

The three sides leaning at an angle on the main structure on the south, roof and west sides form an integral solar panel envelope over the building. A Vierendeel Truss steel frame is fitted out with mass produced solar panels and catwalks to allow easy maintenance and replacement.

The solar panels on the south are arranged in a louver pattern to allow even sunlight on all panels at winter solstice while maintaining natural lighting into the research rooms.

The layout of the solar panels to face the sun resemble “Inagake” or rice drying, an apt agricultural image for receiving similar benefits from the sun.