

Technology Development & Intellectual Property/Promotion of Innovations

J-Power Group's Technological Development

We are working on R&D activities toward transitioning to a business portfolio consisting primarily of carbon-neutral assets in the 2030s. We move forward with these activities by classifying them into the following three initiative categories: "Creating new business opportunities" aimed at developing new profit-making businesses, "promoting transition" applying new technologies to our businesses, and "strengthening existing businesses" aimed at improving profitability and competitiveness of our existing electric power business.

Priority items and major areas of research

Creating new business opportunities	Research aimed at the development of new profit-making businesses centered on energy and the environment (cultivation and fuel conversion of biomass fuels, and synthetic fuels), etc.
Promoting transition	- Increasing the power generation volume of renewable energy and realizing environmental value (offshore wind power generation technology) - Pushing for zero-emission power sources (CO₂-free hydrogen production, CO₂ capture/utilization/storage technology) - Stabilizing and enhancing power networks (energy storage technology), etc.
Strengthening existing businesses	- Improving profitability and competitiveness (reducing the cost and improving the method for maintenance and operation of power plants, diagnostics, improving reliability) - Grid simulation technology - Strengthening resilience against natural disasters (remote monitoring using satellite image data), etc.

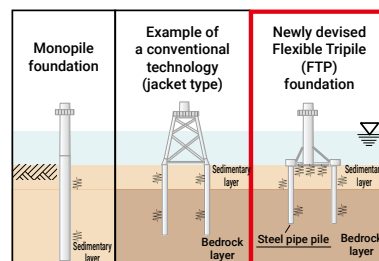
Intellectual Properties

For outcomes achieved in technological development and other activities, we continuously seek to acquire their intellectual property by, for example, filing for patents. We hold 162 patent rights in Japan as of the end of FY2024.

Examples of patents acquired

"Flexible Tripile," a bottom-fixed offshore wind turbine foundation designed for Japan's topography

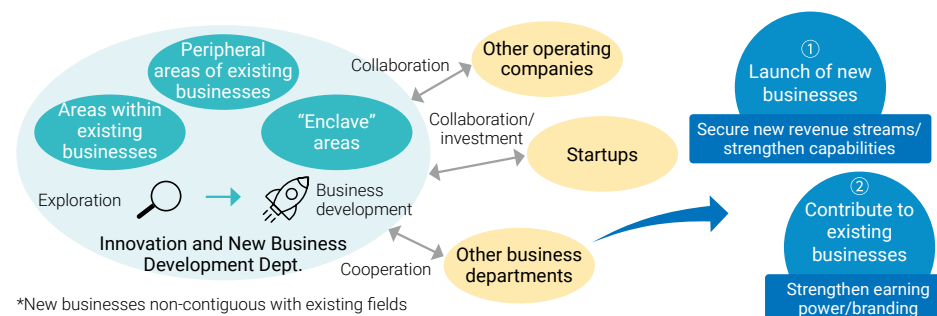
This foundation can be constructed even at locations in Japanese waters where bedrock is widely distributed at shallow depths. In addition, square steel pipes and steel plates are used in the foundation's base plate to create a flexible structure that can deform relatively easily. This provides a seismic isolation from the ground, reducing vibrations caused by earthquakes. As a result, the foundation components can be simpler than conventional technologies, thereby reducing construction costs.



(Patent No. 7465509: "Foundation Structure of Offshore Wind Power Generation Facility")

Promotion of Innovations

The J-POWER Group is taking on the challenge of promoting innovations and capturing new business domains by integrating the assets and know-how, which were accumulated mainly in the power generation business, with the technologies and ideas of startup companies and other organizations. So far, we have invested in three funds and 14 startups. The Innovation and New Business Development Department undertakes exploration and business development/promotion activities in a wide range of areas in existing businesses and their peripheral areas, focusing especially on areas the Company has not tapped into in its existing businesses, such as energy-related, resource recycling, and food/agriculture areas.



*New businesses non-contiguous with existing fields

Major portfolio startups

TOWING Co., Ltd. (Domain: biochar)

TOWING has developed and sells Soratan, a high-performance biochar soil conditioner produced from carbonized local unused biomass using its technology to efficiently sort and cultivate soil-derived microbiomes. J-POWER taps into new business domain, such as the agricultural domain, jointly with TOWING.



Examples of new business development

BASHFIBER®, a continuous filament fiber developed by Nippon Fiber Corporation, in which J-POWER has invested, is made primarily from coal ash. It provides high strength and heat resistance, and thus, is expected to be used in a wide range of fields, including construction, civil engineering, and industrial materials. BASHFIBER® is attracting strong attention as a means of building a sustainable society as it contributes to reducing CO₂ emissions through the upcycling of coal ash and is easier to recycle compared to conventional glass fibers. Currently, J-POWER, Nippon Sheet Glass, and Nippon Fiber Corporation are discussing how to commercialize the product.



For updates of activities by Innovation and New Business Development Department, visit the following site dedicated to the department.

<https://www.jpowers.co.jp/english/innovation/>