

# Laying the Foundation for the Future of Renewable Energy

Fukushima Offshore Wind Farm

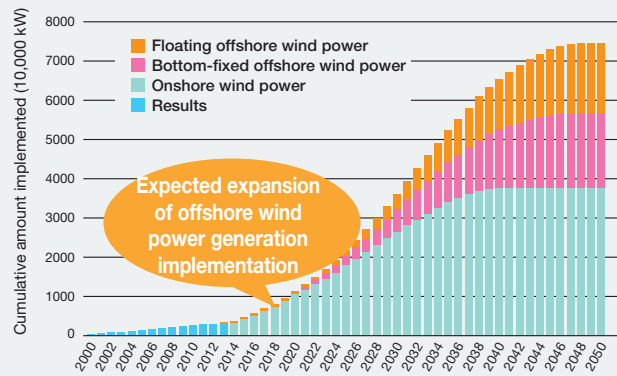
## Challenge to offshore wind power generation

Wind power generation is well-known as a clean source of energy that requires no fuel. Unfortunately, it is difficult in Japan to secure enough flat land for wind turbines, and thus little progress has been made. So stable wind power can be obtained even than land, ensure the location is also easy, offshore wind power generation has been attracting attention.

Furukawa Electric Group was one of the first to focus on the potential of offshore wind power generation, and it has already starting working toward realizing this promising technology.

### Major projects the Furukawa Electric in involved in

- METI Fukushima Restoration Floating Offshore Wind Farm Demonstration Research Project
- NEDO Kitakyushu bottom-fixed Offshore Wind Power Demonstration Experiment



Wind power generation implementation scenario in Japan (source: JWPA)

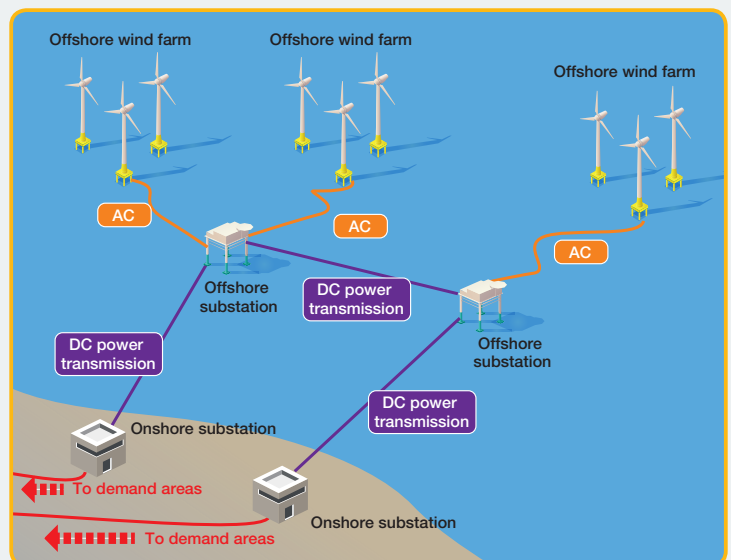
### Proud participants in the Next Generation Offshore DC Power Transmission System Development Project

In July 2015, Furukawa Electric was selected as a planned contractor for NEDO's "Next Generation Offshore DC Power Transmission System Development Project." Furukawa Electric and VISCAS Corporation will be responsible for developing the DC undersea cable systems for offshore multi-terminal DC power transmission systems that are compatible with offshore wind power (see figure on the right).

A major issue standing in the way of implementation is how to efficiently transmit power from offshore power plants located far away from large-scale demand areas. Furukawa Electric Group will establish the foundational technologies needed to accelerate the expansion and implementation of offshore power systems, making full use of the cable development technologies it has built up over the years.

#### Multi-terminal DC power transmission system

Power transmission system which collects powers from multiple wind farms, converts to transmission-efficient DC and transmits to multiple onshore substations.



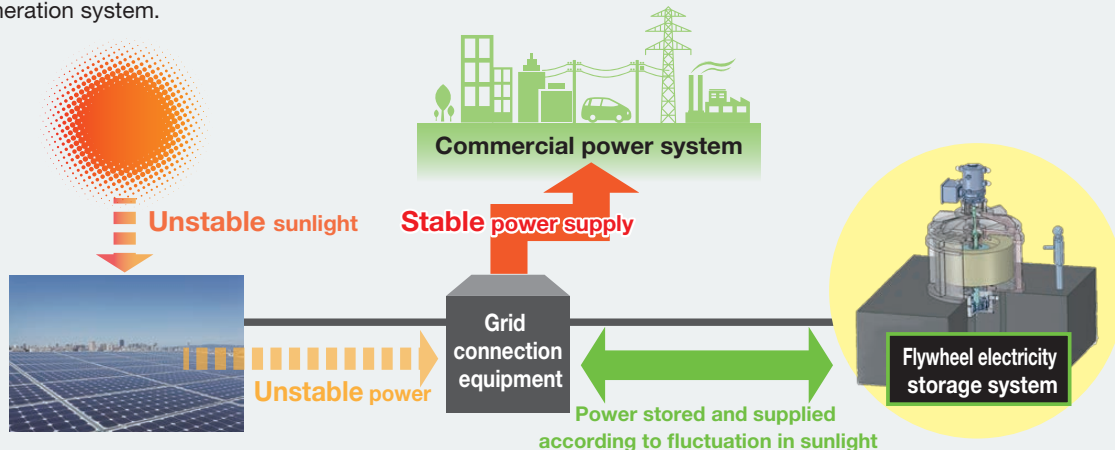
# Develop next generation power storage system



Due to the unstable nature of renewable energy, technologies that can store excess power and then restore power when needed for supply are becoming increasingly important in order to supply stable power from said energy sources. Furukawa Electric Group is also focused on developing next generation power storage systems that can store large amounts of power.

## Proud participants in NEDO's "Safe & Low-cost Large-scale Power Storage System Technology Development" project

Flywheel electricity storage systems store power as kinetic energy by rotating a large disk (called a flywheel) with a motor. Furukawa Electric has successfully lifted and rotated a 4 ton flywheel—contactlessly—by developing an superconducting magnetic bearing that combines a high temperature superconducting coil and high temperature superconducting bulk body. The completed demonstration equipment has an output of 300 kW and a storage capacity of 100 kWh—making it the world's largest flywheel power generation system.



# Promote hydroelectric power generation



Uwanoshiro Power Plant

For over 100 years, the Furukawa Group has been involved in a project to generate hydroelectric power that takes advantage of the abundant and stable supply of water from Nikko's Lake Chuzenji and the steep terrain of the region. Most of the power supplied to the region is generated by the hydroelectric power generation site still located there.

## Hydroelectric plant upgrade completed

Furukawa Nikko Power Generation Inc. (Nikko, Tochigi Prefecture)—a member of Furukawa Electric Group—finished upgrading its Uwanoshiro Power Plant and began operating the generator in October 2015. The plant offers a total power generation capacity of 19,200 kW (normal output) or 30,110 kW (approved maximum output). Any power in excess of that supplied to Furukawa Electric Group is provided to other power companies under the renewable energy Feed-In Tariff (FIT) Program. Equipment at the Setoyama Power Plant has already been approved for FIT and the plant is to begin supplying energy to power companies in January 2017.

