TOSHIBA

HVDC transmission

Connecting distant renewable energy generation to the grid
Interconnecting large power transmission systems

Working on the development of HVDC technologies

Special features

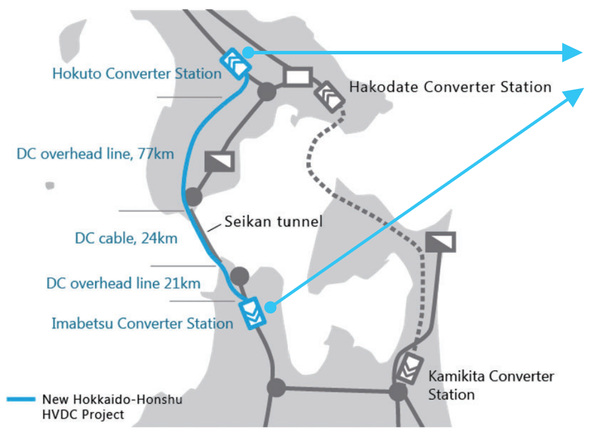
■ Long-distance power transmission with low losses
Long distance transmission with low transmission power losses makes renewable energy generation sites very distant from major power consumption area viable.

■ Connecting grids with different frequencies
Supplying electricity across different frequency regions (50 Hz and 60 Hz)
Contributing to a stable power supply over a large area.

■ Strengthening interconnection between major Japanese islands

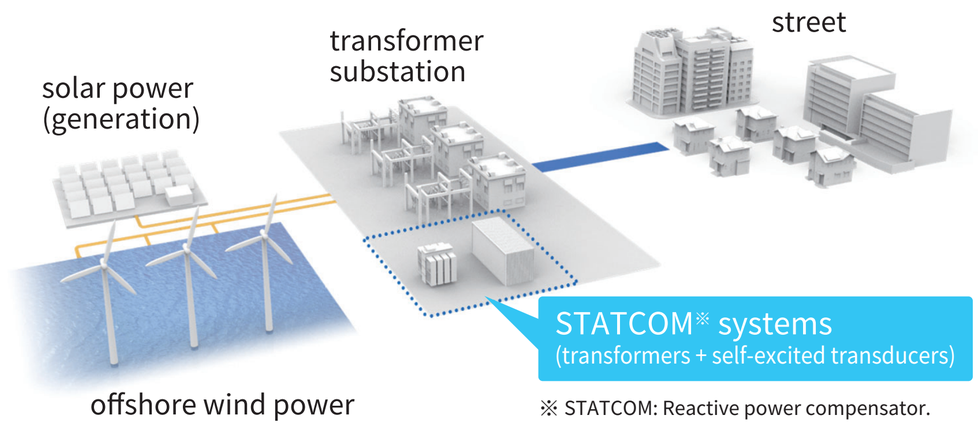
First VSC HVDC in Japan

- The domestic first VSC HVDC for the New Hokkaido Honshu HVDC link
- Smaller installation space than conventional technology



STATCOM for RES grid connection

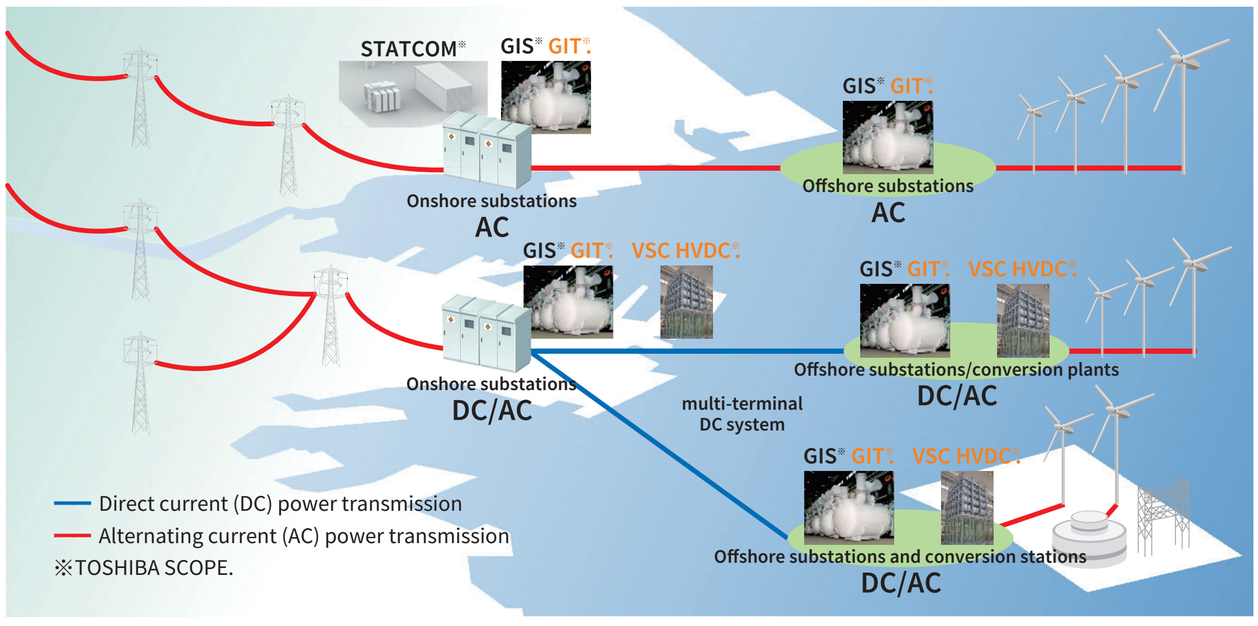
- Improving voltage stability with power generation fluctuation
- Improving grid stability in large power transmission
- Improving voltage stability and suppresing harmonic resonance in long-distance cable transmissions.



※ STATCOM: Reactive power compensator.

More introduction of offshore wind power

- A master plan for the wide-area grid interconnection is being developed in Japan for utilizing renewable energy generations and improving robust power supply.
- Interconnection between multiple wind farms and long-distance submarine cable transmission to onshore substations is required. The introduction of VSC based HVDC will enable power transmission.



GIS: Gas-Insulated Switchgear　VSC: Voltages Sourced Convertor
GIT: Gas-Insulated Transformer　HVDC: Voltage Direct Current transmission
STATCOM: STATic synchronous COMpensator