

2. Initiatives Aimed at Electrical Supply

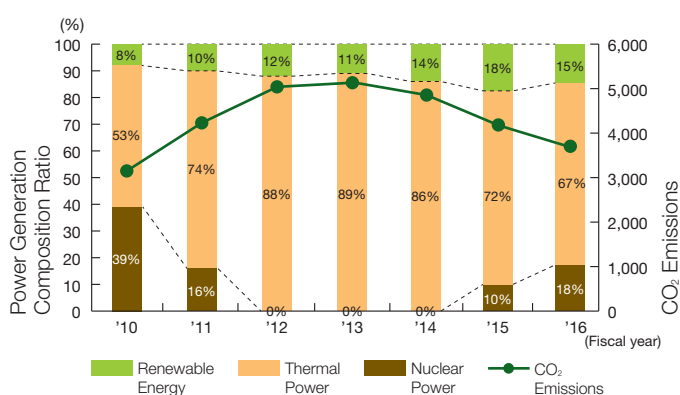
We are working to help realize the low-carbon society by undertaking a variety of initiatives, including pursuing proven and safe nuclear power generation, proactively developing and fully embracing renewable energy options, and working to improve the heat efficiency of our thermal power plants.

Pursuing Proven and Safe Nuclear Power Generation

Our CO₂ emissions volume has risen significantly compared with before the Great East Japan Earthquake (FY2010); however, as a result of such factors as the stable, continuous operation (except for periods of scheduled maintenance) of the Sendai Nuclear Power Plant Reactor #1 and #2 reducing the percentage of overall power generation derived from thermal power generation, CO₂ emissions for FY2016 were approximately 4.3 million tons less than they were in FY2015.

Nuclear power generation is similar to renewable energy in that it produces no CO₂ during power generation; thus, it is an excellent means of mitigating global warming and, from an energy security standpoint, remains an important energy option.

《 Power Generation Composition Ratio* and CO₂ Emissions Volume Change Over Time 》 Units: x10,000 tons-CO₂*



*: Power received from other companies does not include unspecified fuel types. The composition ratio shown here differs from the power source composition ratio for electricity sales volume.

Proactive Development and Full Incorporation of Renewable Energy

We in the Kyushu Electric Power Group are working proactively to develop and fully incorporate renewable energy as part of our operations, recognizing its terrific potential as a source of domestically produced energy which can be effectively utilized, as well as a means of fighting global warming. We are undertaking a variety of renewable energy projects through which we seek to develop 4 million kW of renewable energy (current 1.8 million kW + an additional 2.2 million kW) domestically and overseas by 2030, focusing primarily on geothermal and hydroelectric.

[Tidal Power Demonstration Project]

Kyuden Mirai Energy, the Nagasaki Marine Industry Cluster Promotion Association and two other companies have joined together to create a consortium which has been chosen by the Ministry of the Environment to carry out its Tidal Power Technology Commercial Application Promotion Project in the Strait of Naru-seto near Goto City in Nagasaki Prefecture. The consortium has begun tidal studies in preparation for carrying out demonstration testing of Japan's first commercial-scale, large tidal power project (2,000kW). (Demonstration period: planned for 2016 - 2019)



Tidal power electrical generator

[Basic Specifications]

- Type: Ocean floor installation and open center system
- Output: 2,000 kW
- Diameter: Approx. 16 m
- Height: Approx. 27 m
- Weight: Approx. 1,200 t
- Speed: 10-16 rotations/min.

Approach to Renewable Energy Adoption

We take a well-balanced approach to adopting renewable energy which involves capitalizing on the specific characteristics of each type of energy to incorporate them as fully as possible, but without compromising on the stability of power delivery. This means that we tailor our supply-demand operating policies in response to renewable energy's significant, weather-dependent variations in power output.

[Start of Large Capacity Accumulator System Operation]

We are undertaking a variety of renewable energy adoption initiatives which rely on a well-balanced approach that capitalizes on the specific characteristics of each type of energy to incorporate them as fully as possible, but without compromising on the stability of power delivery.

One such initiative is the establishment in March 2016 of the Buzen Accumulator Substation, which was constructed as part of the national government's project to demonstrate the use of large capacity accumulator systems as a means of better balancing power supply and demand. Demonstration at this substation was conducted to show how accumulators, which charge and discharge depending on the status of solar power generation, can be used to improve the balance between supply and demand, as well as to show how a large capacity accumulator system can be efficiently run. (FY2015 - FY2016)

For the future, we will apply the findings and technology obtained from this demonstration testing to the reduction of output control volume during actual operation.



Aerial view of the Buzen Accumulator Substation

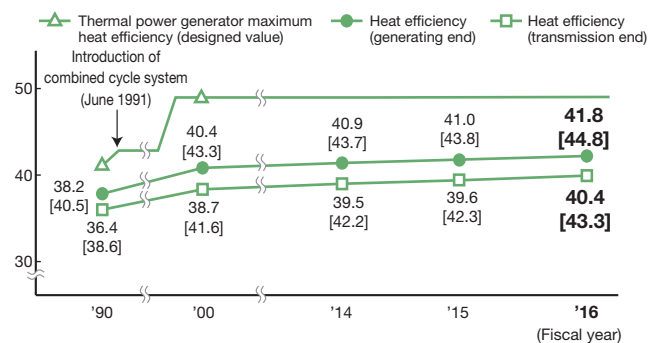
Maintenance and Improvement of Thermal Power Plant Heat Efficiency

We are working to maintain and improve the overall heat efficiency of our thermal power plants in order to better control fuel consumption and CO₂ emissions.

As a result of the continuous, stable operation (excluding periods of scheduled maintenance) of Sendai Nuclear Power Plant causing the operation rate of low heat efficiency oil-fired thermal power plants to drop, coupled with such factors as the start of operations for the high-efficiency Shin-Oita Power Plant No.3×4, results for FY2016 surpassed those for FY2015, reaching 40.4% (transmission end).

Additionally, we are currently constructing Matsuura Power Plant Unit 2 (which is scheduled to start operation in December 2019), and the cutting-edge "ultra-supercritical (USC) pulverized coal combustion" technology it will utilize for power generation will provide improved efficiency while lowering fuel consumption and environmental load.

Thermal Power Total Heat Efficiency (higher calorific value base) Unit: %



(Note) Figures in [] are lower calorific value base-converted values for which Comprehensive Energy Statistics conversion factors, etc., have been used.

Overview of Matsuura Power Plant Unit 2 Development

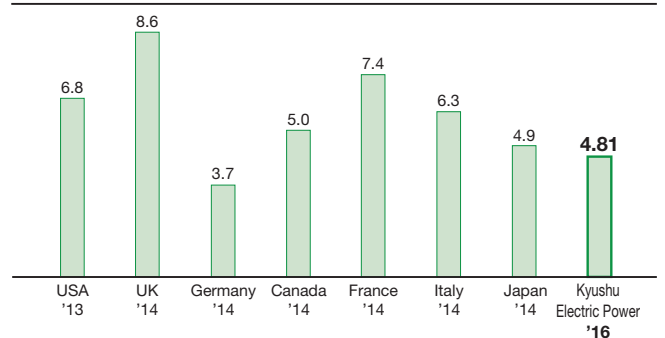
Output	1 million kW	
Power generation method	Ultra-supercritical pulverized coal combustion	
Fuel	Coal	
Thermal efficiency (generating end)	Higher calorific value standard	43% or more
	Lower calorific value standard	45% or more

Reduction of Transmission/Distribution Loss

Efforts to reduce the amount of power lost via transmission and distribution lines (transmission/distribution loss) are not only important to ensure efficient power delivery but also to reduce the amount of fuel used by thermal power plants and the amount of CO₂ which is produced.

As a result of efforts to increase transmission voltage, introduce low-loss transformers and other initiatives, our transmission/distribution loss rate for FY2016 was 4.81%, which is among the best in the world.

Country Comparison for Transmission/Distribution Loss Rates Unit: %



Source: Created based on the Hand Book of Electric Power Industry (2016 ed.).