Marunouchi

Shigeru Inoue
The Tokyo metropolitan area and Marunouchi area

The Tokyo station square

Aerial photography

Marunouchi Naka-Dori

Marunouchi

120ha

Tokyo
Effects and measures of the Great East Japan Earthquake

[Effect on the economy] Soaring energy cost
[Effect on the environment] Increasing CO\textsubscript{2} emission factor
[Effect on security] Loss of credibility on grid power

Measures in the Otemachi–Marunouchi–Yurakucho district

- Ensuring of energy security with multiplexed and diversified power sources
  (Introduction of CGS, enhancement of emergency power generator, and diversification of power sources)
- Reconstruction to high-spec energy-saving buildings and highly efficient buildings
- Introduction of renewable energy (solar, wind, and water power)
- Sophistication of energy management
  - Interchange of district heating and cooling among blocks
  - Demand response (under demonstration experiment)
Ensuring of energy security with multiplexed and diversified power sources

Third development of Otemachi Common Government Offices Building (case of multiplexed power sources)

Completion in 2015

CGS 1,800 kw x 2 units

(Ratio of power to peak power in summer)

1. Emergency generator 50%
2. Continuous generator (CGS) 25%
3. Brought by tenants 25%

Even if the power system is disrupted, 100% of power can be secured for three days.

Shin-Marunouchi Building (case of diversified power sources)

100% green electricity (FY2010 to FY2012)

Area 13 Building (renewable energy)

Output of power generation by solar panels in the Otemachi-Marunouchi-Yurakucho district (FY2012)

1,072 kW

CO₂ cut by 20,000 tons
Demonstration model of advanced environmental technologies, “Kayabacho Green Building” (Completed in May 2013)

[Building plan]
- Control of external heat load, highly efficient exterior
- Two-layer void natural ventilation system
- Solar shading louver

[Electric equipment plan]
- Intelligent LED lighting system (total optimal control by artificial intelligence)
- Freely set illumination and color temperature through each PC

[Management and operation plan]
- Adoption of BEMS
- Visualization of energy consumption

Energy consumption (CO2 basis) is expected to be reduced by approximately 45% [Compared with equivalent conventional office buildings]
Need for management of energy demand and supply across the entire district

District heating and cooling system (heat network)

- CGS (Existing)
- CGS (Under construction)

Steam supply cooperation

Cool water supply cooperation

Steam piping
- Cooling water piping
- Hot-water piping (double bundle refrigerator)

Cooling water cooperation

Steam cooperation (among districts)

1.509

0915 1212 1441

20% UP

※ CO₂ emissions ▲30%
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