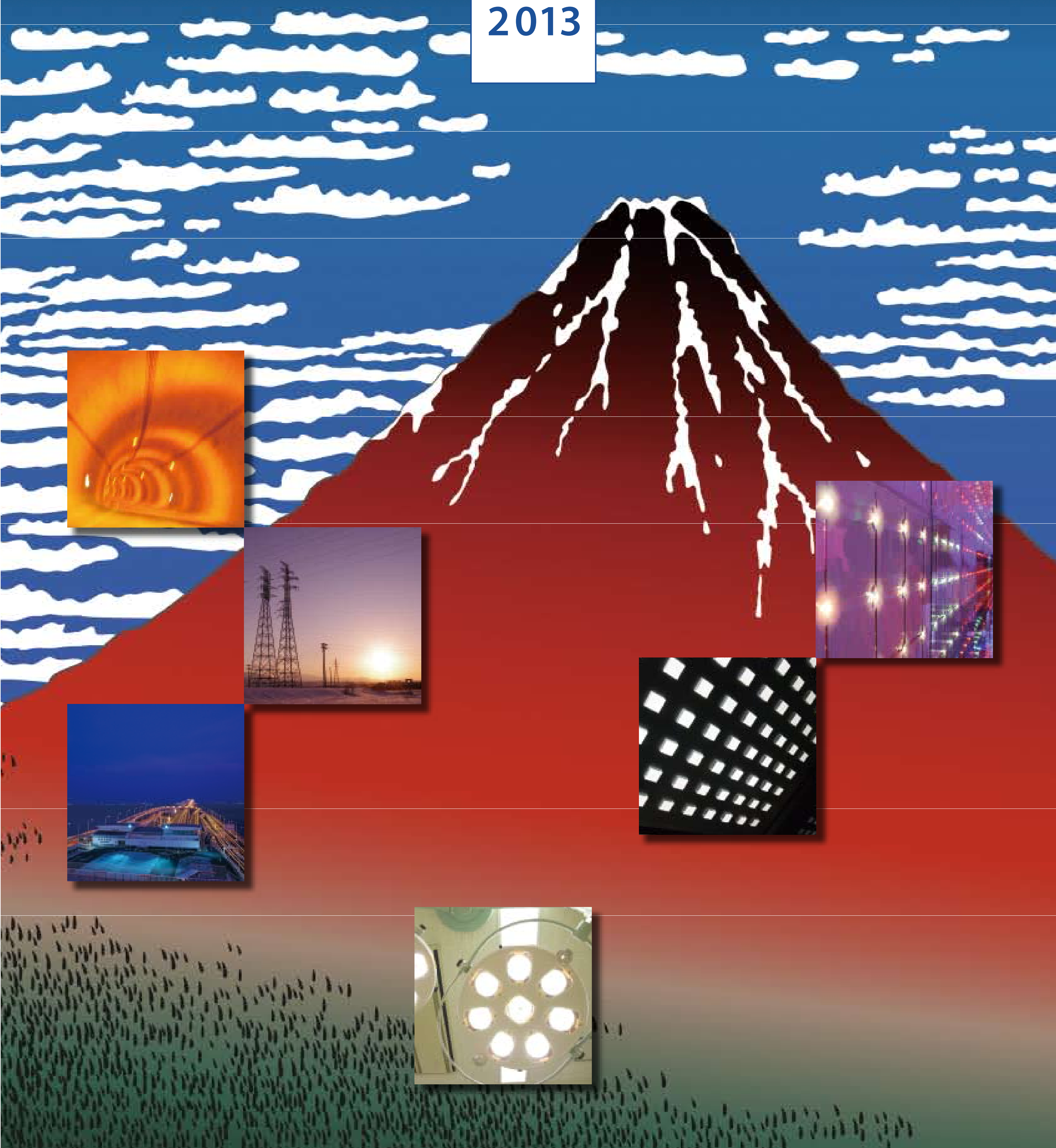
ELECTRICITY REVIEW JAPAN

The Federation of Electric Power Companies of Japan

2013



History of Japan's Electric Utility Industry

Electricity was first used in Japan on March 25, 1878 at the Institute of Technology in Toranomon, Tokyo when an arc lamp was switched on in commemoration of the opening of the Central Telegraph Office. In those days, electricity was still unfamiliar and uncommon not only in Japan but also in Europe and the United States. In 1886, Tokyo Electric Lighting, a private company, commenced operations as the nation's first electric power company, and began supplying electricity to the public in the following year.

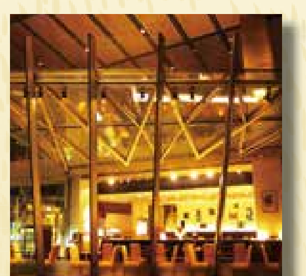
In the early days, use of electricity grew primarily for lighting because of its safety and cleanness, and gradually found broader applications as a power source to replace the steam engine. By 1896, the number of electric utilities established throughout the nation reached a total of 33. The early 20th century marked the establishment of long-distance transmission technology. As larger thermal and hydro power plants were introduced, generation costs fell and electricity came into wider use throughout the country. Consequently, electricity became an indispensable energy source for peoples' lives and industry.

In the years that followed, the electricity utility business grew in tandem with the modernization of Japan and development of its industry. At the same time, the electric utility industry experienced a major restructuring that led to the dissolution of 700 electric utilities, which merged to create five major electric utilities after the First World War. During the Second World War, the electric utility industry was completely state-controlled and utilities were integrated into Nihon Hatsusoden Co. (a nationwide power generating and transmitting state-owned company) and nine distribution companies.

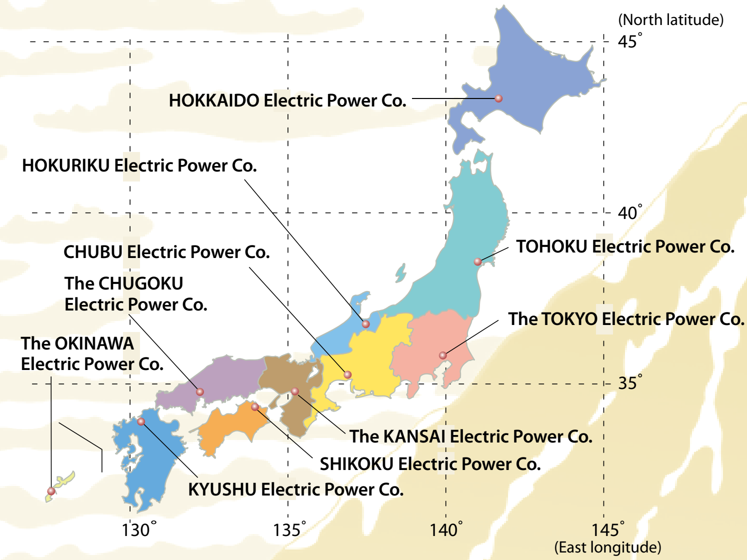
After the end of World War II in 1945, supply and demand for electricity remained very tight in Japan. A series of intense discussions were held on restructuring the electric utility industry as one of the measures for democratizing the economy. As a result, nine regional privately owned and managed General Electricity Utilities— Hokkaido, Tohoku, Tokyo, Chubu, Hokuriku, Kansai, Chugoku, Shikoku and Kyushu Electric Power Companies — were established in 1951 and assumed the responsibility of supplying electricity to each region. This fundamental structure remains to this day, and with the return of Okinawa to Japan in 1972, Okinawa Electric Power Co. joined as a tenth member.

At the end of the 20th century, a trend toward deregulation and competition took hold throughout society, and the electric utility industry started to be liberalized. In December 1995, organizations such as the independent power producers (IPP) were allowed to provide electricity wholesale services and in March 2000, electricity retail supply for extra-high voltage users (demand exceeding 2MW) was liberalized. The scope of retail liberalization was then expanded in April 2004 to users of more than 500kW, and subsequently in April 2005 to users of more than 50kW. Thus, a Japanese model of liberalization based on fair competition and transparency while maintaining the vertical integration of generation, transmission and distribution to ensure a stable supply of electricity, was established.

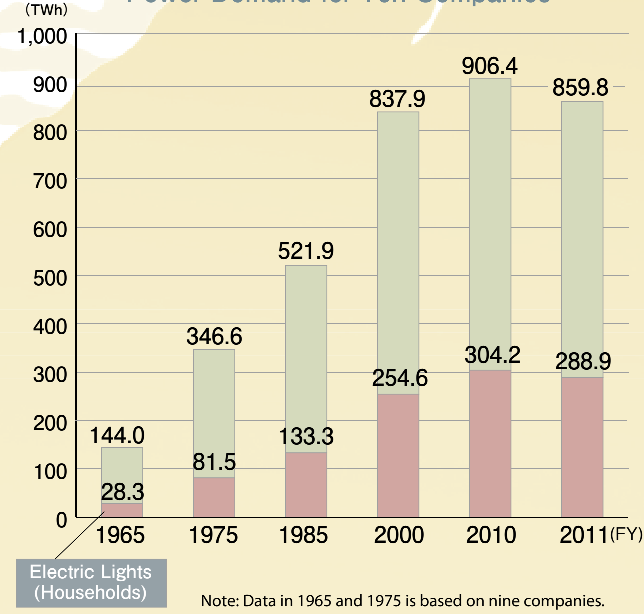


The Ten Electric Power Companies by Service Area



Power Demand for Ten Companies



Note: Data in 1965 and 1975 is based on nine companies.
Sources: Handbook of Electric Power Industry and others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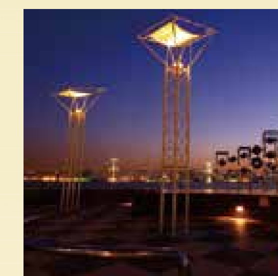
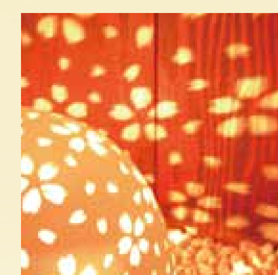
Note:
Nine Companies include Hokkaido, Tohoku, Tokyo, Chubu, Hokuriku, Kansai, Chugoku, Shikoku and Kyushu.
Ten Companies include the above Nine Companies plus Okinawa.

Japan's Energy Supply Situation

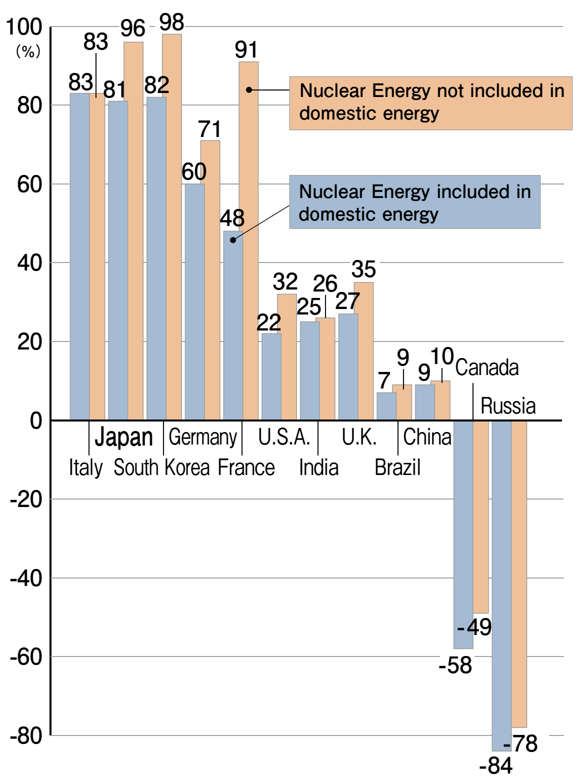
Resource-poor Japan is dependent on imports for 96% of its primary energy supply; even if nuclear energy is included in domestic energy, dependency is still at 80%.

Thus, Japan's energy supply structure is extremely vulnerable. Following the two oil crises in the 1970s, Japan has diversified its energy sources through increased use of nuclear energy, natural gas and coal, as well as the promotion of energy efficiency and conservation. Despite these improvements, oil still accounts for about 50% of Japan's primary energy supply, and nearly 90% of imported oil comes from the politically unstable Middle East. Moreover, although Japan has one of the highest proportions of electricity demand in total energy demand at over 40%, prospects for importing electricity from neighboring countries are very poor because Japan is an island nation. In addition, there is an urgent need for global warming countermeasures such as reduction of carbon dioxide emissions from the use of energy. To ensure Japan's stable electricity supply, it is crucial to establish an optimal combination of power sources that can concurrently deliver energy security, economic efficiency, and environmental conservation, while making safety the top priority.

For the future, it is important for Japan's energy mix to continue to include a certain level of nuclear energy premised on ensuring safety, while maximizing the use of renewable energy and using a reasonable proportion of thermal power considering the stability of fuel supply.

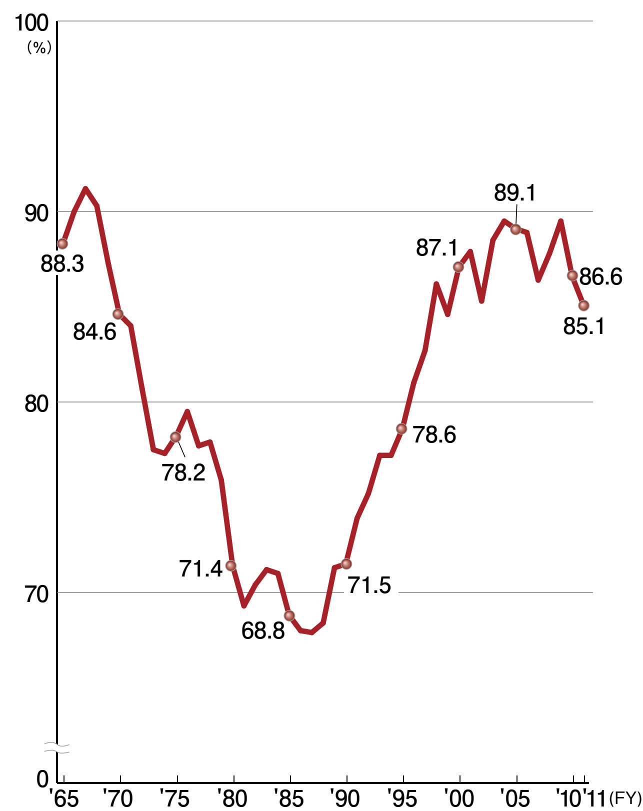

LNG Terminal

Dependence on Imported Energy Sources by Major Countries (2010)



Source: IEA "Energy Balances of OECD Countries 2012 Edition",
IEA "Energy Balances of Non-OECD Countries 2012 Edition"

Japan's Reliance on Middle East Crude Oil of Total Imports



Source: Petroleum Association of Japan

Electric Power Companies' Commitment to Safety Measures at Nuclear Power Plants

The Great East Japan Earthquake on March 11, 2011 led to a nuclear accident at the Fukushima Daiichi Nuclear Power Station, resulting in the release of radioactive materials into the environment.

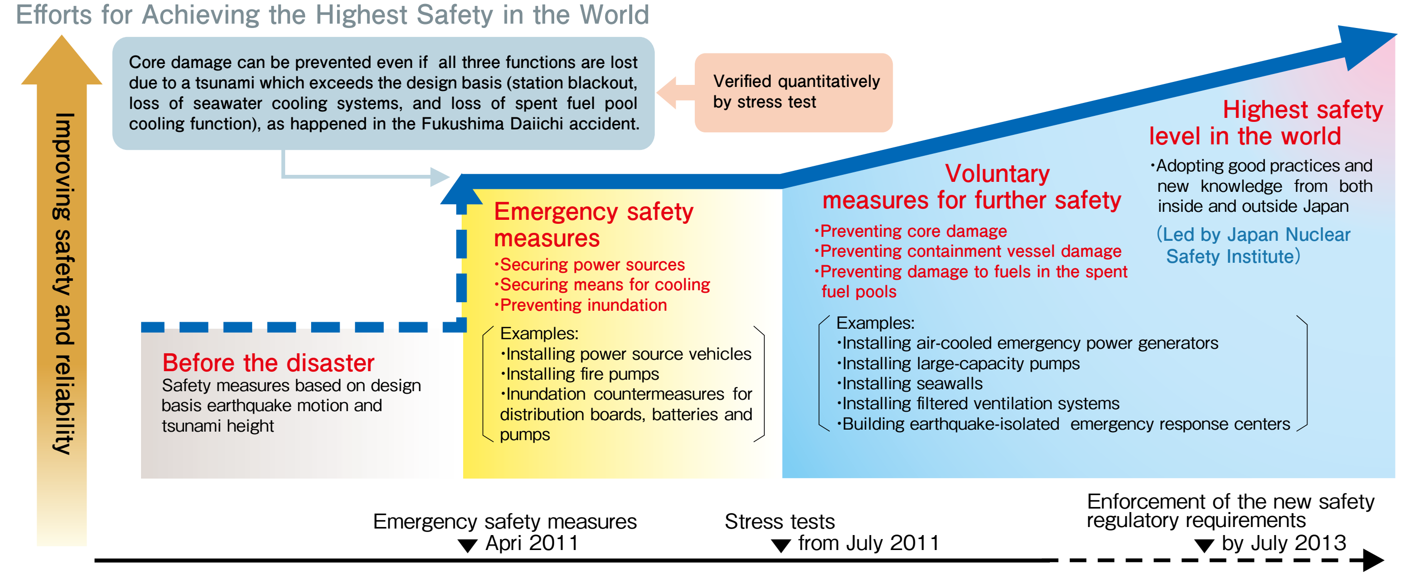
Determined to avoid a repeat of this accident, the electric power companies have been taking both tangible and intangible measures since immediately after the accident, starting with emergency safety measures including the installation of additional emergency power source vehicles and fire engines, as well as upgrading procedure manuals and conducting drills.

Even after implementing the emergency safety measures, the electric power companies are making further efforts to improve safety, including installing air-cooled emergency power generators, filtered ventilation systems and earthquake-isolated emergency response centers, to achieve even higher levels of safety and reliability.

In order to improve the safety of nuclear power stations, electric power companies themselves must voluntarily make continuous efforts to improve safety and achieve the highest safety level in the world. To enable these efforts to be constantly and objectively evaluated, the Japan Nuclear Safety Institute was established in November 2012 to evaluate the safety improvement activities of electric power companies and to give them technical advice with strong leadership from an independent standpoint. The electric power companies take to heart the evaluations and recommendations made by the Japan Nuclear Safety Institute and are striving to achieve the highest safety level in the world.

By July 2013, the new regulatory safety requirements formulated by the Nuclear Regulation Authority will come into effect. The power companies are prepared to fully meet these standards, and will strive to achieve the highest safety level in the world by introducing the latest knowledge and technologies on safety in a timely manner.

Efforts for Achieving the Highest Safety in the World




Seawall


Power Source Vehicle

Ten Electric Power Companies as Responsible Suppliers of Electricity

Currently, the ten privately-owned electric power companies are in charge of regional power supply services as General Electricity Utilities and are responsible for supplying electricity from power generation to distribution to the consumers in their respective service area. General Electricity Utilities must obtain approval from the Japanese Government by providing supply conditions such as electricity rates as general supply provisions to those consumers who are excluded from the retail liberalization. They are also responsible for supplying electricity to consumers subject to retail liberalization, based on the provisions for last resort service, if they cannot conclude contracts with power producers and suppliers (PPSs).

The electric power companies work closely with each other to enhance the stability of electricity supply to customers nationwide. For example, they exchange or provide electricity via extra-high voltage transmission lines linking the entire country from north to south, in order to cope with emergency situations resulting from accidents, breakdowns, or summer peak demand.

Classification of Businesses Specified in the Electricity Utilities Business Act (extract from the Act)

Business Category	Definition
General Electricity Business	Business of supplying electricity to meet general demand (license required)
Wholesale Electricity Business	Business of supplying a General Electricity Utility with electricity for use in its General Electricity Business, using the Electric Facilities with total capacity exceeding 2 GW (license required)
Specified Electricity Business	Business of supplying electricity to meet demand at a specified service point (license required)
Specified-Scale Electricity Business (Commonly called PPSs)	Business of supplying electricity (excluding licensed electricity businesses) to meet a demand exceeding 50kW from electricity users (Specified-Scale Demand), which are conducted by a General Electricity Utility in an area other than its service area, or conducted by a person other than a General Electricity Utility (notification required)
Wholesale Supply Business (Commonly called IPPs)	Supply of electricity to a General Electricity Utility for use in its General Electricity Business (excluding supply through a Cross-Area Wheeling Service) based on a contract of electricity supply exceeding 1 MW for at least 10 years or exceeding 100 MW for at least 5 years

National Trunk Line Connections
(As of December 2012)

Column

The Linchpins of East-West Grid Connection-Frequency Converter Facilities

The frequency of grid power differs between eastern and western Japan, namely 50 Hz and 60 Hz respectively. This difference has a historical root in that Tokyo area adopted German-made generators at the beginning of the electricity business while Osaka chose US-made ones. Therefore, Frequency Converter Facilities (FCF) are necessary to connect the eastern and western power grids. Three FCF, namely Sakuma FCF and Higashi-Shimizu FCF in Shizuoka Pref. and Shin-Shinano FCF in Nagano Pref., operate to convert the frequency.

The capacity of East-West Grid Connection is planned for expansion to 2100MW in total by FY2020. This includes the increase in the capacity of Higashi-Shimizu FCF by up to 300MW in February 2013 by the Chubu Electric Power Company.

Higashi-Shimizu FCF

Fair Competition and Transparency

The electric power market in Japan has been progressively liberalized to ensure competitive neutrality on the basis of a stable power supply by the existing ten General Electricity Utilities which consistently handle all functions from power generation to distribution.

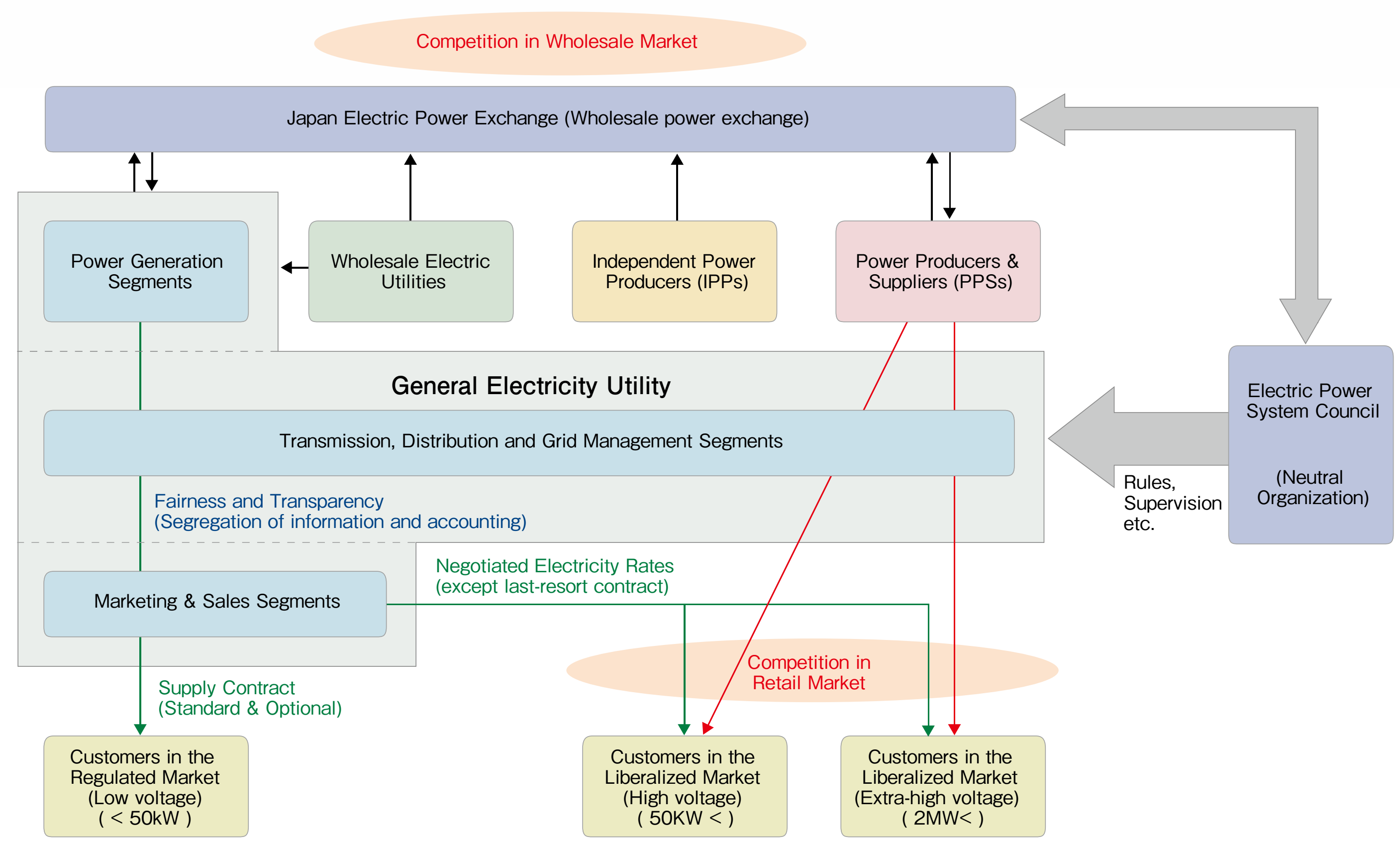
In 1995, a law was revised to enable IPPs to participate in the electricity wholesale market in addition to the conventional Wholesale Electricity Utilities. Then, in March 2000, use of the transmission/distribution network owned by the electric power companies was liberalized, and the retail market was partially liberalized to allow power producers and suppliers (PPSs) to sell electricity to extra-high voltage users requiring more than 2MW. The scope of liberalization was then expanded in April 2004 to users requiring more than 500kW, and subsequently in April 2005 to users requiring more than 50kW. Thus, by 2011, the scope of liberalization covers approximately 60% of total electricity demand in Japan. Electric power companies have responded to this trend of liberalization by increasing their business efficiency while lowering electricity prices and offering a variety of pricing plans.

Currently, expansion of the scope of liberalization to low-voltage users requiring less than 50kW, such as general households, is being considered.

To maintain fair and transparent use of the electric power transmission and distribution system, the Electric Power System Council of Japan (ESCJ) was established as the sole private organization to make rules and supervise operations from a neutral position, and started full-scale operation on April 1, 2005. In addition, Japan Electric Power Exchange (JEPX) was established in November 2003, with investments by the electric power companies, PPSs, self-generators, etc., and started business on April 1, 2005.

* In Okinawa, the scope of market liberalization is different.

The New Electricity Supply System (from April 2005)

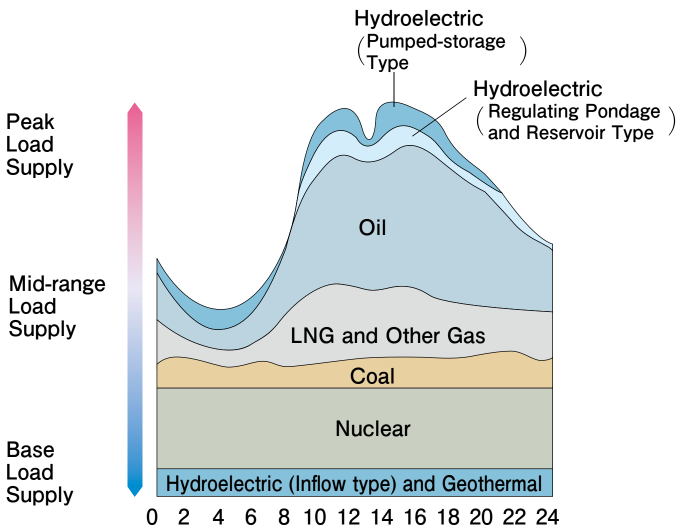


Optimal Combination of Power Sources

Electric power companies in resource-poor Japan are committed to developing an optimal combination of power sources that combines various energy sources such as hydro, thermal and nuclear power in order to provide electricity, which is essential for modern living, in a stable manner at the lowest prices.

As electricity is nearly impossible to store in large quantities, electric power companies generate electricity by combining various power sources, considering optimal operational and economic performance, to ensure that the fluctuating demand, such as during the daytime in the height of summer, can always be met.

(Example) Combination of Power Sources



Hydroelectric and nuclear power provides base load supply, while coal and LNG are major power sources for mid-range load supply. Oil-fired and pumped-storage hydroelectric power respond to peak demand fluctuation and contribute to consistent stable supply of electricity.

Hydroelectric Power

Hydroelectric power has been one of the few self-sufficient energy resources in resource-poor Japan for more than 100 years. Hydroelectric power is an excellent source in terms of stable supply and generation cost over the long term. Though it used to compare unfavorably with thermal power for some time, hydroelectric power saw a renaissance following the oil crisis.

Although the steady development of hydroelectric power plants is desired, Japan has used nearly all potential sites for constructing large-scale hydroelectric facilities, and so recent developments have been on a smaller scale. As the gap in demand between daytime and nighttime continues to widen, electric power companies are also developing pumped-storage power generation plants to meet peak demand. The share of pumped-storage generation facilities of the total hydroelectric power capacity in Japan is growing year by year.

Okumino Hydroelectric Power Station (Pumped-storage)

Takami Hydroelectric Power Station

Thermal Power

Initially, coal was the dominant fuel for thermal power generation in Japan, but it later lost that place to oil. Today, a diverse range of fuels including coal, oil, and LNG are used for the important generating role that thermal power plants play. In particular, in response to global environmental concerns, electric power companies are promoting the introduction of LNG fired plants, as they emit less CO_2 and other pollutants.

To enhance thermal efficiency further, combined-cycle power plants with both gas and steam turbines have been installed. As a result, gross thermal efficiency (maximum designed value) has exceeded 50%. In the future, we will continue to research and develop new technologies in order to increase thermal efficiency as well as the use of integrated coal gasification combined cycle (IGCC) power generation.

Kawasaki Thermal Power Station (LNG Combined-cycle)

Yoshinoura Thermal Power Station (LNG-fired)

Nuclear Power

Japan's first commercial nuclear power plant started operation in Ibaraki Prefecture in 1966. The electric utility industry believes that nuclear power generation will retain an important position in the optimal combination of power sources from the viewpoint of assuring energy security and mitigating global warming.

Electric utilities are firmly committed to implementing extensive safety measures following the recent accident at the Fukushima Dai-ichi Nuclear Power Station, reinforcing the mechanism to reflect the latest findings from both Japan and overseas, and enhancing the safe operation of the country's nuclear power plants. We will also continue to publish the latest information to contribute to the safety of nuclear power generation throughout the world.

Ohi Nuclear Power Station (PWR)

Ohma Nuclear Power Station (ABWR, Under Construction)

Japan's Nuclear Fuel Cycle

The nuclear fuel cycle is a series of processes consisting of reprocessing spent fuel that has been used at nuclear power plants and recovering and recycling plutonium and residual uranium as nuclear fuel.

Japan has chosen a closed nuclear fuel cycle policy since the dawn of its nuclear power generation development. Having few resources, Japan decided to recycle spent nuclear fuel domestically in order to establish nuclear power as a homegrown energy source. The benefits of a closed nuclear fuel cycle for Japan are significant: it adds to long-term energy security by reducing dependence on imported fuels; it conserves uranium resources; and it reduces the amount of high-level radioactive waste that must be disposed of. Reprocessing is a chemical process that recovers plutonium and reusable uranium from spent fuel and separates radioactive wastes into more manageable forms.

Once recovered, the plutonium is ready to be re-introduced into the nuclear power plants in the form known as uranium-plutonium mixed oxide (MOX) fuel. Japan's electric power companies have continuously committed to a plan to utilize recovered plutonium – in the form of MOX fuel – in 16 to 18 nuclear reactors by fiscal 2015 at the latest.

In the past, Japan has relied on countries such as the U.K. and France to reprocess most of the spent fuel it produced. However, to place Japan's domestic nuclear fuel cycle on a firmer footing, Japan Nuclear Fuel Limited (JNFL) is preparing for completion of construction of a reprocessing plant in October 2013 at a site in Rokkasho-mura in the northern prefecture of Aomori. Currently, the reprocessing plant is in the stage of "Final Commissioning Test". In addition, JNFL engages in uranium enrichment, temporary storage of vitrified waste, and disposal of low-level radioactive waste. JNFL has also begun construction of a MOX fuel fabrication plant.

Electric utilities regard nuclear power as an important power source for Japan from the viewpoints such as assuring energy security and mitigating global warming. We will make utmost effort to establish the nuclear fuel cycle on the premise of securing thorough safety.

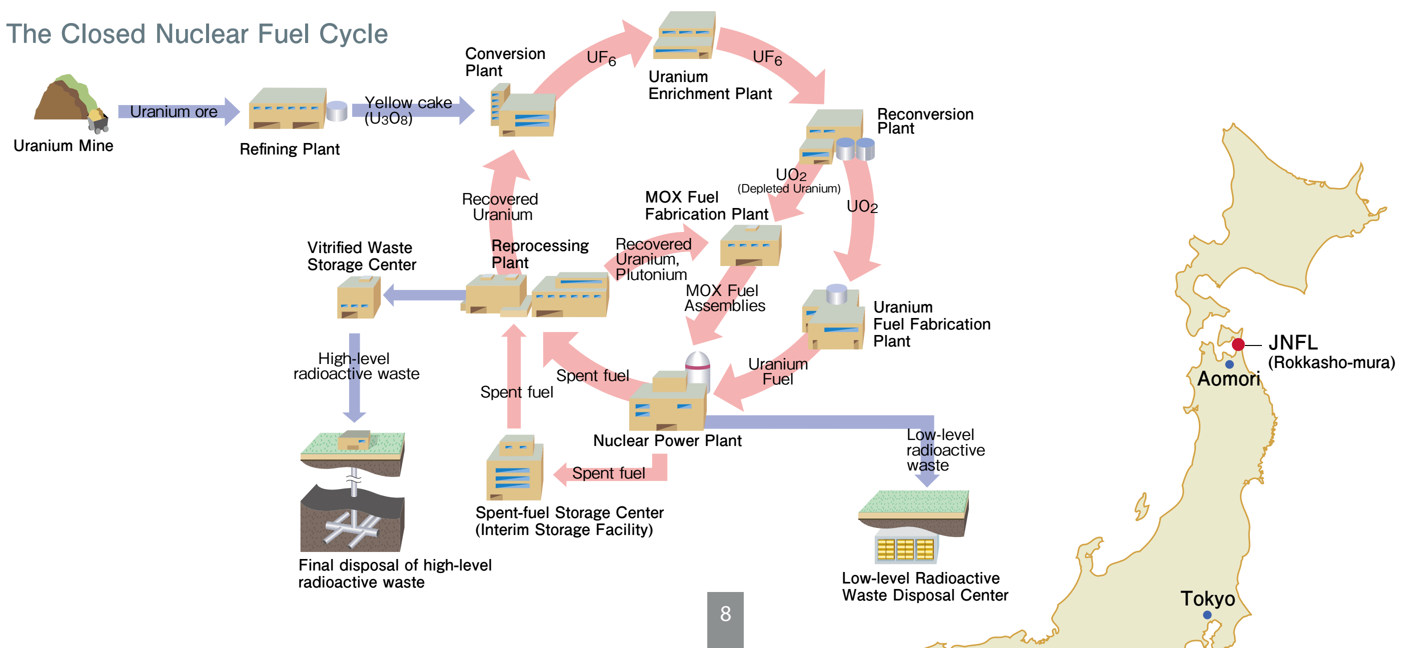
Outline of JNFL's Nuclear Fuel Cycle Facilities (as of February 2013)

Facility	Reprocessing Plant	MOX fuel fabrication plant	Vitrified waste storage center	Uranium enrichment plant	Low-level radioactive waste disposal center
Site	Iyasakatai, Rokkasho-mura, Kamikita-gun, Aomori Prefecture			Oishitai, Rokkasho-mura, Kamikita-gun, Aomori Prefecture	
Capacity	Maximum capacity: 800 ton-U/year Storage capacity for spent fuel: 3,000 ton-U	Maximum capacity: 130 ton-HM/year (*)	Storage capacity for wastes returned from overseas plants: 2,880 canisters of vitrified waste	Design capacity 1,500 ton-SWU/year (*)	Planned to be expanded to 600,000m³ (equivalent to 3 million 200 liter drums)
Current Status	Under construction	Under construction	Cumulative number of stored canisters: 1,442	Running capacity: 1,050 ton-SWU/year	Cumulative number of stored drums: 250,763
Schedule	Start of construction: 1993 Completion of construction: 2013(planned)	Start of construction: 2010 Completion of construction: 2016(planned)	Start of construction: 1992 Start of storage: 1995	Start of construction: 1988 Start of operation: 1992	Start of construction: 1990 Start of operation: 1992

(*) "ton-HM" stands for "tons of heavy metal" which indicates the weight of plutonium and uranium metallic content in MOX.
"SWU" stands for "Separative Work Unit" which is a measure of the work expended during an enrichment process of uranium

Sources: JNFL's website and others

The Closed Nuclear Fuel Cycle



The Peaceful Use of Nuclear Energy

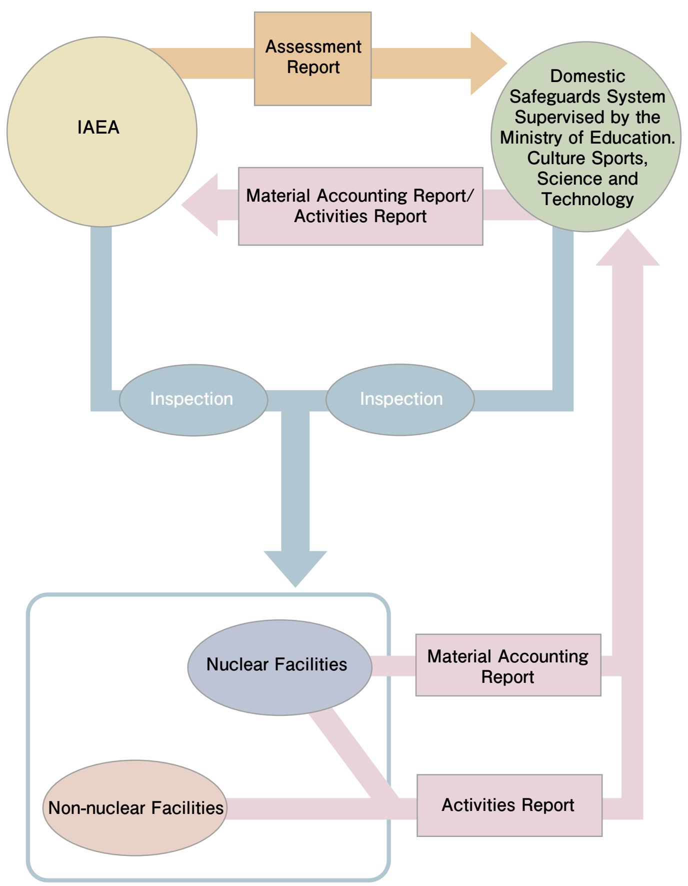
Japan's electric power companies are fully committed to implementing the closed nuclear fuel cycle and plutonium utilization program consistent with all domestic laws and international nonproliferation standards. Since 1955, the domestic laws of Japan require that all nuclear activities, including commercial activities, be conducted only for peaceful purposes. Also, since 1968, Japan has embraced the "Three Non-Nuclear Principles," which state that Japan will not possess, produce, or permit the entry of nuclear weapons into its territory.

In addition, in 1976, the Government of Japan ratified the Nuclear Non-Proliferation Treaty (NPT) and thereby obligated itself to a national policy not to produce or acquire nuclear weapons. In order to ensure the application of more extensive safeguards, Japan signed the IAEA Additional Protocol in 1998, which allows the IAEA to carry out a range of additional inspection measures. In accordance with national laws, Japan's electric power companies submit reports on material accounting and safeguards activities to the Minister of Education, Culture, Sports, Science and Technology, and accept joint inspections by the IAEA and Japanese regulatory authorities to check the reports.

The results of each of these Japanese initiatives were reflected in the IAEA's conclusion in June 2004, which stated that all the nuclear materials in Japan are protected under IAEA safeguards and are not being diverted to the manufacture of nuclear weapons. As a result, more effective and efficient IAEA safeguards known as integrated safeguards commenced in Japan in September 2004.

JNFL's Reprocessing Plant

The Safeguards Program



Column

Start of the "Active Test" and the Recovery of MOX Powder at Rokkasho Reprocessing Plant

On March 31, 2006, JNFL started the final-stage testing, called the "Active Test", at Rokkasho Reprocessing Plant. The Active Test processes real spent fuel and validates the plant's safety features and the performance of equipment and facilities before the start of commercial operations. On November 16, 2006, JNFL successfully recovered MOX powder through the testing. The most remarkable feature of the manufacturing technology at the Rokkasho plant is called co-denitration. The process, developed in Japan, does not yield pure plutonium, but produces MOX powder, which deters proliferation and will be fabricated into MOX fuel for reactors.

Status of MOX Fuel Utilization

The electric power industry in Japan intends to introduce MOX fuel in 16 to 18 nuclear reactors by fiscal 2015. In December 2009, Japan's first nuclear power generation using MOX fuel started at Genkai Nuclear Power Plant Unit 3 of Kyushu Electric Power Company. On April 23, 2008, METI permitted Electric Power Development Co. Ltd. (EPDC) to construct the Ohma Nuclear Power Plant (ABWR, 1,383MW) in the town of Ohma in Aomori Prefecture. This marks the first construction of a nuclear power plant at a new site in Japan within the past ten years. Ohma Nuclear Power Plant is the world's first full-MOX nuclear power plant; it seeks to load the full core with the MOX fuel, thus playing a pivotal role in enhancing the flexibility of Japan's MOX fuel utilization program.

Measures by the Electric Utility Industry to Suppress CO_2 Emmisions

Efforts for environmental conservation including countermeasures against global warming, creating a recycling-based society and managing chemical substances, are key challenges for the electric utility industry. In particular, emissions of carbon dioxide (CO_2), a major cause of global warming, are closely related to energy utilization in economic activities and daily life, and so the reduction of CO_2 emissions is a major challenge for the industry.

With the major assumption of a stable supply of high-quality and inexpensive electricity to customers, the electric power companies are making the necessary efforts on both the supply and demand sides of electricity including supplying low-carbon energy, and improving/promoting high-efficiency electrical devices to enhance the efficient use of electricity by customers. The companies are also conducting various projects for R&D and international cooperation.

CO_2 emissions accompanying electricity consumption may increase or decrease depending on various conditions such as weather and the status of electricity use by customers, which cannot be controlled by the utilities themselves.

Therefore, the electric utility industry is striving to achieve the voluntary target of reducing the CO_2 emissions intensity (emissions per unit of user end electricity) averaged over the five fiscal years from 2008 to 2012, by approximately 20% from the level in FY1990 (to approximately 0.34 kg-CO_2/kWh) by using the CO_2 emissions intensity that the electric utilities can affect by their own efforts.

The user-end CO_2 emissions intensity for FY2011 was 0.476kg-CO_2/kWh, up 14% from FY1990 levels. This is attributed to the increase in thermal power generation due to the long-term shutdown of nuclear power stations after the Great East Japan Earthquake and tsunami.

Decarbonization of Energy on the Supply-side

Promoting nuclear power generation assuming safety, and improving the thermal efficiency of thermal power plants further

Nuclear power emits no carbon dioxide (CO_2) in the process of power generation, and even considering CO_2 emissions over the entire life cycle of various energy sources, those from nuclear power are lower than those from thermal power, and are even lower than those from solar or wind power.

Considering that nuclear power generation will continuously play a key role in combating global warming, the industry is committed to making the utmost effort to improve the safety of nuclear power generation and to restore the trust of citizens.

The electric companies are also striving to increase the share of LNG-fired thermal power which has the advantage of relatively low CO_2 emissions, and to improve the efficiency of thermal power plants.

Currently operating state-of-the-art gas turbine combined cycle power plants have achieved the world's highest level of 59% in thermal efficiency, by, for example, raising the combustion temperature at the gas turbines.

Since the Oil Shocks of the 1970s, electricity demand has grown approximately 3.3-fold while CO_2 emissions have grown only 2.6-fold. This was achieved through measures on both the supply and demand sides, reducing the CO_2 emissions of energy on the supply side while improving the efficiency of energy utilization by users. As a result, CO_2 emissions per unit of user-end electricity have decreased by 20% from 1970 levels.

Decarbonization of Energy at Supply-side (Lowering of CO_2 emissions intensity)

- **Expanding use of non-fossil energy sources**
  - Promotion of nuclear power generation based on the premise safety assurance
  - Development and expansion of use of renewable energy sources
    Hydroelectric, geothermal, solar, wind, and biomass power generation
- **Improving efficiency of electric power equipment**
  - Further improvement of thermal efficiency of thermal power plants
    Introduction of LNG combined-cycle power plant, Improvement of thermal efficiency of coal thermal power plants
  - Reduction of transmission and distribution loss
    High-voltage transmission, low-loss transformers
- **International efforts**
  - Active utilization of the Kyoto Mechanisms
  - Sectoral approaches
    International Electricity Partnership (IEP), etc

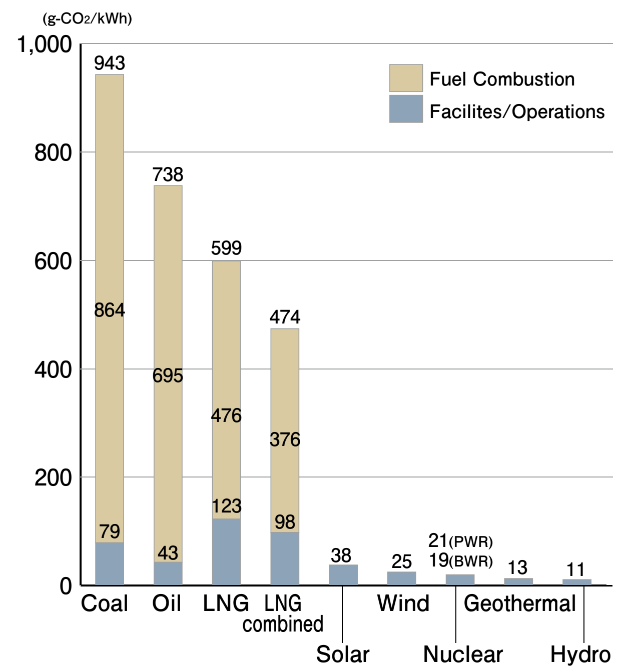
Improvement of the Energy Usage Efficiency at Demand-side

- **Energy conservation**
  - Electrification promotion, energy conservation and expansion of high efficiency electric equipment
    Heat pumps, heat storage air conditioning, electric vehicles, and others
    Participation in energy saving and CO_2 reduction activities by utilizing the domestic credit system
  - Utilization of untapped energy sources
    Heat recovery from river water, waste incineration facilities and substations
  - PR-activities and provision of information aimed at energy conservation and CO_2 reduction
    Household eco-account book, exhibitions on energy-saving appliances and seminars on energy-saving
  - Load leveling promotion such as with heat pump & thermal storage systems
    Thermal storage type air conditioning/hot-water supply, etc
- **Efforts by electric utility industry as users**
  - Efforts in office-use energy conservation and the use of company-owned vehicles
    Reduction of amount of power consumption
    Introduction of electric vehicles and fuel-efficient vehicles

Research and Development

- **Research and Development**
  - Supply-side
    Clean coal technology, next-generation electric power transmission and distribution technology(Smart Grid), CO_2 capture and storage technologies
  - Demand-side
    Ultra-high efficiency heat pump, electric vehicle technology,etc

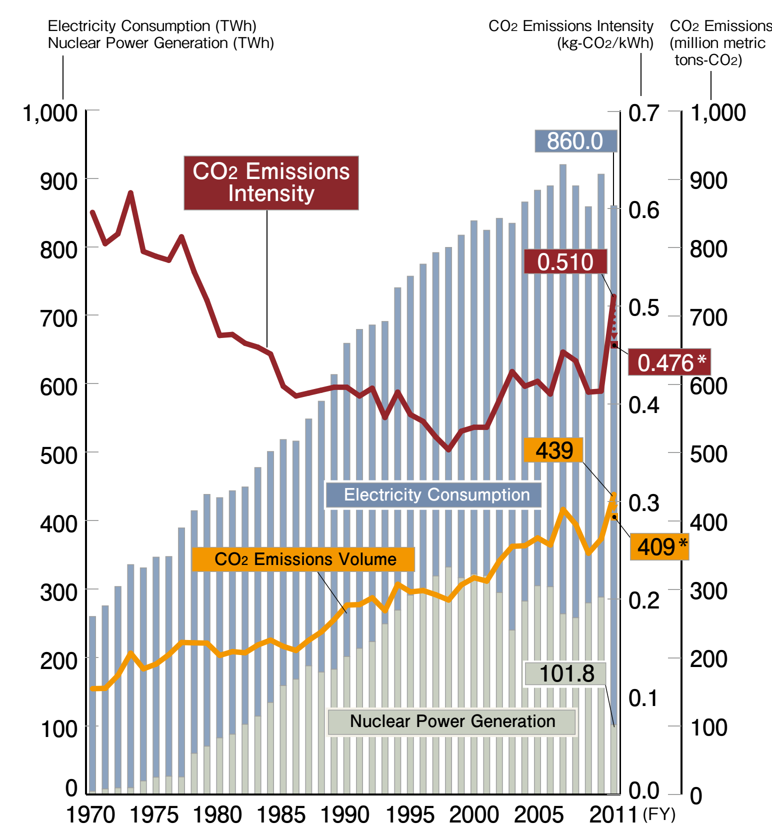
CO_2 Emissions Intensity over the Entire Lifecycle by Source



Note: (1) Based on total CO_2 emissions from all energy consumed in energy extraction, transportation, refining, plant operation and maintenance, etc. in addition to burning of the fuel.
(2) Data for nuclear power: 1) includes spent fuel reprocessing in Japan (under development), MOX fuel use in thermal reactors (assuming recycling once) and disposal of high level radioactive waste, and 2) is based on the capacity-weighted average of CO_2 emissions intensities of existing BWR and PWR plants in Japan, which are 19g-CO_2/kWh and 21g-CO_2/kWh respectively.

Source: Report of the Central Research Institute of Electric Power Industry, etc.

Histrical Trends in CO_2 Emissions from Power Generation
(excluding self-generators)



Note: The numerical value of "0.476*" and "409*" reflected Kyoto Mechanism credit.
Source: FEPC

Decarbonization of Energy on the Supply-side

Development and expansion of the use of renewable energy sources

Hydroelectric, geothermal, photovoltaic, wind, and biomass energy are all clean and renewable , and the electric utilities are striving to develop them.

For example, the electric utilities are developing mega-solar power generation plants (large-scale photovoltaic power generation plants) in addition to the efforts such as utilizing woody biomass fuel at their existing coal-fired power plants. We are planning to build Mega Solar Power Plants with a total capacity of about 140 MW at around 30 sites throughout the country by fiscal 2020, and some plants have already started commercial operation.

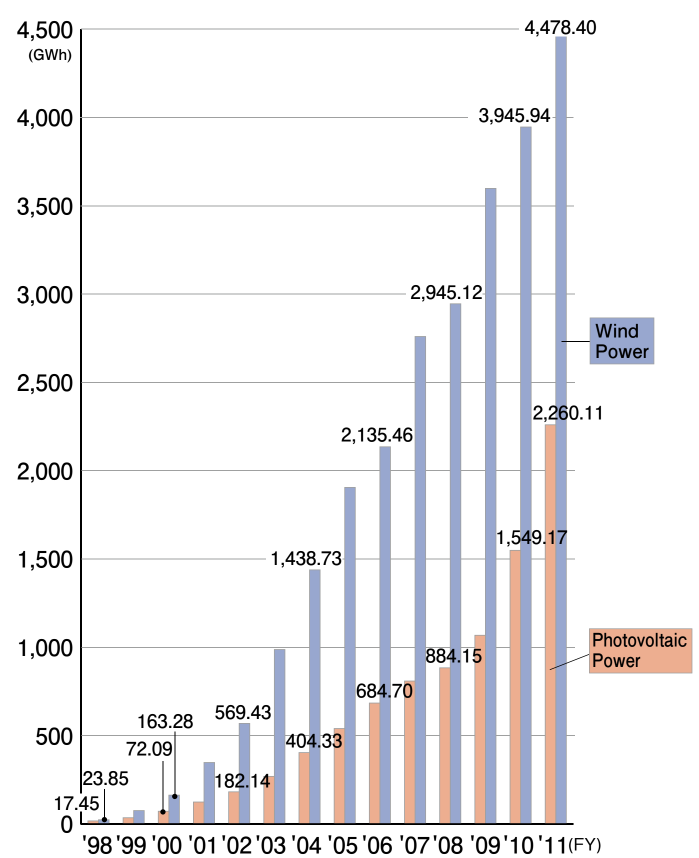
Japanese electric power companies have been purchasing electricity generated from the solar and wind power systems of our customers, and thus renewable energy sources account for about 10% of total electricity.

The feed-in tariff system for renewable energy commenced in July 2012, whereupon the electric power companies are obliged to buy such electricity at a fixed price for a certain period. The cost of purchasing this electricity is finally borne by customers in the form of a surcharge which in principle is proportional to the amount of electricity consumed.

Renewable energy such as photovoltaic power has problems involving efficiency, cost of power generation and stability of output. R&D on the latest power system control technologies for combining existing power plants and storage batteries will be actively conducted to help stabilize the system, when introducing large amounts of wind and photovoltaic power, which are susceptible to the weather.

Electric utilities will keep striving to develop and improve renewable energy sources.

Ten Electric Power Companies' Purchasing Volume of Photovoltaic and Wind Power



Source: FEPC

Mikuni Solar Power Station

Wind Power

Sharing Japan's Top-level Environmental Technologies with the World

As a result of taking various environmental measures at thermal power plants, Japan has achieved the world's top-level energy efficiency. Based on this achievement, the electric utility industry in Japan has been making efforts to establish a mechanism for sharing such advanced technologies with electric power industries in other countries (see the column).

Through the cooperation between advanced and developing countries, and with the "sectoral approaches" for sector-by-sector improvement of energy efficiency, it will be possible to achieve compatibility between economic growth and global environmental preservation. The electric utility industry of Japan has been proposing the sectoral approaches to the world as a new focus for the post-Kyoto period.

It is estimated that the introduction of Japanese technologies to coal-fired power plants in three big countries alone, namely the United States, China and India, could reduce emissions by approx. 1.3 billion tons-CO_2/year, which is almost equivalent to the total annual CO_2 emissions in Japan today.

Column

International Electricity Partnership (IEP)

In October 2008, the FEPC of Japan, Edison Electric Institute of the United States, and EURELECTRIC of Europe jointly announced the establishment of the International Electricity Partnership (IEP) to realize a global low-carbon future through advanced electric power technologies.

On December 15, 2009, the members of IEP presented their technology roadmap entitled "Roadmap for a Low-Carbon Power Sector by 2050" on site at COP15 in Copenhagen, Denmark. In addition to providing analysis of the electric power technology and policies needed to realize a low-carbon society, this Roadmap may also be used as a guideline for transferring advanced electric power technologies to developing countries as a tool of sectoral approaches for reducing greenhouse gas emissions.

Participation in Asia-Pacific Partnership (APP) on Clean Development and Climate

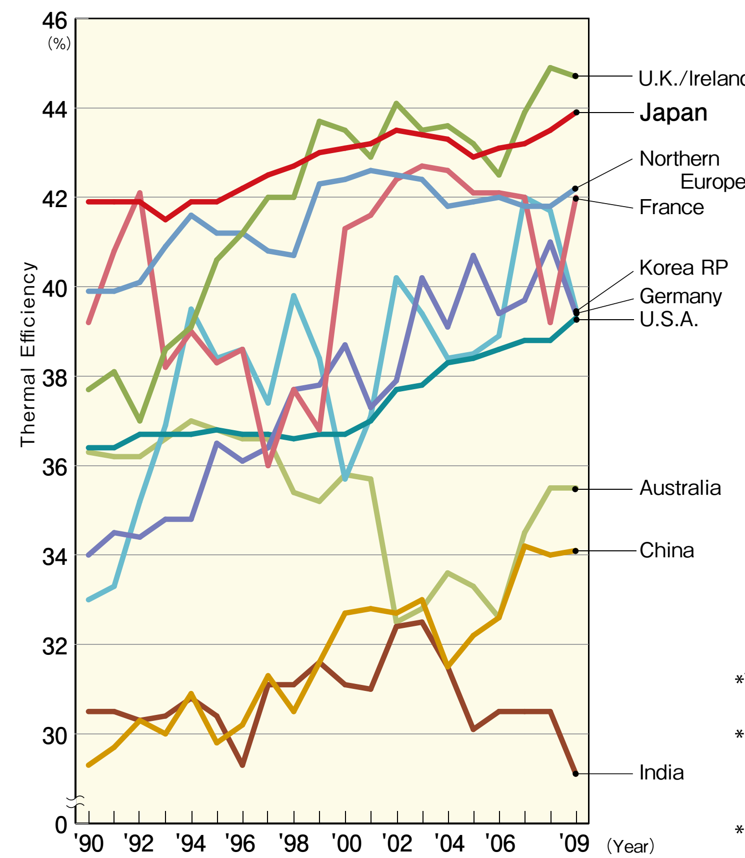
APP is a framework for inter-regional partnership for responding to the challenges of growing energy demand, energy security, climate change, and so on. Under this framework, the seven participating countries (United States, Australia, China, India, South Korea, Japan and Canada) are pursuing the development, transfer and spread of clean and energy-efficient technologies.

CO_2 emissions from the seven participating countries account for more than half of global CO_2 emissions, and so these seven countries' efforts for reducing CO_2 emissions will have a global impact. Electric utilities in Japan have been actively involved in these efforts.

The activities of the APP were completed by the end of April 2011, and were taken over by the Global Superior Energy Performance Partnership (GSEP).

APP 2nd Peer Review Activity in India

Comparison of Thermal Power Plant Efficiency in Japan and Other Countries



∗Thermal efficiency is the gross generating efficiency based on the weighted averages of efficiencies for coal, petroleum and gas (low heat value standard).

∗Comparisons are made after converting Japanese data (higher heating value standard) to lower heating value standard, which is generally used overseas. The figures based on lower heating value are around 5-10% higher than the figures based on higher heating value.

∗Private power generation facilities, etc. not covered.

Source: ECOFYS「INTERNATIONAL COMPARISON OF FOSSIL POWER EFFICIENCY AND CO_2 INTENSITY August 2012」

Demand-side Efforts for CO_2 Reduction

In Japan, the energy demand for water heating constitutes about 30% of the total energy demand in the household sector, and so energy-saving and CO_2 reduction measures in this area are very effective. Electric power companies have been working hard to develop and promote electric appliances and systems to reduce CO_2 emissions. One example is EcoCute, a water heating system with a heat pump that uses CO_2 as refrigerant.

EcoCute heats water by transferring the thermal energy in air, which is freely available, to water by means of refrigerant. With a *single unit* of electric energy for heat pump operation and *two units* of thermal energy from air, it produces *three units* of thermal energy.

Thanks to this principle, CO_2 emissions are cut by about 50% compared with conventional combustion type water heaters. Because of this advantage, the government and industry are jointly promoting the use of heat pump systems as a key means of preventing global warming in the consumer sector (household and commercial sectors). When heat pump systems fully penetrate the consumer and industrial sectors, the resulting CO_2 emissions reduction will amount to about 12% of the present annual CO_2 emissions in Japan, which is about 1.2 billion tons-CO_2.

Column

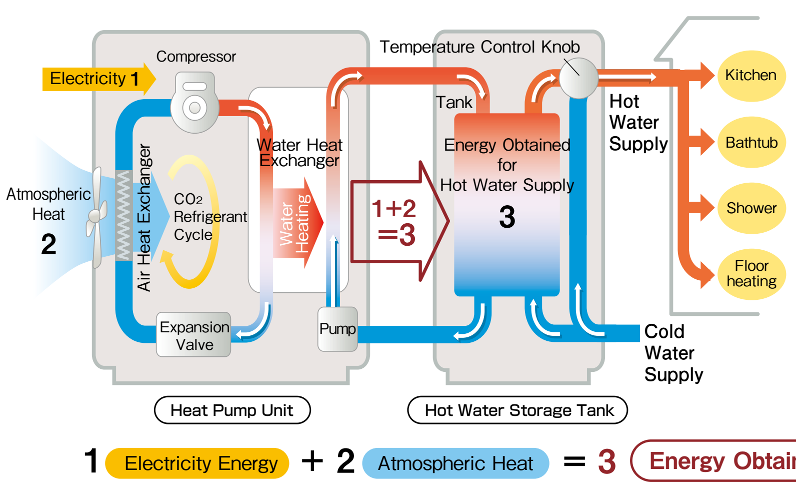
Electric Vehicle Deployment Plan

The electric power companies of Japan have been working hard to achieve full-scale commercialization of environmentally-efficient electric vehicles, such as conducting driving tests and jointly developing new fast battery chargers with automobile manufacturers. To expand the use of electric vehicles, the electric power companies jointly decided to introduce about 10,000 electric vehicles (including plug-in hybrid vehicles) in total for commercial use by FY2020.

Electric Vehicle
(Mitsubishi Motors Corporation, i MiEV)

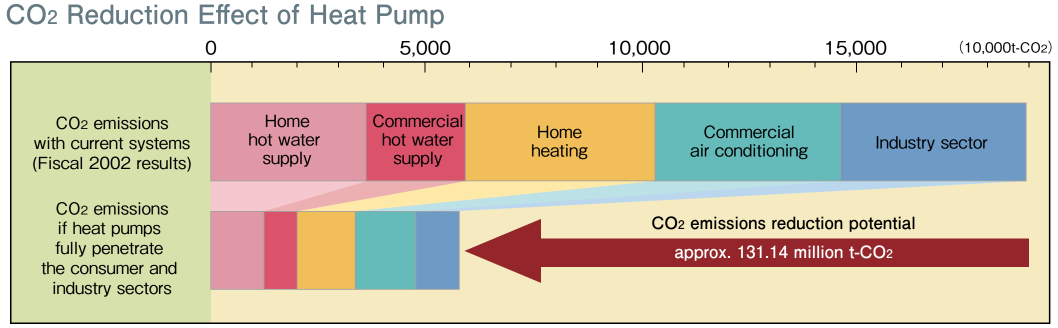
Fast Battery Charger

EcoCute Hot Water Supply Structure: CO_2 Retrigerant Heat Pump Hot Water Heater



EcoCute Heat Pump Unit (left) and Hot Water Storage Tank

CO_2 Reduction Effect of Heat Pump



Source: Calculations by The Heat Pump & Thermal Storage Technology Center of Japan

Strengthening International Communication and Cooperation

Japan's electric power companies remain active on a worldwide basis. In order to cope with global warming and to ensure the safety of nuclear power generation, international cooperation is indispensable. Each of the electric power companies in Japan has individual agreements with overseas utilities in order to facilitate exchanges on a wide range of information such as power generation, customer relations, distribution and quality control. The industry's top executives actively participate in international meetings such as the International Electricity Summit and the World Association of Nuclear Operators (WANO) to exchange views, while we also accept trainees from overseas. We import most of our fuel such as oil and coal from overseas countries and also keep our doors open to foreign companies on the purchase of equipment such as generators.

Overseas Offices

Please feel free to contact your nearest office.

WASHINGTON, D.C.

●The Federation of Electric Power Companies of Japan, Washington Office

The Federation's Washington Office was established in January 1994. Its principal objectives are to study U.S. energy policies and to exchange information with U.S. energy opinion leaders in order to promote a greater understanding of the Japanese electric power industry.

1901 L Street, N.W., Suite 600, Washington, D.C. 20036, U.S.A.
Tel: (202) 466-6781 Fax: (202) 466-6758
Established in 1994

●Tokyo Electric Power Co., Inc., Washington Office
1901 L Street, N.W., Suite 720, Washington, D.C. 20036, U.S.A.
Tel: (202) 457-0790 Fax: (202) 457-0810
Established in 1978

●Chubu Electric Power Co., Inc., Washington Office
900 17th Street, N.W., Suite 1220, Washington, D.C. 20006, U.S.A.
Tel: (202) 775-1960 Fax: (202) 331-9256
Established in 1982

LONDON

●Tokyo Electric Power Co., Inc., London Office
Berkeley Square House, Berkeley Square, London W1J 6BR, U.K.
Tel: (020) 7629-5271 Fax: (020) 7629-5282
Established in 1982

●Chubu Electric Power Co., Inc., London Office
Nightingale House, 65 Curzon Street, London W1J8PE, U.K.
Tel: (020) 7409-0142 Fax: (020) 7408-0801
Established in 1985

PARIS

●Kansai Electric Power Co., Inc., Paris Office
3, rue Scribe, Paris 75009, FRANCE
Tel: (01) 43 12 81 40 Fax: (01) 43 12 81 44
Established in 2008

BANGKOK

●Chubu Electric Power Co., Inc., Bangkok Office
Unit 4, 18th Floor, M. Thai Tower, All Seasons Place,
87 Wireless Road, Phatumwan, Bangkok 10330, THAILAND
Tel: (02) 654-0688 Fax: (02) 654-0689
Established in 2006

DOHA

●Chubu Elecric Power Co., Inc., Doha Office
4th Floor, Salam Tower, Al Corniche P.O.Box 22470,
Doha-QATAR
Tel: (974) 4836-830 Fax: (974) 4834-841
Established in 2007

BEIJING

●Tokyo Electric Power Co., Inc., Beijing Office
Unit 1 Level 11, Tower W1. The Towers Oriental Plaza
No.1 East Chang An Avenue, Dong Cheng District
Beijing 100738, People's Republic of China
Tel: (10) 8518-7771
Established in 2011

Major Power Plants

Japan's electric power industry operates some 1,800 hydroelectric, thermal, nuclear, and other power plants to meet the required demand. Here is a list and map of the country's major power plants:

Principal Thermal Power Plants (1,000MW or greater)

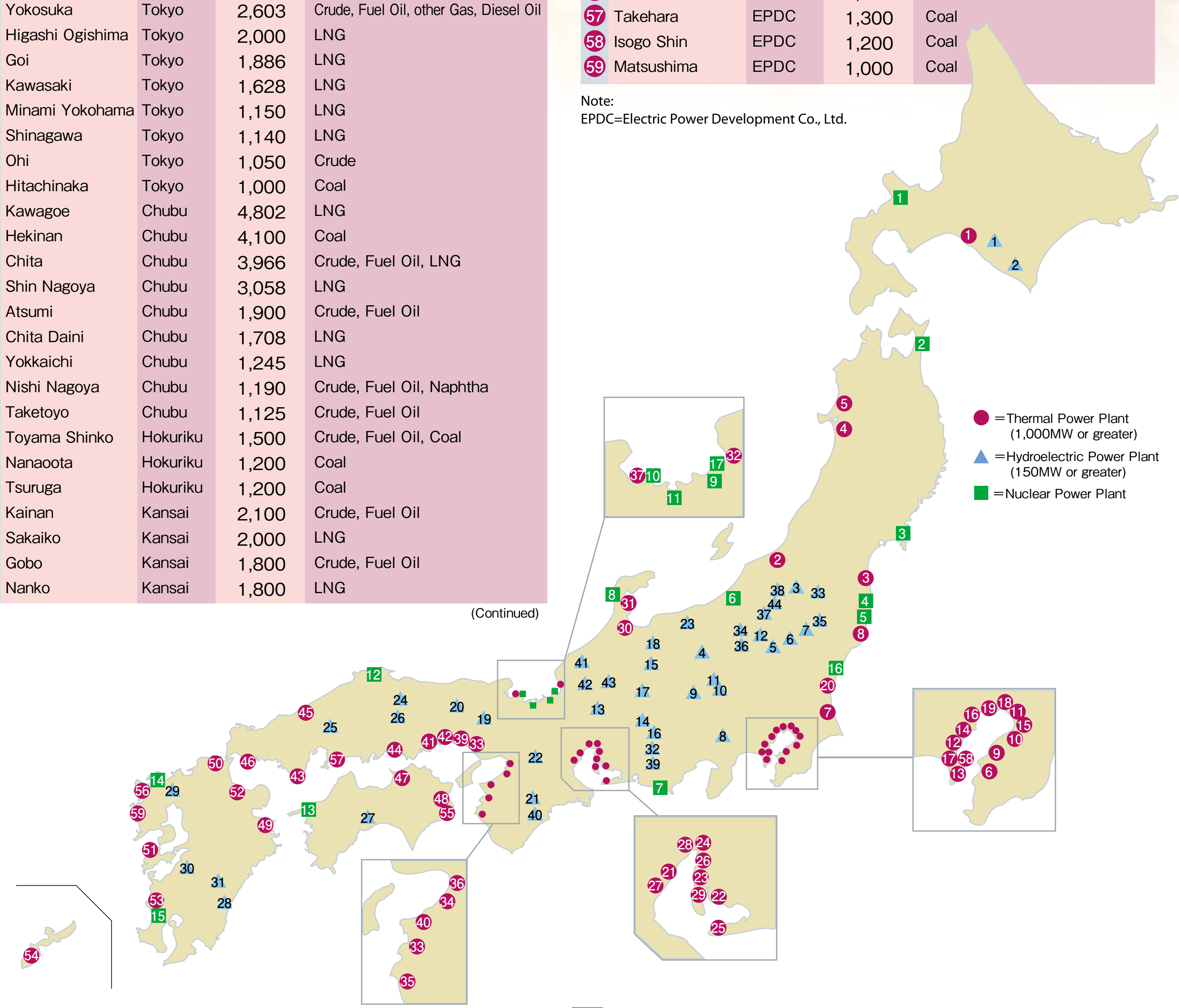
As of March 31, 2012

	Name of Plant	Company	Installed Capacity (MW)	Fuel
1	Tomato-atsuma	Hokkaido	1,650	Coal
2	Higashi Niigata	Tohoku	4,864	LNG, other Gas
3	Haramachi	Tohoku	2,000	Coal
4	Akita	Tohoku	1,300	Crude, Fuel Oil
5	Noshiro	Tohoku	1,200	Coal
6	Futtsu	Tokyo	5,040	LNG
7	Kashima	Tokyo	4,400	Crude, Fuel Oil
8	Hirono	Tokyo	3,800	Crude, Fuel Oil, Coal
9	Sodegaura	Tokyo	3,712	LNG
10	Anegasaki	Tokyo	3,605	Crude, Fuel Oil, LNG, LPG
11	Chiba	Tokyo	3,548	LNG
12	Yokohama	Tokyo	3,325	Crude, Fuel Oil, LNG
13	Yokosuka	Tokyo	2,603	Crude, Fuel Oil, other Gas, Diesel Oil
14	Higashi Ogishima	Tokyo	2,000	LNG
15	Goi	Tokyo	1,886	LNG
16	Kawasaki	Tokyo	1,628	LNG
17	Minami Yokohama	Tokyo	1,150	LNG
18	Shinagawa	Tokyo	1,140	LNG
19	Ohi	Tokyo	1,050	Crude
20	Hitachinaka	Tokyo	1,000	Coal
21	Kawagoe	Chubu	4,802	LNG
22	Hekinan	Chubu	4,100	Coal
23	Chita	Chubu	3,966	Crude, Fuel Oil, LNG
24	Shin Nagoya	Chubu	3,058	LNG
25	Atsumi	Chubu	1,900	Crude, Fuel Oil
26	Chita Daini	Chubu	1,708	LNG
27	Yokkaichi	Chubu	1,245	LNG
28	Nishi Nagoya	Chubu	1,190	Crude, Fuel Oil, Naphtha
29	Taketoyo	Chubu	1,125	Crude, Fuel Oil
30	Toyama Shinko	Hokuriku	1,500	Crude, Fuel Oil, Coal
31	Nanaoota	Hokuriku	1,200	Coal
32	Tsuruga	Hokuriku	1,200	Coal
33	Kainan	Kansai	2,100	Crude, Fuel Oil
34	Sakaiko	Kansai	2,000	LNG
35	Gobo	Kansai	1,800	Crude, Fuel Oil
36	Nanko	Kansai	1,800	LNG

(Continued)

	Name of Plant	Company	Installed Capacity (MW)	Fuel
37	Maizuru	Kansai	1,800	Coal
38	Himeji Daini	Kansai	1,650	LNG
39	Himeji Daiichi	Kansai	1,442	LNG
40	Tanagawa Daini	Kansai	1,200	Crude, Fuel Oil
41	Ako	Kansai	1,200	Crude, Fuel Oil
42	Aioi	Kansai	1,125	Crude, Fuel Oil
43	Yanai	Chugoku	1,400	LNG
44	Tamashima	Chugoku	1,200	Crude, Fuel Oil
45	Misumi	Chugoku	1,000	Coal
46	Shin Onoda	Chugoku	1,000	Coal
47	Sakaide	Shikoku	1,446	Crude, Fuel Oil, other Gas
48	Anan	Shikoku	1,245	Crude, Fuel Oil
49	Shin Oita	Kyushu	2,295	LNG
50	Shin Kokura	Kyushu	1,800	LNG
51	Reihoku	Kyushu	1,400	Coal
52	Buzen	Kyushu	1,000	Crude, Fuel Oil
53	Sendai	Kyushu	1,000	Crude, Fuel Oil
54	Yoshinoura	Okinawa	1,004	LNG
55	Tachibanawan	EPDC	2,100	Coal
56	Matsuura	EPDC	2,000	Coal
57	Takehara	EPDC	1,300	Coal
58	Isogo Shin	EPDC	1,200	Coal
59	Matsushima	EPDC	1,000	Coal

Note:
EPDC=Electric Power Development Co., Ltd.



Nuclear Power Plants

● In Operation

As of March 31, 2012

	Name of Plant	Unit Number	Company	Installed Capacity (MW)	Type of Reactor	Start
1	Tomari	1	Hokkaido	579	PWR	1989.6
		2		579	PWR	1991.4
		3		912	PWR	2009.12
2	Higashi-Dori	1	Tohoku	1,100	BWR	2005.12
3	Onagawa	1	Tohoku	524	BWR	1984.6
		2		825	BWR	1995.7
		3		825	BWR	2002.1
4	Fukushima Daiichi	5	Tokyo	784	BWR	1978.4
		6		1,100	BWR	1979.10
5	Fukushima Daini	1	Tokyo	1,100	BWR	1982.4
		2		1,100	BWR	1984.2
		3		1,100	BWR	1985.6
		4		1,100	BWR	1987.8
6	Kashiwazaki Kariwa	1	Tokyo	1,100	BWR	1985.9
		2		1,100	BWR	1990.9
		3		1,100	BWR	1993.8
		4		1,100	BWR	1994.8
		5		1,100	BWR	1990.4
		6		1,356	ABWR	1996.11
		7		1,356	ABWR	1997.7
7	Hamaoka	3	Chubu	1,100	BWR	1987.8
		4		1,137	BWR	1993.9
		5		1,380	ABWR	2005.1
8	Shika	1	Hokuriku	540	BWR	1993.7
		2		1,206	ABWR	2006.3
9	Mihama	1	Kansai	340	PWR	1970.11
		2		500	PWR	1972.7
		3		826	PWR	1976.12
10	Takahama	1	Kansai	826	PWR	1974.11
		2		826	PWR	1975.11
		3		870	PWR	1985.1
		4		870	PWR	1985.6
11	Ohi	1	Kansai	1,175	PWR	1979.3
		2		1,175	PWR	1979.12
		3		1,180	PWR	1991.12
		4		1,180	PWR	1993.2
12	Shimane	1	Chugoku	460	BWR	1974.3
		2		820	BWR	1989.2
13	Ikata	1	Shikoku	566	PWR	1977.9
		2		566	PWR	1982.3
		3		890	PWR	1994.12
14	Genkai	1	Kyushu	559	PWR	1975.10
		2		559	PWR	1981.3
		3		1,180	PWR	1994.3
		4		1,180	PWR	1997.7
15	Sendai	1	Kyushu	890	PWR	1984.7
		2		890	PWR	1985.11
16	Tokai Daini		Japan Atomic Power Co.	1,100	BWR	1978.11
17	Tsuruga	1	Japan Atomic Power Co.	357	BWR	1970.3
		2		1,160	PWR	1987.2
	Total	50 Units		46,148MW		

● Under Construction (Estimated start)

Name of Plant	Unit Number	Company	Installed Capacity (MW)	Type of Reactor	Start
Higashi-Dori	1	Tokyo	1,385	ABWR	U.D
Shimane	3	Chugoku	1,373	ABWR	U.D
Ohma		EPDC	1,383	ABWR	U.D
Total	3 Units		4,141MW		

● Preparing for Construction (Estimated start)

Name of Plant	Unit Number	Company	Installed Capacity (MW)	Type of Reactor	Start
Namie-Odaka		Tohoku	825	BWR	U.D
Higashi-Dori	2	Tohoku	1,385	ABWR	U.D
Higashi-Dori	2	Tokyo	1,385	ABWR	U.D
Hamaoka	6	Chubu	1,400	ABWR	U.D
Kaminoseki	1	Chugoku	1,373	ABWR	U.D
	2		1,373	ABWR	U.D
Sendai	3	Kyushu	1,590	APWR	U.D
Tsuruga	3	Japan Atomic Power Co.	1,538	APWR	U.D
	4		1,538	APWR	U.D
Total	9 Units		12,407MW		

Principal Hydroelectric Power Plants (150MW or greater)

As of March 31, 2012

	Name of Plant	Company	Installed Capacity (MW)	Type
1	Niikappu	Hokkaido	200	Pumped Storage
2	Takami	Hokkaido	200	Pumped Storage
3	Daini Numazawa	Tohoku	460	Pumped Storage
4	Shin Takasegawa	Tokyo	1,280	Pumped Storage
5	Tamahara	Tokyo	1,200	Pumped Storage
6	Imaichi	Tokyo	1,050	Pumped Storage
7	Shiobara	Tokyo	900	Pumped Storage
8	Kazunogawa	Tokyo	800	Pumped Storage
9	Azumi	Tokyo	623	Pumped Storage
10	Kannagawa	Tokyo	470	Pumped Storage
11	Midono	Tokyo	245	Pumped Storage
12	Yagisawa	Tokyo	240	Pumped Storage
13	Okumino	Chubu	1,500	Pumped Storage
14	Okuyahagi Daini	Chubu	780	Pumped Storage
15	Takane Daiichi	Chubu	340	Pumped Storage
16	Okuyahagi Daiichi	Chubu	315	Pumped Storage
17	Mazegawa Daiichi	Chubu	288	Pumped Storage
18	Arimine Daiichi	Hokuriku	265	
19	Okutataragi	Kansai	1,932	Pumped Storage
20	Okawachi	Kansai	1,280	Pumped Storage
21	Okuyoshino	Kansai	1,206	Pumped Storage
22	Kisenyama	Kansai	466	Pumped Storage
23	Kurobegawa Daiyon	Kansai	335	
24	Matanogawa	Chugoku	1,200	Pumped Storage
25	Nabara	Chugoku	620	Pumped Storage
26	Shin Nariwagawa	Chugoku	303	Pumped Storage
27	Hongawa	Shikoku	615	Pumped Storage
28	Omarugawa	Kyushu	1,200	Pumped Storage
29	Tenzan	Kyushu	600	Pumped Storage
30	Ohira	Kyushu	500	Pumped Storage
31	Hitotsuse	Kyushu	180	
32	Shin Toyone	EPDC	1,125	Pumped Storage
33	Shimogo	EPDC	1,000	Pumped Storage
34	Okukiyotsu	EPDC	1,000	Pumped Storage
35	Numappara	EPDC	675	Pumped Storage
36	Okukiyotsu Daini	EPDC	600	Pumped Storage
37	Okutadami	EPDC	560	
38	Tagokura	EPDC	400	
39	Sakuma	EPDC	350	
40	Ikehara	EPDC	350	Pumped Storage
41	Tedorigawa Daiichi	EPDC	250	
42	Nagano	EPDC	220	Pumped Storage
43	Miboro	EPDC	215	
44	Otori	EPDC	182	

● End of Operation

Name of Plant	Unit Number	Company	Installed Capacity (MW)	Type of Reactor	Start
Fukushima Daiichi	1(*)	Tokyo	460	BWR	2012.4
	2(*)		784	BWR	2012.4
	3(*)		784	BWR	2012.4
	4(*)		784	BWR	2012.4
Hamaoka	1	Chubu	540	BWR	2009.1
	2		840	BWR	2009.1
Tokai		Japan Atomic Power Co.	166	GCR	1998.3
Total	7 Units		4,358MW		

(*) In May, 2011, Tokyo Electric Power Company decided to decommission Units 1 to 4 and to abolish plans to build Unit 7 and 8 at Fukushima Daiichi Nuclear Power Station which was severely damaged due to the Tohoku-Pacific Ocean Earthquake and the tsunami that followed after on March 11, 2011.

● Others

Name of Plant	Company	Installed Capacity (MW)	Type
Fugen	Japan Atomic Energy Agency	165	ATR(Prototype) End of Operation
Monju	Japan Atomic Energy Agency	280	FBR(Prototype)

Note: PWR=Pressurized Water Reactor, BWR=Boiling Water Reactor, APWR=Advanced Pressurized Water Reactor, ABWR=Advanced Boiling Water Reactor, GCR=Gas Cooled Reactor, ATR=Advanced Thermal Reactor, FBR=Fast Breeder Reactor

The Federation of Electric Power Companies

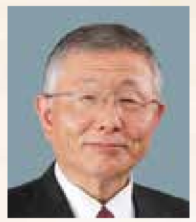
Electricity supply in Japan is carried out by privately-owned independent regional electric power companies and close cooperation among these companies is essential for efficient operations. In 1952, the nine electric power companies established the Federation of Electric Power Companies (FEPC) to promote smooth operations within the industry. Since then, FEPC has played an important role as a base for close communication between the electric power companies and as a forum for exchanging views to create the electric power industry of the future. Moreover, FEPC undertakes various activities to ensure stable operations of the electric power industry, with an awareness of its role in the energy industry of Japan.

With the return of Okinawa to Japan in 1972, the Okinawa Electric Power Company rejoined Japan's electric power industry, becoming an FEPC member in March 2000.

Board of Directors

Chairman
Makoto Yagi

Vice Chairman
Akira Chiba



Vice Chairman
Susumu Kyuwa

Vice Chairman
Shigeru Kimura

Senior Managing Director
Head of Fukushima Support Headquarters
Yuji Kume

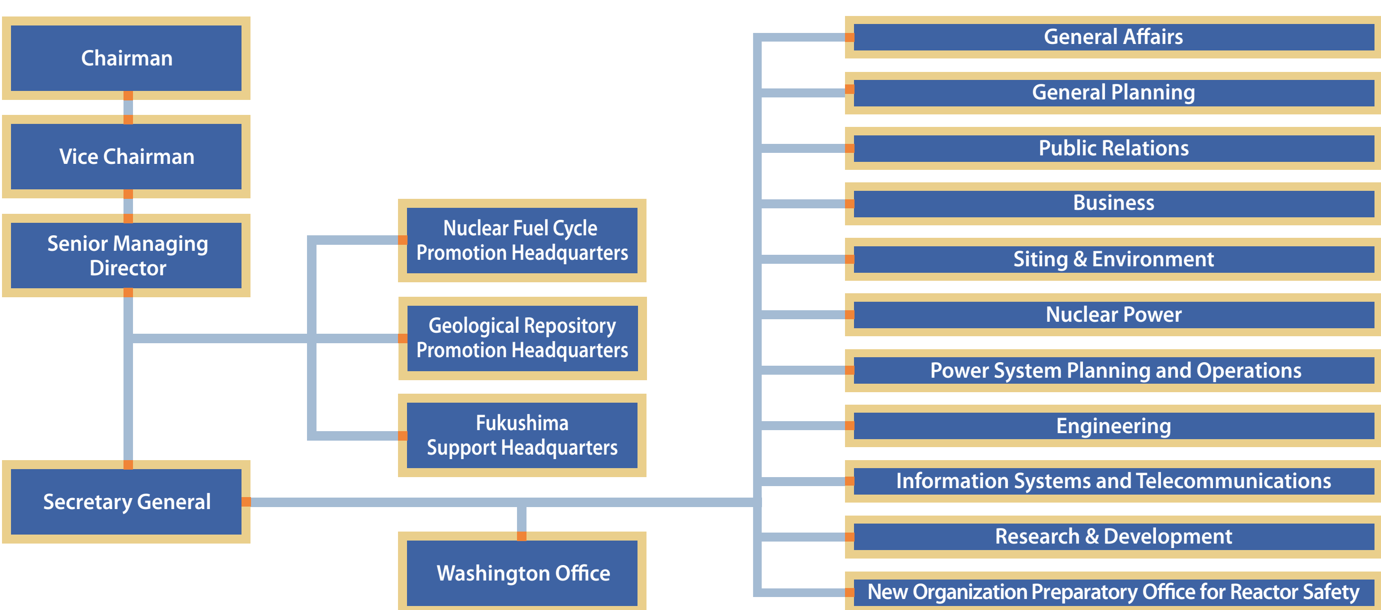
Director
Secretary General
Susumu Tsukiyama

Director
Deputy Secretary General
Yasuhiro Tejima

Director
Head of Nuclear Fuel Cycle Promotion Headquarters
Susumu Tanuma

Director
Head of Geological Repository Promotion Headquarters
Tetsuya Nakao

Organization of FEPC



Data

contents

Company Data (Fiscal year ending March 31, 2011)

Company	Capital Stock (Million yen)	Total Assets (Million yen)	Generating Capacity (MW)	Electricity Supplied (GWh)	Electricity Sales (GWh)	Revenues from Electricity Sales (Million yen)	Number of Customers (Thousands)	Number of Employees
Hokkaido	114,291	1,553,474	7,424	36,473	32,145	615,270	3,993	5,515
Tohoku	251,441	3,875,038	16,818	82,577	75,304	1,457,176	7,618	12,878
Tokyo	900,975	15,149,263	66,472	290,814	268,230	4,995,626	28,763	38,619
Chubu	430,777	5,375,261	32,835	138,965	127,897	2,248,551	10,490	17,177
Hokuriku	117,641	1,358,137	8,058	31,884	28,898	481,642	2,091	4,813
Kansai	489,320	6,660,484	34,882	158,562	146,028	2,429,937	13,513	22,376
Chugoku	185,527	2,688,958	11,989	65,585	60,070	1,078,339	5,211	9,903
Shikoku	145,551	1,313,106	6,963	31,546	28,444	529,532	2,844	5,974
Kyushu	237,304	4,110,950	20,633	92,493	85,352	1,369,537	8,518	12,818
Okinawa	7,586	381,787	1,933	8,440	7,440	157,703	851	1,581
Total	**2,880,413**	**42,466,458**	**208,008**	**937,338**	**859,809**	**15,363,313**	**83,891**	**131,654**

Source: Handbook of Electric Power Industry

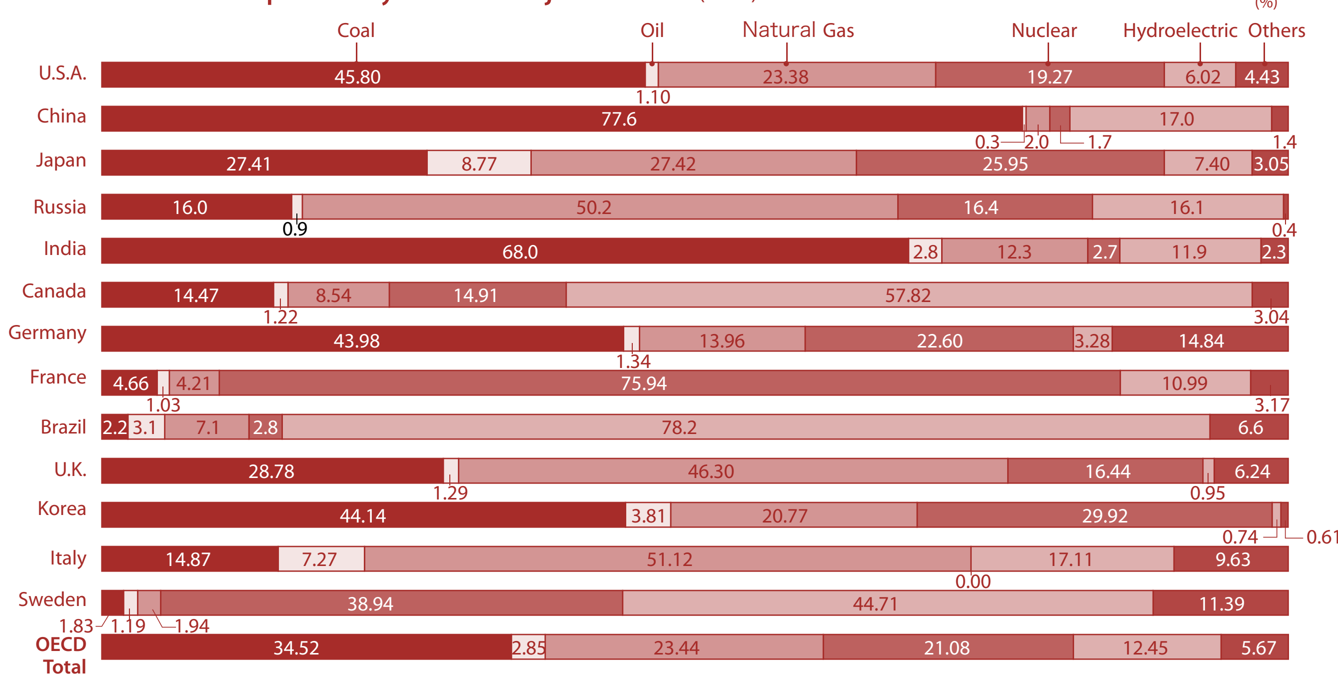
Changes in Electric Power Generation

(TWh)

Fiscal Year		1990	1995	2000	2005	2008	2009	2010	2011
Ten Companies	Hydro	65.4	62.3	66.5	60.0	56.5	57.7	62.9	62.8
	Thermal	392.0	401.1	426.4	459.3	506.1	456.6	485.4	610.7
	Geothermal	1.4	2.8	3.0	2.9	2.5	2.6	2.4	2.5
	Nuclear	181.1	271.4	302.5	287.0	247.1	266.1	271.3	100.7
Subtotal		639.9	737.6	798.4	809.2	812.2	783.0	822.0	776.8
Industry-Owned and Others		217.4	252.3	293.1	348.7	334.1	329.6	334.9	331.1
Total		**857.3**	**989.9**	**1,091.5**	**1,157.9**	**1,146.3**	**1,112.6**	**1,156.9**	**1,107.8**

Source: Handbook of Electric Power Industry

Power Generation Composition by Source in Major Countries (2010)



Sources: Energy Balances of OECD Countries 2012 Edition, Energy Balances of Non-OECD Countries 2012 Edition

Changes in Electricity Sales for Ten Companies

(TWh)

Fiscal Year	1990	1995	2000	2005	2008	2009	2010	2011
Residential (Lighting)	177.4	224.6	254.6	281.3	285.3	285.0	304.2	288.9
Commercial and Industrial	481.5	532.3	583.3	601.2	603.6	573.5	602.2	570.9
Commercial	116.3	152.8	157.9	—	—	—	—	—
Low Voltage	100.1	108.0	115.8	39.4	34.6	33.1	35.5	33.1
Large Industrial	248.1	254.7	74.8	—	—	—	—	—
Others	17.0	16.8	15.0	13.4	12.1	12.0	12.0	11.8
Eligible Customers' Use	—	—	219.8	548.4	556.9	528.4	554.7	525.9
Total	**658.9**	**757.0**	**837.9**	**882.5**	**888.9**	**858.5**	**906.4**	**859.8**

Source: Handbook of Electric Power Industry

Changes in Electricity Sales for Ten Companies

(to large industrial and commercial customers)

(TWh)

Fiscal Year		1990	1995	2000	2005	2008	2009	2010	2011
Mining and Industry	Mining	1.5	1.4	1.3	1.0	0.9	0.8	0.9	0.9
	Foodstuffs	11.3	13.2	15.3	15.4	17.3	17.2	17.7	17.4
	Textiles	6.8	5.1	3.9	3.1	2.8	4.0	4.5	4.3
	Pulp and Paper	11.9	9.5	10.5	10.3	10.6	9.4	9.9	9.2
	Chemicals	27.4	25.4	25.9	27.7	29.4	26.1	27.9	27.0
	Oil and Coal Products	2.4	2.6	1.5	1.5	1.9	1.8	2.1	2.1
	Rubber	3.5	3.4	3.5	3.4	3.1	2.8	3.1	3.0
	Clay and Stone	15.0	14.4	11.9	11.0	11.4	10.3	11.5	11.5
	Iron and Steel	41.3	38.3	36.5	36.2	35.4	29.7	36.3	36.4
	Non-ferrous Metals	12.3	13.1	14.2	14.1	15.7	14.7	16.0	15.7
	Machinery	57.3	62.9	69.8	74.0	75.7	69.0	74.0	71.1
	Others	22.1	24.4	27.0	27.6	28.7	27.4	29.0	27.9
Subtotal		212.7	213.8	221.2	225.2	232.9	213.1	232.9	226.5
Railways		16.4	17.9	18.1	19.0	18.7	18.1	18.1	17.2
Others		19.0	23.0	27.7	29.6	30.0	29.6	29.4	27.9
Total		**248.1**	**254.7**	**267.0**	**273.8**	**281.6**	**260.9**	**280.4**	**271.5**

Source: Handbook of Electric Power Industry

Investment by Type of Power Facility for Ten Companies

(Billion yen)

Fiscal Year	2004	2005	2006	2007	2008	2009	2010	2011
Generation	516	449	499	654	816	771	887	1,100
Distribution,others	996	1,048	1,029	1,199	1,308	1,262	1,235	1,023
Total	**1,512**	**1,497**	**1,529**	**1,854**	**2,124**	**2,034**	**2,123**	**2,123**

Note: Figures rounded down to nearest digit
Source: Handbook of Electric Power Industry

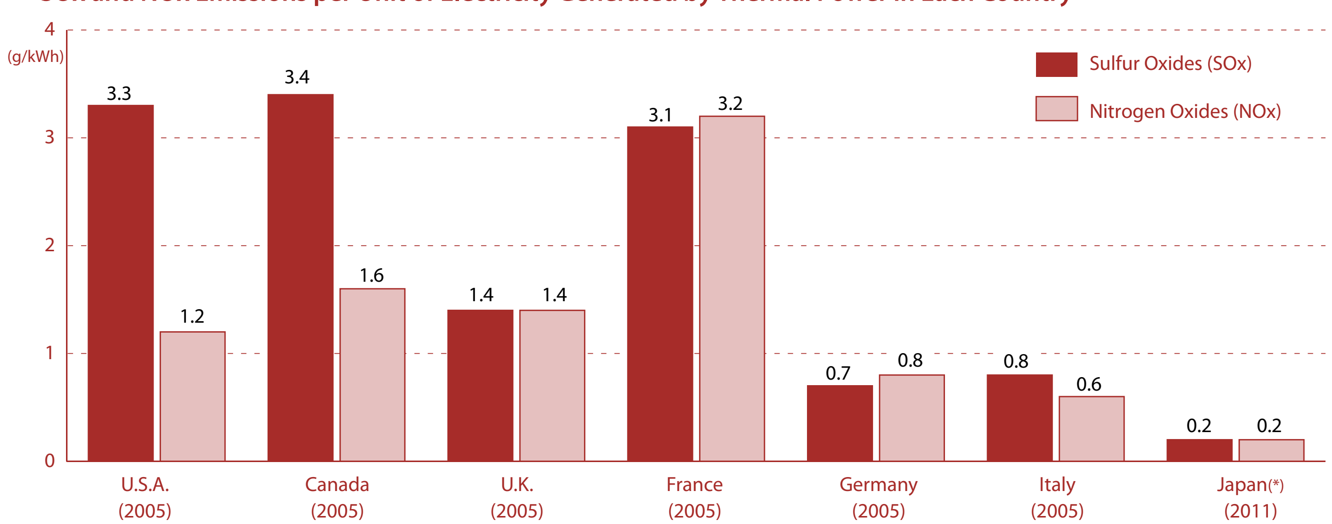
Changes in Electricity Sales* / Consumption** for Major Countries

(TWh)

		2004	2005	2006	2007	2008	2009	2010
U.S.A. (*)All electric utilities	Residential	1,292.0	1,359.2	1,351.5	1,392.2	1,380.0	1,364.5	1445.7
	Commercial and Industrial	2,248.3	2,294.2	2,311.0	2,364.1	2,345.3	2,224.6	2,301.1
	Others	7.2	7.5	7.4	8.2	7.7	7.8	7.7
	Total	**3,547.5**	**3,661.0**	**3,669.9**	**3,764.6**	**3,733.0**	**3,596.9**	**3,754.5**
U.K. (*)All electric utilities	Residential	115.5	116.8	116.4	122.8	119.8	118.5	118.7
	Commercial and Industrial***	194.6	198.5	198.0	194.6	198.1	182.8	187.3
	Others	13.5	13.7	13.8	13.5	14.3	13.4	13.8
	Total	**323.6**	**329.0**	**330.9**	**330.9**	**329.2**	**314.8**	**319.9**
Germany (**)Electricity consumption	Residential	140.4	141.3	141.5	140.2	139.5	139.2	141.0
	Commercial and Industrial	322.5	323.8	328.6	330.6	331.5	282.6	297.8
	Others	69.0	69.1	69.5	70.4	71.2	69.3	70.2
	Total	**531.9**	**534.2**	**539.6**	**541.2**	**542.2**	**491.1**	**509.0**
Canada (*)All electric utilities	Residential	151.0	151.0	147.3	157.8	160.0	148.3	147.1
	Commercial and Industrial	179.8	188.5	182.5	181.6	164.7	141.0	149.6
	Others	147.6	148.2	145.4	158.8	168.6	154.9	156.7
	Total	**478.4**	**487.7**	**475.3**	**498.3**	**473.4**	**444.2**	**453.4**
France (**)Electricity consumption	High voltage	266.4	265.8	258.1	261.3	263.0	250.8	259.2
	Low voltage	182.3	185.7	188.9	187.0	198.0	202.3	216.9
	Total	**448.7**	**451.5**	**447.0**	**448.3**	**461.0**	**453.1**	**476.1**
Italy (*)All electric utilities	Residential	66.6	66.9	67.6	67.2	68.4	68.7	69.2
	Commercial and Industrial	205.7	210.1	217.9	219.5	218.3	201.7	207.7
	Others	11.1	11.5	11.9	11.6	11.9	11.9	11.9
	Total	**283.4**	**288.5**	**297.4**	**298.3**	**298.7**	**282.4**	**288.8**
Japan (*)Ten companies	Residential	272.5	281.3	278.3	289.7	285.3	285.0	304.2
	Commercial and Industrial	592.9	601.3	611.1	629.8	603.7	573.6	602.1
	Others	—	—	—	—	—	—	—
	Total	**865.4**	**882.6**	**889.4**	**919.5**	**888.9**	**858.5**	**906.4**

(***) Including public facilities
Source: Overseas Electric Power Industry Statistics (2011)

SOx and NOx Emissions per Unit of Electricity Generated by Thermal Power in Each Country



Note: (*) = 10 Electric Power Companies + Electric Power Development Company
Sources: Estimate based on "OECD Environmental Data Compendium 2006/2007" and IEA "Energy Balances of OECD Countries 2008 Edition"
FEPC (for Japan)

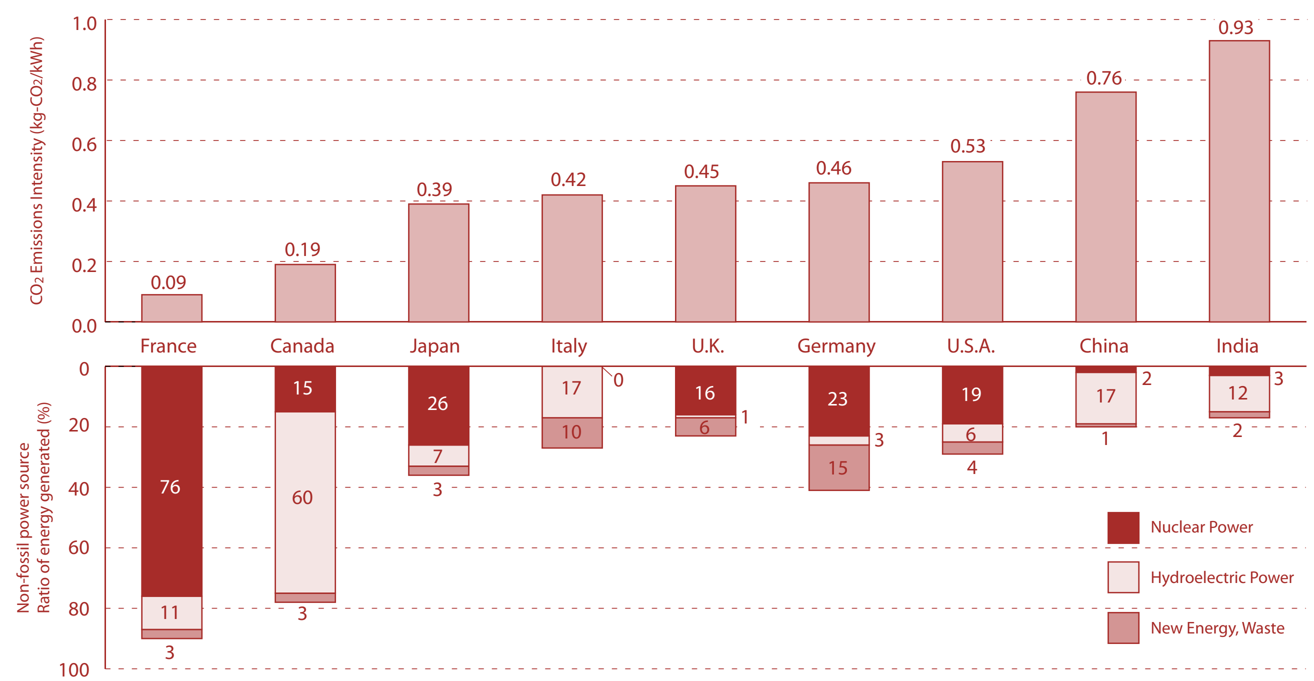
Country Comparison of Thermal Efficiency, Transmission and Distribution Loss, and Annual Load Factor

(%)

		1990	1995	2000	2005	2008	2009
U.S.A.	Thermal Efficiency	36.4	36.8	36.7	38.4	38.8	39.3
	Transmission and Distribution Loss	5.7	7.0	6.6	6.5	6.8	6.4
	Annual Load Factor	60.4	59.8	61.2	58.7	60.5	60.3
U.K. / Ireland	Thermal Efficiency	37.7	40.6	43.5	43.2	44.9	44.7
	Transmission and Distribution Loss	8.1	8.6	9.0	8.4	8.5	8.0
	Annual Load Factor	62.2	65.4	67.4	66.1	67.6	64.5
Germany (Former W. Germany)	Thermal Efficiency	(34.0)	36.5	38.7	40.7	41.0	39.4
	Transmission and Distribution Loss	(4.3)	5.0	4.7	5.7	5.9	5.4
	Annual Load Factor	(68.6)	(71.9)	74.5	77.0	75.9	72.5
Canada	Thermal Efficiency	34.5	32.6	32.9	33.4	30.8	32.2
	Transmission and Distribution Loss	7.7	6.8	8.0	7.1	6.9	11.5
	Annual Load Factor	65.7	66.0	68.5	69.2	N/A	N/A
France	Thermal Efficiency	39.2	38.3	41.3	42.1	39.2	42.0
	Transmission and Distribution Loss	7.5	7.4	6.8	6.6	6.8	6.9
	Annual Load Factor	62.9	67.9	69.5	64.1	66.9	60.1
Italy	Thermal Efficiency	37.7	38.6	39.0	42.7	44.5	44.3
	Transmission and Distribution Loss	7.0	6.7	6.4	6.2	6.0	6.4
	Annual Load Factor	52.4	50.3	59.0	58.4	N/A	N/A
Japan Ten Companies (Nine Companies)	Thermal Efficiency	41.9	41.9	43.1	42.9	43.5	43.9
	Transmission and Distribution Loss	5.7	5.5	5.2	5.1	5.1	5.2
	Annual Load Factor	56.8	55.3	59.5	62.4	61.0	66.7

Source: Overseas Electric Power Industry Statistics (2011)

Comparison of CO_2 Emissions Intensity by Country (2010)



Sources: Energy Balances of OECD Countries 2012 Edition, Energy Balances of Non-OECD Countries 2012 Edition

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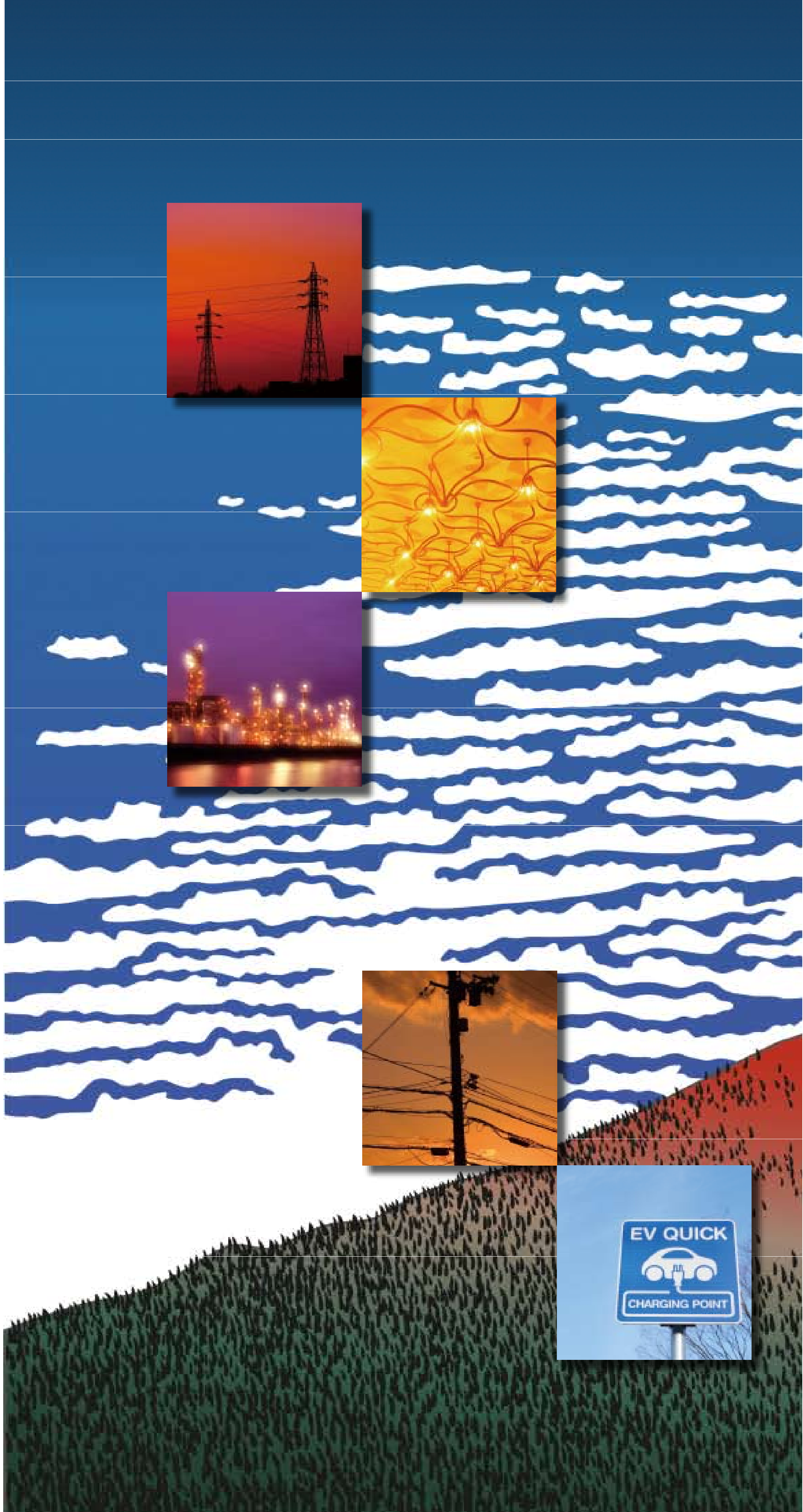

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