Environment

Environment-Friendly Energy

Today, as environmental problems become global issues, it is imperative that energy satisfy the so-called "3Es," namely economic growth, environmental protection, and energy security.

Used in the gas supplied by Osaka Gas, natural gas places a small impact on the environment among all fossil fuels, as it contains no SOx and emits far smaller amounts of CO_2 and NOx than coal or oil. While continuing to supply environment-friendly natural gas, Osaka Gas will realize the 3Es by offering users total services that include providing optimal combina-

tions, such as cogeneration systems for conserving energy as well as solutions, such as consulting on energy conservation. Osaka Gas has designated cogeneration systems, which contribute to enhanced energy efficiency, as one of its key strategic products.

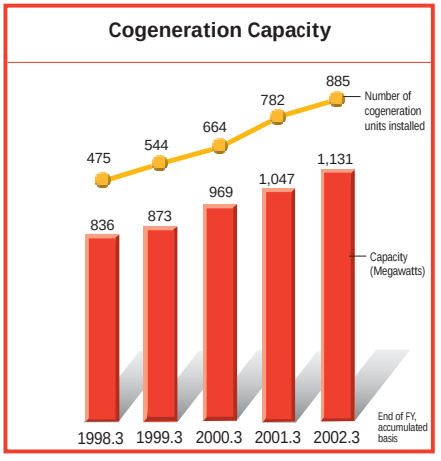
Osaka Gas has engaged in research on cogeneration systems for 20 years and has accumulated an abundance of experience and expertise in this field. Moreover, Osaka Gas has gained extensive experience in consulting for energy conservation in production plants and commercial buildings as well as on-site power generation, and has undertaken these activities as its ESCO business.

Cogeneration Systems

Gas cogeneration systems are already being used by numerous customers mainly in industrial fields as well as in such business-related areas as commercial and pharmaceutical sectors. The cumulative installed generating capacity of gas cogeneration systems marketed by Osaka Gas exceeds 1GW. To respond to demand from small retail outlets as well as households, Osaka Gas is focusing on the commercialization of compact gas cogeneration systems, micro-gas turbines, and fuel cells.

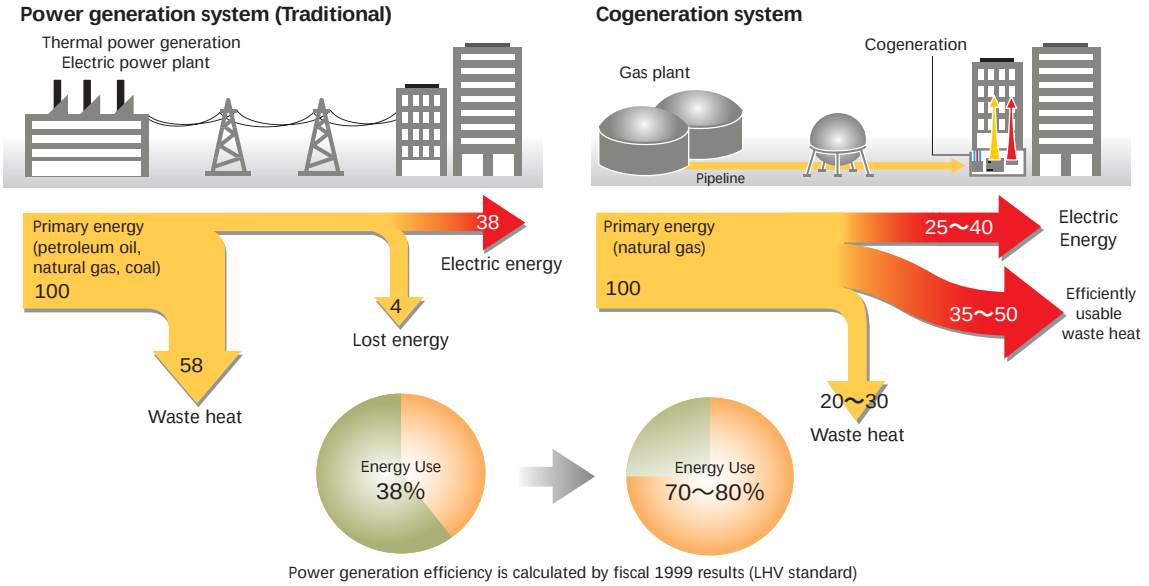
Commercial and Industrial-Use Cogeneration Systems

Spurred by technological advances and lower prices of equipment, markets for cogeneration systems are experiencing significant growth. To address the needs of this expanding market, Osaka Gas will develop and introduce highly efficient large-scale systems that include systems with engines manufactured by Jenbach and those with mirror cycle engines. In 2000 Osaka Gas commenced sales of the Genelight, a 9.8kW gas cogeneration system. We have recorded smooth growth in the installation of these cogeneration systems, mainly at restaurant chains. Subsequently, in 2002 we inaugurated sales of 22kW and 6kW gas micro engines cogeneration systems. Osaka Gas is vigorously responding to demand from small retail outlets and other customers by offering a lineup of products finely tailored to the energy needs and size of customer operations.



The Genelight, a 9.8kW small-sized cogeneration system

General View of Natural Gas Cogeneration



Power generation efficiency is calculated by fiscal 1999 results (LHV standard)

Residential Cogeneration Systems

Cogeneration systems are outstanding in terms of high energy efficiency and placing a low burden on the environment. By securing demand for household electricity in addition to traditional demand for heat, Osaka Gas expects to future demand for natural gas to expand. During fiscal 2002, Osaka Gas plans to commercialize and begin sales of a one-kW cogeneration system that integrates a small-sized engine. This is the world's first residential cogeneration system to be commercialized.

Osaka Gas is also progressing with the development of a cogeneration system that uses a fuel cell, and the Company aims to commercialize this system in 2005. A prototype system has been installed in an actual house and trials are being carried out. Fuel cells are outstanding systems because they furnish such benefits as high energy efficiency and place a low burden on the environment.

One of Osaka Gas's strengths is its high level of technology in fuel reformers and catalysts essential for the processing of hydrogen used in fuel cells. Osaka Gas boasts the world's most advanced technologies in these areas and is also supplying these technologies to domestic and overseas manufacturers of fuel cells.

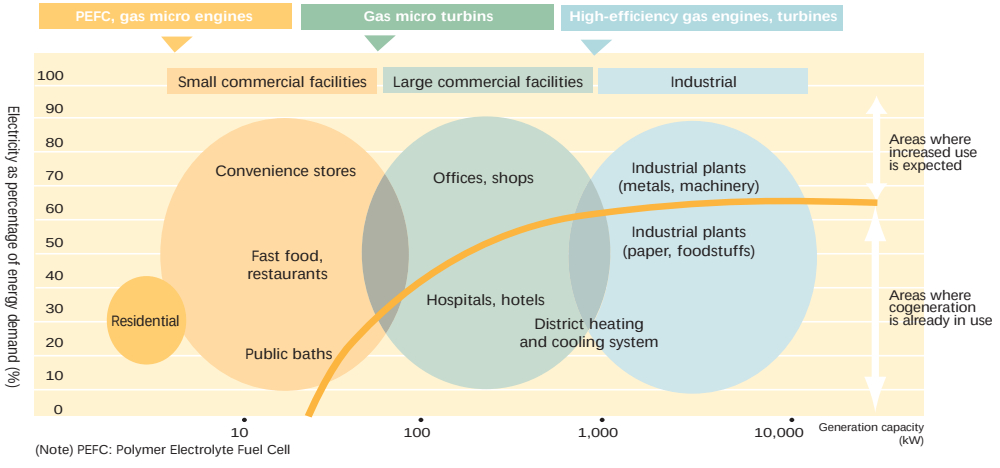
Osaka Medical Center and Research institute for Maternal and Child Health.

Gas Engine Co-generation System

ESCO (Energy Service Company)

Heightened demand for responses to global warming is underpinning expectations that ESCO—our business for energy conservation for production plants and commercial buildings—will play a leading role in promoting energy conservation. In 2001, the Osaka Gas Group received an order in its ESCO business from a large-scale shopping center and from the Osaka Medical Center and Research institute for Maternal and Child Health. Looking ahead, Osaka Gas will respond to a variety of energy conservation needs.

New Technologies to Meet Demand for Gas Cogeneration



(Note) PEFC: Polymer Electrolyte Fuel Cell