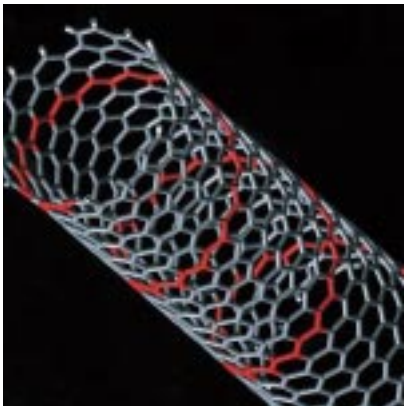
Future

Future-Oriented Strategies

Osaka Gas's technology development activities emphasize enhancing cost effectiveness through selection and concentration and rapidly introducing the results of research into the market. By aggressively pursuing alliances with outside partners, Osaka Gas is reducing lead time from R&D to commercialization and is efficiently developing technology that contributes to its strengthened competitiveness.



Boasting an especially high level of catalyst technologies, Osaka Gas is applying its technological expertise in this field to the development of gas reformer catalysts for fuel cells as well as environmental purifying catalysts for detoxifying exhaust gas and wastewater. Also, to increase value for society, Osaka Gas emphasizes Companywide activities that contribute to the environment, including activities to conserve energy and resources and reduce the environmental burden. At the same time, Osaka Gas engages in activities that help better local communities as a Group of companies with strong ties with each community.

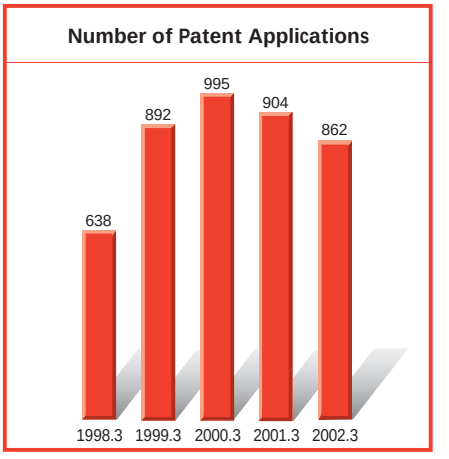
Principal Approaches and Achievements in Technology Development

Compact Gas Cogeneration Systems

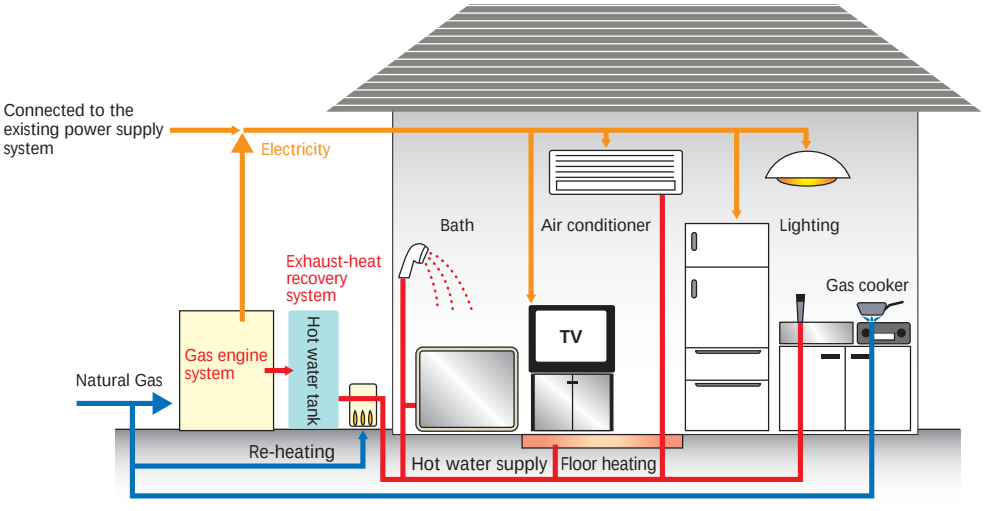
The development of even more compact and highly efficient systems will enable a significant expansion of markets for cogeneration systems. Osaka Gas is focusing its efforts to cultivate demand in this field on the development of micro-gas turbines and micro-engines. In October 2001, Osaka Gas began field-testing a residential 1kW gas engine cogeneration system, and one hundred of these systems will be installed for monitoring purposes between April and September 2002. Osaka Gas plans to commence sales of these systems March 2003 primarily targeting detached homes.

This cogeneration system developed by Osaka Gas has an overall energy efficiency rate of 85%, which includes generating efficiency of approximately 20% and a waste heat usage rate of about 65%. On average these systems enable households to meet most of their heating needs and around 40% of their electricity needs. This system is also expected to yield an average annual reduction in energy usage of 14% compared with currently existing cogeneration systems.

Field Testing for 1kW gas engine cogeneration system



Residential Gas Engine Cogeneration System

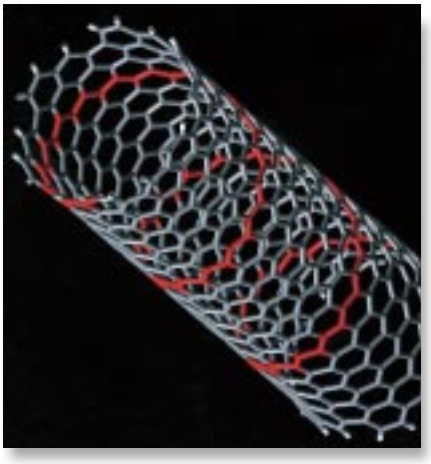


Residential Fuel Cell Systems

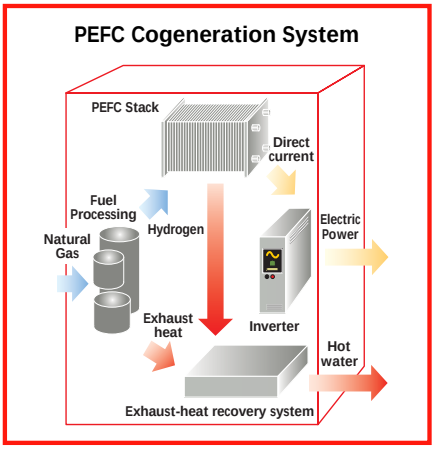
Osaka Gas is achieving steady progress toward the commercialization of a residential fuel cell in 2005. There are high hopes that fuel cells, which produce water and electricity from hydrogen and oxygen, will be increasingly used as a source of clean energy. Among these fuel cells, Osaka Gas is progressing with research on polymer electrolyte fuel cells (PEFCs), which have features that include a high energy conversion rate and compactness of the equipment.

The fuel reformers (extract hydrogen, the source of energy for fuel cells, from natural gas) developed through the application of Osaka Gas's catalyst technologies have achieved a total thermal efficiency rate of 91% (HHV), the world's highest level. Besides outstanding durability of 90,000 hours of maintenance-free operation, these systems reduce the concentration of carbon monoxide, which affects the performance of reformers, to below 1ppm. Osaka Gas will work to commercialize this technology as quickly as possible by licensing this technology to manufacturers.

Residential Fuel Cell Systems under performance monitoring



Carbon monotube model (graphite nanotube)



In fiscal 2001, Osaka Gas supplied this technology to, and carried out joint development with, such manufacturers as H Power Corp. (headquartered in Virginia), a leading U.S. PEFC manufacturer, as well as Sanyo Electric Co., Ltd.

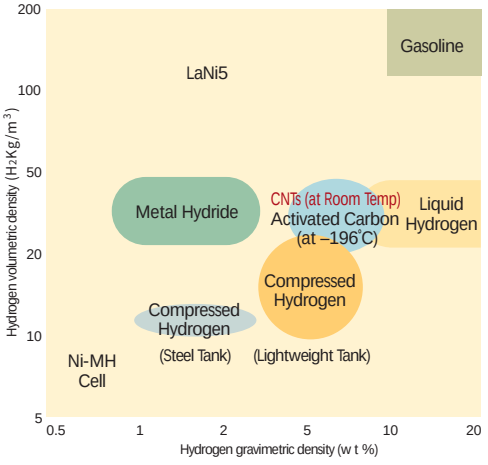
Development with these companies is proceeding smoothly. In April 2002, Osaka Gas installed a prototype 500-W PEFC cogeneration system that was developed jointly with H Power and a 1kW PEFC cogeneration system developed with Sanyo Electric in actual houses and commenced long-term trial operations with the aim of commercializing these systems. While continually introducing improved models, Osaka Gas plans to increase the installation of these systems and promote the development of new systems.

Carbon Nanotubes

Osaka Gas has also compiled noteworthy achievements in basic research. In the field of scientific technologies, nanotechnologies have been gaining the spotlight, and the market for nanotechnologies is expected to grow to ¥27 trillion in 2010. Osaka Gas is at the forefront of R&D in carbon nanotubes (CNTs), a representative new material.

CNTs have outstanding features as a material for storing hydrogen, a key issue in the mass production and diffusion of fuel cells. Osaka Gas has focused particularly closely on this area and has worked on the development of materials with high hydrogen absorption and storage capabilities. In May 2002, Osaka Gas succeeded in the development of a completely new type of CNT with an amorphous structural wall, the world's first such CNT. The new CNT has greater than 3 weight-percentage hydrogen absorption-storage capabilities, compared with 0.5 (at room temperature, under hydrogen pressure of 10 MPa) for other existing types.

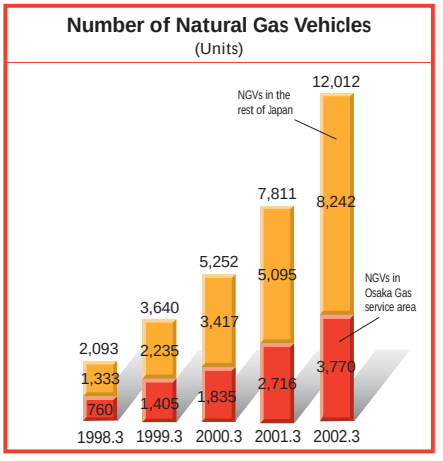
CNTs as Hydrogen Absorbing Materials



Environment Protection

Osaka Gas is working to enhance its value to shareholders, customers and society. In its efforts to enhance its social value, the Company has focused in particular on environment protection. Besides working to promote the spread of cogeneration systems, Osaka gas is making vigorous efforts to encourage the increased use of low-polluting vehicles, including natural gas vehicles, that contribute to reductions in NOx and CO_2. The Japanese government has clarified its intention to replace existing vehicles with natural gas and other low-polluting vehicles over the next three years, and, as a result, the use of these vehicles is expected to increase further.

As internal measures, in accordance with the Long-term Environmental Targets for the period until fiscal 2011, which were adopted in June 2000, Osaka Gas is working to lower CO_2 emissions resulting from its business activities as well as to reduce and recycle waste materials. Other efforts to reduce environmental burden include reducing the volume of soil requiring final disposal during gas pipeline construction work, promoting "green procurement," developing highly efficient products, and recycling used appliances. In addition, the



Eco-Station (Natural Gas Stand)


The Gas Science Museum at Senboku Terminal attracts many visitors

Osaka Gas Group has established a corporate environmental guideline that includes environmental items in its internal performance assessment systems and promoting efforts to achieve ISO 14001 accreditation at all corporate facilities. Through these and other activities, Osaka Gas is working to create a structure for helping to conserve energy and resources and reduce the burden on the environment.

Contributing to Society

All corporate activities of the Osaka Gas Group are closely tied to local communities. The companies and employees who make up the Group are involved in a wide range of community activities through the Osaka Gas Small Light Campaign, which has now been operating for approximately 20 years. Activities range from charity concerts to fundraising for disaster relief, sign language and braille courses as well as local cleanup projects.

The Osaka Gas Group Welfare Foundation provides grants for welfare activities, and for research and surveys relating to the welfare of the elderly. It also supports health improvement activities for the aged. The Osaka Gas Foundation of International Cultural Exchange provides assistance for classroom materials for use in elementary schools and junior and senior high schools in natural gas-producing countries, including Indonesia and Malaysia. It also provides research grants and scholarships to universities. As part of its public relations activities for enhancing community understanding about natural gas, Osaka Gas established facilities at its Senboku and Himeji LNG Terminals. The Gas Science Museum at Senboku and the Gas Energy Hall in Himeji receive around 94,000 visitors per year, most of whom are elementary school children.