

Osaka Gas Perspectives

In this section, we will provide readers with the basic information they need to understand the Osaka Gas Group.

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The Osaka Gas Group's Businesses

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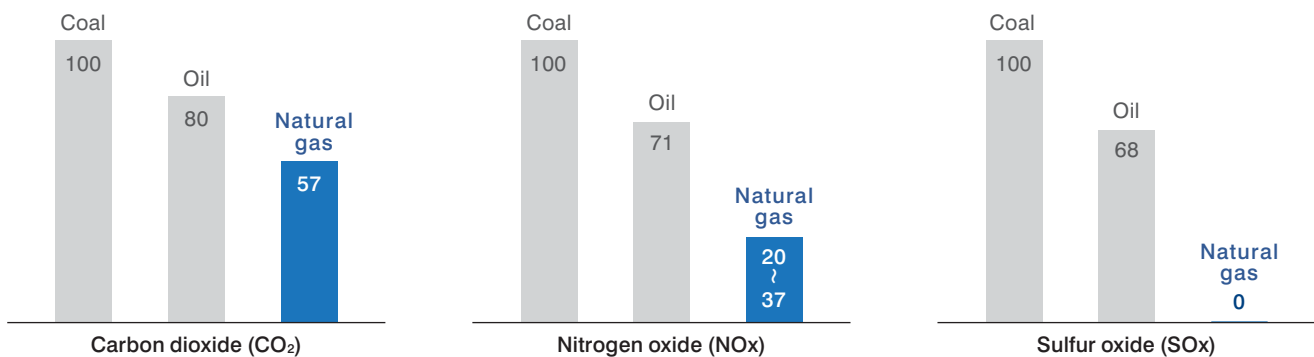
Superiority of Natural Gas

Natural gas is an energy source that is garnering increasing attention due to its superior characteristics including environmental friendliness and stable supply.

1 Environmental Friendliness: Low Emissions of CO₂, NO_x, and SO_x

Natural gas consists primarily of methane, and, compared to other fossil fuels, the energy provided by this resource has the lowest environmental impact. Energy production using natural gas releases very little carbon dioxide (CO₂), which contributes to global warming, and emissions of nitrogen oxide (NO_x), which is an atmospheric pollutant, are also exceptionally low. In addition, when liquefied, sulfur and other impurities are removed. This means there are no emissions of sulfur oxide (SO_x), which is a compound that can create acid rain.

Comparison of Emission Levels of Combustion Products of Fossil Fuels (Coal=100)



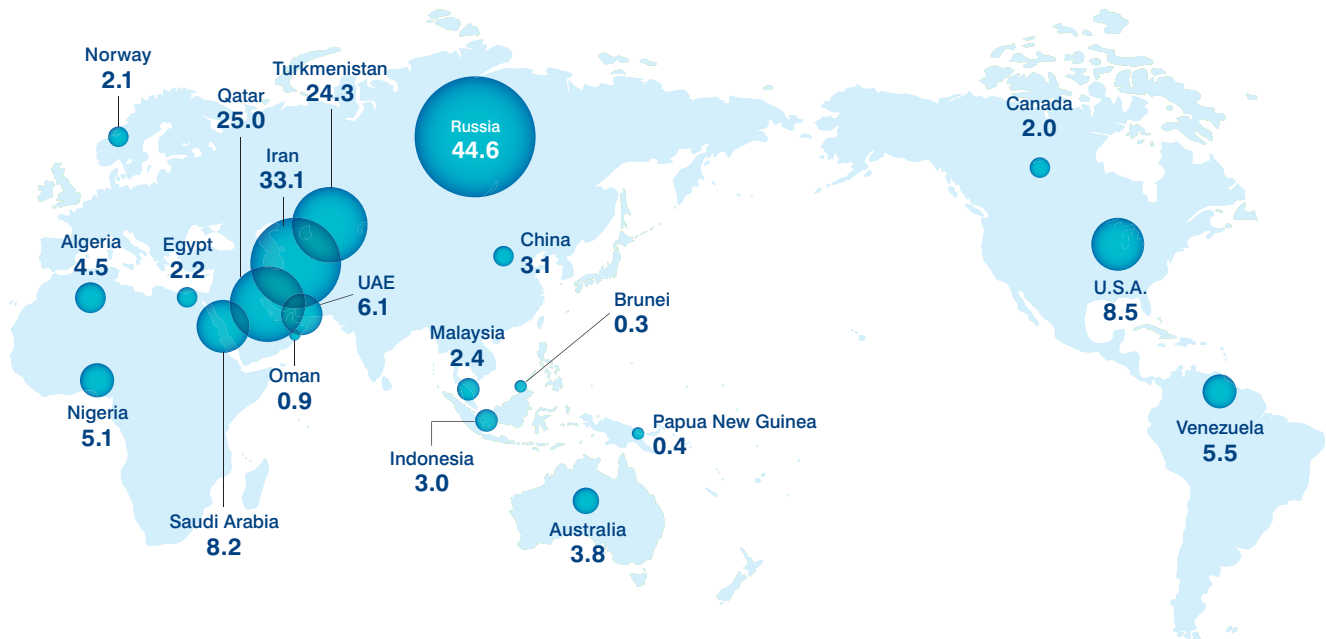
Sources:
 (CO₂ figures) The Institute of Applied Energy, "Report on Thermal Power Plant Atmospheric Impact Assessment Technology Demonstration Surveys" (March 1990)
 (SO_x and NO_x figures) International Energy Agency (IEA), "Natural Gas Prospects to 2010" (1986)

2 Stable Supply: Expanding Reserve Volumes and Range of Reserve Locations

At present, the combined volume of the natural gas reserves confirmed around the world is estimated to be 208.4 trillion m³, sufficient for meeting the yearly natural gas demand for 63.6 years, meaning that a stable supply of this resource can be secured.

Major Nations with Natural Gas Reserves

● Volume of natural gas reserves (Trillion m³)

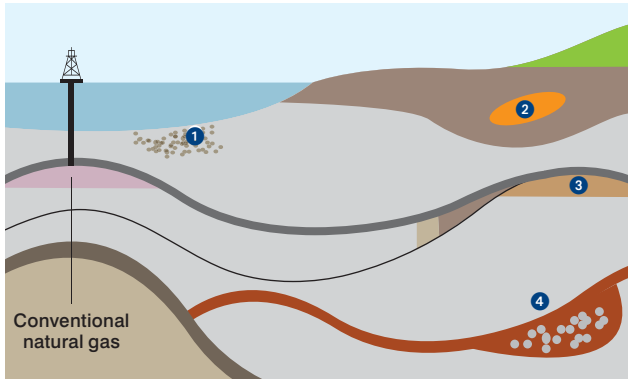


Source: BP "Statistical Review of World Energy June 2012" (2012)

Advancing Development of New Natural Gas Resources

Recently, technological advancement has made it possible to recover new natural gas resources from strata that were previously difficult to access. These so-called unconventional natural gases are extracted from different strata than the gas fields from which conventional natural gas is produced. While shale gas is the best-known example of unconventional natural gases, a wide variety of such resources exist including coal-bed methane (CBM), tight sand gas, and methane hydrate.

Location of Conventional and Unconventional Natural Gases (Underground)



Unconventional Natural Gases

1 Methane Hydrate

Methane hydrate is a natural gas in which a large amount of methane, the primary compound found in natural gas, is trapped within a crystal structure of water, forming a solid similar to ice. When converted to gas, the volume of this resource balloons to approximately 170 times its volume in its solid state. Several reserves of methane hydrate have been found in ocean beds around the world, including some near Japan.

2 Coal-Bed Methane (CBM)

CBM is a natural gas that consists mainly of methane and is found in coal beds. Reserves of this resource are thought to be plentiful, and development is accelerating in the United States and Australia.

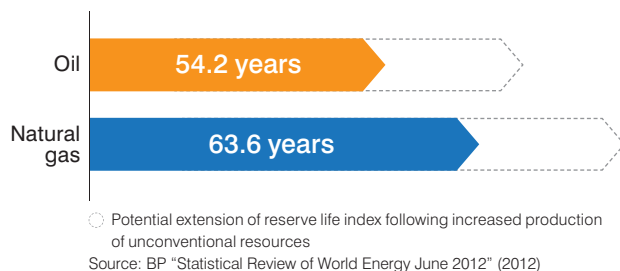
3 Tight Sand Gas

Tight sand gas is natural gas that is trapped within tightly compressed rock and sand formations with lower permeability. Commercial production of this resource is conducted mainly in the United States.

4 Shale Gas

Shale gas is a natural gas collected from cracks in shale formations that have become buried in sedimentary rock. Substantial reserves of this resource are believed to exist, and shale gas production is rising significantly in the United States. Currently, shale gas is gaining a great deal of attention on a global scale.

Global Reserve Life Indexes of Natural Gas and Oil

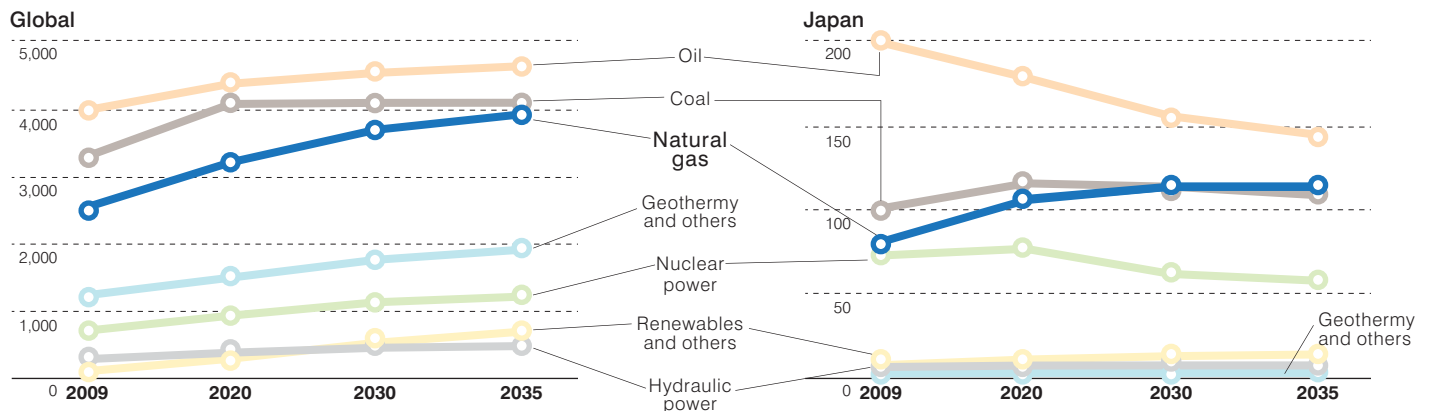


Demand Forecast

Demand for natural gas is expected to rise into the future as it becomes used increasingly for power generation purposes in Japan and around the world and as utilization in gas cogeneration systems in Japan becomes more common.

Primary Energy Consumption Forecasts

(Million tons crude oil equivalent)



Sources:

(Global figures) International Energy Agency (IEA), "New Policies Scenario Energy Demand, World Energy Outlook 2011" (2011)

(Japan figures) The Institute of Energy, Economics, Japan, "Elimination of Nuclear Power Scenario 1, Energy Outlook for Asia and the World 2011" (2011)