Corporate Vision

Contribute to society through the stable supply of energy and address social issues toward realizing the sustainable development goals.

- Explore, develop, produce and deliver oil and natural gas in Japan and overseas.
- Further enhance the natural gas supply chain, consisting of our domestic infrastructures and electric power supply.
- Contribute to addressing challenges toward realizing a sustainable society associated with energy and climate change through the development and commercialization of new technology, drawing from our expertise.
- Place top priority on maintaining trust with all stakeholders and achieve sustainable growth and maximize corporate value.

Contribute to society through the stable supply of energy and address social issues toward realizing the sustainable development goals.
Oil and Natural Gas

Oil is a general term for a flammable liquid substance that exists underground mainly composed of various hydrocarbons. Crude oil is the liquid extracted from underground, and gas and water are removed. By applying heat based on their distinct boiling points, it is distilled and decomposed into oil products such as liquefied petroleum gas (LPG), naphtha (gasoline), kerosene, diesel oil, heavy fuel oil, and asphalt.

According to their properties, these products are used as fuels for powering automobiles and machines, and as raw material for PET bottles, plastic products, textiles, and chemical products.

Natural gas is a flammable gas mainly composed of methane, which is colorless, odorless and lighter than air. Regarded as an energy source with a lower environmental impact than other fossil fuels such as oil or coal due to its smaller emissions of carbon dioxide (CO₂), nitrogen oxide (NOₓ) and sulfur oxide (SOₓ) when burned. LNG is liquefied natural gas produced by cooling natural gas to minus 162°C, where it exists in liquid form. When liquefied, its volume is reduced by one six-hundredth, allowing for long-distance transport and mass storage. Most of the natural gas consumed in Japan is imported from overseas as LNG.

Origin of Oil and Natural Gas

Oil and natural gas were said to be formed by the decomposition of prehistoric organisms underground over several to tens of millions of years as a result of high subterranean temperatures and microorganisms. These resources move upward through subterranean cracks and collect in a stratum called the source rock. Then, oil and natural gas is accumulated in formations where reservoir rocks exist, and dense rocks called cap rocks form in domes.

Oil and Gas E&P Value Chain

Since its establishment, JAPEX has been engaged in oil and gas E&P (exploration and production) and its transportation and supply. Also, JAPEX contributes to the stable supply of energy, drawing from its extensive track record both in and outside of Japan and the broad range of technology and expertise it has accumulated over the years.

Overview of Oil and Gas E&P

Acquisition of Interests
Information gathering
Preliminary survey
Acquisition of interests

Geological survey
Geophysical survey
Exploratory and appraisal drilling
Evaluation of reserves

Onshore drilling rig
Offshore drilling rig

Drilling of production wells
Construction of production facilities
Production of oil and gas

FEED (Front-end Engineering and Design)

Transportation and Supply
• Crude oil: Tank trucks, tankers, pipelines
• Natural gas: Pipelines, LNG carriers (ocean-going carriers, coastal vessels), tank trucks, tank containers by railway

Crude oil tank truck
Crude oil tankers
Crude oil pipeline
LNG tank truck
LNG tankers
LNG pipeline
LNG carrier
LNG tank containers by railway
Receiving terminal
LNG liquefaction plant

Clients
• Gas-fired power plants
• Local gas distributors
• Industrial users
• Oil refiners
• Others

JAPEX Corporate Guide 2018
Maximizing the Value of E&P Projects

JAPEX is engaged in oil and natural gas E&P (exploration and production) projects around the world, leveraging its technology and expertise to maximize project value. We are also pursuing new opportunities.

1. Oversea Projects

**Garraf Project**
- **Block**: B
- **Project Company**: Japex Garraf Ltd.
- **Location**: Garraf Oil Field (northern region of Dhi Qar Governorate, Iraq)

JAPEX has been participating in the development and production of crude oil since it was awarded the contract with the Malaysian state-owned oil company PETRONAS in 2009. Commercial production was commenced in 2013, and total production volume reached approximately 168 million barrels by June 2018. The current production rate of crude oil is approximately 90,000 barrels per day, and its development is underway to increase daily production up to 230,000 barrels by the end of 2020.

**Kangean Project**
- **Block**: Block A
- **Project Company**: Energi Mega Pratama Inc.
- **Location**: Kangean Block (offshore East Java, Indonesia)

JAPEX has been participating in the project since 2014, and a production test based on the test result. Production of natural gas is being conducted in several offshore gas fields in East Java, and JAPEX has been participating the project since 2007. Terang Gas Field commenced commercial production in 2012, and the produced natural gas is processed at a floating production unit (FPU) and supplied through the East Java Gas Pipeline to clients in the suburbs of Surabaya City, including the state-owned electric power company and fertilizer factories. Total production at the field reached 80 million barrels (crude oil equivalent) in November 2017.

**Shale Gas Project**
- **Block**: Block C
- **Project Company**: Japex (U.S.) Corp.
- **Location**: Hangingstone (Province of Alberta, Canada)

Since the establishment of JACOS in 1978, JAPEX has been engaged in oil sands projects in Canada over the past 40 years as a pioneer in oil sands development. JACOS contributed to establishing the SAGD (steam-assisted gravity drainage) method to extract bitumen (ultra-heavy oil) from the oil sands layer using steam. Test production of bitumen by the SAGD method at the Hangingstone leases began in 1999, followed by the start of commercial production in 2003. And we have continuously sought to improve its technology and productivity in oil sands development.

Today we continue to develop and produce oil sands by the SAGD method. At the area where production operation was commenced in August 2017, the phase shifted to stable bitumen production operation by 20,000 barrels per day scale in mid-2018.

**Oil Sands Project**
- **Block**: Block B
- **Project Company**: Canada Oil Sands Ltd. (JACOS), a local subsidiary.
- **Location**: North Montney (Province of British Columbia, Canada)

The project is led by Japan Canada Oil Sands Ltd. (JACOS), a local subsidiary.
Ensuring Stable Supply by Combining Domestic Production with Overseas Procurement

JAPEX is currently conducting oil and natural gas E&P (exploration and production) at oil and gas fields in 10 locations around Japan. We transport and supply crude oil and natural gas through pipelines and by tank trucks and tankers. Also, we are expanding the scope of our energy business, which includes receiving imported LNG and electric power generation.
Energy Development Including Unconventional and Renewable Resources

JAPEX engages in the development and production of oil and natural gas with both conventional and unconventional resources such as oil sands and shale gas, as well as the development of renewable energy including geothermal power generation.

Oil Sands Development by SAGD Method

JAPEX pioneered the SAGD method for extracting bitumen (extra heavy oil) from the oil sands layer. We began our approach to commercialization of the method from 1992 in Alberta, Canada, and then succeeded in test production in 1999, and commenced its commercial production in 2003. Today we conduct the production operation of bitumen at the Hangingstone leases in Canada (see page 5).

The SAGD method uses high-temperature, high-pressure steam to heat the oil sands layer and provide liquidity to the bitumen. A pair of horizontal wells are drilled, and as heat is applied to the oil sands layer by injecting steam into the upper well, the bitumen contained in the layer begins to flow downward to be recovered in the lower well.

Development of Shale Gas and Tight Oil

The development and commercial production of shale gas and tight oil became active in the 2000s with the introduction of technologies for drilling horizontal wells along low permeability shale formations and applying hydraulic fracturing that utilizes high-pressure water to crack shale formations (see page 5). JAPEX has been participating in a tight oil development project in Texas, United States, since 2012, and in a shale gas development project in British Columbia, Canada, since 2013.

Tight Oil Development in Japan

In Japan, JAPEX was the first to succeed in the commercial production of tight oil in 2014, at the Ayukawa Oil Field in Akita Prefecture. We conducted a verification test of tight oil development from 2014 to 2017 by applying multistage fracturing to the Onnagawa formation at the Fukumizawa Oil Field in Akita Prefecture.

Renewable Energy

Geothermal power generation, which provides electricity by extracting high-temperature steam and water from the subsurface, is one type of renewable energy that can be supplied both day and night regardless of the season.

The development of geothermal energy has a lot in common with that of oil and natural gas, such as surveying the subsurface structure and drilling wells. JAPEX has been exploring the potential of geothermal energy in Japan by applying technology acquired through oil and natural gas development.

We also engage in the operations of two mega-solar power plants capable of generating over 1,000 kW in Tomakomai City, where our Hokkaido District Office is located.
Ensuring a Stable Supply of Energy by Reinforcing Domestic Infrastructure

To meet natural gas and LNG (liquefied natural gas) demand in Japan, which has less environmental impact compared to other fossil fuels, JAPEX has been expanding our natural gas supply chain by reinforcing a stable supply system that combines natural gas produced in Japan and LNG procured overseas, and supplying electricity generated by natural-gas-fired power plants.

Natural Gas Pipelines

Fugro Fukushima Natural Gas Power Plant

Fugro Gas Power Co., Ltd. (FGP), a joint venture involving five private companies including JAPEX, is proceeding with the construction of a gas-fired power plant with maximum output of 1.18 million kWh at a site adjacent to the Soma LNG Terminal toward its commencement of commercial operations in the spring of 2020. The plant is scheduled for commercial operations in March 2018 as a key base of our natural gas supply network in Japan.

Yufutsu LNG Receiving Terminal and Yufutsu LNG Plant

The terminal receives, stores, and vaporizes LNG procured overseas and supplies LNG vaporized gas through our natural gas pipeline network to clients along the way. It is also responsible for supplying LNG by tank trucks to clients in the Tohoku region and transporting LNG by coastal vessels to the Yufutsu LNG Receiving Terminal.

The terminal consists of one of the largest ground-type LNG storage tanks Japan with a capacity of 230,000 kl, a receiving jetty for large ocean-going LNG carriers from overseas, a jetty for coastal vessels for receiving LPG (liquid petroleum gas) and dispatching LNG, LNG vaporization equipment, and an LNG shipping facility for tank trucks. In addition, construction of a second LNG tank and additional LNG vaporization equipment is in progress at the terminal to start its commercial operation coinciding with the commencement of commercial operations of the Fukushima Natural Gas Power Plant, now being built on adjacent land.

The terminal receives LNG carried by coastal vessels and supplies natural gas, which is combined with natural gas produced in the Yufutsu oil and gas field with LNG vaporized gas, to clients in Hokkaido. Part of the natural gas produced in the gas field is liquefied at the Yufutsu LNG Plant and transported by tank trucks and tank containers on railways to clients in Hokkaido.

LNG Satellite System

Utilizing the Underground Storage of Natural Gas

We operate the underground storage of natural gas at the Shiunji gas field to take advantage of its subsurface geophysical properties and connectivity to our natural gas pipeline network in order to effectively respond to seasonal fluctuations in demand.

Our 800km network of high-pressure gas pipelines including the Niigata-Sendai Gas Pipeline as its main line, which connects locations between Niigata and the greater Sendai region as well as our domestic gas fields and our LNG terminals along its way, supplies natural gas to clients. Most of our natural gas pipelines are buried underground and use high-tensile steel pipes, which are highly flexible and resilient to internal and external pressure and are designed to withstand a big earthquake. Steel pipes buried underground are secured so that its semi-permanent service life can be applied with an anti-corrosive coating on the surface and impressed current protection, a highly reliable anti-corrosion method with an external power source.

The monitoring center keeps track of the operational status of the pipeline around the clock to support our capability for a safe response to contingencies, such as remotely shutting down the gas supply in the event of an emergency. Also, our specialists patrol the length of the pipeline and conduct maintenance and inspections of facilities with the utmost care to ensure safe operation.
Rising to the Challenge of Advanced Technologies to Address Future Energy Needs

Leveraging our strengths in technology and experience acquired through oil and gas E&P, we actively participate in projects for establishing and commercializing technologies toward realizing a low-carbonization decarbonization society and developing new energy sources.

Carbon Dioxide Capture and Storage (CCS)
CCS is a method to capture CO₂ from industrial facilities and power plants without emitting it to the atmosphere, and to transport and store it stably for a long period underground, which is suitable for geological sequestration. Correspondence related to global warming is needed in a global scale, and CCS is regarded as the practical, secure, and safe method for large-scale reduction of CO₂. A demonstration project of CCS is being conducted in Tomakomai City, Hokkaido.

JAPEX will contribute to the commercialization of CCS by providing the advanced technologies it has acquired through the exploration and development of oil and gas, such as investigating subsurface structures and estimating petrophysical properties, drilling injection wells, production, fluid migration simulation, and subsurface monitoring based on seismic surveys.

Carbon Dioxide Capture, Utilization and Storage (CCUS)
CCUS is a method to capture CO₂ from industrial facilities and utilize it before storing it in a sustainable site. CO₂-EOR (Enhanced Oil Recovery) is an example of the method whereby CO₂ is injected into an oil field in which production has declined, to push out its remaining crude oil and store the CO₂ underground. It is considered ideal for adoption in Japan and elsewhere, as we expect to reduce CO₂ emissions while also increasing crude oil production.

Methane hydrate is a mixture of methane and water in a solid form. It has been confirmed to exist abundantly under the seabed at depths of more than 500 meters near Japan. It is attracting significant attention in Japan for its potential of becoming a new domestic energy resource, and the government has launched a project to develop technology for its commercial production in a joint effort with private companies.

JAPEX will continue to pursue its commercialization by participating in the government verification test through Japan Methane Hydrate Operating Co., Ltd. (JMH), a joint venture established by 11 private companies including JAPEX in 2014.

The next-generation technology for ocean resources exploration is a technology to conduct low-cost, highly efficient surveys of metal and mineral resources under the seabed. It has been included in Japan’s Cross Ministerial Strategic Innovation Promotion Program (SIP), which is intended to develop science and technology through means that transcend conventional bureaucratic and academic boundaries. The Research and Development Partnership for Next Generation Technology of Marine Resources Survey (J-MARES) was established in 2014 by four private companies including JAPEX and plays a central role for developing the technology of research on metal and mineral resources and toward creating private industries. As part of the SIP, J-MARES is currently working to develop the technology for the phased survey to specify a potential area where hydrothermal deposit exists. Hydrothermal deposits were formed by cooling and deposition of hot water containing substances such as copper, lead, and zinc under or on the surface of the seafloor, particularly under the seabed, and it is confirmed to exist in an exclusive economic zone of Japan. JAPEX has been contributing to the study of the subject, as recognized in the SIP, by applying our technology and expertise related to oil resource exploration, including seismic surveys using sound waves and electromagnetic research methods.
Sustainable Growth and Higher Corporate Value Together with Stakeholders

Considering that our business of ensuring a stable energy supply is itself a corporate social responsibility (CSR), JAPEX seeks to grow as a company and increase our corporate value through forging relationships of trust and promoting mutual understanding with various stakeholders while ensuring safety and also the environment.

**Making HSE Our Corporate Culture**

**HSE Policy and HSE-MS**

JAPEX regards HSE (Health, Safety, and Environment) as our top priority and endeavors to ensure safe and stable operations in its business activities and address social issues such as reducing the effects of its activities on the environment. Also, we declare our commitment to occupational HSE and environmental preservation as the JAPEX-HSE Policy and organize an HSE Management System (HSE-MS) to implement the policy. HSE-MS ensures that our efforts to promote and improve our HSE-MS by PDCA cycles are ongoing while we effectively manage and reduce risk, foster and improve our HSE culture, and promote employee health.

**Initiatives on Occupational Safety and Health**

To ensure health and safety for employees, we conduct company-wide HSE education systematically while also working to cultivate and secure staff with the legally mandated and voluntary qualifications so they can meet key roles and positions in HSE management. And we develop company-wide activities to let the HSE-first mentality penetrate, so to speak, and raise HSE awareness, through measures such as starting meetings with an “HSE Moment” to share personal experiences and observations related to HSE.

Wide-ranging HSE-MS audits are conducted at each worksite to confirm the status of legal compliance and implementation of HSE-MS as well as risk assessment and HSE education.

**Protecting the Environment**

JAPEX has set targets for limiting its greenhouse gas emissions and promotes activities for conserving energy and reducing emissions. We are also developing environmental technologies including CCS (see page 12) and renewable power generation (see page 9) to reduce future emissions.

In addition, we have promoted tree planting and afforestation activities in Hokkaido, Akita and Niigata Prefectures, where we maintain operations. Furthermore, we actively engage in preserving local environments. At Shinchu Town in Fukushima Prefecture, the location of the Soma District Office, our staffs participated in an event that included planting trees at the Tsurushi Disaster Prevention Forest.

**Contribution to Local Communities**

In regions where maintaining our business operations is key, we strive to be a trusted company that contributes to the local community by engaging with various stakeholders and responding to their expectations. In our overseas operations, we develop infrastructure to meet local needs and carry out support and exchange activities.

In Japan, we participate in events hosted by local governments and hold lectures, facility tours, and work experience programs. Also, we take part in local events including seasonal festivals as a member of the community to deepen engagement.

**Establishing the Best Place to Work**

The JAPEX Diversity Policy was executed in January 2016 for developing dynamic working environments and enhancing programs to enable all employees to work with the demonstration of their abilities as self-disciplined professionals, regardless of nationality, gender or career type.

A company-wide effort is driving such actions as the implementation of career development programs for various workstyles, support for keeping these individuals with a work-life balance by reforming the personnel system, and seminars to raise their awareness.

JAPEX has been named a “Nadeshiko Brand 2018” company for the third consecutive year running, a designation that recognizes JAPEX as a listed enterprise for its proactive promotion of women’s careers.
Main Offices

Headquarters:
SAPIA Tower, 1-7-12 Marunouchi, Chiyoda-ku, Tokyo 100-0005, Japan
TEL: +81-3-6268-7000

Subsidiaries and Affiliates

Akita Natural Gas Pipeline Co., Ltd.
JAPEX SKS Corporation
SK Engineering Co., Ltd.
North Japan Oil Co., Ltd.
Shrine Gas Co., Ltd.
Japex Pipeline Ltd.
JJI, Inc.
Geophysical Surveying Co., Ltd.
Japex (U.S.) Corp.
Japan Canada Oil Sands Ltd.

North Japan Security Service Co., Ltd.
JAPEX Offshore Ltd.
GEOSYS, Inc.
Japex Energy Co., Ltd.
Japex Garrard Ltd.
JAPEX Monray Ltd.
JAPEX UK E&P Ltd.
TOHOKU NATURAL GAS CO., INC.
JJI S&N BV.

TEL NITE CO., LTD.
Universe Gas & Oil Company, Inc.
Kakayusu LNG Sales and Lorry Transport Corp.
Energia Mega Pratama Inc.
Kangei Energy Indonesia Ltd.
EMP Exploration (Kangei) Ltd.
Diamond Gas Netherlands B.V.
Sakhalin Oil and Gas Development Co., Ltd.
Fukushima Gas Power Co., Ltd.

Executives

Representative Director and Chairman
Osamu Watanabe

Representative Director and President
Chief Executive Officer
Hirotoshi Okada

Director
Senior Managing Executive Officer
Hikaru Fukasawa
Yousei Higaki
Takahisa Inoue

Director
Managing Executive Officer
Kazuhiko Ozeki
Hajime Ito
Hirotaka Tanaka

Director
Managing Executive Officer
Toshiyuki Hirata
Michihiro Yamashita
Yoshitaka Ishii

Outside Director
Akira Kojima
Tetsuo Ito

Audit & Supervisory Board Member
Kenji Uchida
Koichi Shimomura

Outside Audit & Supervisory Board Member
Hiroyasu Watanabe
Nori Nakajima

Special Advisor to President
Ajay Singh

Managing Executive Officer
Managing Executive Officer
Managing Executive Officer
Managing Executive Officer
Managing Executive Officer
Managing Executive Officer
Fellow
Fellow
Satoru Yokoi
Amane Waseda

Corporate History

Established as a government-owned company by the Law of Japan Petroleum Exploration Co., Ltd.
Dec. 1955

Discovered Mitsukai oil field
Mar. 1958

Discovered Sarukai oil field
Jul. 1958

Discovered Higashi-Nigata gas field
Jun. 1959

Discovered Amakusa oil field
Mar. 1960

Discovered Kataki gas field
Dec. 1960

Discovered Shunji gas field
Aug. 1962

Expanded the operation range overseas
May 1965

Discovered Yoshibe gas field
Apr. 1968

Separated from the Japan Petroleum Development Corporation (JPCOC) and reorganized as a private company
Apr. 1970

Discovered Yurihara oil and gas field
Jun. 1976

Participated in the oil sands project in Canada
Dec. 1978

Discovered hearat-oki oil and gas field
Jun. 1983

Discovered Yutusai oil and gas field
Apr. 1989

Discovered Ayakawa oil and gas field
Nov. 1989

Operation commencement of Nigata-Sendai Gas Pipeline
Mar. 1996

Began test production in the oil sands project in Canada (in commercial production from 2003)
Mar. 1999

Listed on the First Section of the Tokyo Stock Exchange
Dec. 2003

Participated in the Kangei project in Indonesia
May 2007

Participated in the Garraf project in Iraq
Dec. 2010

Participated in the shale gas project in Canada (in development and production)
Apr. 2013

Participated in the Natural Gas-fired Power Generation Project in Soma Port, Fukushima Prefecture
Apr. 2015

Commenced operation of Soma LNG Terminal
Mar. 2018