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South Korea

ENERGY – OIL & GAS

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This country-specific Q&A provides an overview of energy – oil & gas laws and regulations applicable in South Korea.

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SOUTH KOREA
ENERGY – OIL & GAS

1. Does your jurisdiction have an established upstream oil and gas industry? What are the current production levels and what are the oil and gas reserve levels?

State-owned entities such as Korea National Oil Corporation (KNOC) and Korea Gas Corporation (KOGAS) and private sector entities such as POSCO International, SK Innovation, and GS Energy are the participants in upstream oil and gas operations in Korea and abroad.

In 1998, an offshore natural gas field (Donghae-1) was discovered southeast of Ulsan, Korea, and production began in 2004. In 2014, another natural gas field (Donghae-2) was discovered near Donghae-1. As of December 2019, daily production from Donghae-1 and Donghae-2 was 29 million cubic feet of natural gas and 463 barrels of condensates. These reserves are expected to be depleted by 2022. After production from the said gas fields (i.e. Donghae-1 gas reservoir) ends, these gas fields are planned to be used as an underground storage facility for carbon dioxide (CO2) and promoted as a demonstration project for Carbon Capture Utilization and Storage (CCUS). According to the plan, a total of 12 million tons of CO2 will be stored for 30 years, equivalent to 400,000 tons per year.

In 1978, Korea and Japan entered into a treaty for joint development over approximately 82,000 square kilometres, stretching south of Korea's Jeju Island. The area is called "Joint Development Zone" or "Block 7," estimated to have oil and gas reserves of approximately 7.2 billion tons. However, no significant discovery has been made, as Japan has not been cooperative in developing Block 7. Recently, the Korean government granted concession right to KNOC to explore and exploit Block 7.

2. How are rights to explore and exploit oil and gas resources granted? Please provide a brief overview of the structure of the regulatory regime for upstream oil and gas. Is the regime the same for both onshore and offshore?

The Mining Industry Act (Mining Act) governs the onshore upstream oil & gas exploration and exploitation, and the Submarine Mineral Resources Development Act (SRDA) governs the offshore upstream oil & gas exploration and exploitation. All exploration and exploitation of petroleum within the territory of Korea have been confined to offshore areas, so SRDA has been the main regulatory regime that governs the upstream oil and gas activities. However, the regulatory regimes for onshore and offshore oil and gas exploration and productions are similar, as Mining Act prescribes that SRDA applies *mutatis mutandis* to onshore oil and gas upstream activities.

The Korean government has the sole ownership of mining right (under Mining Act) / submarine mining right (under SRDA) for hydrocarbon. The (submarine) mining right includes both "exploration right" – the right to explore certain minerals within a mining area – and exploitation right – the right to extract and acquire certain minerals.

While the Korean government enjoys the sole ownership of onshore and offshore mining rights, both Acts provides for (submarine) mining concession right of hydrocarbon. "(Submarine) mining concession right" means the right granted to a third party to explore for and extract certain minerals in the mining area granted by the Korean government (being the (submarine) mining right holder).

Under SRDA, submarine mining concession right for exploration shall be granted only to a person deemed to possess sufficient financial resources, technical capability, and equipment to reasonably carry out exploration of hydrocarbon. In case the exploration leads to a commercial discovery of hydrocarbon, the concessionaire of the submarine mining right for exploration can apply for submarine mining concession right for exploitation by reporting the discovery to the

Minister of Trade, Industry and Energy (MoTIE). After confirming that the applicant has reasonably performed the exploration, that the discovery has economic value, and that the applicant has the capacity to carry out the exploitation, MoTIE grants the submarine mining concession right for exploitation.

3. What are the key features of the licence/production sharing contract/concession/other pursuant to which oil and gas companies undertake oil and gas exploration and exploitation?

Although the statutory regime on licensing/concession is silent on the mechanism of concession agreement, private sector explorers enter into concession agreements with KNOC, which acts both as the representative of the Korean government and the concessionaire itself.

The concessionaire of the submarine mining right is obligated to (i) pay concession fees to the MoTIE if it exploits petroleum or natural gas and (ii) submit to the MoTIE any research materials on exploration and exploitation, daily drilling reports, monthly geological survey, and annual report on the progress of obtaining research materials and the progress of the submarine mining (in terms of financial and technical aspects).

Any private entity entering into concession agreements with KNOC may also have to pay training fees for local technicians and royalties, among other things.

4. Are there any unconventional hydrocarbon resources (such as shale gas) being exploited and is there a separate regulatory regime for unconventionals?

No unconventional hydrocarbon resources, including shale gas, have been exploited in Korea. However, such will be considered as “mineral” under the current Mining Act and SRDA.

5. Who are the key regulators for the upstream oil and gas industry?

MoTIE, KNOC, Korea Gas Safety Corporation (KGSC), and other government agencies in charge of granting the license to use public water (in case of submarine mining) regulate the upstream oil and gas industry in Korea. So far, activities for hydrocarbon exploration and exploitation have been confined to offshore areas within Korean territory.

6. Is the government directly involved in the upstream oil and gas industry? Is there a government-owned oil and gas company?

While Korean government has the sole ownership of the onshore and offshore mining rights, the actual exploration and exploitation is done through concessions granted to qualified (submarine) mining concession holders.

KNOC is the flagship government-owned upstream oil and gas company in Korea and engaged in foreign oil and gas projects by itself and through a number of foreign subsidiaries. KOGAS being partially owned by Korean government is also engaged in gas projects overseas.

7. Are there any special requirements for or restrictions on participation in the upstream oil and gas industry by foreign oil and gas companies?

Foreign oil and gas companies are not subject to special requirements for or restrictions on participation in the upstream oil and gas industry, except for the requirement that only business entities may hold concession rights.

8. What are the key features of the environmental and health and safety regime that applies to upstream oil and gas activities?

Pursuant to the Environmental Impact Assessment Act, an environmental impact assessment shall be administered if minerals (including hydrocarbon) are exploited from river, mountainous district or shores larger than as specified under the applicable laws and regulations. Also, Mining Act requires an applicant for the exploitation right to acquire various environment-related licenses and permits. Such licenses and permits include those for occupancy and use of public waters, development activities, conversion of mountainous districts, and occupying and using rivers.

The Mining Damage Prevention and Restoration Act was enacted to prevent upstream oil and gas activities from causing environmental pollution and damage. It obligates the mining concession right holders to implement a mining damage prevention plan that includes (i) prevention of mining damages that occurred or is expected to occur in active, inactive, or abandoned mines; (ii) restoration of deteriorated mining areas; and (iii) removal and disposal of facilities, materials, and

others that are not in use. Moreover, for the offshore exploitation of hydrocarbon, the Act on Conservation and Utilization of the Marine Environment applies to prevent marine pollution and deterioration of marine ecosystem, obligating the polluter to restore, at polluter's own expense, the polluted and/or deteriorated marine environment.

The Mining Safety Act is applicable to environmental, health, and safety issues relating to upstream oil and gas activities. It requires a mining concession right holder to obtain approval before installation of mining facilities and to receive regular inspections from the MoTIE thereafter. In addition, a mining concession right holder must implement safety measures and provide safety education to protect health and safety of mining workers and prevent environmental pollution and damage. The mining concession right holder also has to appoint personnel for mining safety management and comply with the safety regulation established in accordance with the Mining Safety Technology Standard.

9. How does the government derive value from oil and gas resources (royalties/production sharing/taxes)? Are there any special tax deductions or incentives offered?

As a mining right holder, Korean government imposes concession fees when granting a concession right to a third party.

According to SRDA and the Restriction on Special Taxation Act, a submarine mining concession right holder are exempt from customs duties and value-added tax on the machinery, equipment, and materials that the person imports by December 31, 2022, for submarine minerals exploration or exploitation.

10. Are there any restrictions on export, local content obligations or domestic supply obligations?

While Korea does not have any general restrictions on export, local content obligations or domestic supply obligations, hydrocarbon imports and exports may be subject to government control measures when its supply is interrupted or disturbed or in case of emergency.

11. Does the regulatory regime include any specific decommissioning obligations?

Pursuant to Mining Act and SRDA, the concessionaire shall restore the mining area to the original state upon the expiration of the concession right.

12. What is the regulatory regime that applies to the construction and operation of offshore and onshore oil and gas pipelines?

SRDA, the Mining Safety Act, and the Petroleum Mining Security Rules regulate the construction and operation of offshore oil and gas pipelines in Korea.

The Oil Pipeline Safety Control Act regulates the construction and operation of the onshore oil pipelines, by providing special rules for obtaining authorizations and for expropriation.

The KOGAS Act regulates the construction and operation of the onshore gas pipeline constructed by KOGAS and provides special rules for obtaining authorizations and for expropriation. These special rules mandate most of the onshore gas pipeline to be owned and maintained by KOGAS. Once constructed, a gas pipeline is maintained pursuant to the Urban Gas Business Act (UGBA) and the internal rules of KOGAS.

Any person other than KOGAS may install gas pipelines but only after acquiring land use rights and authorizations pursuant to UGBA. Such gas pipelines constructed thereafter shall also be maintained pursuant to UGBA and the internal rules of KOGAS, since such gas pipelines are connected to KOGAS-owned gas pipelines.

13. What is the regulatory regime that applies to LNG liquefaction and LNG receiving terminals? Are there any such terminals in your jurisdiction?

Regulations applicable to gas supply facilities and gas consumption facilities under UGBA may apply to LNG liquefaction as well. A regulation specifically tailored to LNG liquefaction is expected to be introduced when there are a sufficient number of business participants in LNG liquefaction in Korea.

In Korea, there are five LNG receiving terminals operated by KOGAS (those in Pyeongtaek, Incheon, Tongyeong, Samcheok and Jeju) and two LNG receiving terminals operated by private entities (those in Gwangyang and Boryeong). Additional LNG receiving terminal projects are those currently underway in Dangjin, Yeosu, Ulsan, and Tongyeong, and these projects are well advanced at present and are already reflected in the government's The 14th Basic Plan for Long-term Natural Gas Supply

and Demand (the 14th Plan, details of which are further listed out in paragraph 18 below). Several other business entities are also in the course of preparing for additional terminal construction.

Principal regulations governing LNG receiving terminals are UGBA and the High-Pressure Gas Safety Control Act (HGSA). Pursuant to these regulations, only a few types of entities may construct LNG receiving terminals. Those entities include authorized gas business entities, direct importers for self-consumption, natural gas suppliers for ships (i.e. LNG bunkering) and those companies leasing the LNG receiving terminals to one of the foregoing entities.

14. What is the regulatory regime that applies to gas storage (not LNG)? Are there any gas storage facilities in your jurisdiction?

UGBA regulates natural gas in general. The Safety Control and Business of Liquified Petroleum Gas Act (LPG Act) regulates liquefied petroleum gas, and the Petroleum and Alternative Fuel Business Act (PAFA) provides a few regulations on natural gas and petroleum gas.

In addition, according to the Economic Promotion and Safety Control of Hydrogen Act (Hydrogen Act), which took effect on February 2021, hydrogen storage and distribution facilities will be regulated under the Hydrogen Act as well as under HGSA.

The HGSA regulates high-pressure gas matters. There are more than 100 high-pressure gas storages in Seoul alone, which are subject to HGSA. In addition, LPG Act applies to liquefied petroleum gas storage.

These high-pressure gas storages store not only petroleum gas and natural gas, but also other gas including ammonia, helium, nitrogen, and carbon dioxide.

15. Is there a gas transmission and distribution system in your jurisdiction? How is gas distribution and transmission infrastructure owned and regulated? Is there a third party access regime?

Natural gas is mainly supplied through pipeline networks. KOGAS supplies approximately 35 million tons per year through its main pipeline with a length of 4,971 km and 416 supply management offices. Some of the dedicated pipes connecting the main pipe with the end-users are installed and managed by urban gas business entities or end-users. Natural gas business has been split into a wholesale and a retail business, with the wholesale business monopolized by KOGAS. Urban gas business entities (being private sector companies) purchase natural gas from KOGAS and supply it to end-users for residential, heating, and business purposes.

KOGAS has long been monopolizing the import of natural gas. Although, in recent years, companies that use natural gas for power generation and industrial use or bunkering services have been allowed to directly import natural gas, they are still subject to relevant regulations that have the effect of restricting competition against KOGAS.

Distribution of natural gas can be done through gas stations, tank lorries, ships, etc., in addition to the pipeline networks.

Local gas pipelines should be connected to the main pipeline network of KOGAS and can only be installed after a relevant license is obtained. Natural gas imports are subject to the aforementioned regulations, and domestic distribution of natural gas is strictly regulated.

Petroleum gas is liquefied and supplied through gas stations or tank lorries. Liquefied petroleum gas can be supplied after obtaining authorization pursuant to PAFA. Compared to natural gas market, participating in petroleum gas market is easier.

Since the government's Road Map to a Korean Hydrogen Economy (Hydrogen Roadmap) was announced in January 2019, various activities have been carried out in Korea to produce, store, distribute, and utilize hydrogen, and infrastructure for transportation and distribution of liquefied hydrogen (LH2) or pressurized hydrogen is rapidly expanding. For example, in the case of hydrogen fueling stations, there were only 14 hydrogen stations in 2018, but as of August 2021, the installation was completed up to 122 hydrogen stations.

16. Is there a competitive and privatised downstream gas market or is gas supplied to end-customers by one or more incumbent/government-owned suppliers? Can customers choose their supplier?

KOGAS retains a *de facto* monopoly in the domestic LNG wholesale market and is the only entity allowed to distribute natural gas imported from overseas. Some companies are also allowed to import natural gas, but only for their own respective uses or for bunkering services.

Only the businesses that acquired special authorization pursuant to UGBA can receive natural gas from KOGAS and distribute it to general public. End users cannot choose a natural gas supplier as these businesses monopolize the supply within a certain geographic region.

On the other hand, privatized downstream petroleum gas market is well-established with domestic refineries and solvent producers comprising petroleum refineries.

As a reference, through the 14th Plan, the government plans to promote alternate fuel contracts that can supply the temporarily-converted fuel from natural gas to LPG for the purpose of achieving stable gas supply and demand.

17. How is the downstream gas market regulated?

UGBA, PAFA, and HGSA are the principle legislation regulating downstream natural gas market, whereas LPG Act (instead of UGBA) applies to downstream petroleum gas market.

Natural gas business is heavily regulated, with KOGAS and a few private business entities monopolizing the import and the domestic distribution, as previously noted.

18. Have there been any significant recent changes in government policy and regulation in relation to the oil and gas industry?

There has been a recent effort to promote competition in the natural gas sector. Law has changed to allow companies using natural gas for power generation, industrial use or bunkering services to directly import natural gas, bypassing KOGAS.

In line with such change, KOGAS can now set so-called an “individual price” for a specific power plant, different from the price of natural gas supplied to the general public. In other words, KOGAS had a single price for all power plants by averaging all LNG prices in the contracts executed by KOGAS. With such change, different prices may apply for different power plants based on the individual contract executed by KOGAS for a specific power plant.

On April 2021, the government announced the 14th Plan and unveiled the natural gas supply and demand plan from 2021 to 2034. Some significant changes are as follows – (i) including new market demands related to ship bunkering, hydrogen production, and revitalization of the cold and heat industry into the future supply and demand prospect, (ii) introducing a control order to UGBA against private natural gas importers in the event of a national supply crisis, and (iii) planning to raise the mandatory stockpile of natural gas.

19. What key challenges have been identified by the government and/or industry in relation to your jurisdiction’s oil and gas industry? In this context, has the Covid-19 pandemic had an impact on the oil and gas industry and if so, how has the government and/or industry responded to it?

As demand for domestic petroleum products declined due to COVID-19 at the outbreak, crude oil imports dropped dramatically by 8.6% (47 million barrel) year on year basis, and petroleum product exports dropped by 4.3% year on year basis. To cope with the ever-worsening market condition, Korean oil refining companies are expected to continue expanding its business portfolio in the non-refining sector by increasing market share in EV battery business and investing in olefin production plants.

However, it is now becoming another set of a problem as energy prices soar. The government is attempting to counter this by cutting oil/fuel taxes. There are many domestic LNG power plants that directly import LNG from overseas, and they also seem to be suffering from the rising LNG price.

Important changes in the long term are expected to take place following the revitalization of the carbon neutrality and hydrogen economy as below. As natural gas is something that the government intends to regulate due to its aspect as an energy source that emits carbon, and in combination with carbon capture technology, it serves as a *bridge* energy source for the transformation of the hydrogen economy, domestic demand hereafter is expected to be maintained to a certain extent as predicted in the 14th Plan.

20. Are there any policies or regulatory requirements relating to the oil and gas industry which reflect/implement the global trend towards the low-carbon energy transition? In particular, are there any (i) requirements for the oil and gas

industry to reduce their carbon impact; and/or (ii) strategies or proposals relating to (a) the production of hydrogen; or (b) the development of carbon capture and storage facilities?

Korea has enacted various laws such as the Framework Act on Low Carbon, Green Growth, the Act on the Allocation and Trading of Greenhouse-gas Emission Permits, and the Act on the Promotion of the Development, Use, and Diffusion of New and Renewable Energy to reduce fossil fuel reliance, promote use and supply of renewable energy, foster research and development of green technology, and expand carbon sink to reduce greenhouse-gas emissions.

In particular, Korea has implemented the Korean Emissions Trading Scheme (K-ETS) since 2015. As the mining sector is subject to K-ETS, a mining concession right holder may be designated as a business entity eligible for allocation if it has emitted more than 125,000tCO2-eq in the last 3 years or owns a place of business that emits more than 25,000tCO2-eq annually. Please note that a total of 5 companies in the mining sector were designated as business entities eligible for allocation during the second commitment period (2018-2020). However, no upstream oil and gas company has been designated as business entities eligible for allocation.

Meanwhile, Korea currently implements the Renewable Portfolio Standard in accordance with the Renewable Energy Act, which provides that anyone who owns a facility that generates more than 500,000kW must generate at least 10% of its electricity by utilizing renewable energy. If such power generation business does not generate electricity using renewable energy, then the power generation business has to purchase Renewable Energy Certificate from other power generation businesses. Such policies encourage the use of renewable energy, which could reduce the demand for hydrocarbon.

The Hydrogen Act and the Basic Act on Carbon Neutral and Green Growth in response to Climate Crisis (Carbon Neutral Basic Act) which will take effect from September 2022, have been enacted, and Korea is moving very actively in that direction. Carbon emissions should be reduced, and efforts are being made to move towards the hydrogen economy. Concerning this, the government announced Carbon-Neutral Scenarios in October 2021, aimed at reducing greenhouse gas emissions by 40% by 2030 compared to those in 2018. In addition, two scenarios (Proposal A & Proposal B) were presented in line with the goal of making net greenhouse gas emissions zero (so-called “net-zero”) by 2050. Proposal A prohibits LNG power generation in its entirety, and Proposal B prohibits coal power generation but allows LNG power generation, provided that carbon capture is integrated therein. In addition, the Hydrogen Act and the Hydrogen Roadmap (dated January 2019) are seeking to produce and distribute clean hydrogen including (i) blue hydrogen that captures, utilizes and/or stores CO2 accompanied by reforming natural gas and (ii) green hydrogen produced through water electrolysis using renewable energy, and are in the course of constructing hydrogen distribution facilities, equipped with the world’s largest number of hydrogen fuel cell vehicles in terms of utilization (approximately 16,000 hydrogen vehicles are in operation in Korea as of August 2021). A domestic manufacturer has signed a contract to export 1,600 10-ton hydrogen trucks to Switzerland by 2025. In order to facilitate clean hydrogen distribution, preparation for the introduction of the HPS (Hydrogen Portfolio Standards) system is underway, and a separate rate system is being drawn up for LNG used in hydrogen production. Furthermore, in respect of the utilization of hydrogen, a method of burning natural gas and hydrogen together at the LNG power plant is being actively introduced, and a method of utilizing ammonia is also being studied.

Attempts are being made in regards to carbon capture, but seemingly there is no progress crystallized yet. As mentioned earlier, there is a movement towards underground carbon storage at the Donghae gas fields and finding ways to utilize captured carbon for the production of methanol, carbon, dry ice, and plastic. The government announced on June 2021 □A Roadmap to Technology Innovation of Carbon Capture and Utilization (CCU)□, further indicating its plan to invest approx. USD 100 million annually in R&D for carbon capture.

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