2021

OIL AND GAS INDUSTRY
AN OVERVIEW

VTT GLOBAL (PRIVATE) LIMITED
OFFICE 201, BLOCK-8
SCHOOL ROAD, F-6 MARKAZ
ISLAMABAD, PAKISTAN
TEL: +92 (51) 2276284-5
RIZWAN@VTTGLOBAL.COM
WWW.VTTGLOBAL.COM

APRIL, 2021

Table of Contents

Abbreviations

MMTOE	Million Tons of Oil Equivalent
MMT	Million Tons
MMCFD	Million Standard Cubic Feet per Day
MTPA	Million Tons per Annum
BCF	Billion Cubic Feet
TCF	Trillion Cubic Feet

Pakistan Energy Profile

Oil and gas are major industries in the energy market and plays an influential role in the economy as Pakistan's primary fuel sources. In 2018, the total energy supply stood at 86.3 MMTOE. The biggest source of energy is indigenous natural gas (34.6 percent), followed by oil (31.2 percent). In terms of consumption, in Pakistan, a total of 55 MMTOE of energy was consumed in 2018. The largest source of consumption was oil (35 percent), followed by natural gas (30.4 percent) *(Development Plan 2020, MEPD).* In the coming years there is expected to be an upward trend in utilization of hydro, nuclear and renewables as a source of energy due to Government's push for establishing an economical and sustainable energy mix.

Oil and Gas Market Structure

Pakistan's energy industry is structured into upstream (exploration and production), oil downstream, gas downstream and power sectors (Ibid). Further division of the aforementioned streams is as follows:

Oil Market:

Upstream (Exploration and Production):

It consists of 24 national and international companies operating independently. In 2019, oil production stood at 89,030 BPD. The largest exploration and production company in the country is Oil and Gas Development Company, with a share of 45.3 percent in the market. Other major oil production companies include MOL Group, Pakistan Petroleum Limited, Pakistan Oilfields Limited and Mari Petroleum.

Downstream:

- Oil Refineries: The oil downstream sector includes six oil refining companies, Pak Arab Refinery, Attock Refinery Limited, Pakistan Refinery Limited, National Refinery Limited, Byco Petroleum and Enar-Petrotech. In 2019, the total annual refining capacity stood at 19.36 MMT. High Speed Diesel (HSD) is the largest produced petroleum product with 4.7 MMT, followed by furnace oil with 2.8 MMT and motor gasoline with 2.3 MMT. However, these refineries have low refining technology levels. Diesel products can meet Euro II standards, and gasoline product label is based on 87 RON and the highest is 92 RON.

- Oil Marketing Companies: A total of 30 Oil Marketing Companies have their operations in Pakistan. Pakistan State Oil, a state-owned company dominates the petroleum market with a market share of 50 percent. Other notable players include Hascol Pakistan Limited (12 percent) and Attock Petroleum Limited (9 percent Over the last year the consumption of oil has dropped from 25 MMT in 2018 to 19.7 MMT in 2019. This is due to reduction of usage of oil in the power sector due to Government's policy of substituting oil-based power generation with gas-based generation.

- Oil Pipelines: Pakistan has an extensive oil pipeline network of approximately three thousand kilometers starting from the port city of Karachi to upcountry stations such as Faisalabad and Machike in Punjab operated by three companies. Pak Arab Pipeline Company operates $480 million, White Oil Pipeline. The pipeline accounts for 60 percent of petroleum consumption in the country. The sectors future plans include the dualization of this pipeline, that will allow the transportation of an additional 4 MMT petroleum.

- Oil Terminals: There are two oil terminals in Pakistan that are run by Fauji Oil Terminal and Distribution Company and Karachi Port Terminal with a combined capacity of 51 MTPA.

Gas Market:

Upstream (Exploration and Production):

The total natural gas supply in 2019 stood at approximately 4,397 MMCFD with local production contributing 3,416 MMCFD natural gas and 981 MMCFD LNG imports. While gas consumption stayed stagnant post 2006 due to constrained gas supplies owning to depleting gas fields in the country and the unavailability of gas import facilities. However, in 2019 the consumption reached 1,458 BCF, the highest the country has witnessed. Residential, industrial and fertilizer sectors have shown patterns of growing consumption due to expansion is distribution pipeline network. The largest exploration and production company in

the country is OGDCL, 29.2 percent of country's gas is produced by the company. Other major gas exploration and production companies include PPL, MPCL, MOL and ENI.

Downstream:

The gas downstream sector includes two government owned utilities, Sui Southern Gas Company (SSGC) and Sui Northern Gas Pipelines (SNGPL) that provide gas to the majority of the country, whereas, a small transmission network exists that is owned and operated by gas producers or bulk consumers for direct supplies.

Oil and Gas Market Structure

In 2019, the country's oil reserves stood at 568 million US barrels an increase of approximately 64% from 347 million US barrels in 2018. While, gas reserves summed to 21.45 TCF up from 19.54 TCF in 2018, an increase of approximately 10%. The increase in the country's oil & gas reserves is a result of the Government's policy of aggressive exploration & production in the country, the advent of 3D seismic surveying and advanced exploration techniques & tools. Around 96% of the country's exploration wells have been drilled leaving only 4% wells yet to be drilled. However, vast areas in the province of Baluchistan, Punjab and Khyber Pakhtunkhwa remains unexplored.

Oil and Gas Imports

Oil Imports

Pakistan imports most of its oil, as local oil accounts of only 16% of its total oil consumption and the oil refinery sector only caters to approximately 50% of the local petroleum products demand. Therefore, the import volume of Pakistan in 2019 was as high as 17.97 MMT out of which 9.2 MMT was imported crude oil and 8.76 MMT was imported refined oil. This in turn has resulted in a large foreign exchange spending.

Gas Imports

Pakistan started importing gas in the form of LNG to meet gas demands particularly due to depleting sources and high demand in the Power Sector. At present four long-term LNG supply agreements exists for import of 6 MTPA LNG quantities. In addition, as and when required, LNG is also imported on spot basis.

Prevalent Challenges

There are major challenges that are prevalent in the oil and gas industry. Pakistan's oil and gas industry has a relatively mature system. Pakistan's local oil accounts for only 16 percent of the total consumption and 50 percent of the petroleum demand is fulfilled by the country's oil refinery sector, the rest is imported. Therefore, the price of Pakistan's domestic crude oil and refined oil is correlated to the price of oil in the Middle East market. Similarly, the shortage of gas in the in the power sector is fulfilled by import of LNG. The price of imported LNG gas is correlated to that of Brent oil, and the price of domestic gas is fixed by the government. The development of the oil and gas industry with respect to exploration and development, construction of infrastructure such as refineries and pipelines, faces quite a number of challenges at present (Energy Source Guide, ITA). The same are reiterated hereunder:

- Major oil and gas fields are in the later stage of development and as such, their production is in a gradual decline and carries insufficient resource potential.
- Insufficient financial strength to develop the petroleum sector.
- Technology gaps which require capital and human resource investments.
- Demand of oil and gas exceeds the domestic production of crude oil and refining capacity, and a large amount of foreign exchange is spent to import crude oil and refined oil.
- **Domestic oil and gas pipeline network require upgrading.**

Future Prospects

These include and are not limited to the following:

- Invigorating Exploration & Production activities.
- Facilitating the construction of large-scale oil refining facilities.
- Strengthening the construction of oil and gas import infrastructure these include crude oil import facilities, LNG import facilities and onshore transnational gas import pipeline.
- Accelerating the construction of oil & gas pipelines and storage projects.