Energy Market Structure: Oil & Gas[133]

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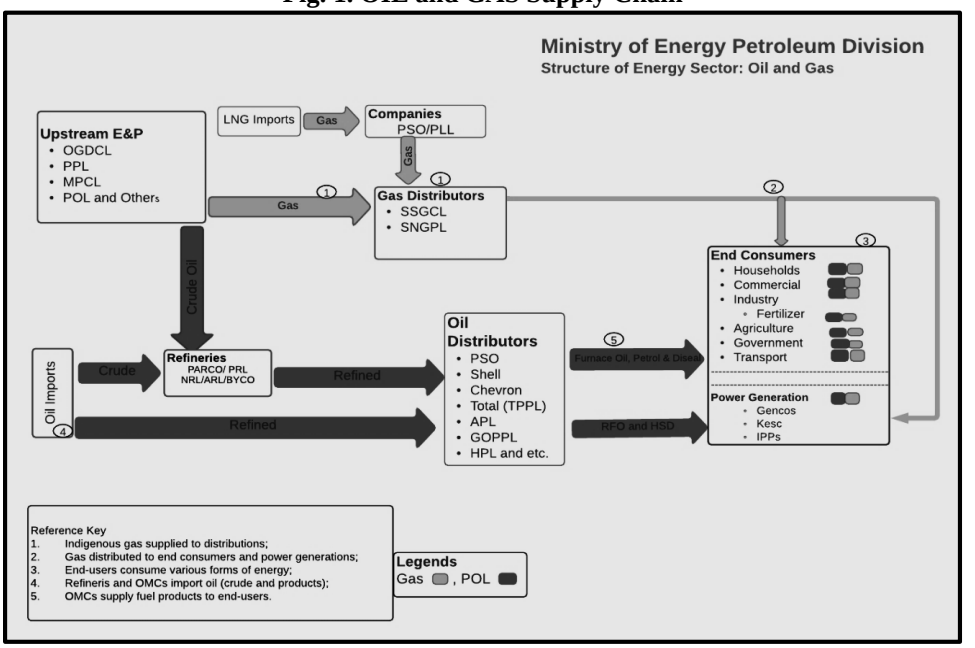
INTRODUCTION

Oil and gas play a prominent role in the energy matrix of Pakistan. In FY2019, oil and gas account for 61 per cent of final energy supplies and 63 per cent of final energy consumed (Chart 1 and Chart 2). With limited oil resources and declining gas reserves, dependence on imports is increasing.

The supply chain of both petroleum and gas consists of several activities connected with the flow of goods and services from the raw material stage till the final product reaches the consumer. It involves the interactions of independent companies; various structures are typically involved in the supply chain (Figure 1). An important variable in the constitution of the chain is the financial as well as contractual obligations of these companies and of course the responsibilities of the regulator to monitor those obligations. The problem at any point may have its impact at the final consumer end. This chapter provides an overview of the oil and gas market structure.

Fig. 1. OIL and GAS Supply Chain



[133] This chapter was earlier published in *PIDE Monograph Series, May 2021*.

Chart 1. % share in Energy Supplies (FY2019)

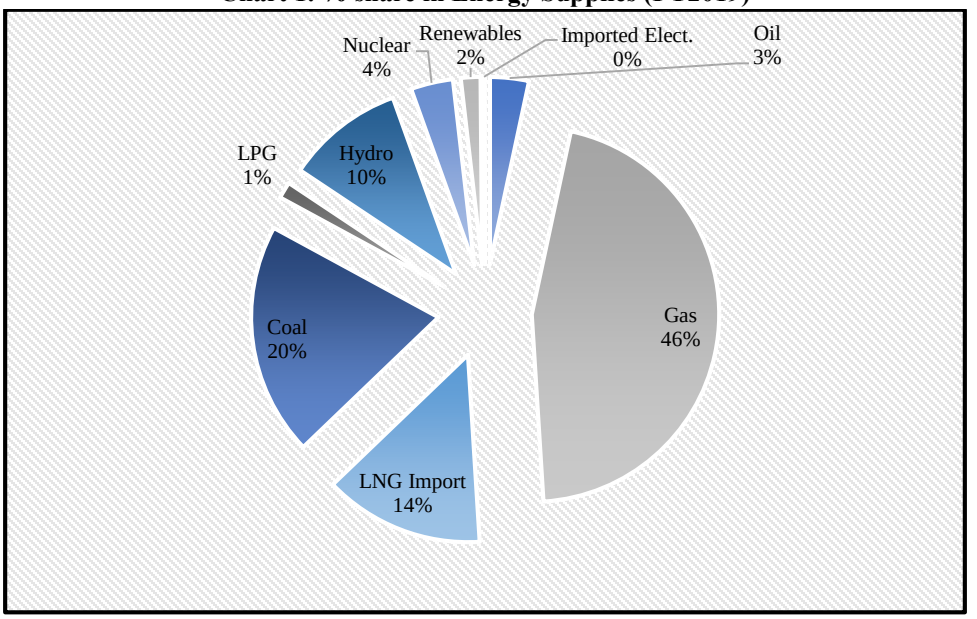
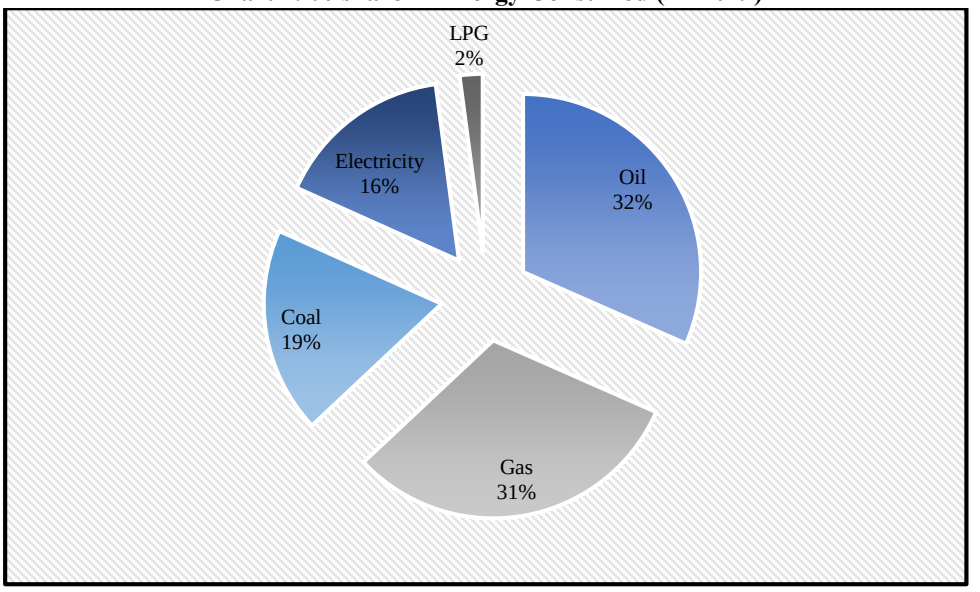


Chart 2. % share in Energy Consumed (FY2019)



Source: Pakistan Energy Yearbook, 2020

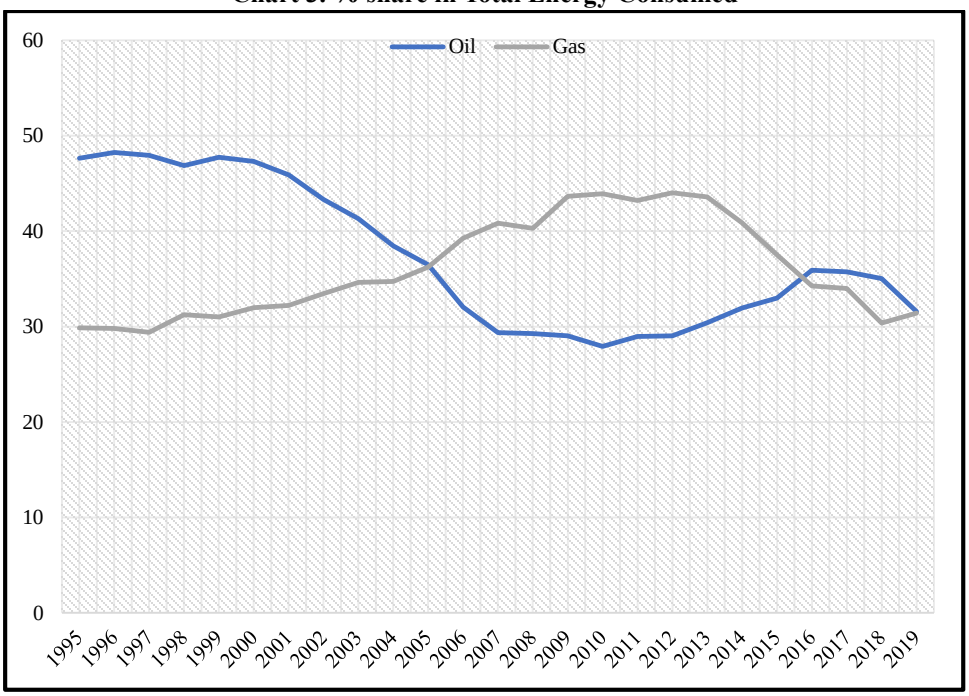
OIL MARKET STRUCTURE AND SUPPLY CHAIN

Until 1999, the government had tight control over the petroleum sector in Pakistan. All the decisions were made solely by the government and were often based on political as opposed to economic considerations. Since 2000, the government has initiated an ambitious pro-market reform program in the sector.

As a developing country, Pakistan's energy requirements are growing gradually over time, from 7 million TOE in FY1972 to 55 million TOE in FY2019. Over the years, the country has seen a change in its energy mix from the dominance of oil in the 1990s to the dominance of gas until FY2015. With the depletion of natural gas resources, the trend again upturned in FY2016, and oil consumption exceeded gas consumption (Chart 3).

Due to the massive domestic demand for oil, a large quantity of crude oil is imported every year. Demand for refined petroleum products greatly exceeds domestic oil refining capacity, so nearly half of the Pakistani imports are refined products.

Chart 3. % share in Total Energy Consumed



Source: Pakistan Energy Yearbook (Various Years).

Petroleum Supply Chain

Petroleum supply chain infrastructure in Pakistan starts from port facilities at Karachi. Crude oil, white-oil products, Low Sulphur Furnace Oil (LSFO) are received at the Karachi port, while LPG and High Sulphur Furnace Oil (HSFO) are received at the Fauji Oil Terminal at Port Qasim. In FY 2019, the total import of (black and white oil) in Pakistan was 18.6 million TOE. The port facilities are connected to the tankage/storage facilities of the refineries and oil marketing companies (OMCs).

Similarly, oil explored and produced (E & P) locally is transferred from E & P companies (Chart 4) to refineries, and from refineries to oil marketing companies, and from oil marketing companies to thermal power plants and other petroleum consumers (individuals, industries).

Oil Upstream

Chart 4. Resources Meeting Domestic Petroleum Demand

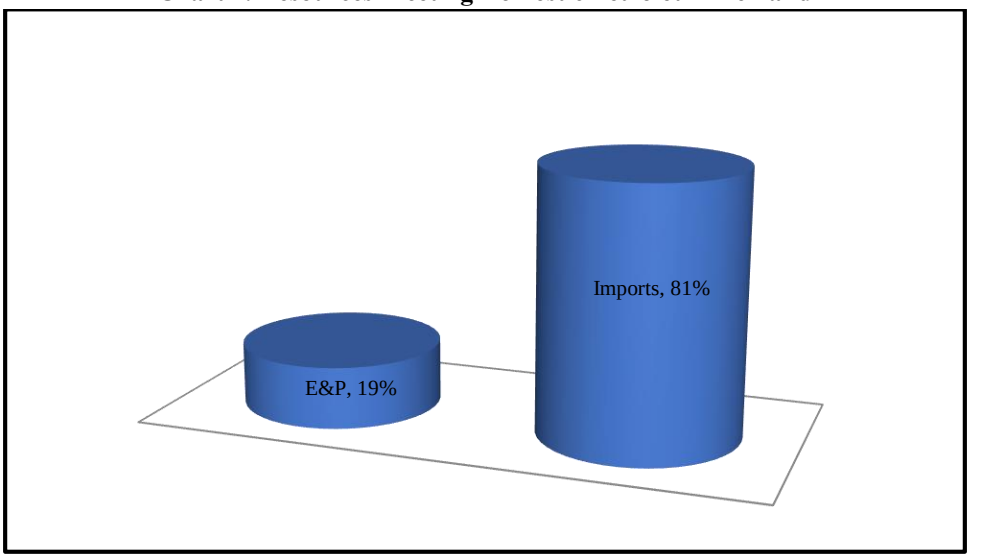
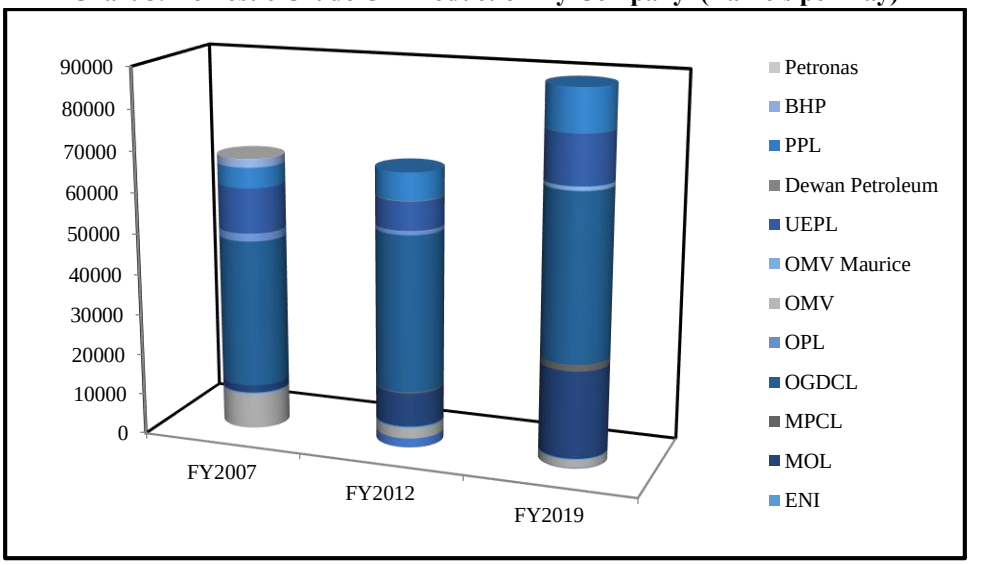


Chart 5. Domestic Crude Oil Production By Company (Barrels per Day)



Source: Pakistan Energy Yearbook, Various Years.

Pakistan has oil reserves of around 568.5 million barrels as of June 2019 (Table 1). A major part of produced oil comes from the reserves located in the southern half of the country, where the three largest oil producing fields are located (in the Southern Indus Basin). In addition, some producing fields are in the middle and upper Indus Basins. After late 1980s, Pakistan did not find many new oil fields. However, from FY2013 to FY 2015 83 oil and gas discoveries have been made. These added 631 million cubic feet per day of gas and 27,359 barrels per day of crude oil to the total reserves of Pakistan (Hussain, et al., 2019).

Table 1

Crude Oil Reserves (Million Barrels) as of June 30, 2019

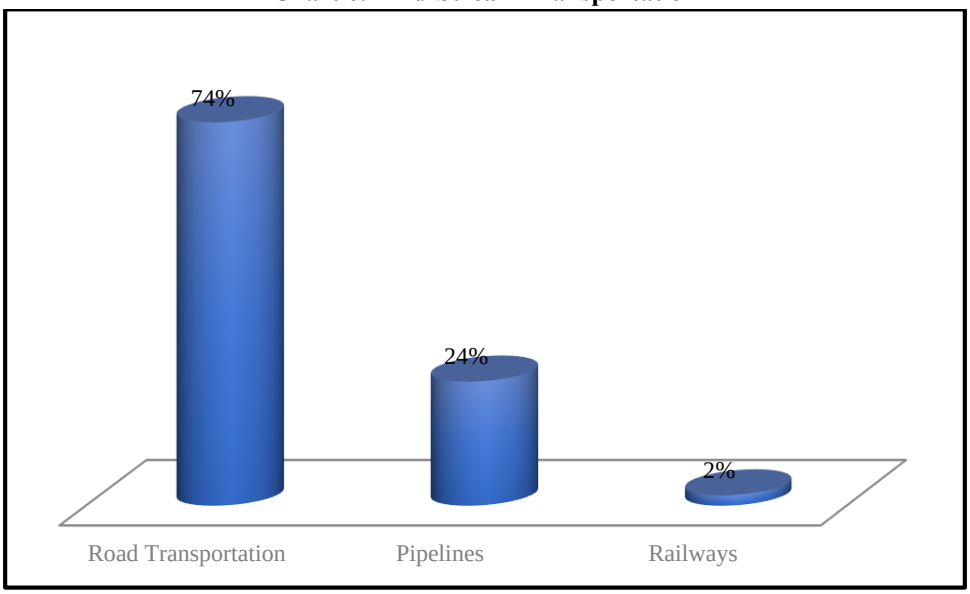
Original recoverable Reserves	Cumulative Production	Balance Recoverable Reserves
1498.773	930.327	568.446

Source: Pakistan Energy Yearbook (2020).

There are almost twelve companies involved in crude oil production. Among these twelve, Oil and Gas Development Company Limited (OGDCL) has the highest share of almost 45 % as 40356 barrels per day is produced during 2019. Hungarian Oil and Gas Company (MOL) and United Energy Pakistan (UEP) contributed 24 % and 13 percent respectively, while the contribution of Pakistan Petroleum Limited (PPL) was 12 percent (Chart 5). The rest is shared by other companies.

Oil Midstream

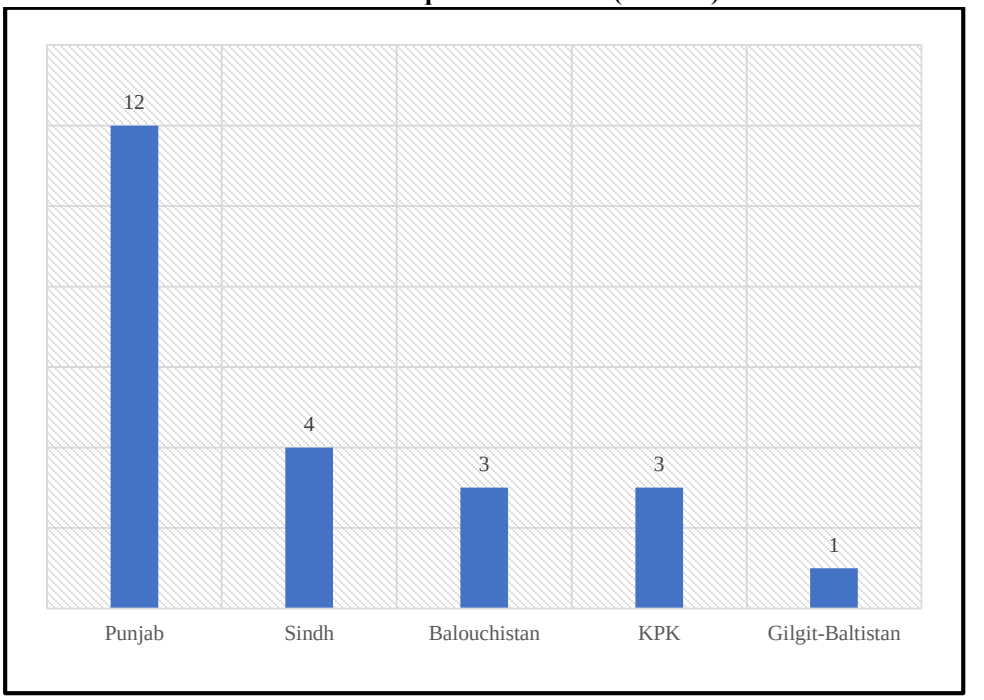
Chart 6. Mid-Stream Transportation



Source: OGRA State of Industry Report, 2018-19.

In the midstream _ the bulk of 19.22 million tons of petroleum products required by Pakistan's market is transported by road, oil pipelines and railways (Chart 6). Refineries, Oil Marketing Companies (OMCs) and large consumers own terminals and storage facilities to receive and store crude oil and petroleum products throughout Pakistan. The key installations/terminals are the primary supply points for transportation of petroleum products to regional depots. There are 22 depots spread throughout the country (Chart 7). The total storage capacity of the installations and depots, however, amounts to only 21 to 23 days of consumption equivalent, which may well be insufficient during a supply crisis.

Chart 7. Oil Depots in Pakistan (FY2019)



Source: OGRA State of Industry Report, 2018-19

Box1. Strategic Oil Stocks

Strategic oil stocks are the main defence governments have to protect their economies from oil price shocks and other security concerns. Strategic stocks are not exactly intended to guard against high prices; their main objective is to ensure availability in the event of a physical disruption in supply. Pakistan's strategic oil storage capacity is insufficient to ensure its energy security. Further, there is no distinction between oil marketing companies (OMCs) commercial inventories and strategic stocks, which is necessary to make a difference between its various needs and ensure supply during any unforeseen event.

The OMCs (i.e., PSO, SPL and TPPL) hold equity partnerships in the White Oil Pipeline (WOP), which provides the strategic infrastructure to transport petroleum products from Karachi to the Up-Country locations. WOP has a transportation capacity of 12 million tons / annum.

Oil Downstream

Chart 8. Refineries Percentages Shares in Crude Oil Refining- FY2019

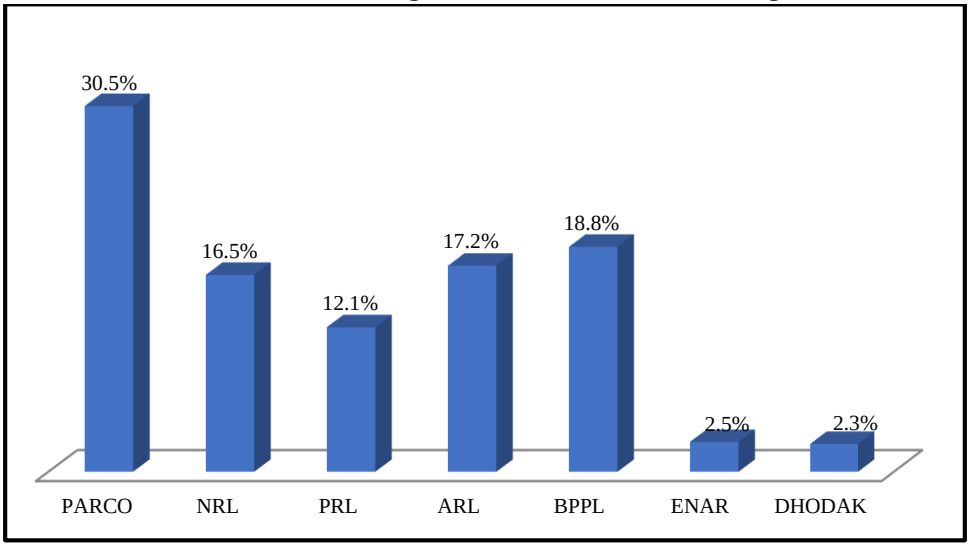
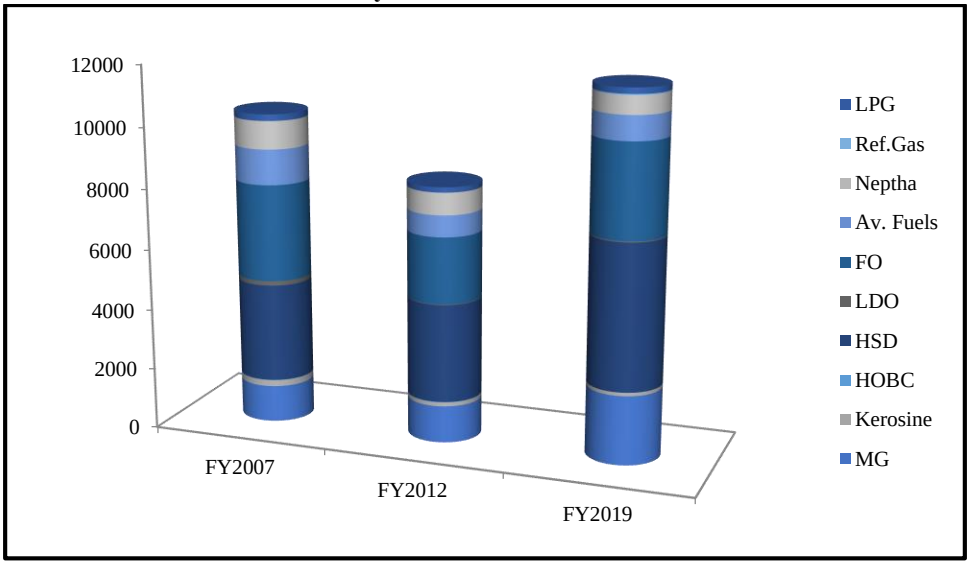


Chart 9. Refinery Production of Petroleum Products



Source: Pakistan Energy Yearbook (Various Years) and OGRA State of Industry Report 2018-19.

In the downstream oil sector, there are seven refineries_ Pak-Arab Refinery Limited (PARCO), National Refinery Limited (NRL), Byco Petroleum Pakistan Limited (BPPL), Pakistan Refinery Limited (PRL), Attock Refinery Limited (ARL), ENAR and DHODAK (Chart 8). These refineries have a total capacity of 19.37 million tons per annum. In FY2019, refineries produced 12.40 million tons. PARCO was the major contributor in POL production with 30.50 per cent share followed by BPPL with 18.80 per cent, ARL and NRL with 17.23 per cent and 16.48 per cent share respectively during FY 2019.

Box 2 Oil Refinery

Features

- Demand for Petroleum Products: 19.22 MT; Refining Capacity, 62 percent of country's demand (11.86 MT)
- Import of Petroleum Products: 38 percent (7.36MT)
- Crude Oil Requirement for Refineries: 400,000 Barrels/per day out of which 22 percent is supplied by Local E&P and 78 percent is imported.

Challenges

- Volatility in margins because of fluctuating crude oil prices.
- Unfavourable changes in pricing regime_ removal of deemed duty.
- Circular debt in power sector affects financial flows.
- Exchange rate depreciation.
- OMCs procuring substantially from local refineries are likely to have limited impact on profitability in the current macroeconomic situation as compared to those relying on imports.

Source: Pakistan Energy Yearbook (2020) and PACRA (2019).

Table 2

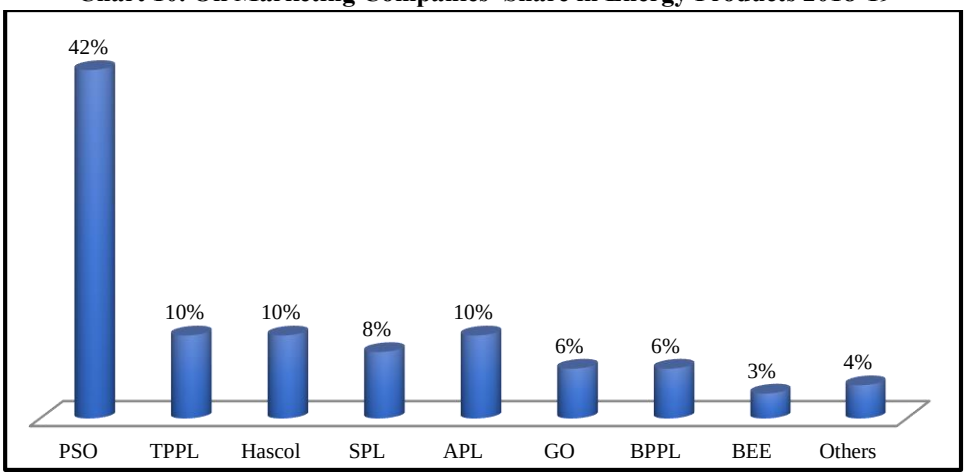
Business Risk- Refining Capacity (Million Tons) and Utilisation (%)

Refinery	Capacity	Utilisation	Capacity	Utilisation	Capacity	Utilisation	Capacity	Utilisation
BYCO	7.19	22	7.19	18	7.17	38	7.17	33
PARCO	4.5	100	4.5	100	4.5	100	4.5	89
NR	2.71	85	2.83	85	2.83	86	2.83	81
ATTOCK	1.96	86	2.44	91	2.44	93	2.44	94
ENAR	0.33	97	0.33	88	0.33	97	0.33	97
PR	2.10	81	2.10	76	2.10	81	2.1	76

Source: Pakistan Energy Yearbook (2020).

In the downstream, there are twenty-eight Oil Marketing Companies (OMCs) operating in Pakistan and fifty-nine have been granted licenses by OGRA. However, the top five companies' holds 80 per cent of the market share in FY2019. In FY 2019, the market share of Pakistan State Oil (PSO) was at the top (41.8 per cent of the total energy Supply); followed by Attock Petroleum Limited (APL) with 10.5 per cent, Total Parco Pakistan Limited (TPPL) 10.1 per cent, Hascol 10.1 per cent and Shell Pakistan Limited (SPL) 8 per cent (Chart 10).

Chart 10. Oil Marketing Companies' Share in Energy Products 2018-19



Source: OGRA, State of Industry Report, 2018-19.

Table 3

Share of OMCs in White and Black Oil

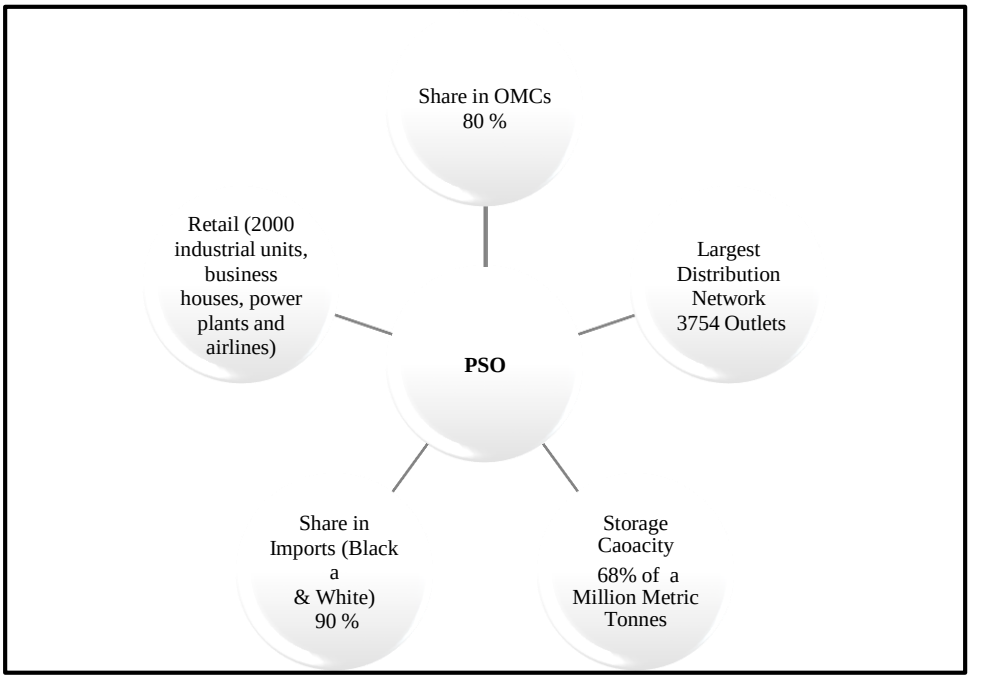
	White Oil	Black Oil
PSO	41%	52%
PARCO	12%	8%
ARL	10%	13%
HASCOL	10%	12%
SPL	10%	-----
Others	10%	16%

Source: PACRA (2019).

MG (Petrol), diesel and HOBC are sold through retail outlets. OMCs hold nearly 1.0 million tons of storage capacity, with PSO having nearly 68 per cent of this capacity. Most of the OMC storage is for finished products, of which nearly half is for HSD. So, when supply chain involves so many agents/ structures its effective management, monitoring and regulation at every level become necessary to avoid a crisis. PSO leads the way in White Oil (MG, HSD, LDO and Jet Fuel) as well as Black Oil (FO, lubes & Greases) (Table 3). Although the share of PSO is declining over the years, it is still the market leader (Figure 2).

Pakistan has more than 8600 retail outlets. PSO has the largest share of more than 40 per cent, followed by TPPL (10.2 per cent) and SPL (10.1 per cent). In FY2019, adjusting for FO (as it is not sold in retail outlets) PSO also leads in revenue earned per pump (Rs 349 million), followed by ARL (Rs 293 million) and SPL (Rs 258 million) (PACRA, 2019).

Fig. 2. Oil Market Leader_ PSO



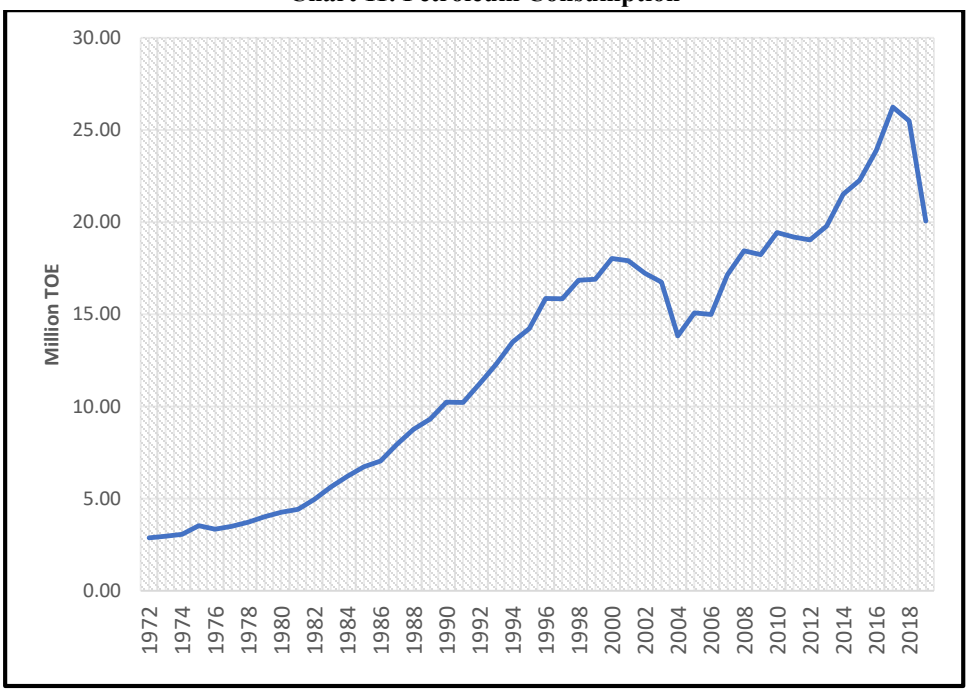
Issues

- PSO is losing its share in the retail sector, but a high horizontal and vertical concentration_ Non-Competitive Market Behaviour.
- Reform of energy industries_ to create market structures and institutions that promote competition

Petroleum Demand

The Consumption of petroleum products in the country during FY2019 was 19.2 million TOE. The consumption of petroleum products increased sharply during the 1980s and 1990s at about 6 per cent per annum. Between FY2001 and FY 2006, growth slowed, in fact, become negative because of fuel switching (Chart 3). But in FY2007 with a decline in gas resources and increased demand for furnace oil in the power sector, total demand for petroleum products increased. The demand for petroleum products increased at an annual growth of 4 per cent between FY2007 and FY2017. Since FY2018, with a decrease in demand for furnace oil in the power sector, overall petroleum demand is declining (Chart 11).

Chart 11. Petroleum Consumption



Source: Pakistan Energy Yearbook (Various Years).

As in FY 2019, transport is the major user of the petroleum products which accounts for about 76 percent followed by power generation which uses about 14

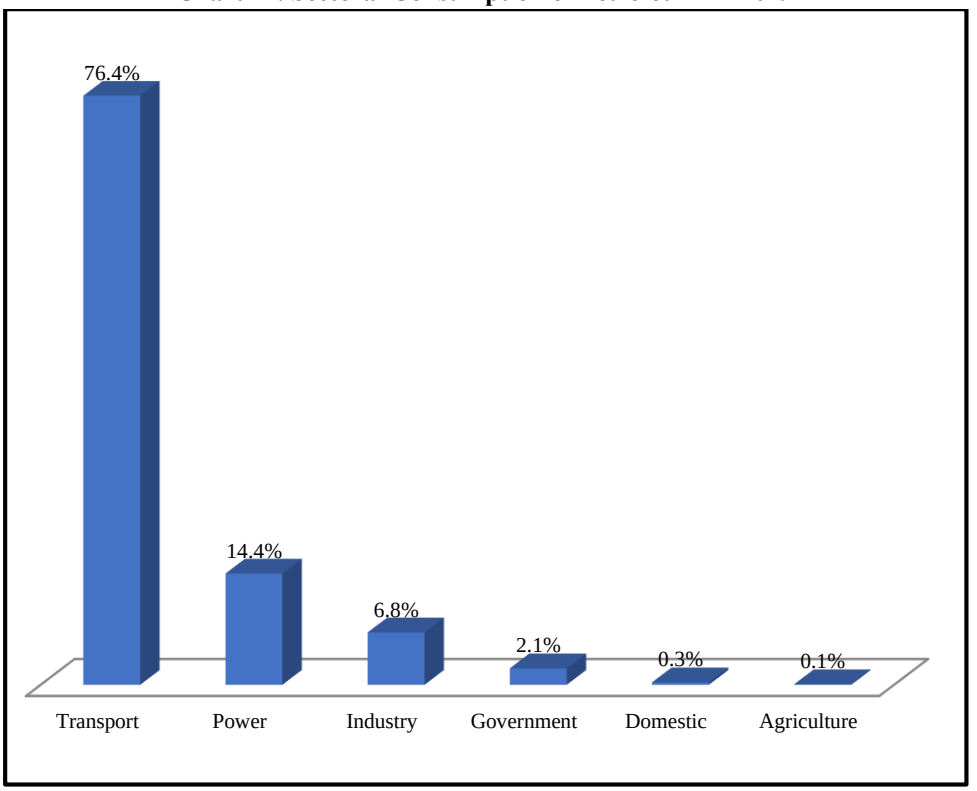
percent and industrial sector which has a share of 7 percent while remaining is shared by the residential, agriculture and other government sectors (Chart 12). Motor gasoline (MG) and high-speed diesel (HSD) are the two main petroleum products consumed in Pakistan (Chart 13).

The demand for MG is increasing continuously and so is its local production and imports (Chart 14 and Chart 15). However, stagnant industrial activity affects the consumption of HSD in industry and transport in FY2019 and its imports also declined in FY2019 (Chart 14 and Chart 16). Additionally, illegal traffic of HSD (from Iranian border) is a challenge for OMCs because of its cheap price. Local production of petrol is also increasing (Chart 14).

In the power sector replacement of LNG and coal has decreased the demand for furnace oil (FO) (Chart 14 and Chart 17). The government of Pakistan (GOP) restricts the import of FO in December 2017, to save foreign exchange reserves.

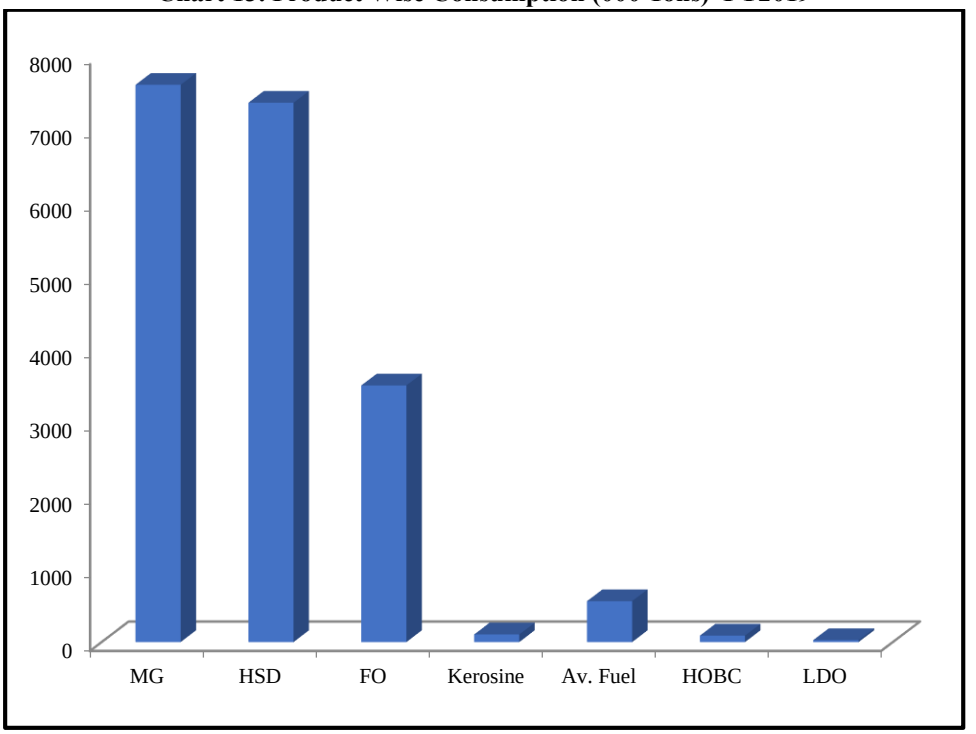
Pakistan is a net importer of crude oil. For petroleum products, Pakistan remained the net importer until FY2018. Since FY 2017, imports of petroleum products have been declining. In FY2017, imports of petroleum products was 15.1 million tons, which declined to 13.3 million tons in FY2018 and then to 8.8 million tons in FY2019.

Chart 12. Sectoral Consumption of Petroleum FY2019



Source: Pakistan Energy Yearbook, 2020.

Chart 13. Product Wise Consumption (000 Tons) FY2019



Source: Pakistan Energy Yearbook, 2020.

Chart 14. Total Petroleum Consumption & Main Products Consumed

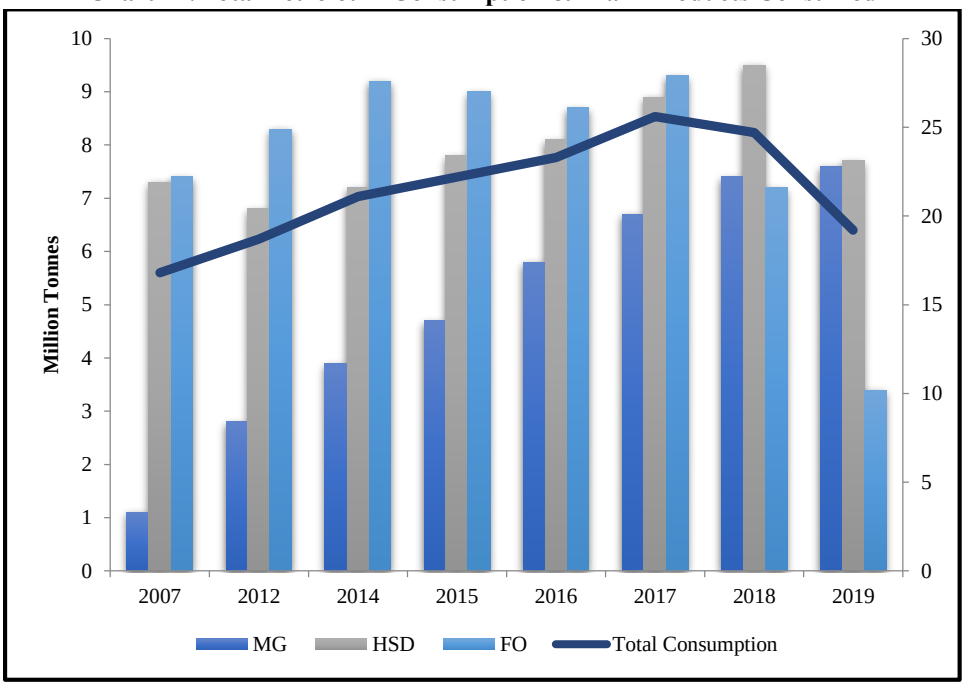


Chart 15. MG Consumption (Million Tons)

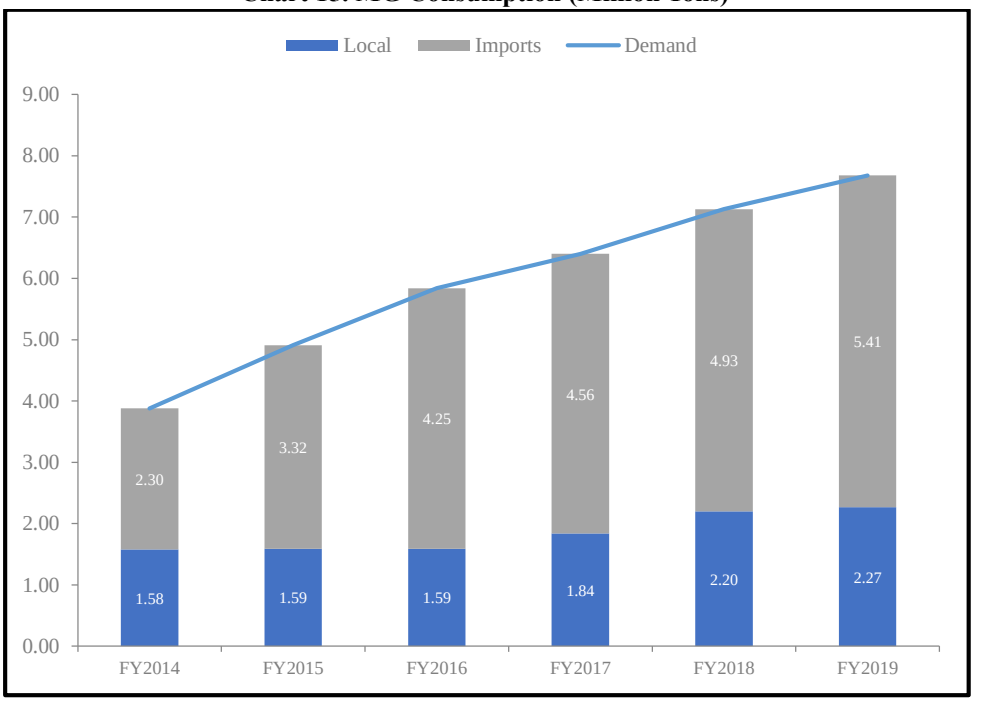


Chart 16. HSD Consumption (Million Tons)

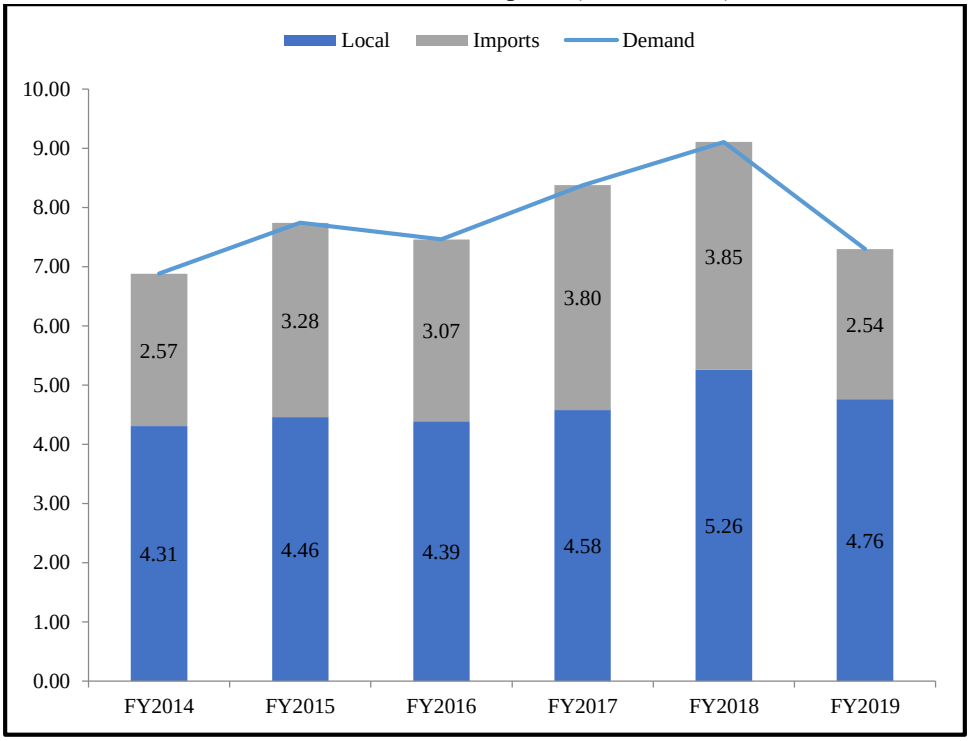
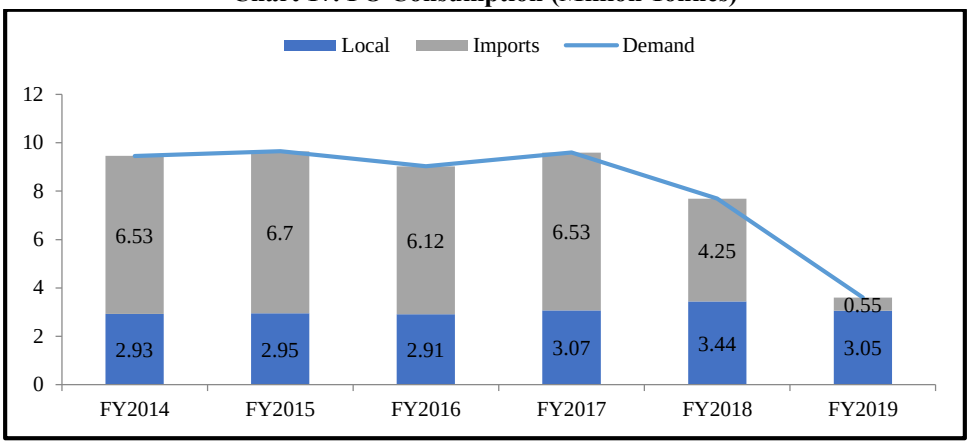


Chart 17. FO Consumption (Million Tonnes)



Source: Pakistan Energy Yearbook (Various Years).

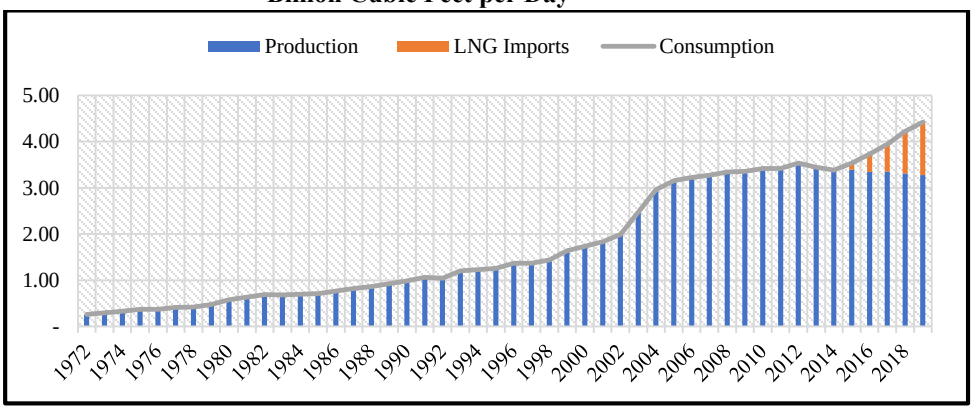
GAS MARKET STRUCTURE AND SUPPLY CHAIN

Natural gas is the most important indigenous fossil fuel, accounting for 35 per cent of commercial energy supplies and about 31 per cent of commercial energy use in Pakistan (Chart 1 and Chart 2). Pakistan is the 19th largest consumer of natural gas in the world, with the established natural gas industry. Out of the total 4.42 billion Cubic feet/ Day consumed in FY2019, 75 per cent is produced domestically (Chart 18).

Over the last two decades, gas consumption has increased substantially (4.8 per cent per annum). In comparison, Pakistan's gas production is almost stagnant at about 4 Bcf/D. Since FY 2015 we have been importing liquefied natural gas (LNG).

In Pakistan, first natural gas discovery was made in 1952. Pakistan Petroleum Limited (PPL) was established in 1950. Their first project was the drilling in Baluchistan, which results in the discovery of the largest gas field in Sui (Hussain, et al., 2019). In 1952, gas reserves of more than 10 trillion cubic feet were found in Sui (Gomes, 2013). This discovery leads to the development of a huge network of gas transmission and distribution in the country.

Chart 18. Gas Consumption, Production and LNG Imports
Billion Cubic Feet per Day



Source: BP Statistical Database, 2020

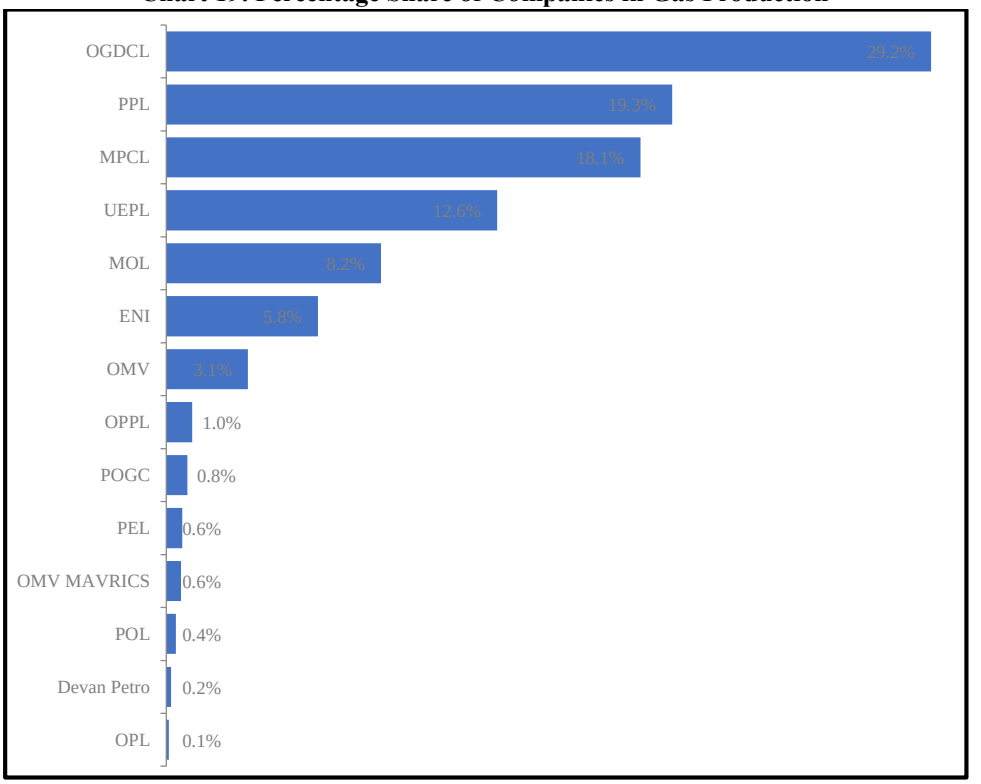
Gas Supply Chain

The supply chain of natural gas just like oil starts from the gas fields, but it is relatively simple as compared to the oil supply chain. Gas explored and produced is transferred to two main gas utilities Sui Northern Gas Pipeline Limited (SNGPL) and Sui Southern Gas Company Limited (SSGCL) via pipelines for further distribution to the end consumers.

In comparison, the supply chain of imported LNG starts at the Port Qasim Karachi. The LNG imported is re-gasified at the plants installed at the port. The re-gasified LNG is then transferred via pipelines to the two utilities for further transmission.

Gas Upstream

Chart 19. Percentage Share of Companies in Gas Production



Source: Pakistan Energy Yearbook (2020)

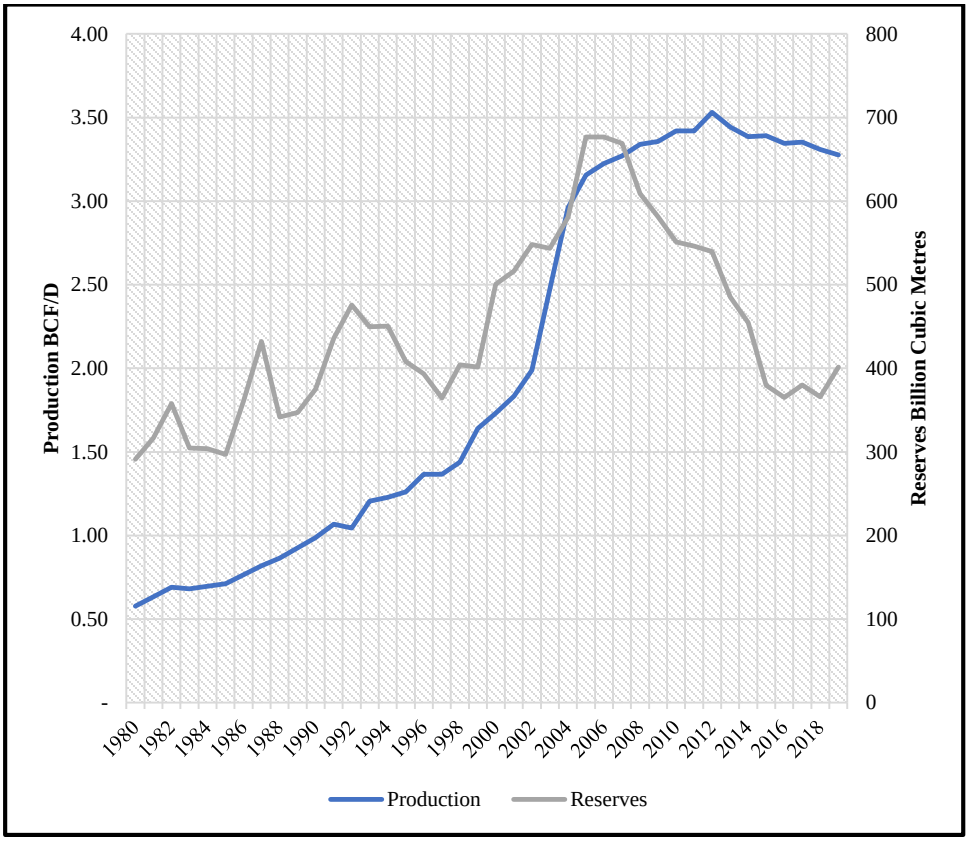
In the upstream, there are 15 gas exploration and production companies working in 55 gas fields, spread throughout the country. The major gas fields of the country include Sui, Uch, Qadirpur, Sawan, Zamzama, Badin, Bhit, Kandhkot, Mari and Manzalai.

The upstream gas sector is led by three state-owned companies (majority shares owned by the state). In FY2019, Oil and Gas Development Cooperation Limited (OGDCL) has the largest share in total gas production (29 per cent). OGDCL was followed by Pakistan Petroleum Limited (PPL) with a share of 19 per cent and Mari Petroleum Company Limited (MPCL) with a share of 18 per cent (Chart 19). Among all the E&P

companies, Mari petroleum has the highest well success rate in Pakistan (69.23 per cent). In comparison, for other companies, the average success rate is 30.1 per cent (Minhas, 2020).

Overall, with no new major gas discoveries in recent years, gas production after reaching a peak in FY2012 has started decreasing. With no significant addition, gas proven reserves are also on the decline (Chart 20). Basin studies have suggested huge gas potential in the country; roughly 10 times the gas proved reserves (Sattar, 2020).

Chart 20. Gas Proven reserves and Production



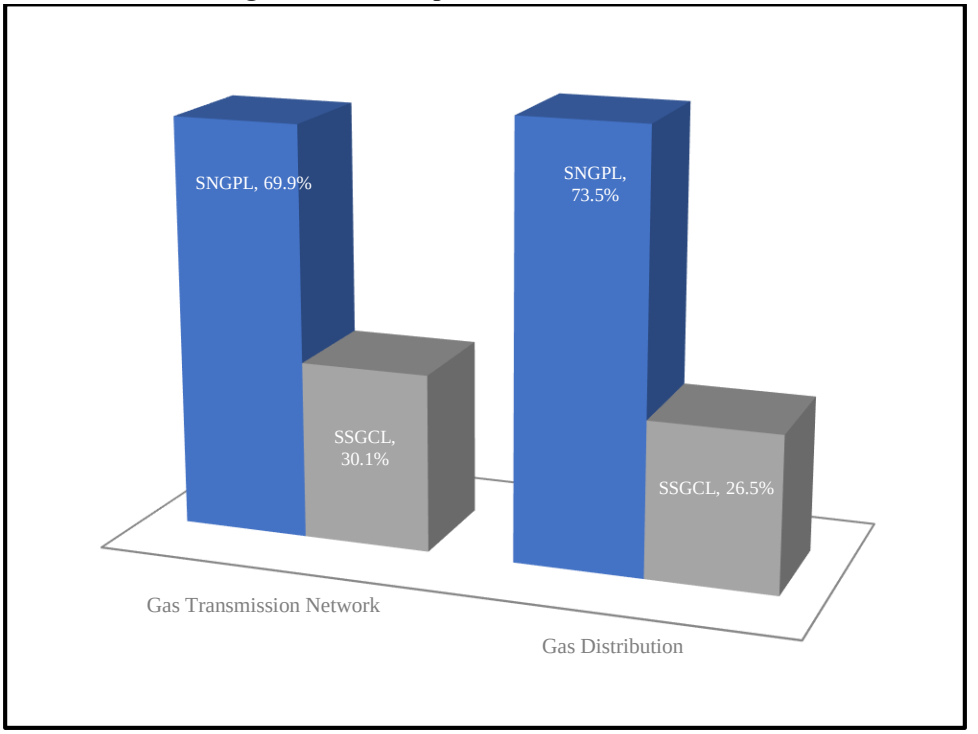
Source: BP Statistical Database, 2020.

In FY 2019, around 25 per cent of the country's gas supplies were met through the imported RLNG. Two state-owned companies, that is, Pakistan State Oil (PSO) and Pakistan LNG Limited (PLL) are authorised by the GOP to import LNG. PSO has signed a long-term contract (span of 15 years) with Qatar. PLL has relatively short-term contracts with Gunvor and Shell.

LNG imported by PSO is re-gasified at the Engro Elengy Terminal Limited (EETL) at Port Qasim, Karachi at a tolling tariff. EETL has a peak capacity of up to 690MMCFD for re-gasification. Similarly, PLL has hired the capacity of PGP Consortium Limited (PGPCL) for re-gasification of LNG at Port Qasim, Karachi. PGPCL has a peak re-gasification capacity of 750 MMCFD (OGRA, 2020).

Gas Midstream

Chart 21. Percentage Share of Companies in Gas Transmission and Distribution



Source: OGRA State of Industry Report, 2018-19.

The midstream gas sector is dominated by two monopolies, SNGPL and SSGCL. The two are state-owned companies (the majority share is owned by the state). As mentioned earlier, the responsibility for gas transportation, marketing and distribution lies with these two companies. In addition to these utilities, some independent pipelines from Mari and Uch are supplying gas to nearby power and fertiliser plants (Ali, 2020).

Right after the huge gas discovery in Sui, the GOP started developing a gas transmission and distribution network. The transmission networks are now spread across the four provinces. Almost all urban areas in these provinces have access to gas distribution networks. SNGPL supplies gas to Punjab and KPK, whereas SSGCL supplies gas to Sindh and Baluchistan.

The sustained growth in gas production in the early years made the authorities complacent, and they started giving connections to everyone as the demand was quite below supplies. Gas tariff methodology also encouraged capital investments in the expansion of transmission and distribution (T & D) network.

Gas exploration and production activities slowed down after early discoveries. Consequently, the gas produced indigenously became insufficient in FY2006 and onwards. But the expansion of the T & D network continued at the same pace. From FY2007 to FY2019 gas distribution network in Pakistan expanded at the rate of about 6 per cent per annum (Table 4). Extension of the T & D infrastructure enabled gas utilities to continue providing gas to an increasing number of consumers (Figure 3).

Table 4

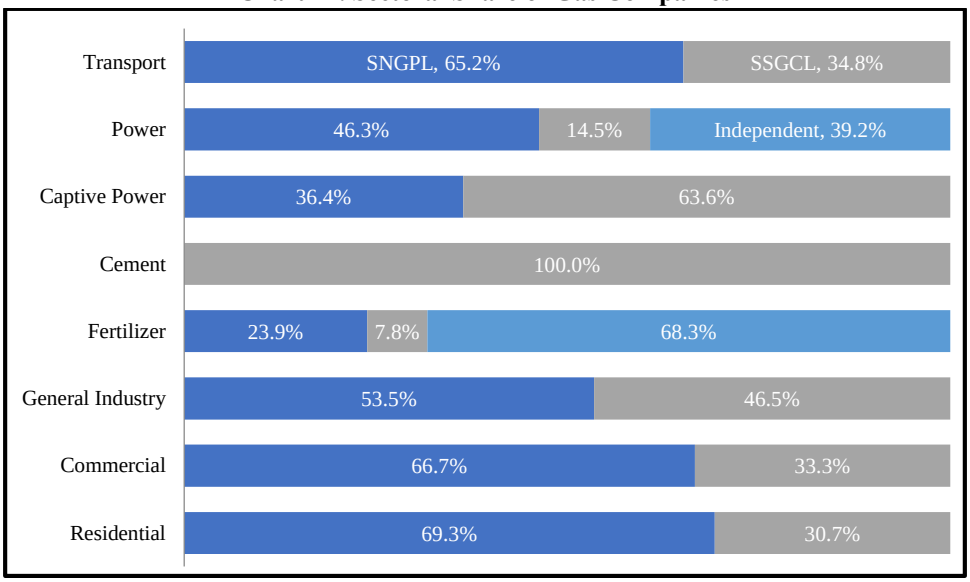
Transmission and Distribution Network (Km)

	Transmission		Distribution	
	SNGPL	SSGCL	SNGPL	SSGCL
2007	6142	3290	36919	23448
2019	9399	4054	130157	46872

Source: Pakistan Energy Yearbook (2012) and OGRA State of Industry Report, 2018-19.

Gas Downstream

Chart 22. Sectoral Share of Gas Companies



Source: OGRA State of Industry Report, 2018-19.

Gas Demand

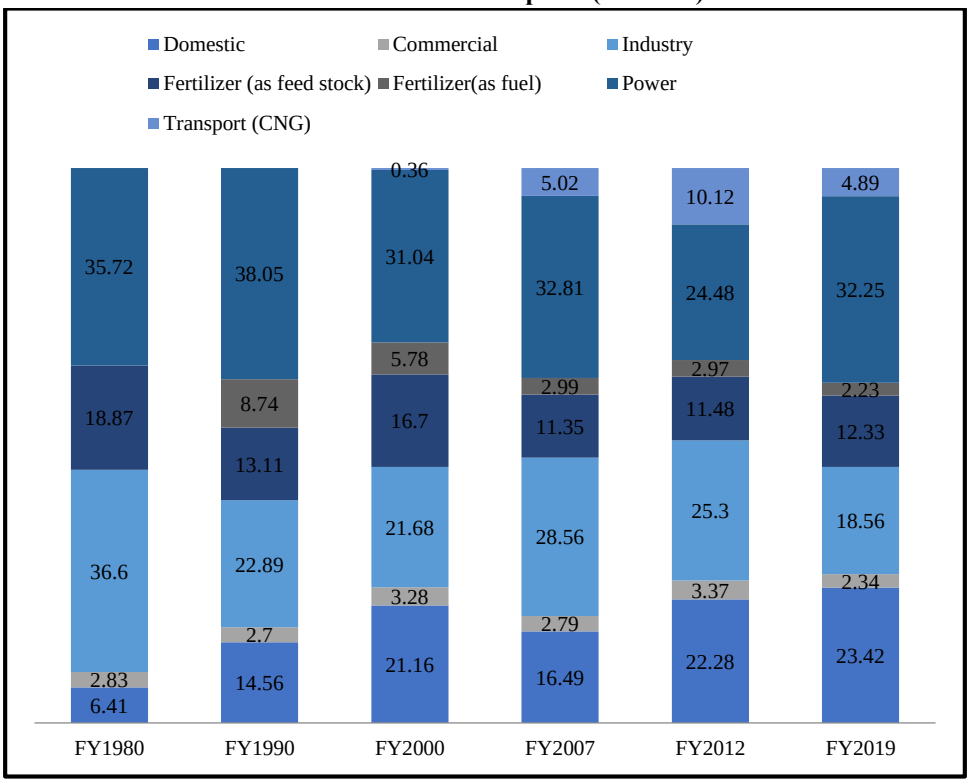
The consumption of natural gas in FY2019 was 31.2 billion TOE. The demand for gas increased fairly rapidly in the 1970s (8 per cent per annum). There was moderate growth of around 5 per cent per annum in the 1980s and onwards until FY2009.

Gas consumption slowed down in 2010 and onwards given the shortage in supplies. In 2013 constrained demand and supply gap was estimated as 2 BCF/D and unconstrained demand and supply gap was almost 4 BCF/D (GOP, 2020). In FY2019, the constrained demand-supply gap, despite the import of LNG was about 2 BCF/D. This shortage necessitated gas load management across the country.

In FY2019, the power sector was leading as a gas consumer with a share of 32 per cent, followed by domestic consumption of 23 per cent. Over the years domestic consumption has increased tremendously at the expense of all other sectors (Chart 23). Not only relatively very low tariffs for domestic consumers (gas pricing policy), but GOP gas priority policies have also played a significant role in increasing the share of domestic consumers. In addition, gas and electricity price differential encouraged more gas consumption in Pakistan (Sattar, 2020).

Moreover, the gas is used quite ineffectually in Pakistan. Pakistan is energy intense country, with huge potential for energy conservation (Malik, 2020). In most countries (especially in the developed countries) a single source of energy is provided at the domestic level. But in Pakistan, both power and gas are provided at the domestic level. Providing two types of infrastructure at the domestic level is not only costly, but also encourages inefficiencies in the supply chain. Just like power sector T & D losses, there is a significant problem of unaccounted for gas (UFG) in the gas sector (Figure 3).

Chart 23. Gas Consumption (% share)

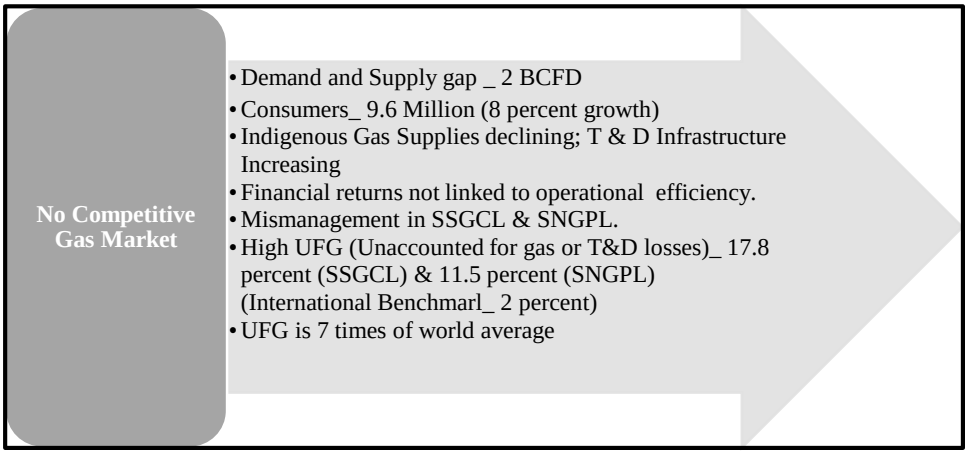


Source: Pakistan Energy Yearbook (various years)

Fig. 3: Gas Industry_ Facts and Issues

Gas Industry Facts

- SNGPL and SSGCL are integrated utilities (quasi monopoly).
- 40 per cent of their shares owned by private entities.
- They do not own gas molecules, therefore, not in competition with gas producers, unlike many in emrging gas markets.
- They buy gas from the well-head, transport and distribute gas under 10-25 years contract at prices , determined when E &P concessions were awarded.
- T & D fees relatively modest as compared to other gas markets, e.g., Brazil.



Source: PIDE (2020), Minhas (2020) and OGRA (2020).

LPG Supply and Demand

In FY2019, the total market demand for LPG was around 1061447 MT/ Annum. It is mainly supplied by 72 field plants (605025 MT/ Annum) followed by refineries (Attock, Byco, PARCO, PR, and NR), which supplied 191060 MT/ Annum. Around 265362 MT/ Annum of LPG were imported in FY2019 (Chart 24).

Mainly, LPG is consumed in the domestic sector and industries like textile, ceramic, steel, glass, edible oil, beverage, and chemical (Chart 25). LPG primarily supplies domestic fuel requirements, especially in natural gas-starved areas/ sectors and peak shaving times in urban territories. It is mainly consumed in the most populous province, Punjab (Chart 26).

Over the years, LPG consumption has increased by about 4 percent annually since FY2007. The share of the industry has grown over the years (Chart 27). The increase in demand is mainly caused by the shortage of natural gas availability, which is on the rise.

Chart 24. Percentage Share of LPG Supplies by Source FY2019

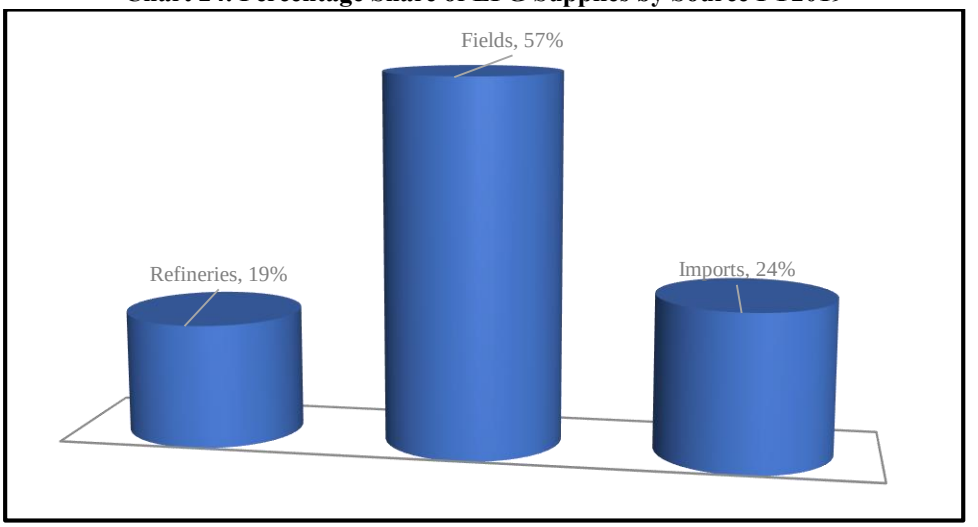


Chart 25. Sector-wise Consumption of LPG FY2019

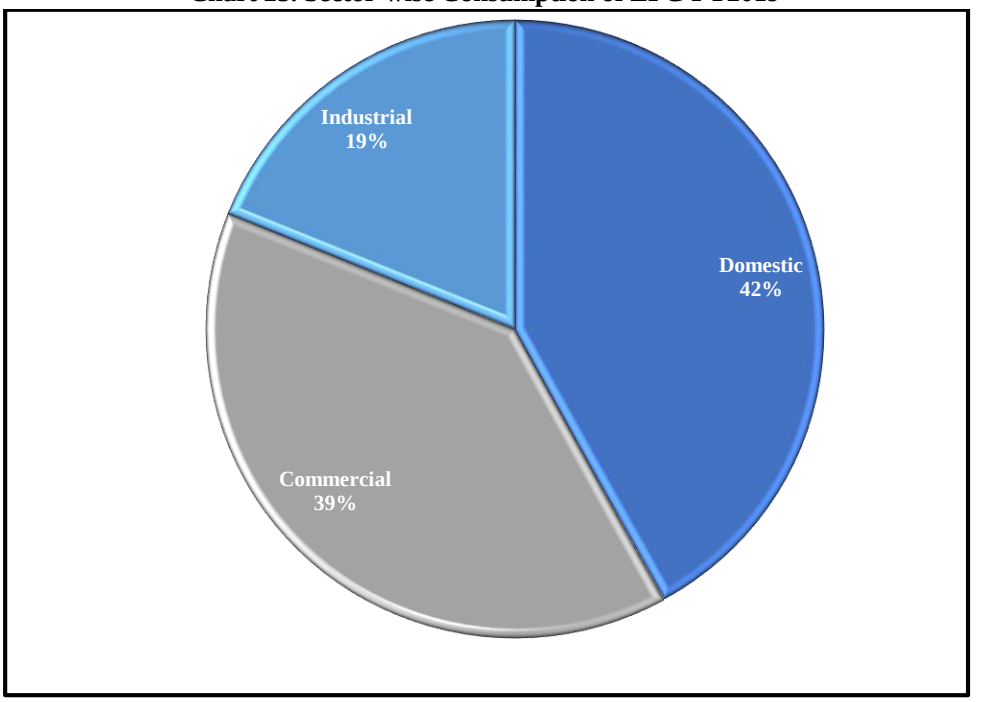


Chart 26. Province wise LPG Consumption FY2019

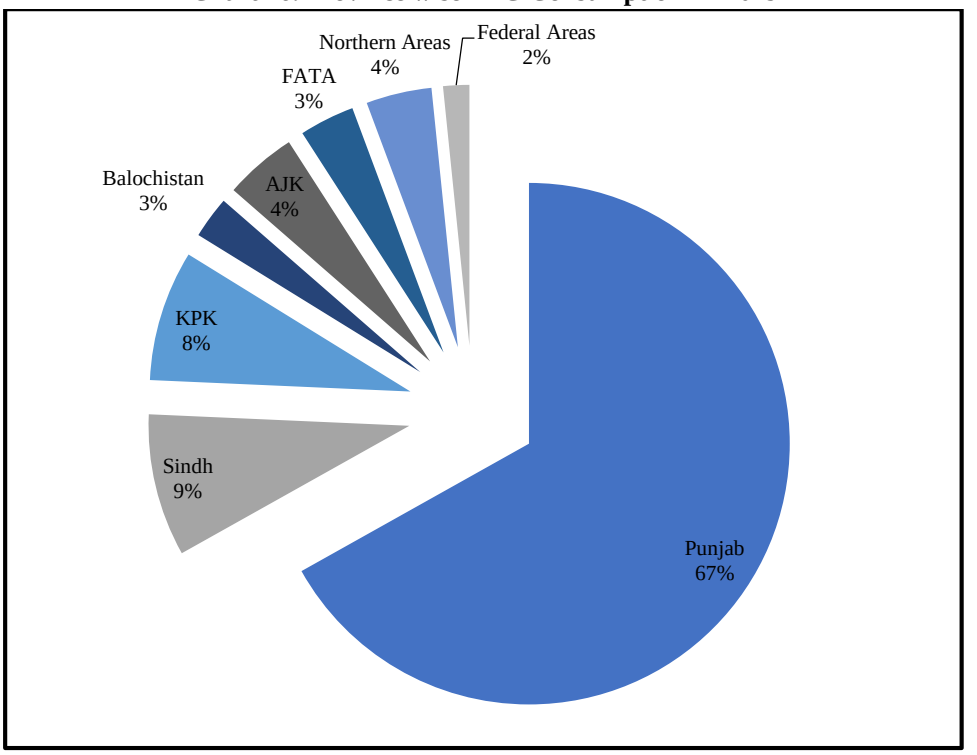
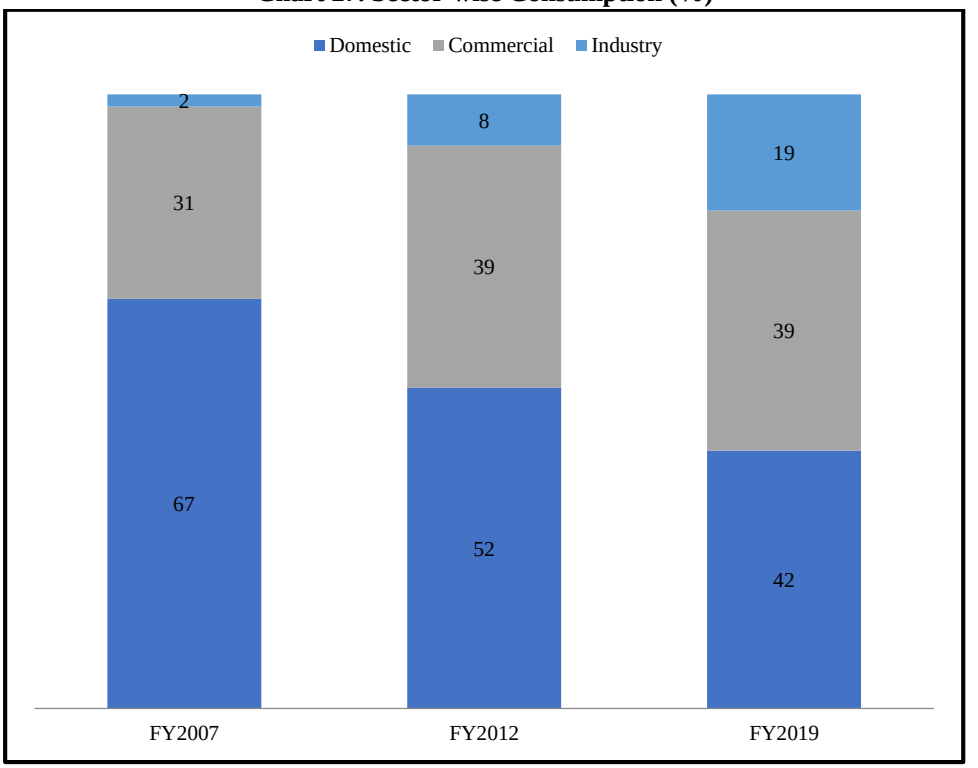


Chart 27. Sector-wise Consumption (%)



Source: PGRA State of Industry Report, 2018-19.

There are 12 LPG producers, 190 LPG marketing companies, having more than 5,500 authorised distributors (FY 2018-19). Each LPG marketing company has several 'Authorised Distributors' – authorised by OGRA to sell on behalf of the company.

LPG accounts for only 1.3 percent of the total primary energy supply in the country. This low share of LPG in the overall energy mix is primarily caused by supply limitations and the higher cost of LPG compared to other competing fuels such as natural gas and wood.

REGULATIONS AND POLICIES IN OIL AND GAS SECTOR

The Ministry of Energy, Petroleum Division (MEPD) under Regulations of Mines Act, Petroleum Policies and relevant Rules governs E&P activities in Pakistan. MEPD is a primary regulator.

Directorate General of Oil (DG Oil) regulates the crude oil sales to refineries and the sale of refined products such as diesel, petrol, kerosene oil, etc. by the oil marketing companies such as PSO, Shell, Total Parco, etc. Directorate General of Gas (DG Gas) regulates the gas sales to Sui Northern Gas Pipelines Company Limited (SNGPL) and Sui Southern Gas Company Limited (SSGC).

Oil and Gas Regulatory Authority (OGRA) regulates midstream and downstream activities in the oil and gas sector. Some of the regulatory and policy features are outlined in Box 4 and Box 5.

Box 4. Regulations

- MEPD allocates gas from gas fields and imports after approval from ECC.
- First right to buy crude/ condensate from the upstream E&P is with the GOP.
- GOP nominates a refinery.
- The GOP has the first right to purchase all gas produced in the country (directly or indirectly) through govt.-controlled companies (SNGPL, SSGCL). SSGCL and SNGPL overregulated.
- LPG (locally produced) can be sold to LPG distribution companies, which are licensed by the Government.
- Selling price (crude oil, condensate & gas) is stated in the relevant contract with Government_ it is linked to the international crude oil price.

Box 5. Policies

- Under the 1948 Regulations of Mines and Oil Fields & Mineral Development Act, the GOP has regularly issued uninterrupted petroleum policies, starting from 1991.
- The main modification in policies relates to prices, return on investments and fiscal incentives.

Latest 2012 (amended 2020)

- Aimed at attracting private investors (local & international).
- Granting of Petroleum Exploration Licences for entering into petroleum concession agreement (PCA) or production sharing agreement (PSA) concerning onshore and offshore blocks offered through competitive bidding.
- Granting of licence for PCA or PSA without competitive bidding to Strategic Partner Companies (govt. to govt. basis).
- 2018 gas allocation policy: domestic and commercial sectors (1st priority) followed by power and zero-rated industry (2nd priority); general industry, fertiliser, and captive power (3rd priority); cement and its captive power (4th priority); and CNG (5th priority).

CHALLENGES AND OPPORTUNITIES IN OIL AND GAS UPSTREAM

Basin studies suggest the total oil resource potential of 27 billion barrels and total gas resource potential of 282 trillion cubic feet (Abbasi, 2018). The issue lies with the government, they lack commitment. Not only the well-head prices, but too much government interference is creating hurdles in upstream exploration and production activities (Sattar, 2020).

Figure 4 Challenges and opportunities in the Upstream

Challenges

- High taxes_ withdrawal of many tax exemptions and new taxes at the import stage_ SROs.
- Government's role/ rules in SOCs hinders growth.
- SOCs hesitate in investing in new technologies_ fear of bureaucracy and NAB.
- PEPRA rules focus on the cheapest source, quality of the product not taken into account.
- Circular debt in power sctor_ consequent tighter cash flow affects companies' liquidity and ability to invest in technology & development of wells.
- Political instability.
- Discontinuation of oil and gas drilling activities_ COVID -19.
- Security Protocols_ difficulty in O& G drilling activities in Baluchistan & KPK.
- Long civil trials with no clear outcome are discouraging_ small companies facing litigations relating to the interpretation of contract terms and taxes.
- High cost of doing business.
- Discriminatory share of certain companies_ preference to western investors.
- High administrative costs_ several audit proceedings and long bureaucratic procedures are discouraging.

Opportunities

- Concessionary import duty of 5 percent for the E & P industry for items not manufactured in Pakistan_ SRO 678(1)/2004.
- Public-private partnerships_ foreign companies are allowed to work with public limited exploration E &P companies (OGDCL, PPL, MPCL and POL).
- Chinese investors have 'price' advantage over Western competitors in various bidding processes.
- Improved security situation on Western borders_ attracted investments in mega projects, CPEC.
- Geological surveys confirm vast potential reserves with potential estimated at 300 TCF versus the 54 TCF discovered so far. Baluchistan has large areas still unexplored, especially in the frontier.

Companies also exploiting; they bid for blocks but do not start work on them. Government has clauses in the contract that can penalise or take back blocks but has never really enforced these and not taken one back in decades. The attitude of companies in the upstream sector explains regulatory weaknesses in the oil and gas sector.

KEY TAKEAWAYS

- Despite increasing focus on renewables, oil and gas will remain significant for the energy matrix of Pakistan. Pakistan has vast oil and gas resources (yet to be discovered). For the exploitation of these resources, we need a robust regulatory infrastructure in place. A single regulator across the supply chain can deal with issues more effectively.
- Despite private participation, state dominance is prevalent in the oil and gas sectors. Too much government interference in the company activities creates hurdles in the company's/ industry's growth.
- The free market is the only solution_ with equal opportunities for all participants.

- Improvement in energy productivity_ decoupling of energy and economy is indispensable for Pakistan. We need a more transparent and targeted approach to increase energy productivity in all sectors.
- An effective regulatory apparatus must be in place to minimise gas leakages in the supply chain. There is a need for market-based pricing to curtail misuse.
- In the oil sector, there is an urgent need to expand our strategic stock capacity.

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