Distribution | Gas

Sector Study

June 2022

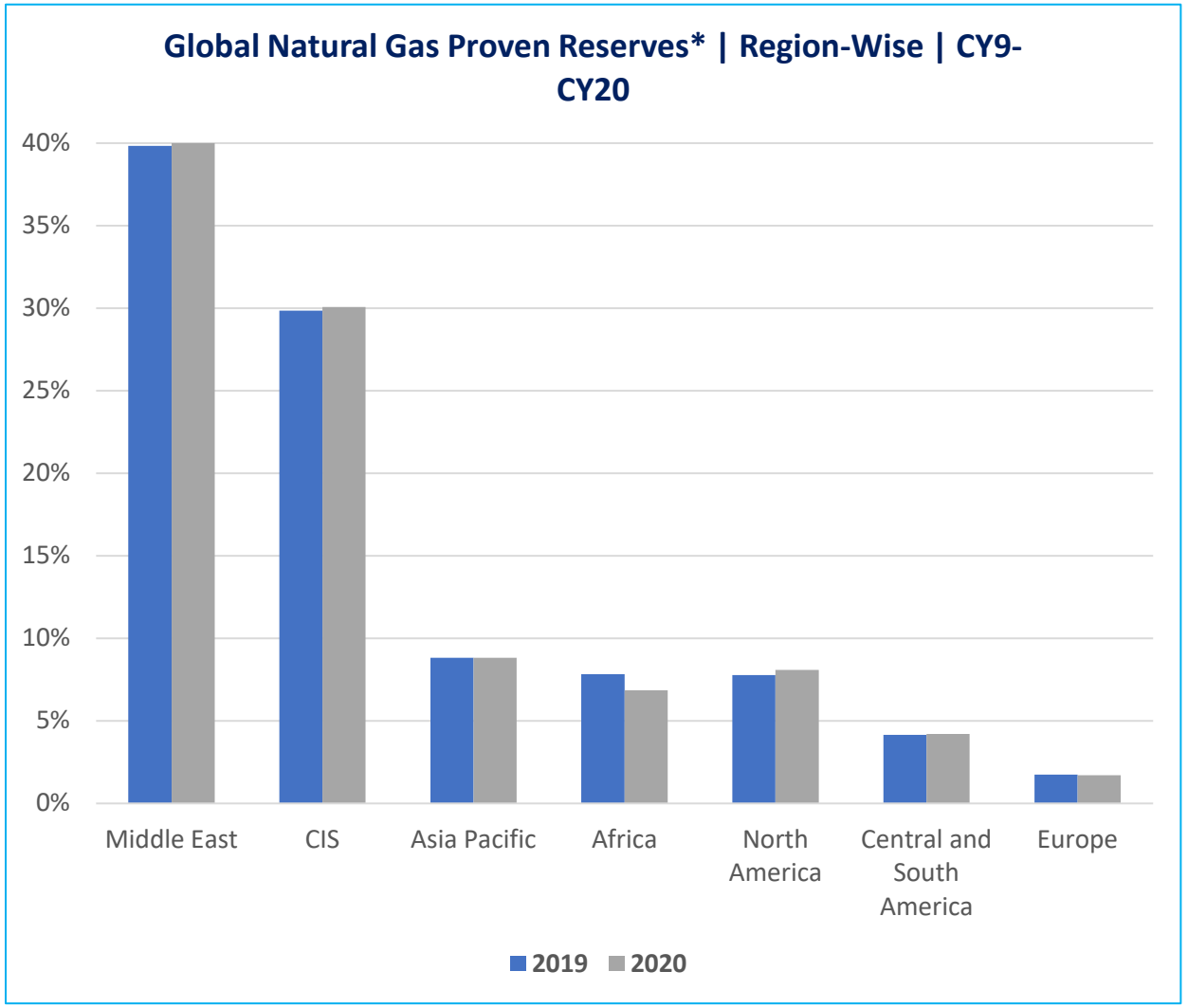
Table of Contents

Table of Contents

Distribution | Gas

Global Overview | Proven Reserves

- Proven reserves are estimates of the volume of oil and natural gas which geographical and engineering data demonstrate to be recoverable from known reservoirs under existing operating and economic conditions.
- The world's natural gas reserves are not distributed evenly. Nearly half of the proven gas reserves are situated in Middle East.
- On a country level, the Russian Federation, Iran and Qatar have the largest proven natural gas reserves comprising ~20%, ~17%, ~13%, respectively, of global reserves. It is pertinent to note that Europe (excluding the CIS region - Russian Federation, Turkmenistan, Azerbaijan, Kazakhstan, and Uzbekistan) has the lowest share of proven gas reserves comprising ~2% of the global share only.
- Comparing the size of reserves, natural gas reserves fell ~by 1.1% from CY19 to CY20 largely attributable to lower gas prices which caused reserve operators to revise proven reserves estimates downwards and scale back development plans for new wells.

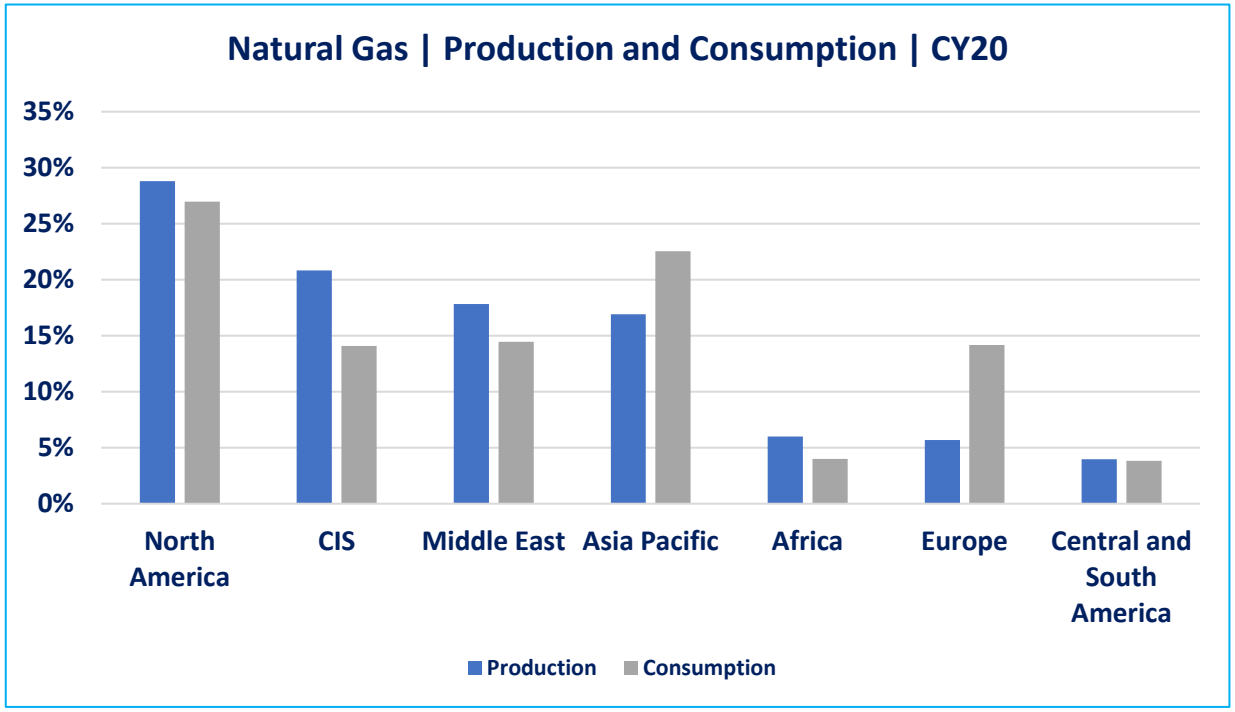


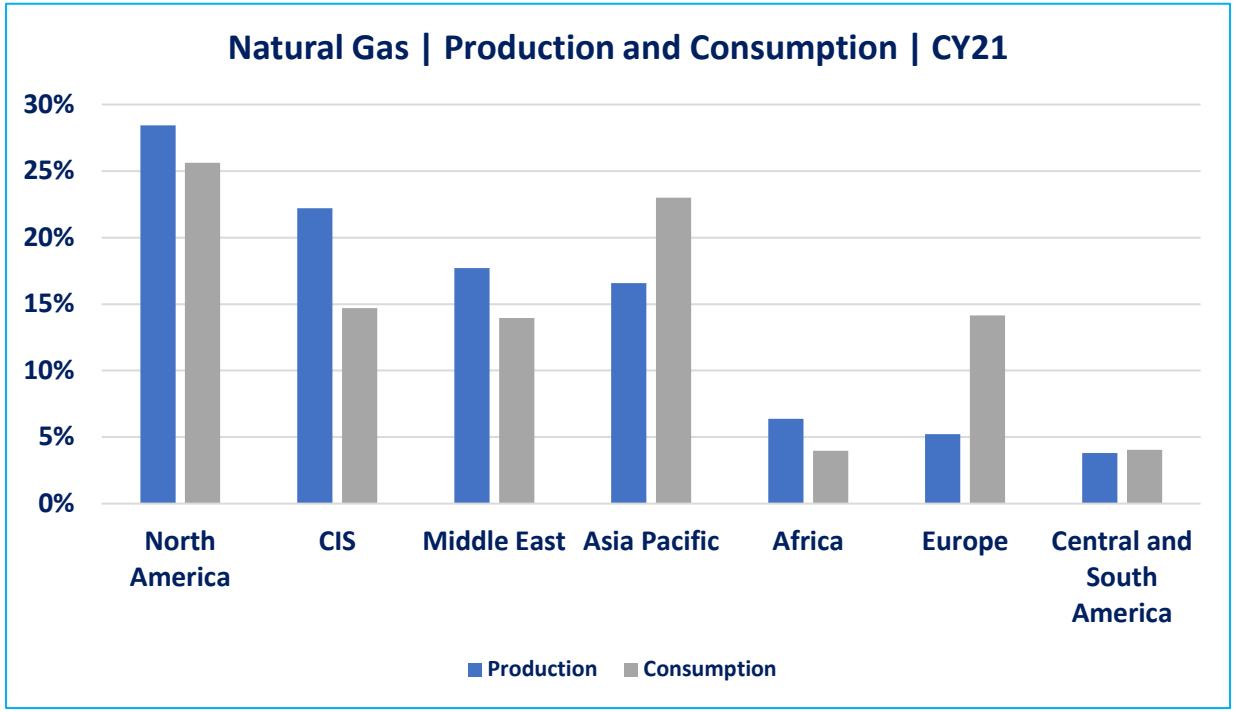
*Data is available for CY20.

Source: eia.gov, BP's Statistical Review of World Energy 2021

Distribution | Gas

Global Overview | Production and Consumption



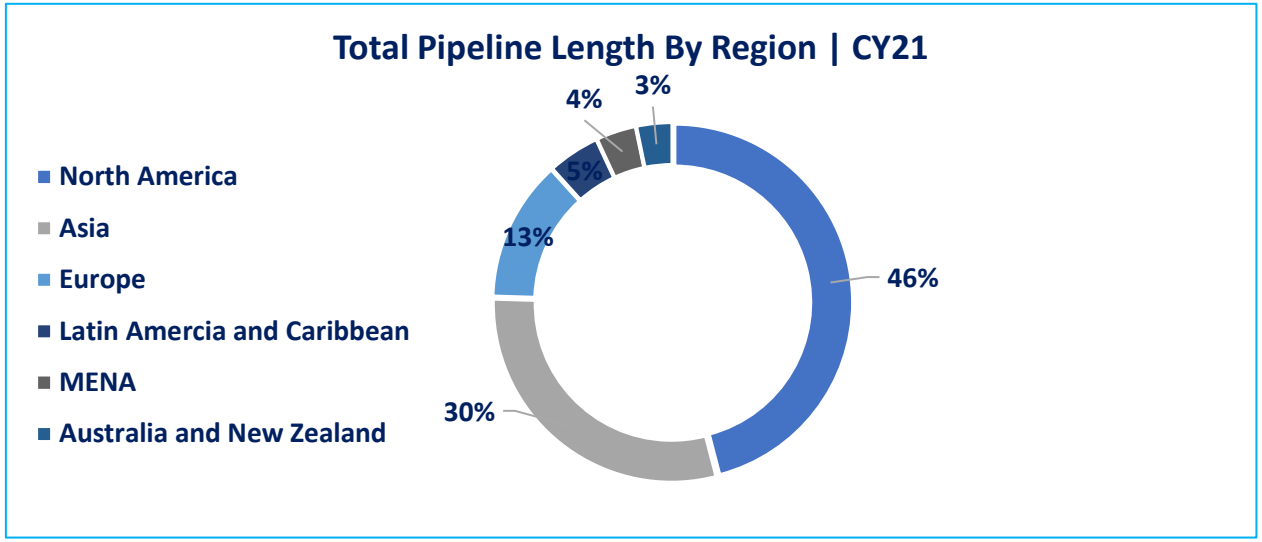


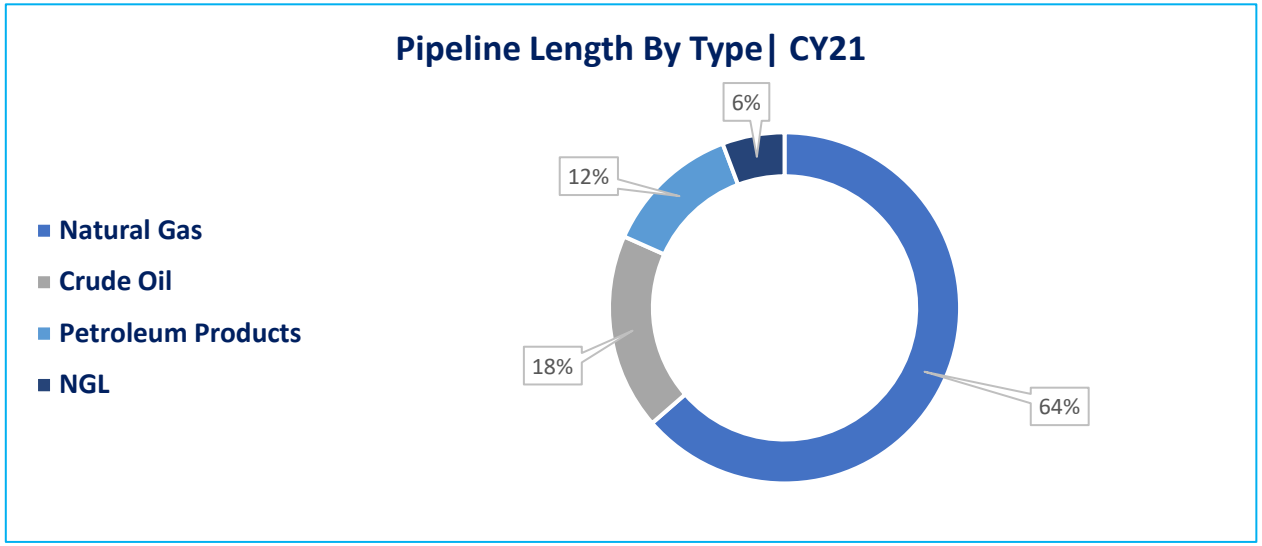
- Natural gas consumption increased by ~6% YoY in CY21 (CY20: ~-2%). On a regional level, in CY21, the highest consumption growth was observed in CIS and (~11.4%) followed by Central and South America (~11.3%). The lowest consumption growth was observed in North America (~0.8%).
- The top four consumers of natural gas were US, followed by Russia, China, and Iran (CY21 consumption: ~827; ~475; ~379; and ~241 bln cubic metres, respectively). Growth in consumption was driven by economic (post-pandemic) recovery and a succession of extreme weather events.
- Global production increased by ~5% in CY21 (CY20: ~-3%). The growth level in CY21 was still The top two producers of natural gas, US and Russian Federation, with a global production share of ~23% and ~17% witnessed a rise in production of ~2.3% and ~10.4%, respectively. Russia reached its highest production output since 2008 and this was fueled by greater domestic demand, to a larger extent, and exports, to some extent.

Source: BP's Statistical Review of World Energy, 2022, spglobal.com

Distribution | Gas

Global Overview | Pipeline Lengths





- Demand for global oil is expected to rise to ~101mln barrels per day (bpd) in CY23 from the ~100mln bpd. Consumption for FY22 was recorded at ~99mln bpd. In a bid to meet the rising consumption of oil and gas, the pipeline capacities are being expanded, and new pipeline projects are being commissioned.

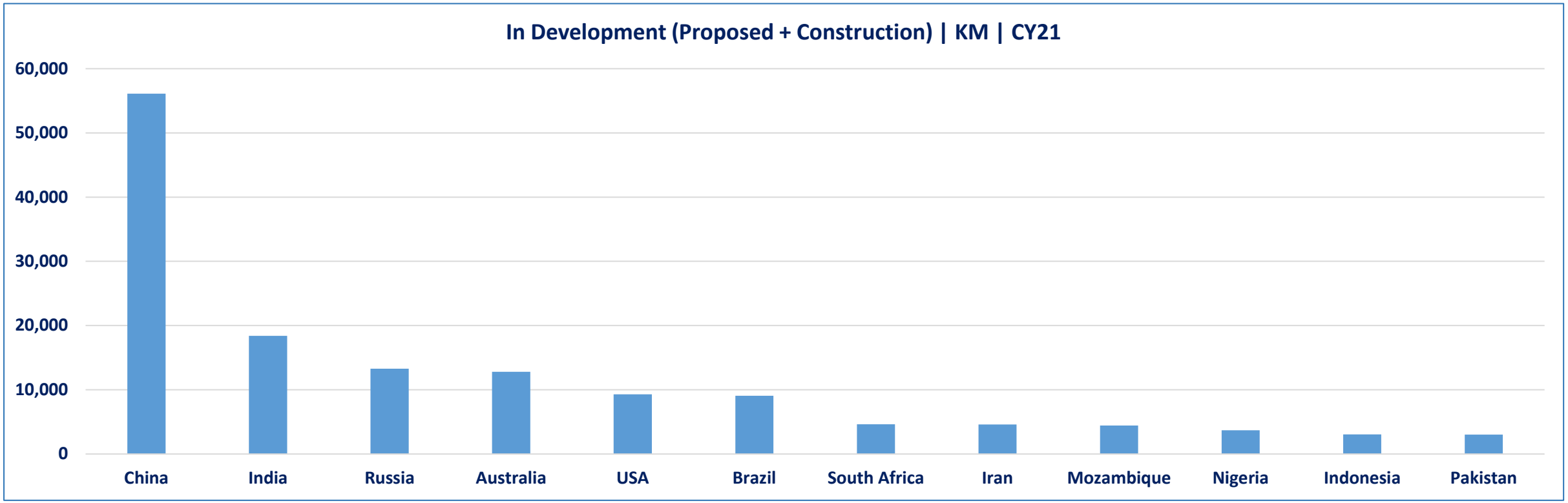
- However, the global shift towards renewable sources for electricity generation poses a huge threat to the demand for oil and gas, which is likely to be a major challenge for the growth of oil and gas pipeline installation in the coming years.

- The total length of the operating global gas trunk/transmission pipeline network is ~924,786km. Globally, North America has the longest gas trunk/transmission pipeline network of ~418,631km followed by **A**sia of ~269,112km and Europe ~116,899km.

Source: off-shore Technology, globalenergymonitor.org

Distribution | Gas

Global Overview | Pipelines In Process | Country Wise

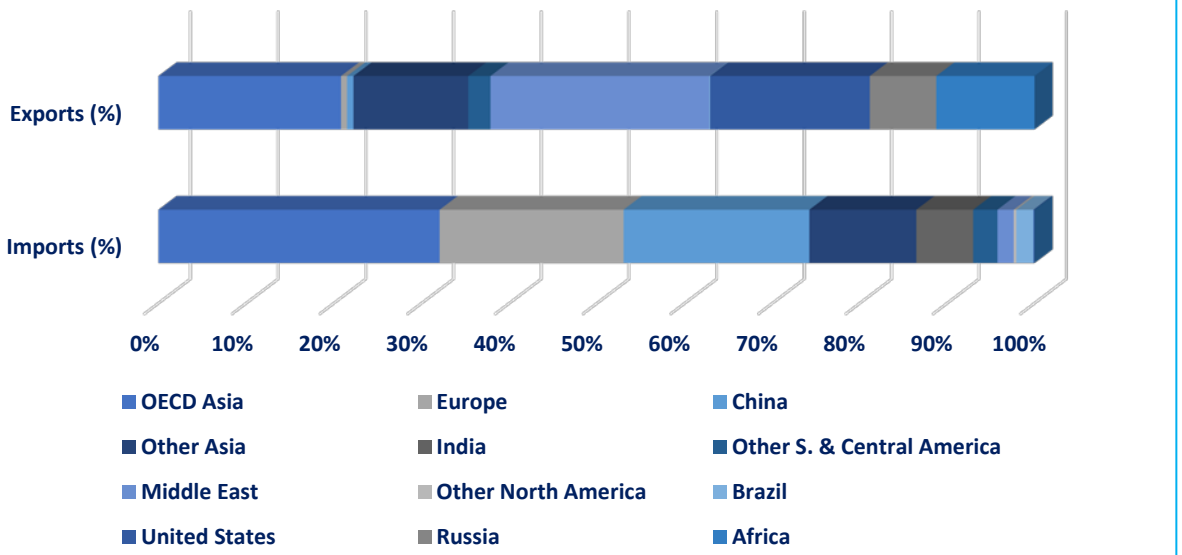


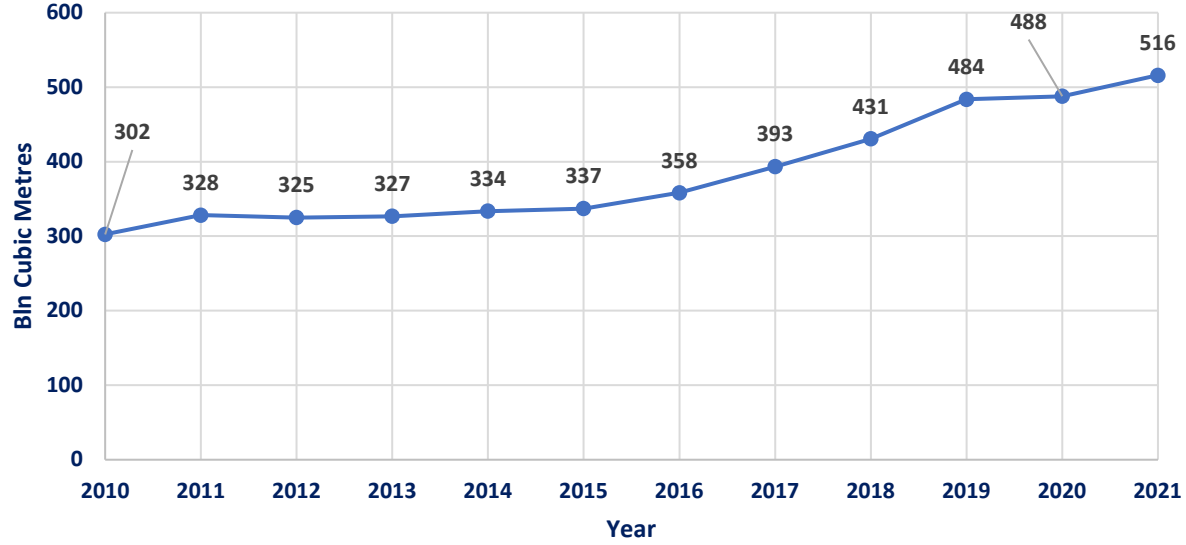
- Natural gas pipelines have an average useful life of 50 years.
- Gas pipeline projects, planned and under construction, have the highest length in the world. China and India are currently in the process of expanding their existing pipeline network by ~56,120 km and ~18,900 km, respectively, based on their proposed and under construction development plans.
- In terms of operating gas pipelines, the USA has the longest pipeline of ~34,100 km. Russia ranks second at ~112,000km; China at third with a ~87,360km operating infrastructure and Central African Republic at fourth at ~61,000km.

Source: globalenergymonitor.org

Distribution | Gas

Global Overview | Trade





- OECD Asia is the largest LNG importer while China and Europe (excluding Russian Federation) are the second and third largest, respectively (share of world imports: ~32.1%, ~21.2%, and ~21.0%, respectively).
- The top exporter in CY21 was the Middle East (share: ~25.1%) followed by OECD Asia (share: ~21.0%).
- At a country level, Australia and Qatar were the top LNG exporters in CY20 (share: ~21% each) followed by the US (~18%) and Russian Federation (~8%). LNG trade between US and Europe increased in CY21 and Europe (excluding Russia) received ~32% of its LNG supply from the US.
- In CY21 LNG trade grew by ~5.6%, a much slower rate compared to historical rates (SPLY: ~1%). Tight supply, caused both by LNG capacity outages and upstream underperformance, was a major reason. The IEA states that some of these issues were due to unplanned factors and disruptions in maintenance schedules caused by COVID-19 in CY20.

Source: BP's Statistical Review of World Energy 2022, iea.org

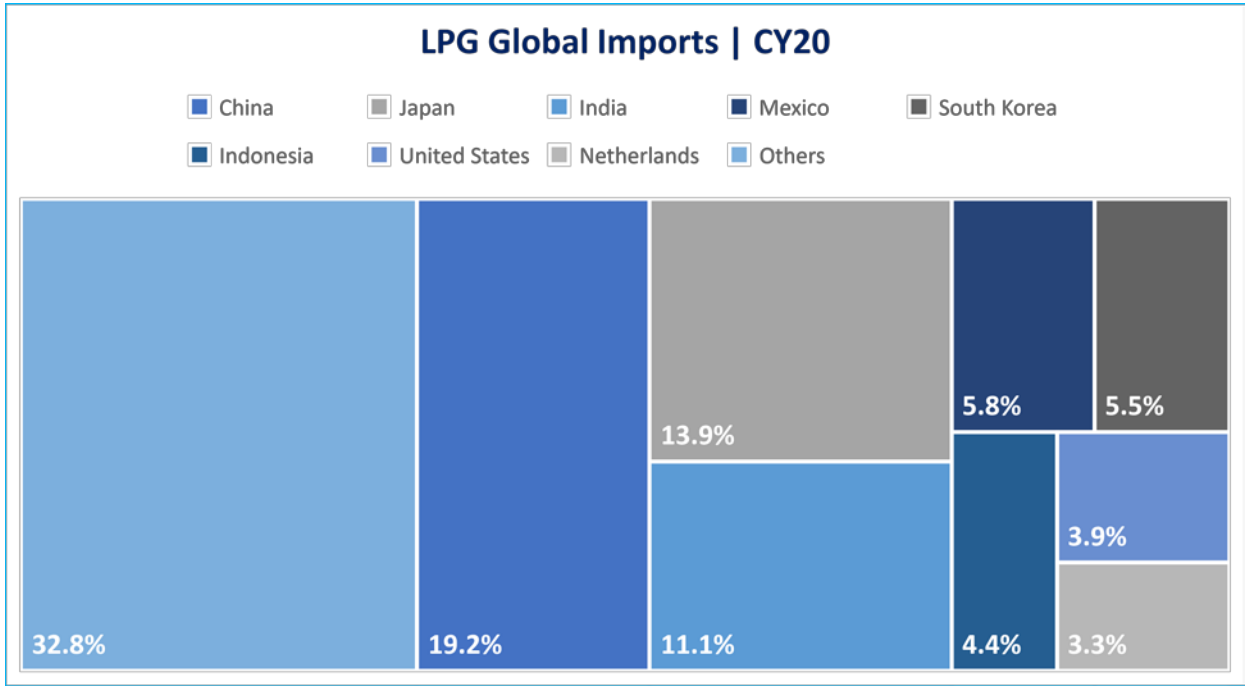
Distribution | Gas

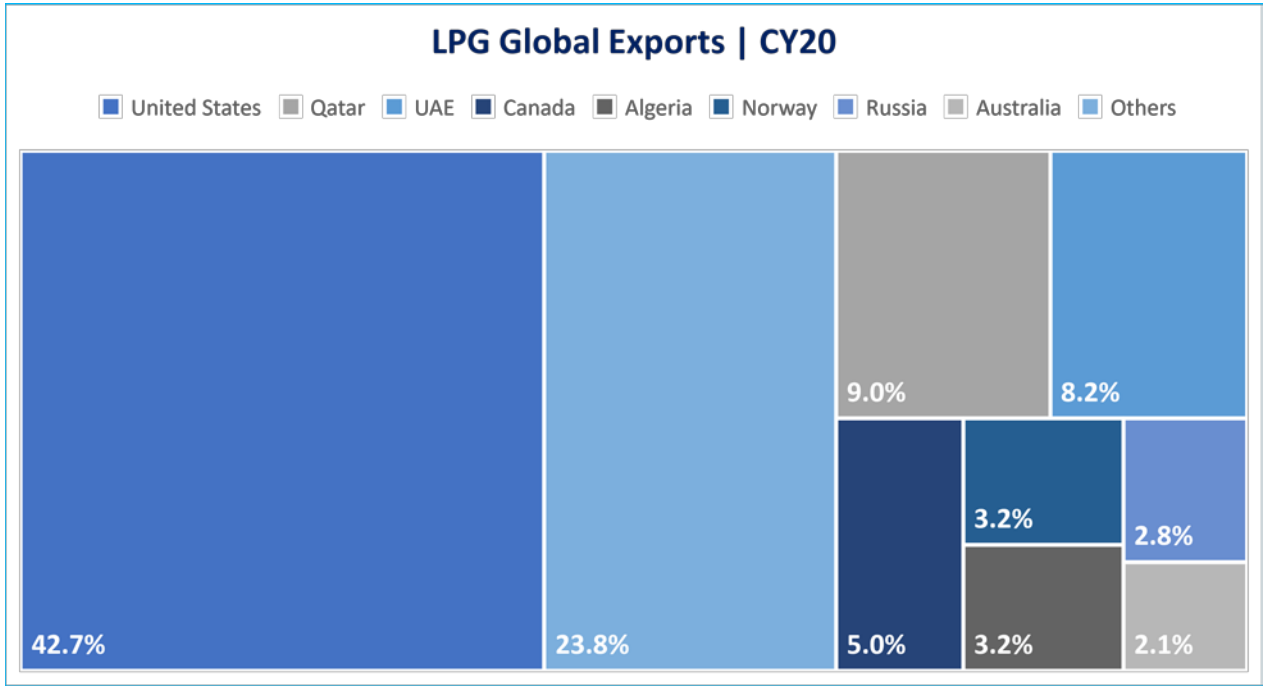
Global Overview | LPG

- Liquified petroleum gas (LPG) is a family of light hydrocarbon gases. The gas is a derivative of two industries: crude oil refining and natural gas processing.
- LPG is gaseous at normal room temperature and pressure and liquifiable under reduced temperature and moderate pressure.
- Natural gas drawn from the earth is a mixture of several gases. Methane, sold as natural gas by utility companies represents ~90% of this mixture. ~10-15% is represented by propane while the remaining ~5% is other gases such as butane and ethane.
- Prior to transportation, the heavier portion of natural gas (the non-methane portion), is separated out.
- ~60% of world's LPG is produced from natural gas and the remainder from crude oil.
- In crude oil refining, LPG is the first product produced prior to the more heaver fuels (diesel, jet fuel, fuel oil, and gasoline).

Source: SSGC LPG

Global Overview | LPG Trade





- Global LPG supply was not severely affected in CY20 compared to other fuel sources because of the heavy reliance of the energy commodity as an input in the residential cooking sector and as feedstock in the petrochemical sector.
- Between CY19 and CY20, LPG exports declined to USD~27.4bln (growth rate: ~-9.0%). One of the reasons for this was a flat demand in majority of the countries around the world except for India and China which reported a rise in consumption of ~0.9% and ~3.9%.
- Growth in China's petrochemical sector while heightened demand for cooking and heating fuel in India were the main drivers of import growth in the two nations.
- The US is the largest global LPG exporter (share: ~42.7%). In March CY22, the YoY increase in US LPG exports was ~24%.

*Data is available till CY20

Source: oec.world

Distribution | Gas

Industry Snapshot | Local

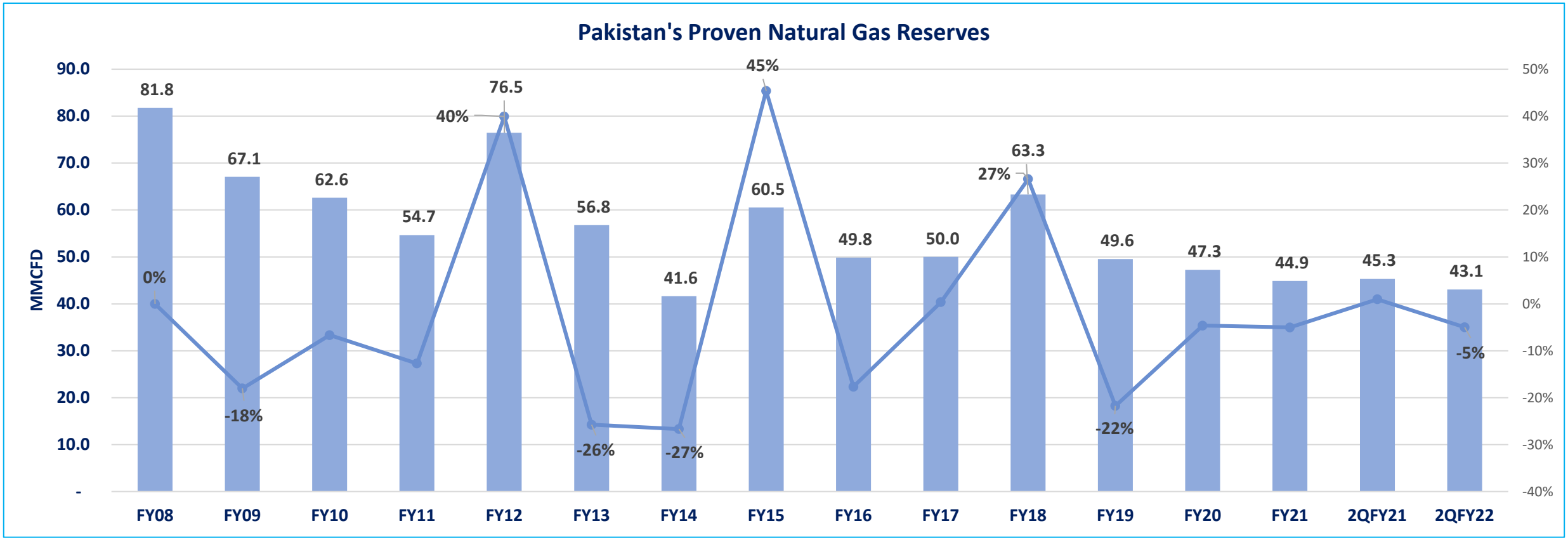
- Natural gas is a clean, safe, efficient and environment friendly fuel. In the 9MFY22 period, indigenous gas contributed ~33% (SPLY: ~35%) to the primary energy supply mix of the country, witnessing a decline of ~6%.
- Pakistan has an extensive gas network of over ~13,513km transmission, ~155,679km distribution and ~41,231km services gas pipelines to cater for the requirement of more than ~10.7mln connections across the country.
- Production of natural gas from indigenous resources is decreasing. Thus, to bridge the supply demand gap, Pakistan's reliance on imported Re-gasified Liquified Natural Gas (RLNG) has been increased in recent years. At present, the capacity of two Floating Storage Regasification Units (FSRU) for RLNG is more than 1,200MMCFD.
- The average natural gas consumption during 9MFY22 was ~32.5mln tons (SPLY: ~33.9mln tons) including ~7.9mln tons of RLNG (SPLY: ~ 8.7mln tons). During FY21, the two gas utility companies (SNGPL & SSGCL) had laid a 67km gas transmission network, ~3,244km mains and ~829km services lines.

Particulars	FY21	9MFY21	9MFY22
Consumption Gas (mln tons)*	36.6	34.0	32.5
Local Sales (mln tons)*	28.8	25.3	24.7
RLNG Imported (mln tons)*	8.1	8.7	7.9
Structure	Regulated & Oligopolistic		
Length of Transmission Lines (km)	13,315**	13,315	13,513
Length of Distribution Lines (km)	149,715**	149,715	155,679
Total Number of Connections (mln)	10.3**	10.3	10.7

*Numbers have been converted into Tons of Oil Equivalent
**9MFY21 Numbers

Source: Economic Survey MOF, PBS, SNGP, SSGC

Pakistan's Proven Gas Reserves

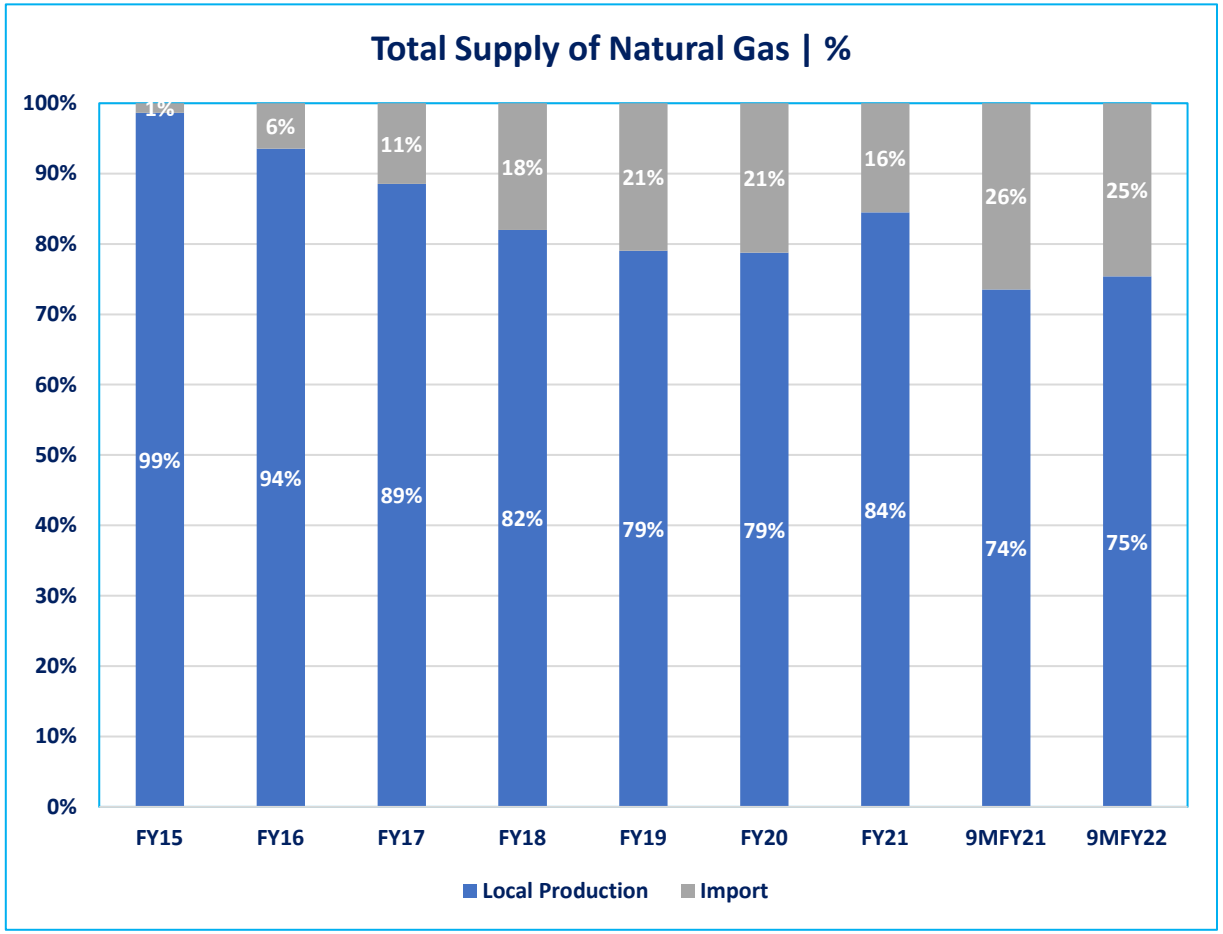


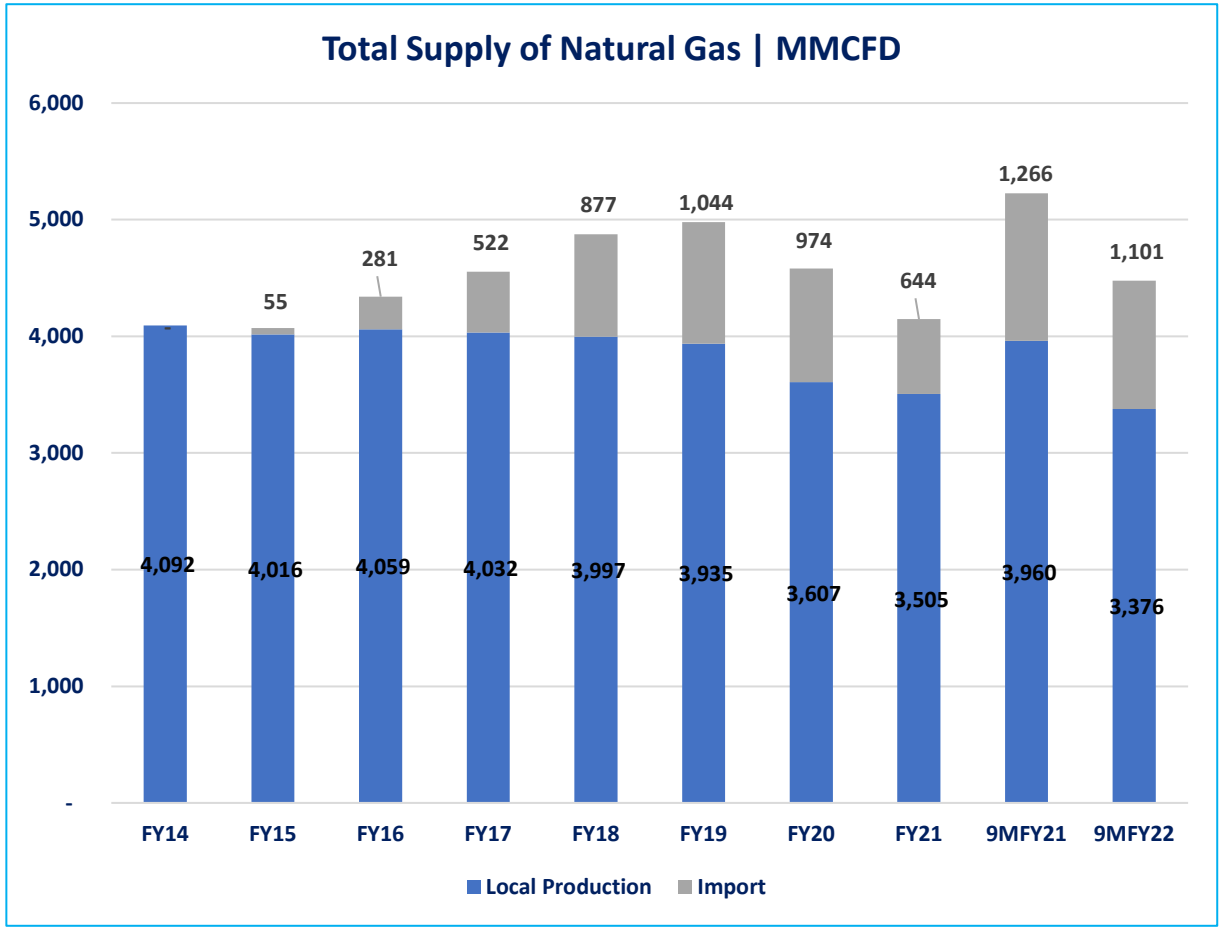
- Pakistan's proven natural gas reserves have been on a decline owing to a lack of substantial discoveries. Between FY08 to FY21, natural gas reserves have declined by ~45%.
- Between 2QFY21 and 2QFY22, the decline in reserves was ~5%.

Source: OGDCL Investor Presentations

Distribution | Gas

Supply Side Overview



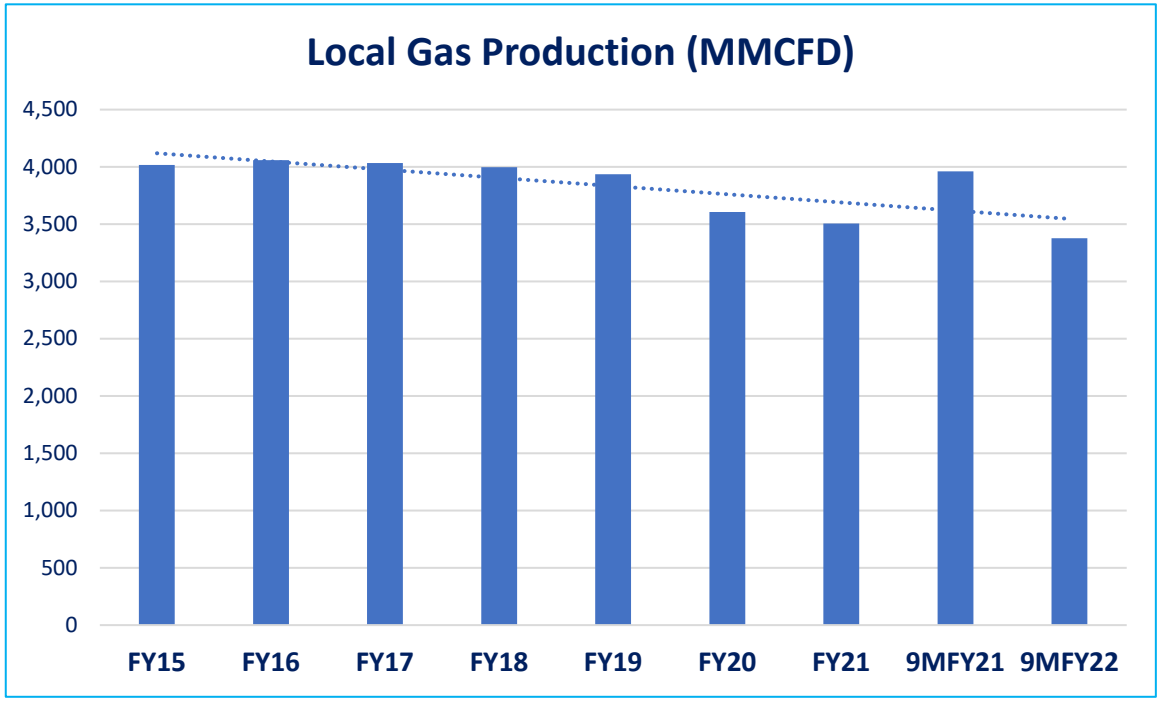


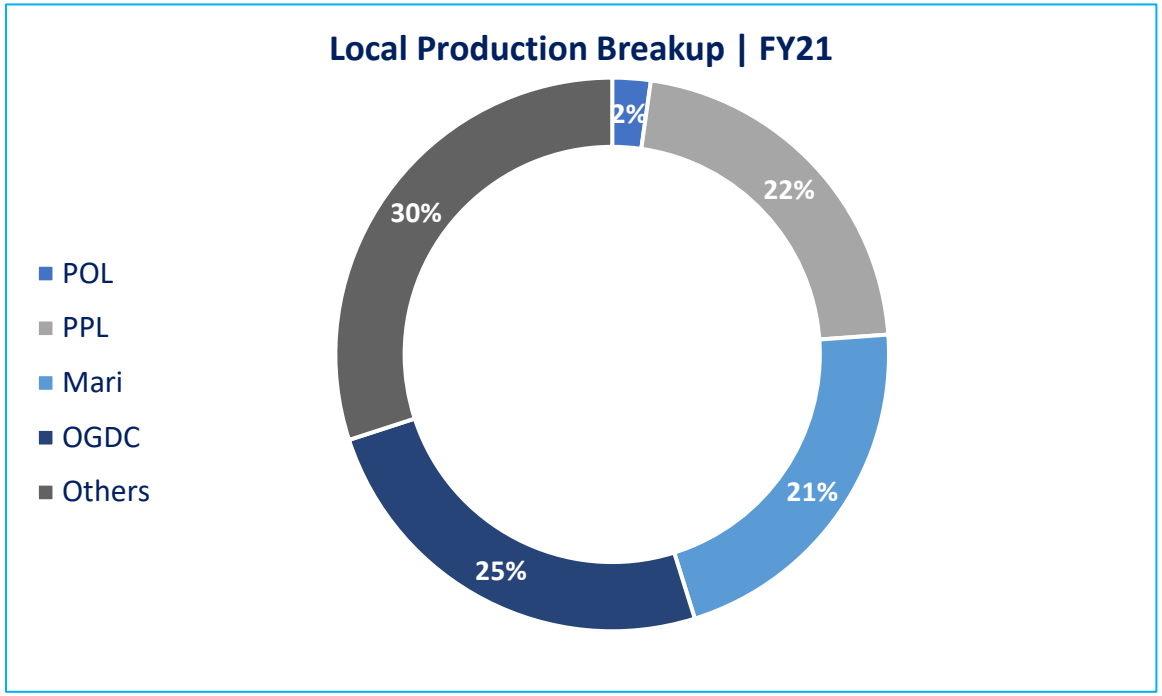
- Pakistan first imported LNG in FY15. Overall share of imported gas in the country's total gas supply is on a rising trajectory. With depleting gas reserves and rising demand, the share of imported gas is expected to go up, in the absence of any major reserve discovery.

Source: Economic Survey, 2021-22: MO

Distribution | Gas

Supply Side | Gas Local Production



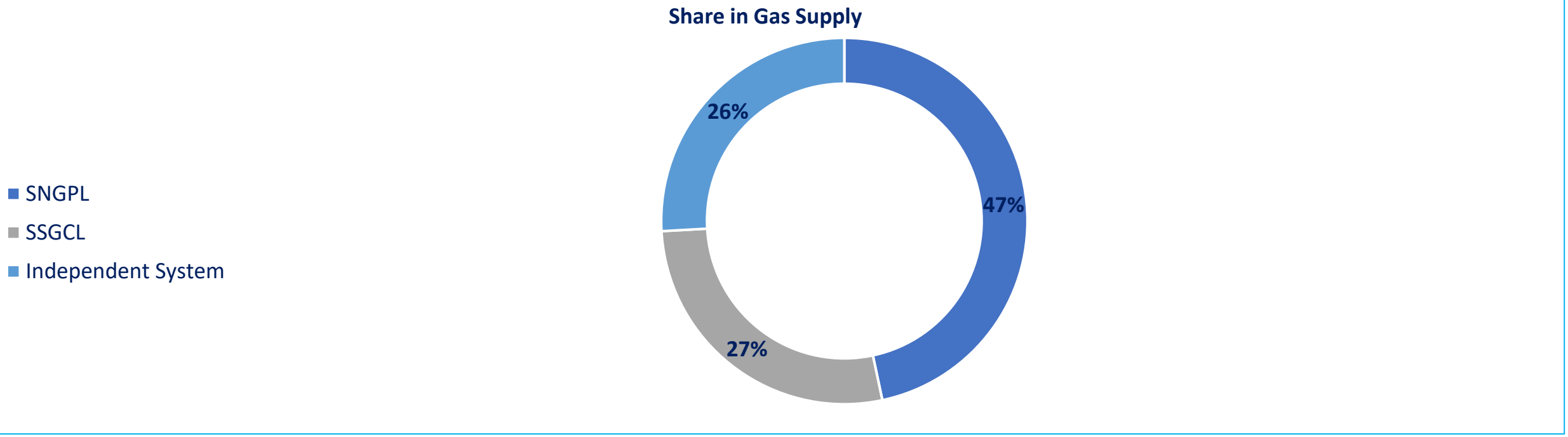


- In the absence of big gas discoveries, the natural gas reserves of Pakistan are declining and estimated at ~43.1MMCFD as at 2QFY22. Local natural gas production is also declining. During 9MFY22, local natural gas production drastically reduced to ~3,376MMCFD from ~3,960MMCFD SPLY with a YoY decline of ~15% owing to depleting gas reserves from the existing fields. Moreover, the production during FY21 was recorded at ~3,505MMCFD (FY20:~3,607MMCFD). In addition, local gas exploration firms have failed to announce any major discoveries in the past two years.

- Oil and Gas Development Company (OGDC) is the largest gas producer in the country with a share in total gas production of ~25% followed by Pakistan Petroleum Limited (PPL) and Mari Petroleum (Mari) with a share of ~22% and ~19%, respectively.

Source: Economic Survey MOF, Companies' Financials

Supply Side | Natural Gas Distribution Market

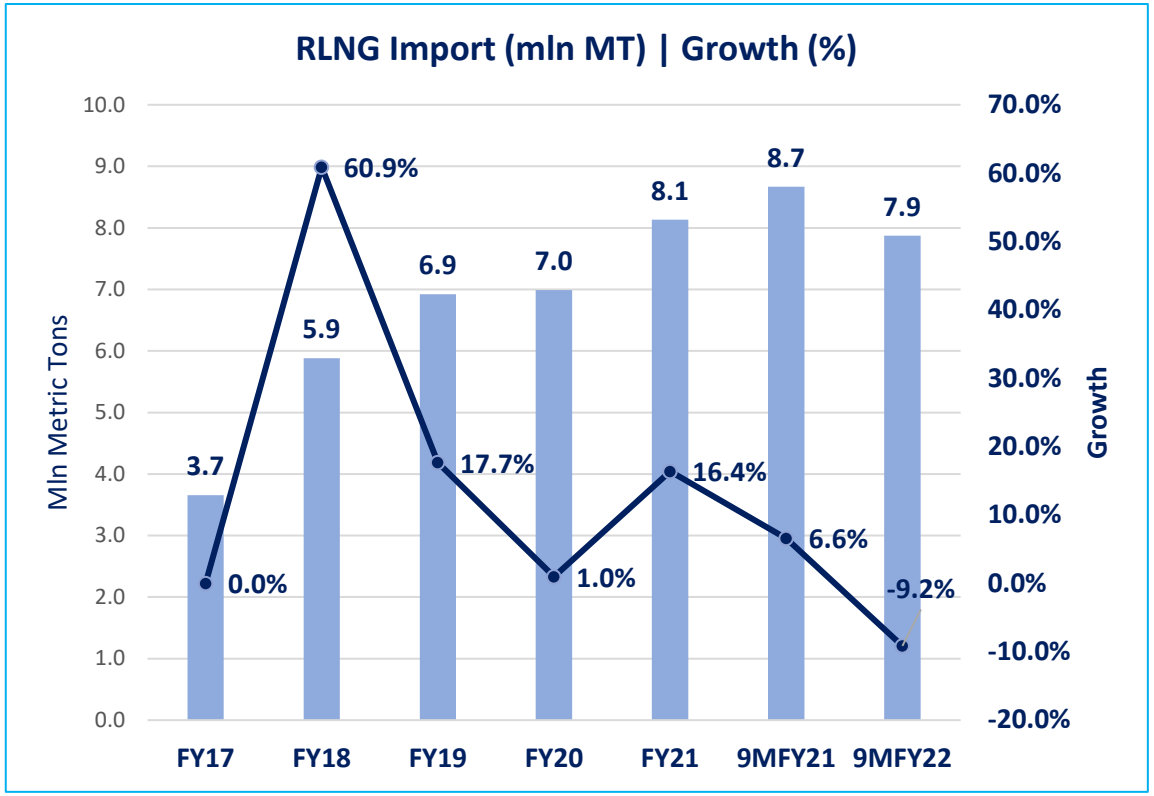


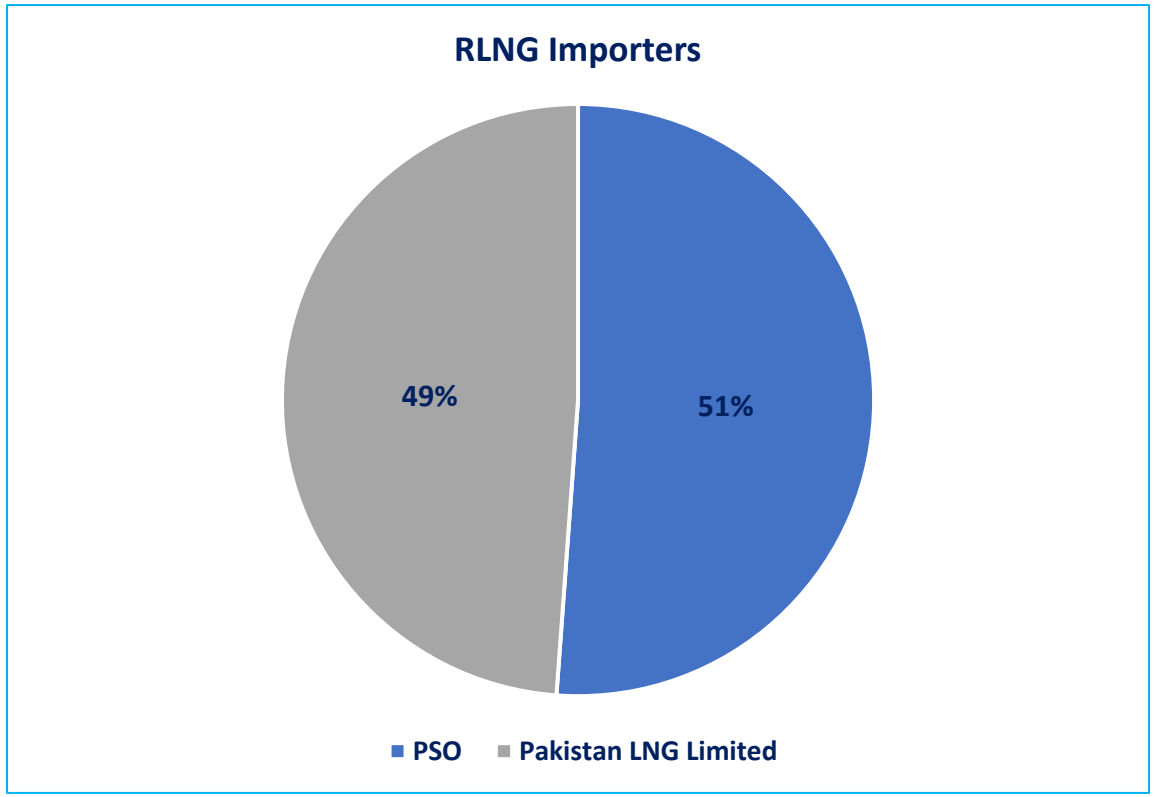
- The two Government owned gas utilities, SNGPL and SSGC, have a significant share of ~73% in total gas supply to consumers in the country.
- Meanwhile, Independent system comprises consumers having direct arrangements with gas producing companies since they receive natural gas through dedicated pipelines or through virtual networks including containers.

Source: OGRA: Pakistan Petroleum Industry Report

Distribution | Gas

Supply Side | RLNG Import





- Amid rising energy demand and low local production, Pakistan started RLNG imports in FY15 to bridge the rising supply and demand gap.
- RLNG import decreased by ~-9.2% in 9MFY22 compared to the SPLY.
- Moving forward, the import of RLNG is playing a crucial role Pakistan's energy sector. The demand is expected to increase further on the back of ever increasing demand of energy in the country. Due to low domestic capacity, imports are crucial to make up for the shortfall.
- PSO and Pakistan LNG have approximately equal market shares.

Source: Economic Survey MOF, PPIS, Companies' Financials

Supply Side | LNG Operators

- According to LNG Policy 2011, the license for LNG related activities can be classified into the following categories:

Integrated Project Structure: in which the terminal developer arranges LNG imports as well as arranges its own buyers.
Unbundled Project Structure: in which the terminal developer, LNG importer and LNG buyers are different.

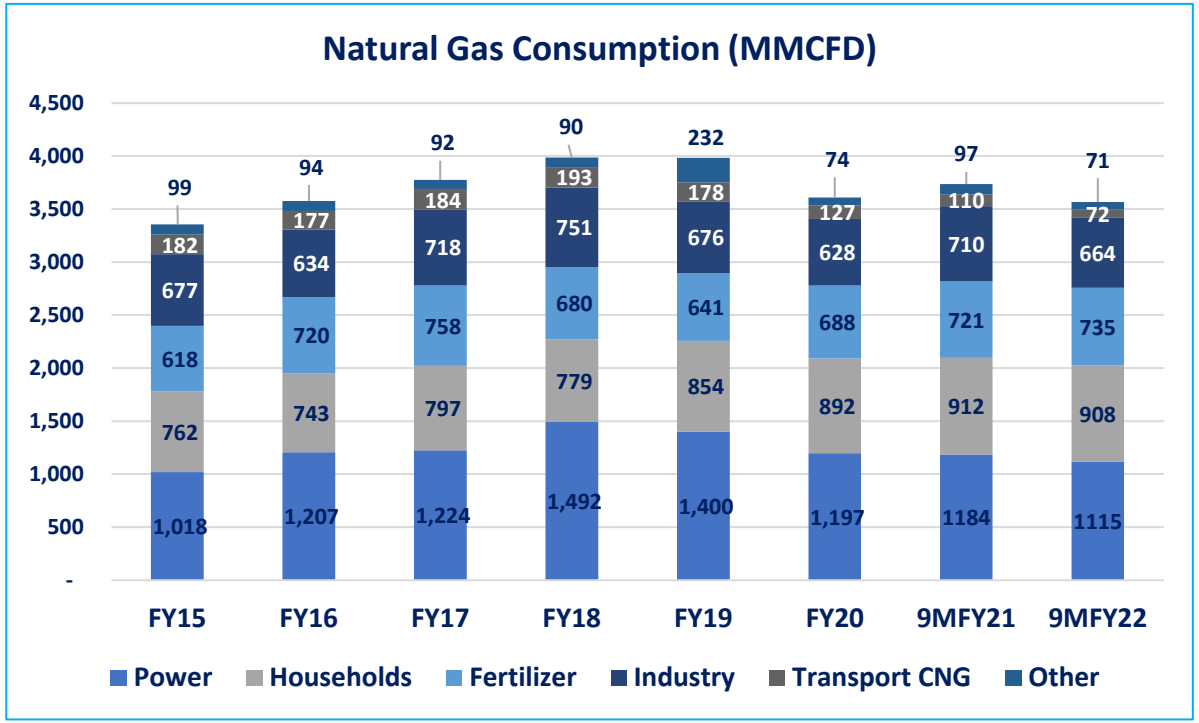
- As of May 2021, the detail of import licenses issued by OGRA for LNG related activities to privately owned entities are as follows:

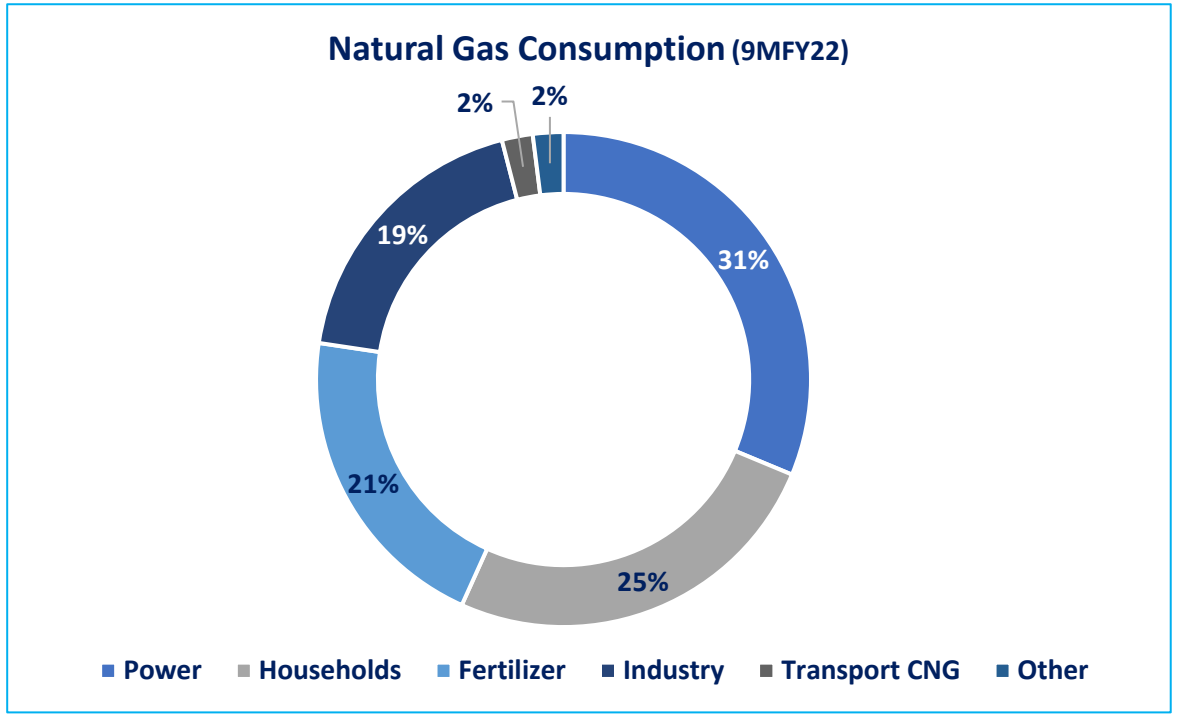
Name of Developer	Type of License Issued	License Issuance Date
Engro Elengy Terminal Limited (EETL)	Unbundled Project Structure Operation License of LNG Receiving Terminal at Port Qasim, Karachi. Regasification Capacity: 600-690 MMCFD	March 18, 2016
PGP Consortium Limited (PGPCL)	Unbundled Project Structure Operation License of LNG Receiving Terminal at Port Qasim, Karachi. Regasification Capacity: 600-750 MMCFD	Apr 03, 2018
Global Energy Infrastructure Pakistan Limited & Global Energy Infrastructure Limited (GEIP/GEIL)	Integrated Project Structure	(Construction license till) March 29, 2022
Tabeer Energy (Private) Limited (TEPL)	Integrated Project Structure	April 28, 2021
Energas Terminal (Pvt.) Limited (ETPL)	Integrated Project Structure	April 28, 2021
Daewoo Gas Private Limited (DGPL)	Integrated Project Structure (Virtual Pipeline project)	Jan 13, 2021
LNG Easy Private Limited (LNGe)	Integrated Project Structure (Virtual Pipeline project)	Jan 08, 2021

Source: OGRA

Distribution | Gas

Demand Side | Natural Gas Consumption





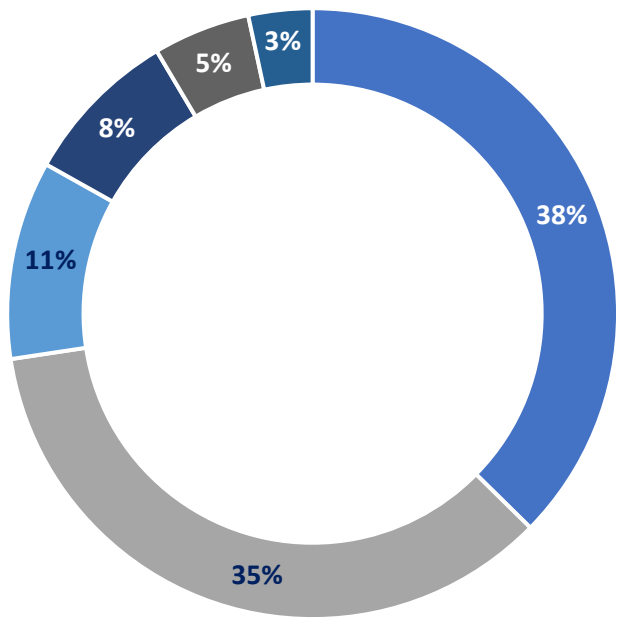
- Overall gas consumption has declined in 9MFY22 by ~4.5% from the SPLY. The greatest decline was felt by the transport CNG sector (~34.3%) followed by the general industry (~6.5%), and power sector (~5.8%). The power sector is the highest consumer of gas followed by the household sector in 9MFY22. The fertilizer sector is the only sector to experience a rise in consumption of ~1.9%. This is because the federal government had placed the domestic fertilizer sector in the gas supply priority list for three month till March FY22 to boost production.
- Household consumers use expensive LPG during curtailed gas supplies, by national gas utility corporations, to fulfil their energy needs. Fertilizer sector's dependence on natural gas is significantly high as it is a key input feedstock making it difficult to switch to other forms of energy.

Source: Economic Survey MOF, Pakistan Petroleum Industry Report

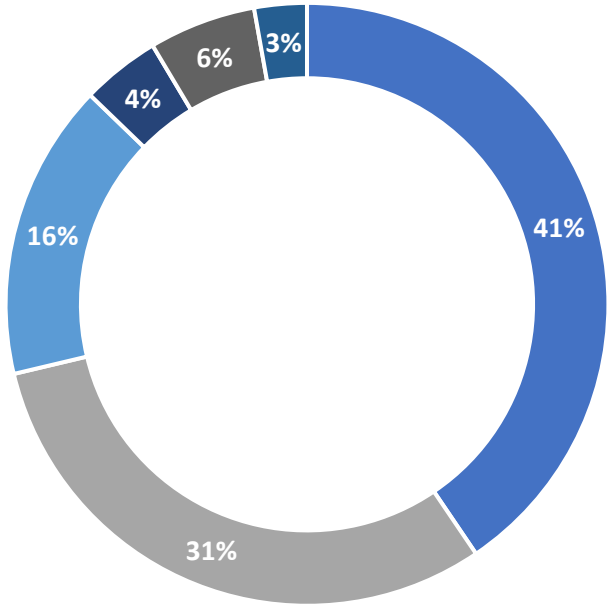
Distribution | Gas

Demand Side | Sector Wise Consumption

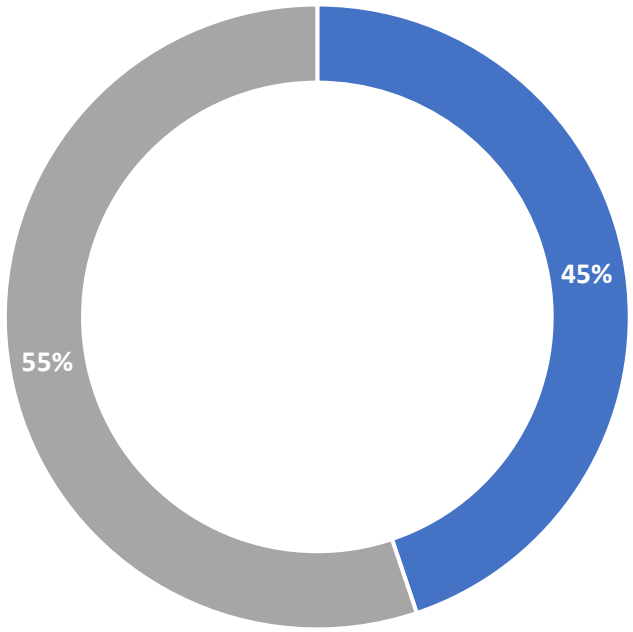
SNGPL Consumers



SSGC Consumers



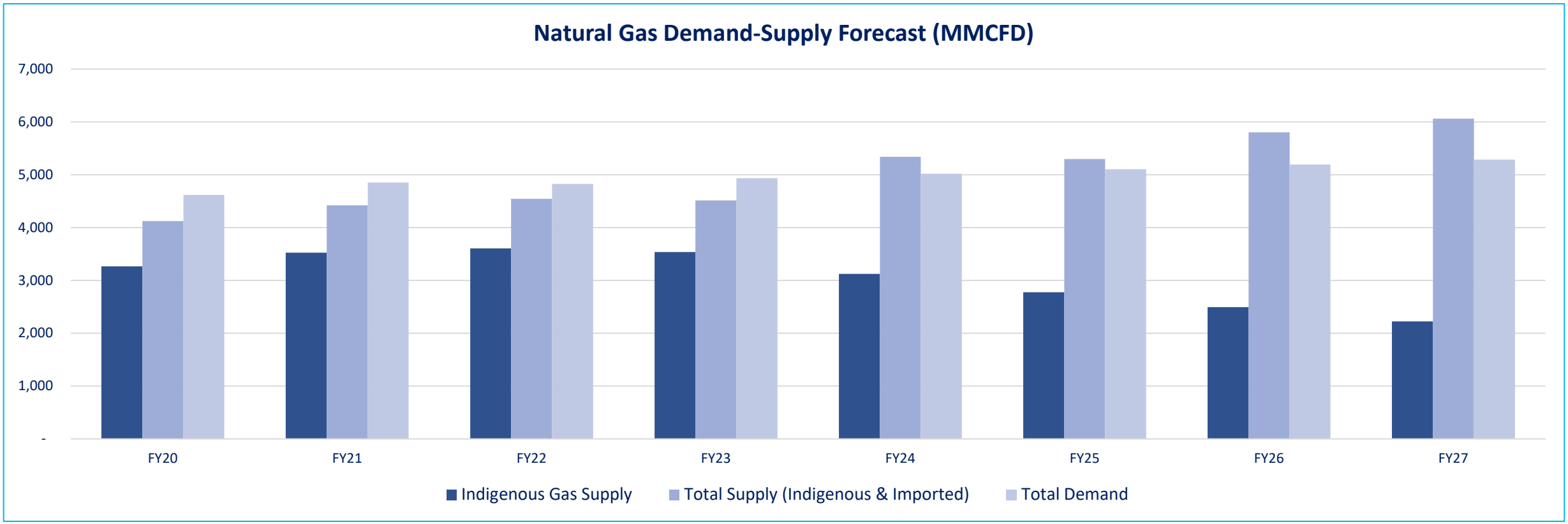
Independent System



Source: Economic Survey MOF, Pakistan Petroleum Industry Report

Distribution | Gas

Natural Gas | Demand Supply Forecast



- As domestic natural gas production continues to decline, Pakistan's domestic gas supply gap continues to widen. Therefore, Pakistan needs to accelerate domestic E&P activities and/or increase imported gas to meet its gas demand. Pakistan is forecasted to experience a rise in LNG imports of ~37% and a decline indigenous production by ~38% from FY20 to FY27 indicating that LNG will replace the lost gas production.
- Pakistan’s Private Power Investment Board is actively working to pay attention to RLNG projects. Presently, one IPP is under construction with an RLNG capacity of 1,263MW.

Source: OGRA, Petroleum Industry Report, Economic Survey, 2021-2022

Business Risk | Natural Gas | Pricing

- Based on the Revenue Requirement of the Gas Companies, OGRA determines the prescribed price (i.e. price to be retained by the companies) for each category of consumers.

- The Government fixes consumer gas prices and as a matter of policy, maintains them at a uniform level throughout the country. Therefore, the cost of supplying gas to customers at various locations is not accounted for and, regardless of the difference in cost due to location, all consumers within the same category pay a uniform price.

- The consumer price of natural gas in Pakistan comprises:

  (a) the prescribed price for the gas companies and
  (b) Gas Development Surcharge (GDS). OGRA fixes the 'prescribed price' for the gas utilities after conducting public hearings where stakeholders express their views. Also, a thorough analysis is carried out in terms of prudence and rationale for revenue and capital expenditures.

- The prescribed price includes the following elements:

  - Producer gas prices, which are linked with international prices of crude oil and HSFO
  - Transmission and distribution costs
  - Depreciation
  - Return to SNGPL and SSGCL (~17% on net operating fixed assets)
  - Allowed UFG losses

Source: Pakistan Petroleum Industry Report

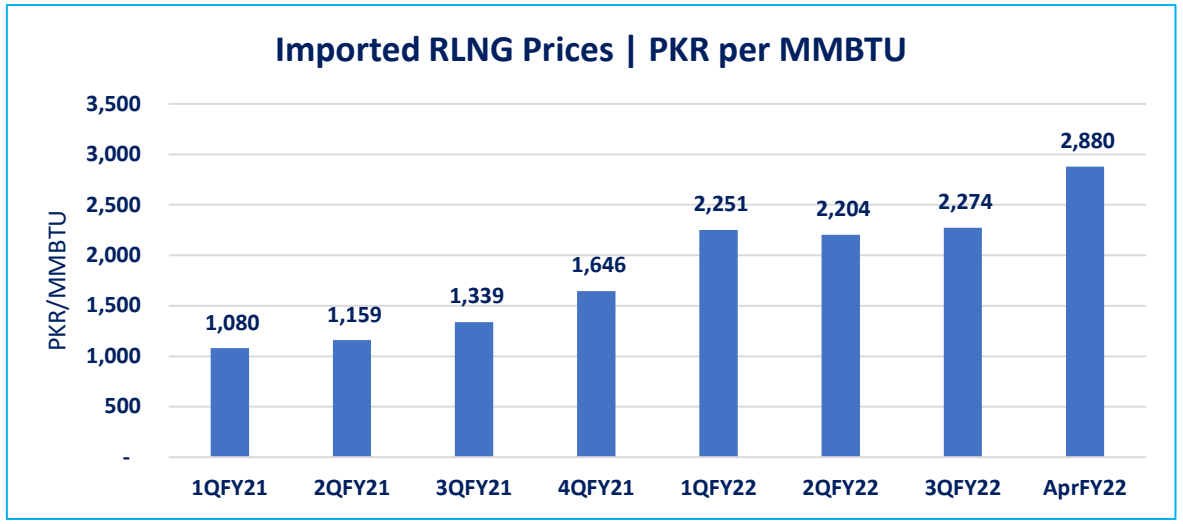
Business Risk | Natural Gas Pricing

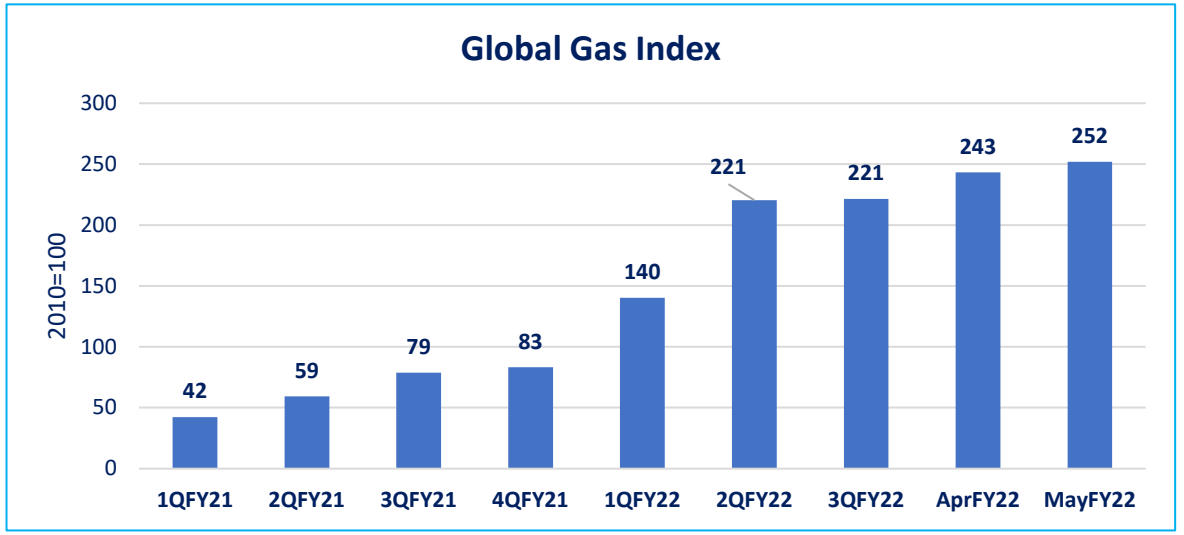
Consumer (w.e.f 01-09-2020)	PKR/MMBTU
Households	
Up to 0.5MMCFD per month	121
Up to 1MMCFD per month	300
Up to 2MMCFD per month	553
Up to 3MMCFD per month	738
Up to 4MMCFD per month	1,107
Above 4MMCFD per month	1,460
Fertilizer Feed Stock	302
Fertilizer Fuel Stock	1,023
Power	857
General Industries	1,054
Export Oriented Industries	819
Transport CNG (Average of Regions I and II)	1,361

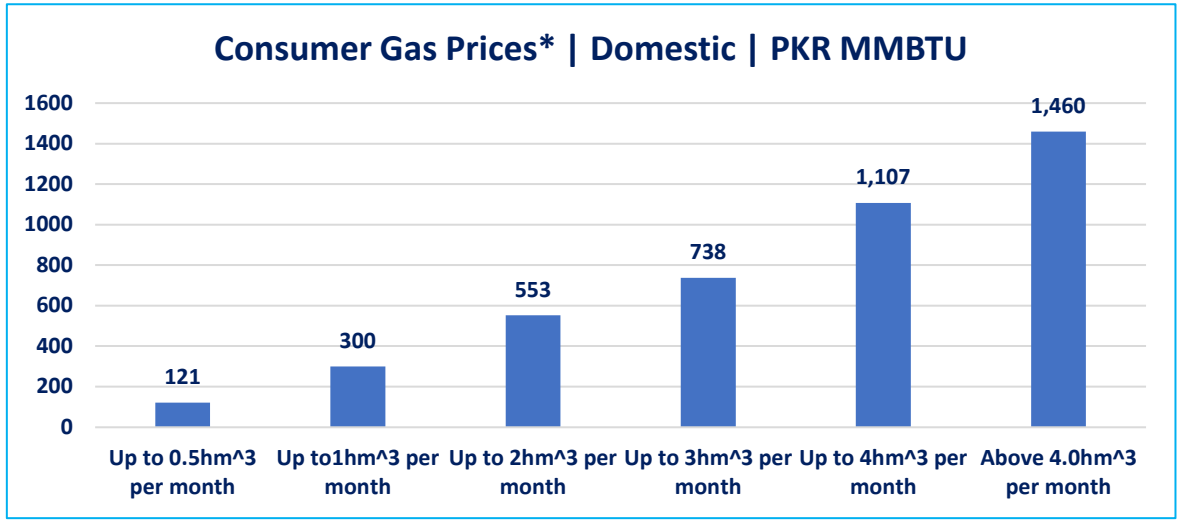
Source: OGRA

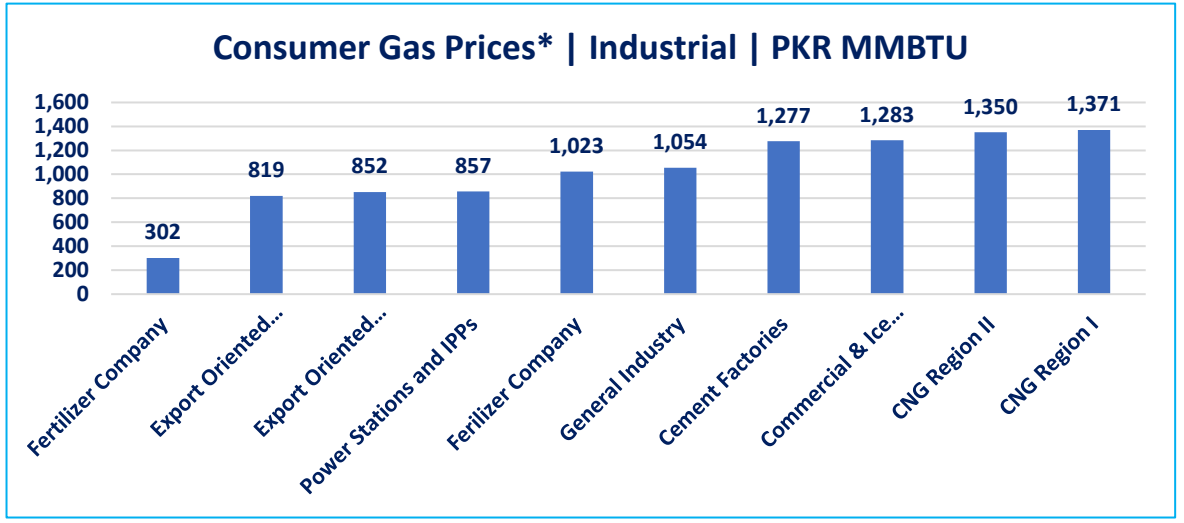
Distribution | Gas

Business Risk | Local vs. International Pricing









*Source: OGRA's Gas Price Notification is effective from September 1, CY20 to date

Source: OGRA, PSO, World Bank's Pink Sheet

Business Risk | Natural Gas | UFG

- The determination of annual revenue requirement takes into account the determination of Unaccounted For Gas (UFG) allowance and disallowance to the state owned gas utilities companies. UFG is a phenomenon of gas loss which is contingent upon occurrence of various technical factors when gas flows from fields to end consumers. It is calculated as the difference between metered gas volume injected into the transmission and distribution network (Point of Dispatch/Delivery) and the metered gas delivered to the end consumers (Consumer Meter Station) during a financial year.

- The determination of annual revenue requirement takes into account the determination of Unaccounted For Gas (UFG) allowance and disallowance to the gas companies.

- A two-component formula for calculating UFG allowance being used is as under:

UFG Allowance = Gas Received X (Rate1+ Rate2 x β)

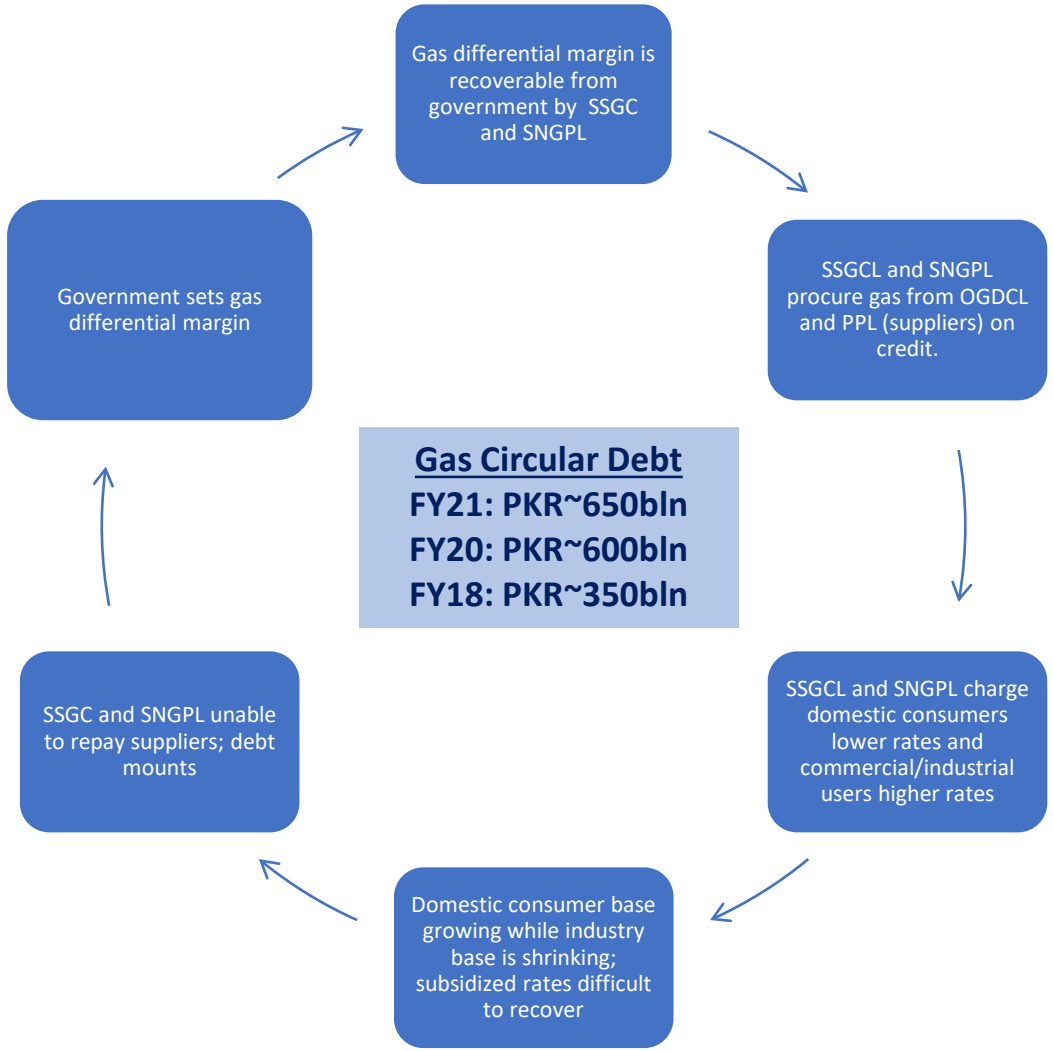
- Rate1= Technical Component (Inherent gas loss in the system): is the benchmark fixed rate based on prevalent conditions / infrastructure in the areas of the operation of the Sui companies and same is fixed at 5% for the next five years.

- Rate 2= Local Challenging conditions component (Pakistan specific): is the allowance for local challenging conditions as compared to the world at large. Allowance for these challenging conditions is fixed at a maximum of 2.6%.

- β =Performance factor (Key Monitoring Indicators - KMIs): in order to ensure appropriate and serious efforts are directed towards reducing UFG over the agreed term of five (5) years, the local challenging conditions component has been linked to the achievement of KMIs by each gas utility company.

Source: Ministry of Energy, Petroleum Division

Financial Risk | Gas Circular Debt



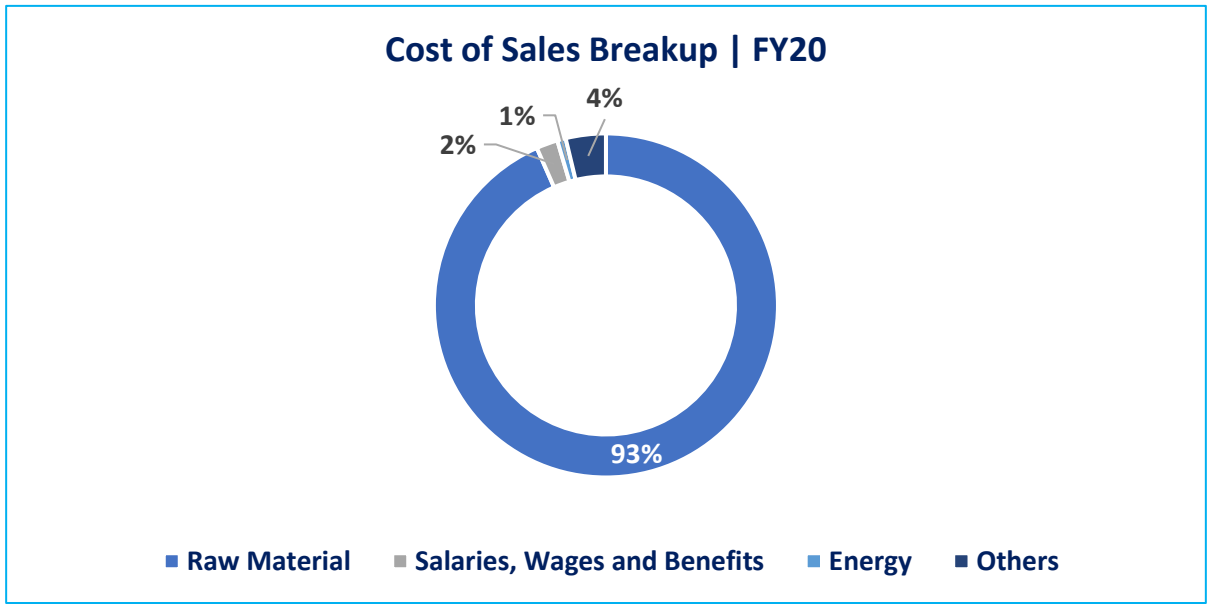
- Gas circular debt is rising at an alarming pace and holds the potential to cause serious problems for an already fragile distribution gas sector.
- Initially, a major portion of debt was stemming from natural gas, however, lately the share of RLNG is building up as well.
- In turn, as of March 2022 the receivables of OGDC and PPL from the two gas utility companies were registered at PKR~513bln – hindering prospective exploration of gas and oil.
- Differential margin = Tariff approved by government - Tariff recommended by OGRA.
- UFG and gas theft further increase the amount to be recoverable from the government.
- Costly RLNG is further adding to the circular debt as the commodity is used to make up for depleting indigenous gas reserves particularly in the peak winter months.

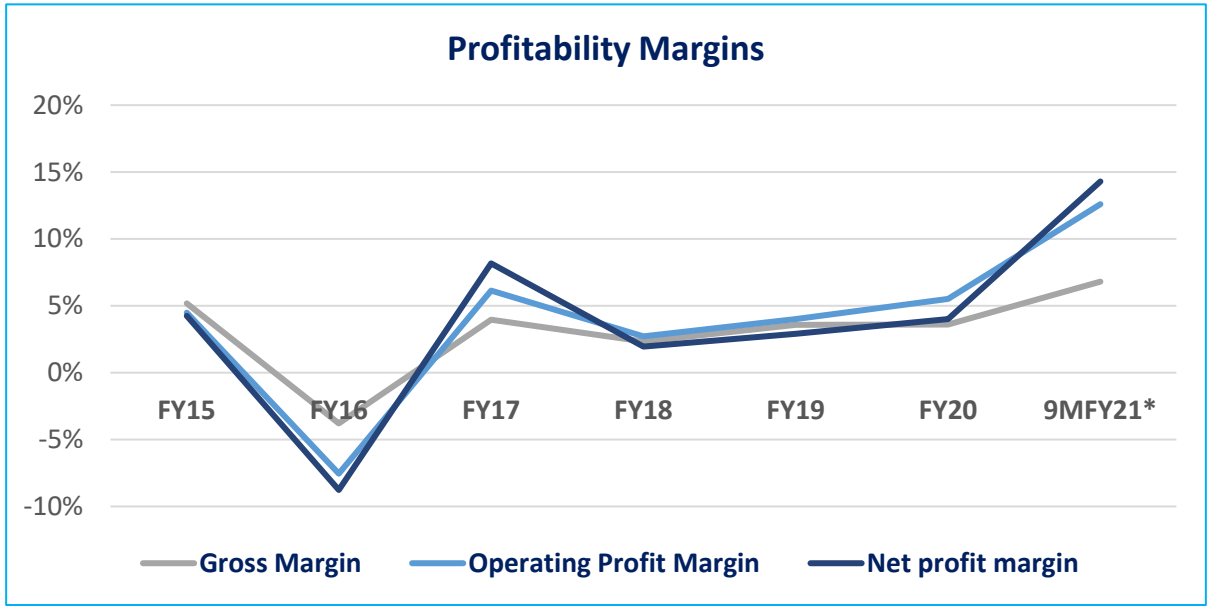
Outstanding Payable on account of SNGP & SSGC (March-2022)			
Company (PKR bln)	**OGDC**	**PPL**	**Total**
SNGP	141	182	**323**
SSGC	142	141	**283**
Total	**283**	**323**	**606**

Source: Ministry of Energy, Petroleum Division

Distribution | Gas

Margins and Cost Structure | Natural Gas



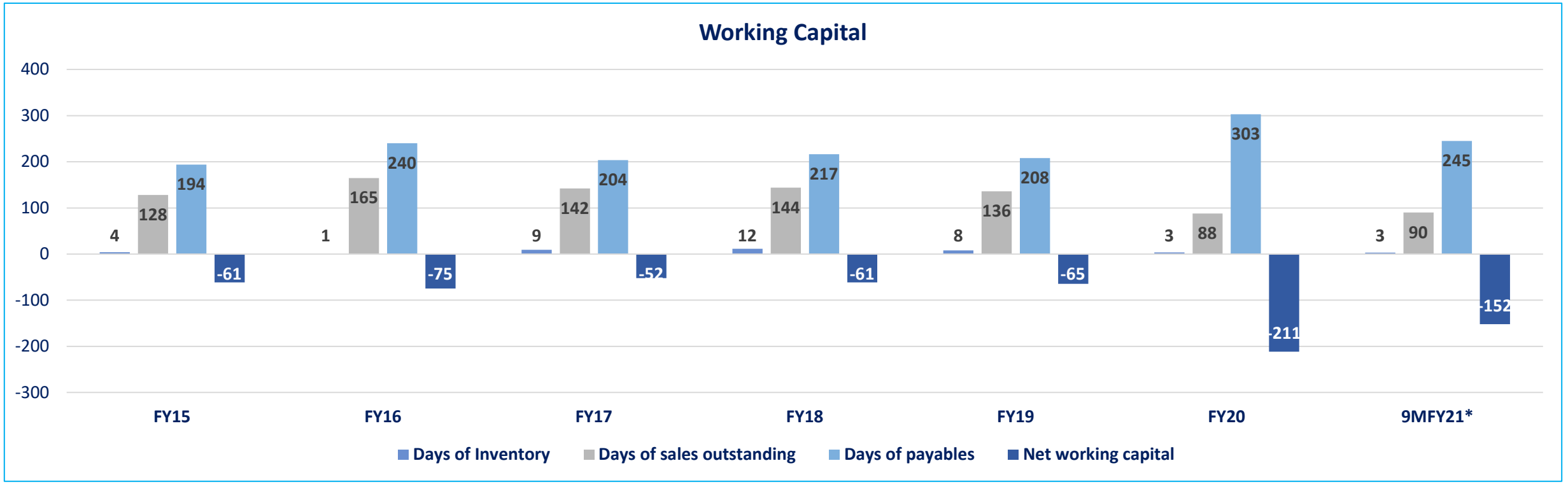


- The reason for the lack of improvement in the net profit margin (which stood at ~1% in FY19 and FY20) from the SPLY is due to an increase in UFG percentage and value of UFG disallowance; this was mainly attributable to the decrease in the availability of indigenous gas volumes during the year.
- The increase in allowance is due to an increase in the weighted average cost of gas (WACOG) being used by the regulator for valuing the UFG disallowance. In addition, higher interest rates raised finance costs adversely impacting net profits. Net profit margin did not improve from its ~-1% level in FY20. SNGPL observed a slight improvement in net profit margin in 9MFY21 by ~1% (FY20: ~1%; 9MFY21: ~2%).
- Operating profit margins increased by ~2% in FY20 from the SPLY owing primarily due to lower exchange losses in FY20.
- It is pertinent to note that the industry faced suspension of operational, development and field activities amidst the COVID-19 pandemic in FY20.
- Raw material (natural gas and RLNG) comprises the largest proportion of cost of sales indicating that gross margins are highly sensitive to this input.

* Financial statement data only available for SNGPL

Source: Company Financial Statements

Financial Risk | Working Capital | Natural Gas



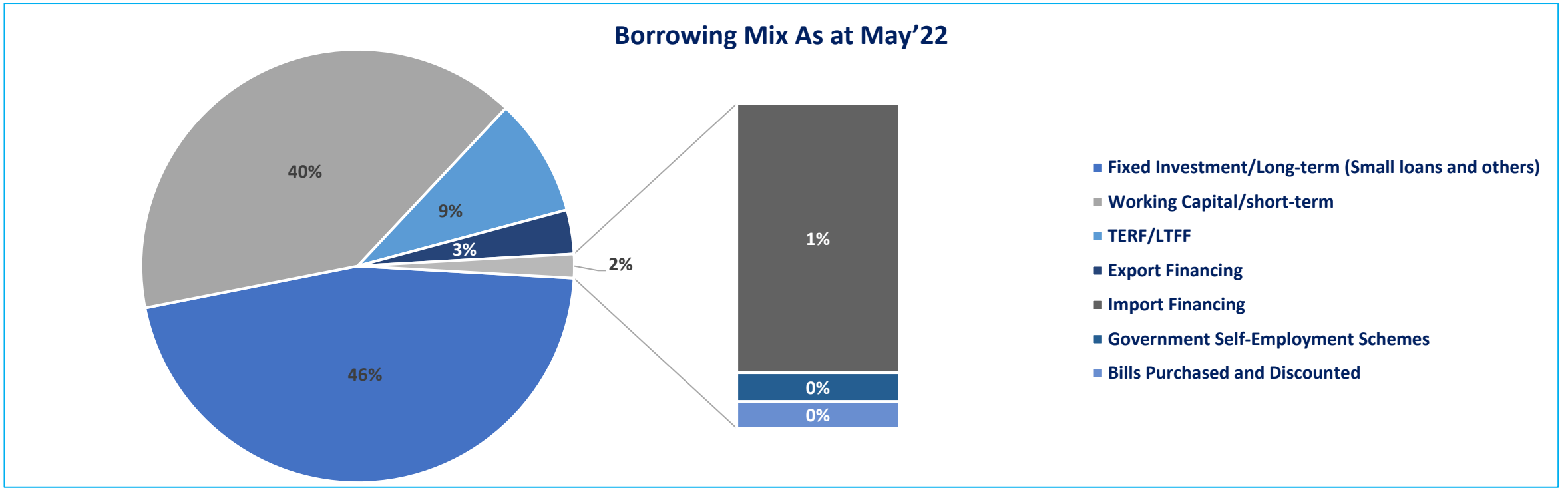
- The circular debt has been mounting the industry's payables and posing a significant liquidity risk. Between FY15 and FY20, payables increased by ~109 days.
- While days of sales outstanding declined dramatically from FY15 to FY20 by ~40 days, tariff adjustments have considerably accumulated in the indigenous gas and RLNG segments and are to be recoverable from the government. Recoverability depends on the government increasing gas prices, providing subsidy or employing another mechanisms.
- Overall, the cash conversion cycle has declined by ~91 days between FY15 and FY20. The 9MFY21 period demonstrated a similar trend.

* Financial statement data only available for SNGPL

Source: Company Financial Statements

Distribution | Gas

Financial Risk | Borrowing Mix



- The total borrowing for "manufacturers of gas distribution of gaseous fuels through mains" stood at PKR~9,501bln in May-22, as compared to PKR~9,740bln in Apr-22 and PKR~8,923bln in May-21.
- The sector receives the greatest amount of financing for working capital and fixed capital investment (~40% and ~46% share, respectively, of the borrowing mix) as much of its activities revolve around ensuring uninterrupted distribution of gas across Pakistan.
- Working capital financing is a critical liquidity source for distributors as overdue trade debts from the governments have been a long standing problem for the sector and have not generated the required (timely) inflow from sales.

Source: SBP

Distribution | Gas

LPG | Import | Production | Distribution

SSGC (Pvt.) Ltd:

- SSGC (Pvt.) Ltd (SLL) is a wholly owned subsidiary of Sui Southern Gas Pipelines Ltd engaged in production, marketing and distribution of LPG owning one-third of the nation's LPG storage facility.
- The company's value chain starts from the import of LPG and progresses to storage, bottling, distribution, and marketing of LPG in both bulk and cylinders.
- The company operated a fully owned import terminal at Port Qasim which has 3.5 km pipelines and a jetty capable of handling vessels of up to 15,000 DWT. The bulk storage capacity is 6,500 MT.
- SSL operates three LPG cylinder plants two of which are operational (in Port Qasim, which is fully automated, and Haripur) and one under development (in Muridke). The Haripur plant operates as a regional distributor.
- SSL has over 160 dealers nationwide.
- The main bottling, storage and terminal facilities are located in Port Qasim which handles LPG from various international sources for its own use and for a common user facility for other LPG marketing companies.
- SLL offers 'hospitality arrangements' to other LPG marking companies in all its nationwide storage and bottling operations.

Engro Vopak Terminal Limited:

- Engro Vopak Terminal Limited operates a terminal and storage facility for LPG and other bulk liquid chemicals receiving a LPG Storage and Handling License from OGRA.
- The facility provides for more than 50% of the country's marine LPG imports enabling the operations of Pakistan's chemical and petrochemical manufacturing plants by delivering 650 KT Phosphoric acid, 300 KT of 300 KT of Paraxylene, and 72 KT of Ethylene among other chemicals.
- Vopak's total LPG storage capacity now stands at 7,000 MT while the storage capacity of the terminal operation is 82,400 cubic metres.

Source: Company websites

Distribution | Gas

Supply Side | Local LPG Extraction or Processing

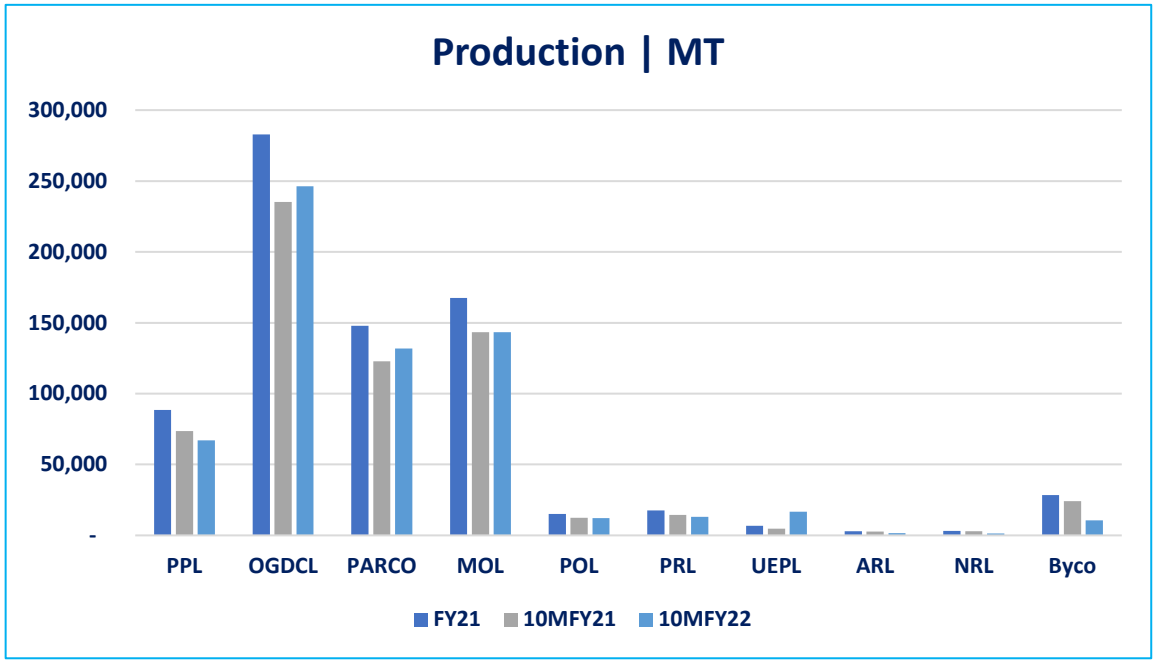
- In FY20, total LPG extraction/processed was ~854,496 MT of which ~81% was produced from natural gas extracted in fields while the remaining ~19% was produced in refineries. Total imports in FY20 was ~350,096MT making the total supply equal to ~1,104,592MT.

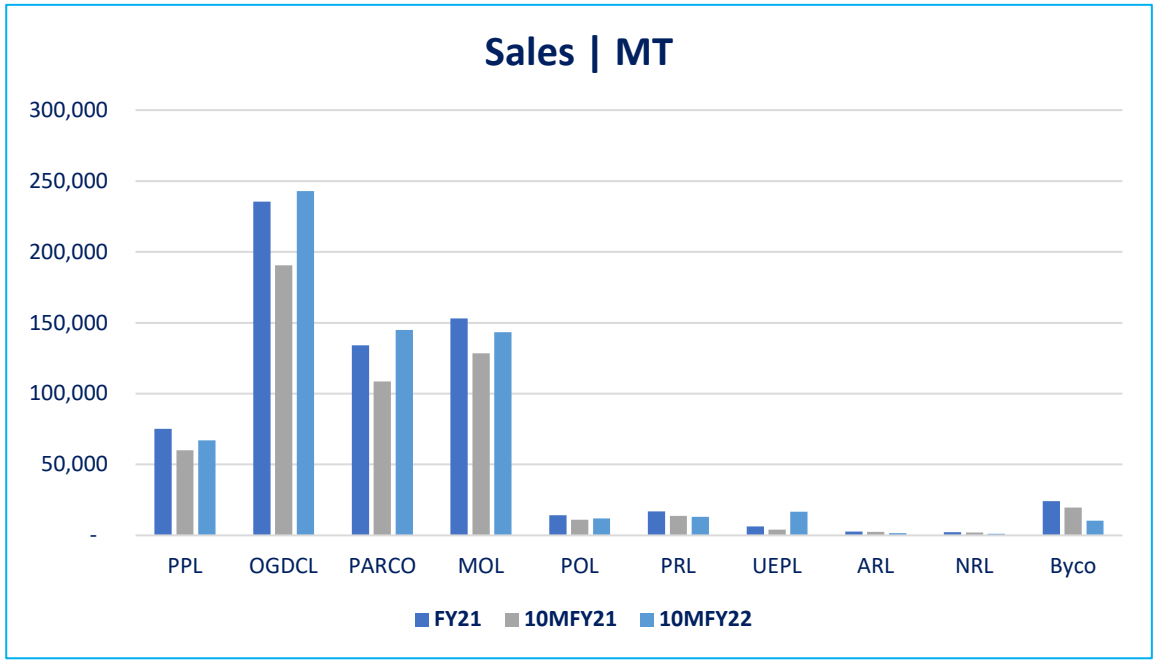
FY20 | In MT					
Refineries			Fields		
Company Name	Annual	Daily Average	Company Name	Annual	Daily Average
ARL	3,983	11	OGDCL	226,752	620
PRL	15,237	42	UEPL	11,929	33
NRL	6,227	17	JJVL	90.078	246
PARCO	97,553	267	POL	14,183	39
BYCO	38,433	105	PPL	84027	230
			MOL	166,093	454
Total	161,434	441	Total	693,062	1,622

Source: OGRA

Distribution | Gas

Supply Side | LPG Production and Sales





- In the 10MFY22 period, LPG production increased by ~1% while sales by local producers increased by ~21%. There are presently four major indigenous LPG producers in Pakistan – OGDCL, MOL, PARCO and PPL – with OGDCL having the greatest market share of ~35%.
- The natural decline in mature reserves had a role to play in the almost negligible growth in production. However, the top producers managed to increase production by an average growth rate of ~19%.
- In the case of OGCDL, the high quantity sold in FY21 was largely due to the start-up of production in the Mela and Saand fields coupled with stable production from producing fields.
- The decrease in PPL's sales volume of ~9% is due to lower production arising from lower offtake in the Adhi and Nashpa fields.

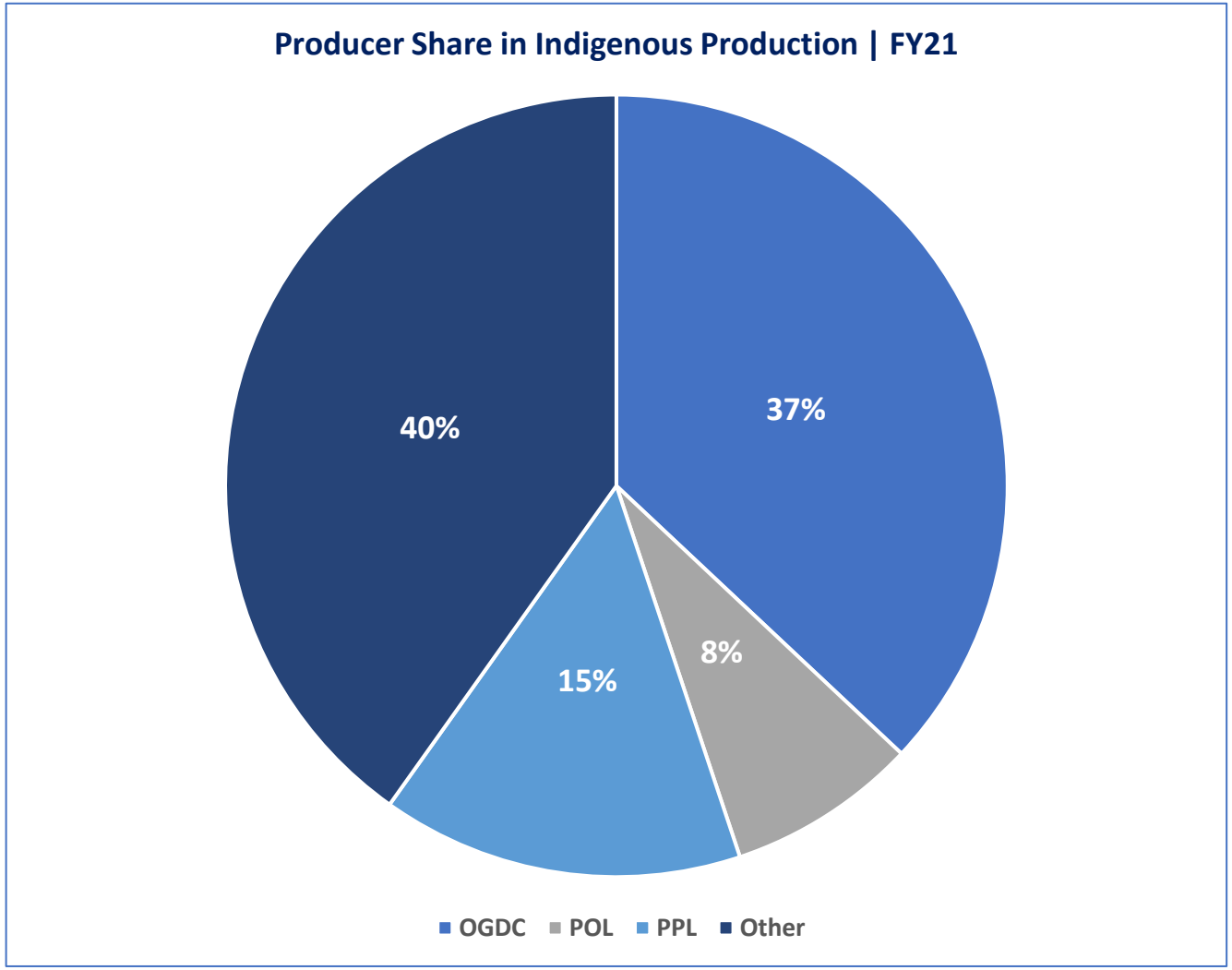
Source: OGRA, Company Financial Statements

Distribution | Gas

Supply Side | LPG | Local Players

- OGDC holds the largest share in the indigenous LPG production industry making it the market leader in exploration and production activity.

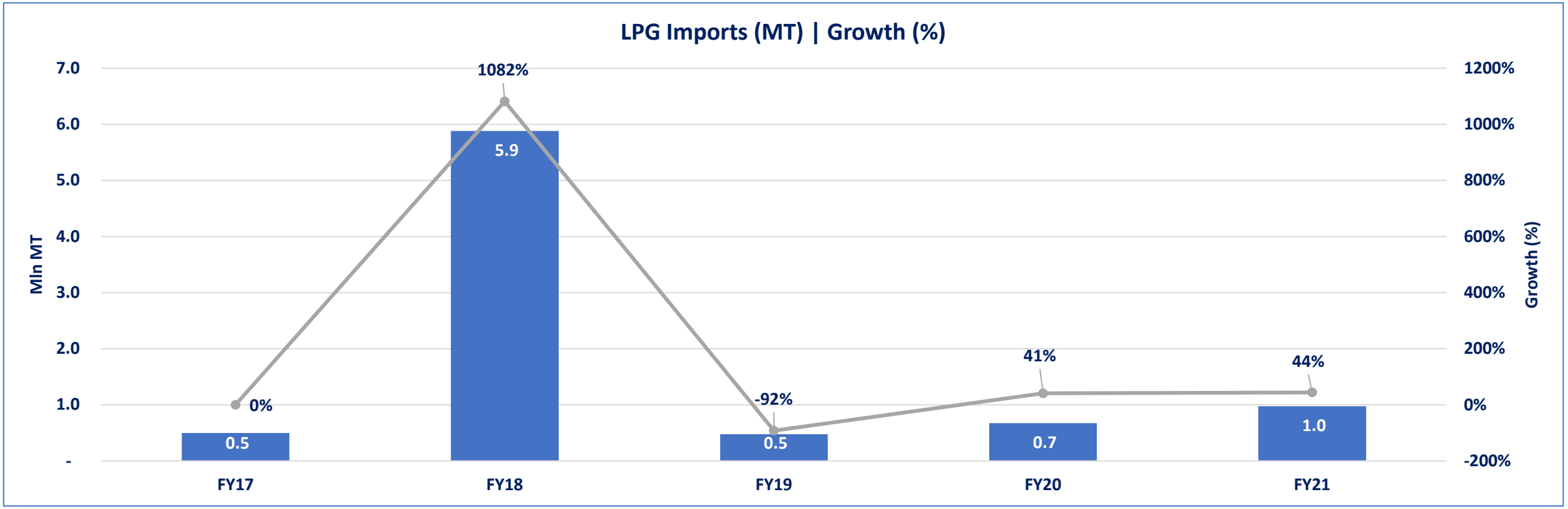
- On August 31, 2021, the company won a competitive exploration bid, along with other exploration companies. This will enable E&P companies to explore, appraise, and develop oil and gas resources in Abu Dhabi along with establishing strategic partnership with Abu Dhabi National Oil Company (ADNOC).



Source: Company Financial Statements

Distribution | Gas

Supply Side | Total Import | LPG



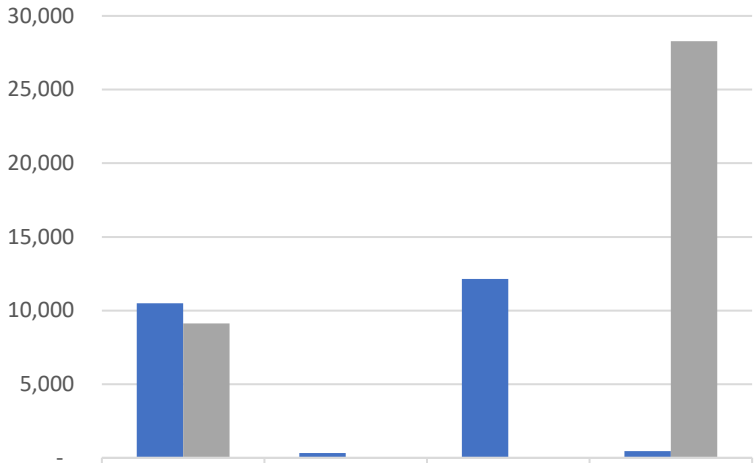
- Major suppliers of LPG are from Iran and the energy commodity is exported through both land route via the Taftan border and the sea.
- Overall Pakistan's LPG imports have nearly doubled from FY20 to FY21 with Iran and Qatar being the top import sources. In FY22, LPG imports increased by ~82.9% in value and ~39.8% in quantity. The disparity in value and quantity appreciation is mainly due to the impact of the USD appreciation in FY22.

Source: PBS

Distribution | Gas

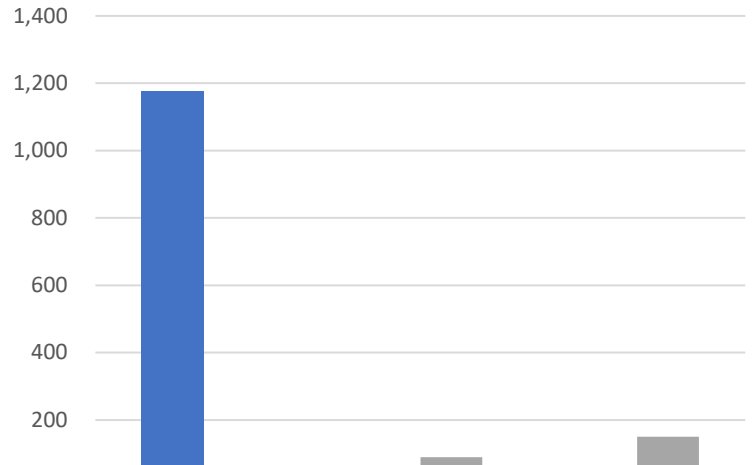
Supply Side | LPG Import Sources

PROPANE, LIQUIFIED (PKR in 000s)



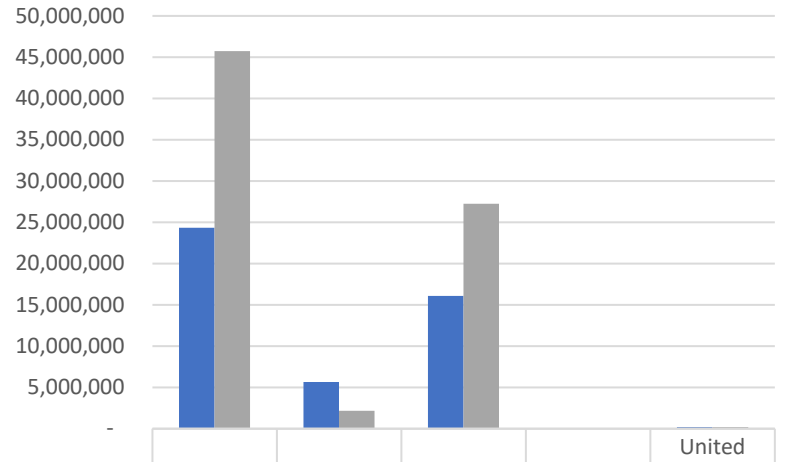
	China	France	Saudi Arabia	United Arab Emirates
FY 20	10,498	341	12,151	464
FY 21	9,120	-	-	28,276

BUTANES, LIQUIFIED (PKR in 000s)



	China	Korea	Netherlands
FY 20	1,177	-	-
FY 21	-	89	150

L.P.G. LIQUEFIED (PKR in 000s)



	Iran	Iraq	Oman	U.S.	United Arab Emirates
FY 20	24,334,49	5,645,863	16,073,30	5,485	204,161
FY 21	45,715,90	2,166,290	27,244,87	-	201,069

- Propane and butane are two forms of LPG gas and products of either crude oil processing or natural gas processing and are liquified through pressurization. Propane is used in heating and cooking across homes and restaurants. Butane is commonly used as a fuel, propellent, and refrigerant.
- The key difference between the two lies in their boiling point. Propane has a boiling temperature of -42 degrees Celsius while butane's boiling temperature is -2.
- Between butane and propane, propane appears to be the more popular import with UAE imports dominating the charts in FY21.

Source: PBS

Distribution | Gas

LPG Terminals | Marketing | Distribution

- There are currently three OGRA approved LPG terminals situated in Pakistan which provide storage, distribution and/or marketing facilities.

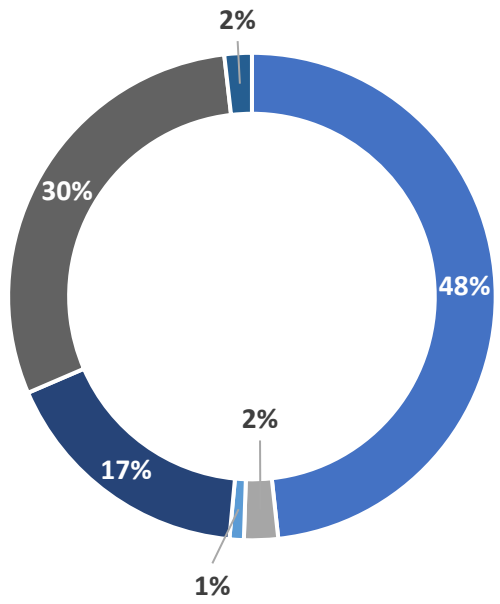
Company Name	Head Office Location	Terminal Location
SSGC LPG (Pvt.) Limited	Karachi	Port Qasim
ENGRO Vopak Limited	Karachi	Port Qasim
Al-Qasim Gas (Pvt.) Limited	Islamabad	Gawadar Port

- In addition, there are 132 LPG marketing and 4,303 LPG distribution companies authorized by OGRA. Marketing companies typically import and/or procure LPG from local producers and market the commodity to various sectors of the LPG market (geographically and based on segment – Autogas, domestic, bulk, commercial agriculture). Furthermore, these companies liaise with a network of distributors which deliver the gas to the end consumers.

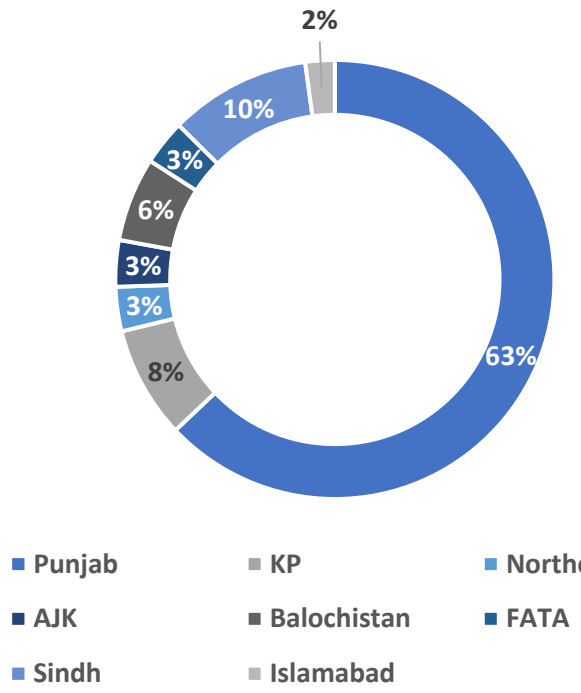
Source: OGRA

Demand Side | LPG Consumption

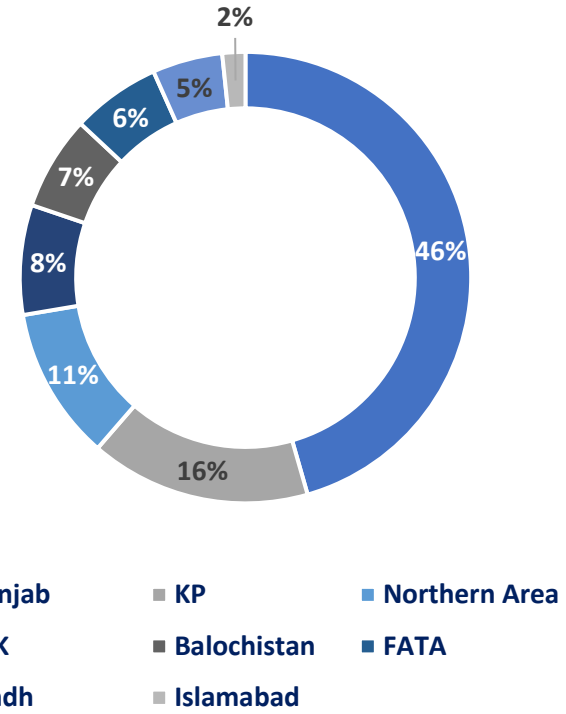
Commercial Consumption* | 10MFY22| %



Industrial Consumption | 10MFY22 | %



Domestic Consumption | 10MFY22| %



- Punjab is the highest LPG consumer across the three sectors (commercial: ~48%; industrial: ~63%; domestic: ~46%) and over the specified time horizon. Moreover, in the 10MFY22 period, Punjab's LPG consumption has dropped by ~2% in the domestic sector; increased by ~11% in the industrial sector; and dropped by a massive ~47% in the commercial sector.

*Northern Areas and FATA excluded due to ~0% consumption

Source: OGRA

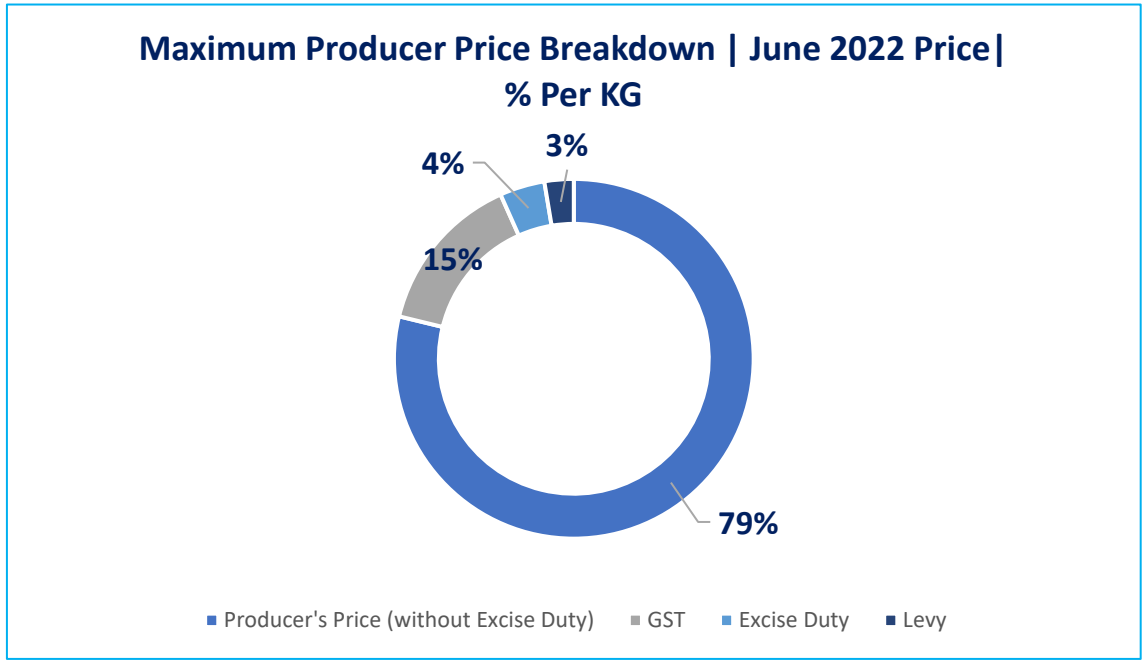
LPG | Pricing

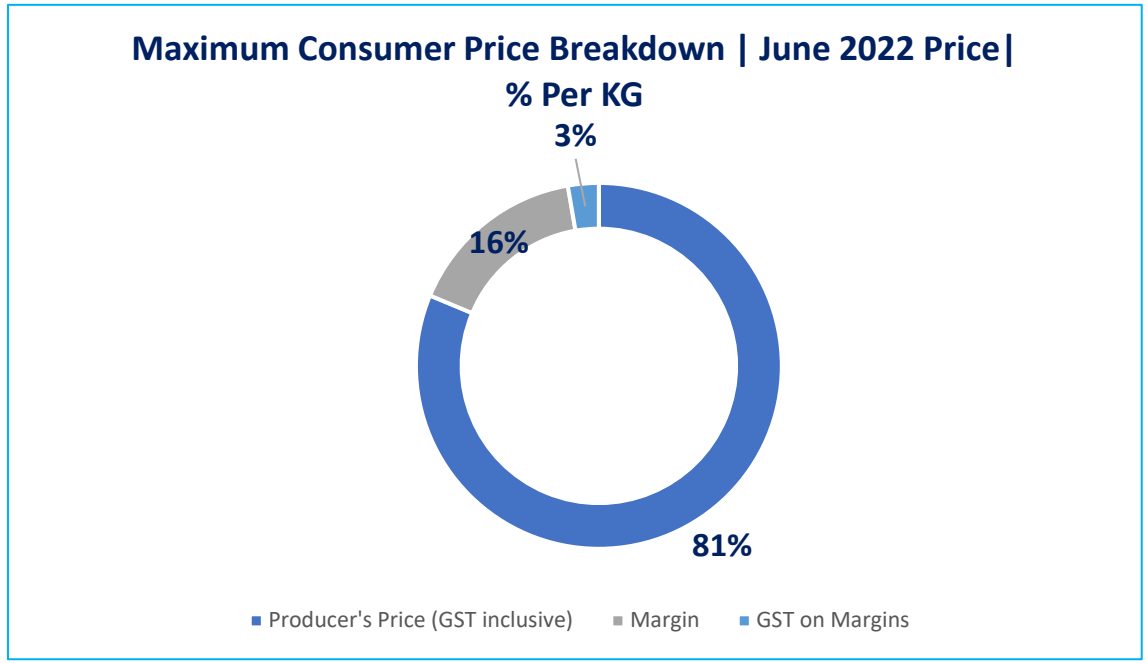
The LPG Policy 2016 fixes the maximum LPG price at all levels of the supply chain. However, producers, marketing companies and distributors may sell below the maximum price determined from time to time.

Ministry of Energy | Indigenous LPG Price | Effective: June '22				
			PKR/MT	PKR 118/Cylinder
LPG PRODUCER PRICE				
i. Producer's Price (includes excise duty of PKR 85/MT)			147,304.38	1,738.19
ii. Petroleum Levy			4,669.00	55.09
iii. Sum of i and ii			151,973.38	1,793.29
iv. 17% GST of iii			25,835.47	304.86
v. Maximum Producer Price with GST (iii + iv)			177,808.85	2,098.14
LPG CONSUMER PRICE				
i. Producer's Price (inclusive of GST)			177,808.85	2,098.14
ii. Breakup of marketing, distribution and transportation margin			35,000.00	413.00
Marketing: PKR 17,000/MT	Distribution: PKR 10,000/MT	Transportation: PKR 8,000/MT		
iii. 17% GST of ii			5,950.00	70.21
iv. Maximum LPG Consumer Price (i+ii+iii)			218,758.85	2,581.35

Source: OGRA

LPG | Pricing Breakdown

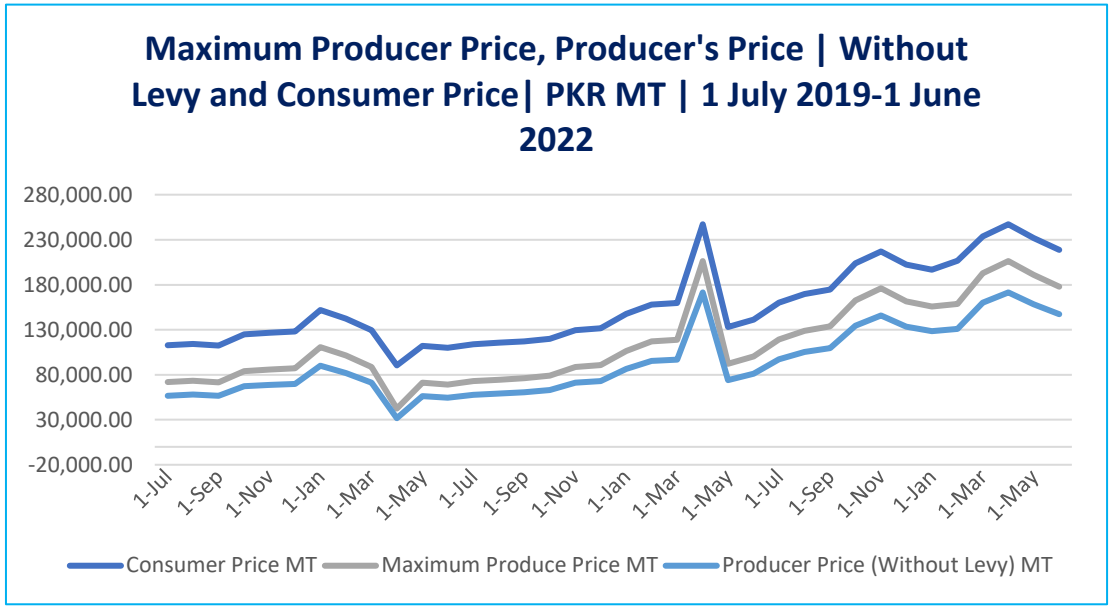


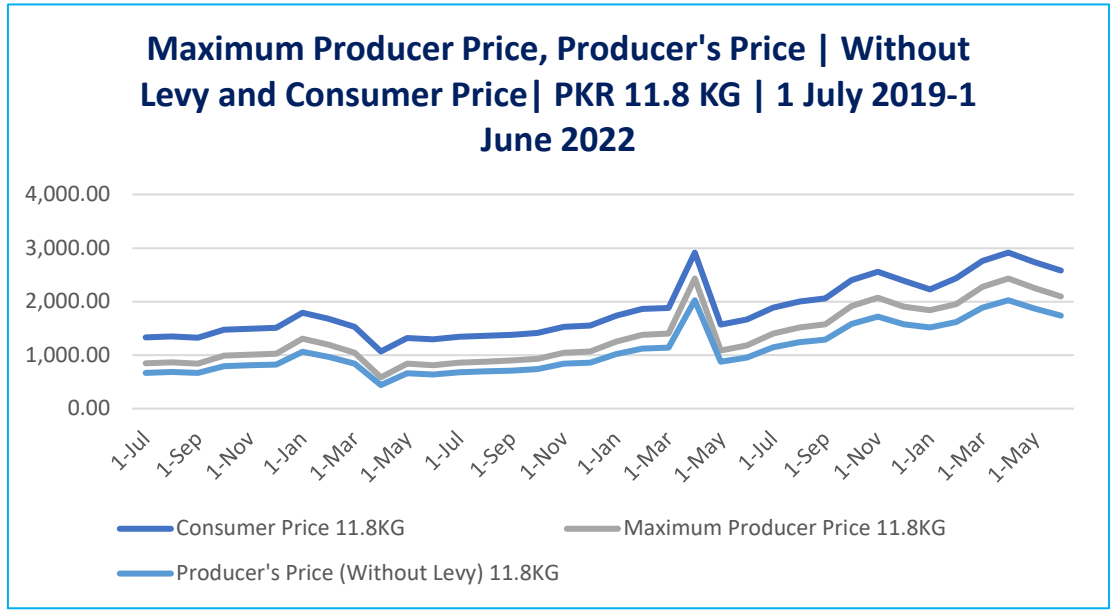


- According to the LPG Policy 2016, OGRA will regulate and notify the prices of indigenous LPG including producer's price, margins of marketing and distribution companies and consumer prices.
- The government also charges a levy from time to time at its discretion.
- The maximum LPG prices (consumer and producer) are regulated at all levels of the supply chain. Distributors have the liberty to sell below this maximum fixed price from time to time.
- In the two breakdowns, it can be observed that the producer's price comprises the largest chunk of both the producer and consumer prices which indicates that LPG marketing and distribution companies have limited flexibility in price adjustment. In addition, the government retains the authority to intervene in case there is a significant deviation from the above pricing.

Source: OGRA, LPG Pricing Policy 2016, OGRA website

LPG | Pricing Trends



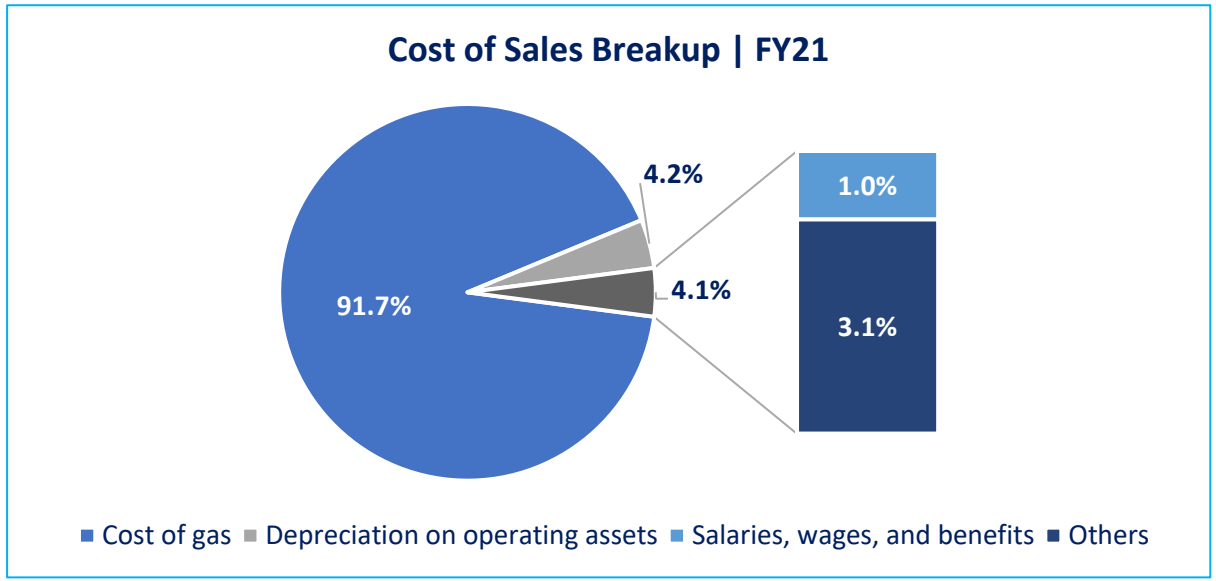


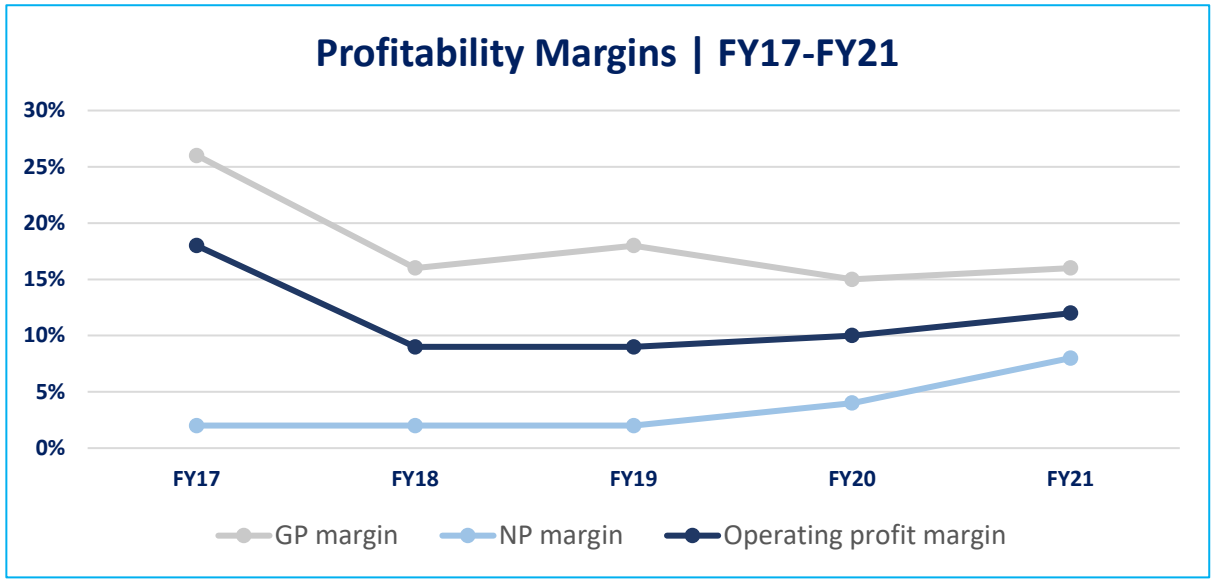
- OGRA typically announces LPG prices on a monthly basis.
- OGRA LPG is typically sold domestically in cylinder sizes of 4kg, 6kg, and 11.8kg. LPG is sold commercially in cylinder sizes of 45kg and industrially in metric tons. The two graphs depict the LPG pricing trends as set by OGRA. LPG prices for an 11.8kg cylinder touched their highest level in April 2022 with the maximum producer price at PKR 2,098 and consumer price at PKR 2,024.
- The reason for the spike in April 2022 is because of the closure of the Jamshoro Joint Venture Limited (JVL) plant which had been catering to the demand of ~750,000 households and has been shut since June 2020. In addition, the depreciation of the PKR at the time meant LPG was being imported at a very high price.
- In June 1, 2022 OGRA reduced LPG prices and the 11.8kg cylinder is now selling at a maximum producer price of PKR 2,098.14 and consumer price of PKR 2,581.35. This marks a ~7% and ~6% respective reduction in MoM prices.

Source: OGRA

Distribution | Gas

Margins and Cost Structure | LPG Importers and Distributors



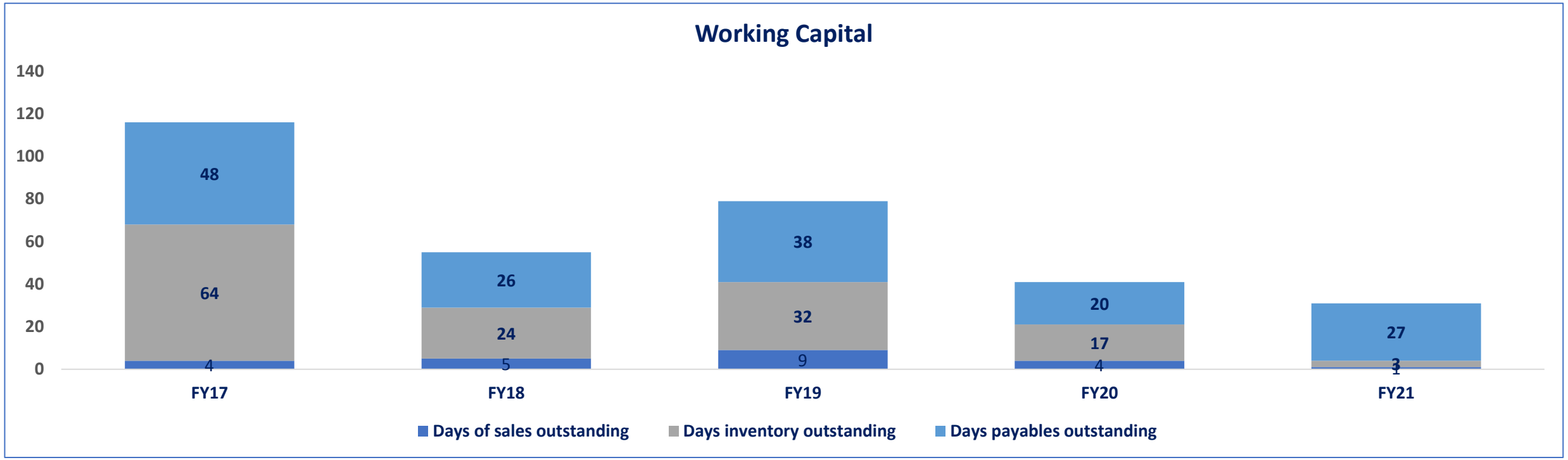


- Cost of gas (raw material) comprises the largest portion of importers' cost of sales (~91.7%) followed by depreciation on operating assets (~4.2%). This indicates variability in forex rates and, in turn, imported prices have the potential to create variation in operating and net profits.
- Despite an increase in cost of sales by ~25%, the gross profit increased by~39% in FY21 implying growth in sales volume was the key driver. On the contrary, growth in sales volume slowed down to ~36% in FY21 (FY20: ~141%). This is one of the reasons contributing to a modest increase in gross profit in the period. As a result, gross profit margins exhibited a modest growth of ~1% in FY21.
- While operating profit margin increased by ~2% to ~12% in FY21, the strongest growth was of net profit margin which increased from ~4% to ~8%. A ~50% reduction in finance cost helped grow the bottom line in FY21.
- FY21 was marked by a higher volume of LPG imports via sea route by the industry.
- The terminal business also grew by ~30% and this included a share of local importers' own imports of ~8%. The growth In margins was supported by a steady increase in LPG pricing owing to a devaluation of the PKR in FY21. LPG sales are the major revenue drivers.

Source: Company financial statements

Distribution | Gas

Financial Risk| Working Capital | LPG



- A negative cash conversion cycle of ~-23 days was reported in FY21. The cash conversion cycle shrank by ~215% from FY17 to FY21 and by ~13% in FY21. This indicates a very strong working capital position.
- The receivable days shrank from ~4 days to ~1 day. This indicates a positive sign given the fact that ~67% of sales are on credit, majorly unsecured, while ~33% are sales made on advance deposit.
- The payable days increased from ~20 days in FY20 to ~27days in FY21. Out of the total purchases made, ~89% were made on advance while ~11% were made on credit.

Source: Company financial statements

Distribution | Gas

Taxes

- Special tax provisions apply to the exploration and production of natural gas, pipeline operations of production and extraction companies, manufacture and sale of liquified petroleum gas or compressed natural gas
- Profits and gains derived by LNG Terminal Operators and LNG Terminal Operators and Terminal Owners are exempt from tax for tax expenditure of PKR~816.33mln.
- In addition, the petroleum development levy and gas infrastructure development cess (GIDC) has been set at PKR 750 bln and PKR 200bln, in the FY23 Budget. Petroleum levy on LPG is budgeted at PKR 8bln.

	Category	FY22
Natural Gas (Gaseous state)	Federal Excise Duty	PKR 10/mln MMBTU
	Custom Duty	5%
RLNG	Custom Duty	11%
	Sales Tax	17%
	Federal Excise Duty	PKR 10/mln MMBTU
	Additional Custom Duty	2%
LPG	Custom Duty	Exempt
	FED	PKR 17.80 per 100m^3
Butane	Custom Duty	Exempt
	FED	PKR 17.80 per 100m^3
Propane	Custom Duty	Exempt
	FED	PKR 17.80 per 100m^3

Source: FBR

Natural Gas Regulatory Framework

- The regulatory functions of natural gas sector were transferred to OGRA on March 28, 2002 with the objective to break the public sector monopoly and open natural gas transmission and distribution to private sector to promote and enhance competition in the midstream and downstream oil and gas sectors. OGRA has been performing the following functions pertaining to the Natural Gas Sector: -

  - Grant of licenses for the regulated gas sector.
  - Formulation of rules, regulations and procedures for the conduct of licensees.
  - Determination of Revenue Requirement Petitions of SNGPL & SSGCL.
  - Monitoring and enforcement of rules, regulations and applicable license conditions.
  - Pipeline capacity allocation.
  - Licensing of low pressure (flare) gas.
  - Licensing for transmission, distribution and sale of RLNG.
  - Approval of Gas Sale Agreements (GSAs) for supply of gas between the Gas Producers and Gas Companies/
  - Consumers.

Source: OGRA

LPG Regulatory Framework | Production and Distribution | Import | Pricing

- The LPG (Production and Distribution) Policy, 2016 developed by OGRA regulates the local LPG industry.
- In 2000, the Federal government deregulated the LPG industry to making it investor friendly, foster healthy competition, improve safety standards and ensure better consumer services.

Production and Distribution for E&P Companies:

- Public Sector E&P Companies shall directly or through other companies exercise their right to set up LPG extraction facilities at gas fields where LPG can be commercially extracted in accordance with the development plan approved by the Government.
- Public Sector E&P Companies and Refineries shall give preference in sale of LPG to Gas Utility Companies for supply to LPG Air-Mix Plants. In case Gas Utility companies are unable to lift LPG, the LPG would be disposed of in a transparent manner through a competitive bid process to the licensed LPG marketing companies on terms and conditions to be settled between the Buyer and Seller.

Import and Export of LPG:

- Any party with an authorized license will be granted the right to import LPG into Pakistan.
- Any surplus of LPG can be exported after meeting local industry demand.
- The Federal Government, OGRA, and key stakeholder will determine the quantity of LPG to be imported to meet any gap between demand and supply; this quantity will be imported by Public Sector companies.
- Levy on LPG or Gas Infrastructure Development Cess (GIDC) may be utilized to subsidize the LPG imported by Public Sector companies for bringing the prices equal to local LPG prices for domestic sector supplies.

Pricing:

- OGRA regulates and notifies the prices for indigenous LPG (including all margins)
- The government currently charges a levy of PKR 55.09 for a 11.8kg cylinder and may charge this levy from time to time.

Source: OGRA's LPG Production and Distribution Policy

LPG Regulatory Framework | Marketing and Distribution

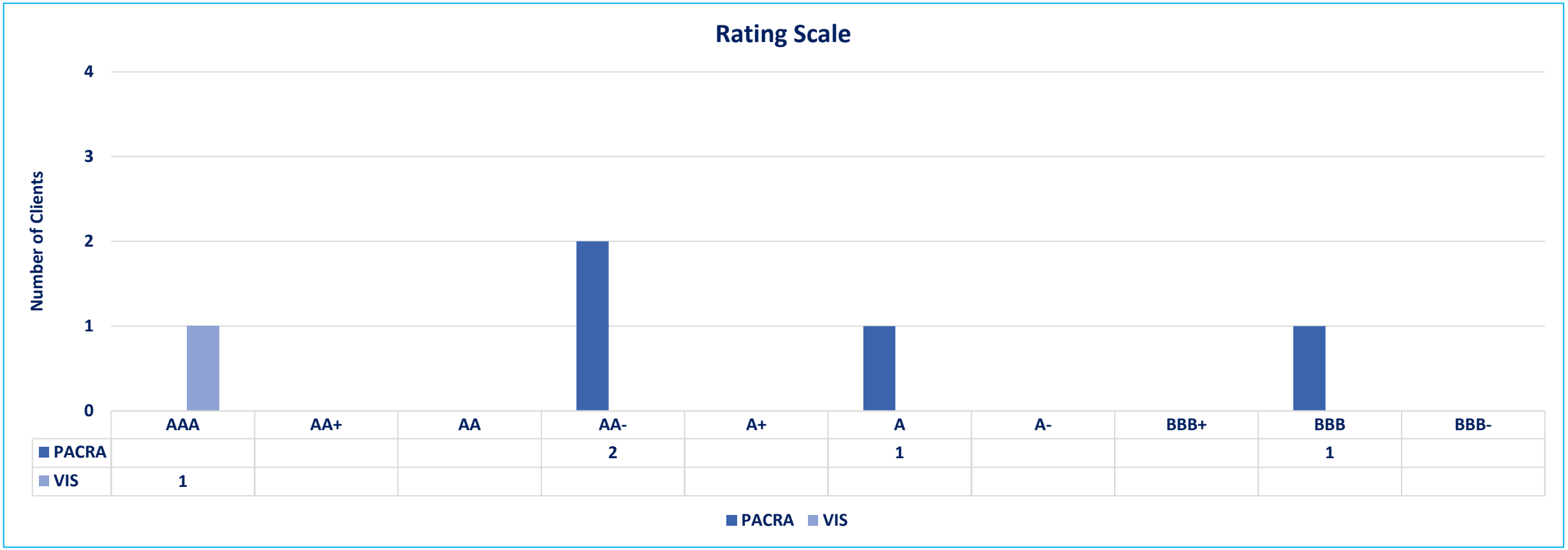
- OGRA will issue a Provisional Licenses for an initial period of two years for LPG Marketing to technically and financially sound applicants for construction of works commensurate to their work program. The work program will ensure that adequate storage, cylinders and logistics infrastructure is constructed within this timeframe in line with the marketing plan of the company; this license will be converted to a period of fifteen years on completion of works.
- To ensure safety throughout the LPG supply chain i.e. LPG Extraction Plants, LPG Storage Tanks, LPG Transporters and Distribution Outlets, the Licensees will meet the minimum safety standards.
- Decanting of LPG from cylinder to cylinder is prohibited and cross filling of other LPG marketing companies' cylinder is also prohibited LPG except under hospitality arrangement with prior information in writing to OGRA.
- OGRA will publish a list of authorized manufacturers for all LPG equipment including LPG refueling stations, conversion kits, fuel tanks, cylinders, storage tanks etc. duly approved and certified by HDIP or any other party authorized by OGRA. The equipment manufactured by the authorized manufacturers will be verified and monitored for conformance to the international standards.
- OGRA shall obtain list of all existing LPG Distributors from LPG Marketing Companies and register them within 90 days of the date of issuance of this Policy.
- OGRA will charge a reasonable fee from each LPG Distributor not exceeding Rs. 10,000/- for registration. For all future Distributors, the Marketing Companies shall within 7 working days of the appointment of a Distributor notify OGRA which, in turn, will register these distributors within 90 days
- Licensed LPG Marketing Companies would remain responsible for observance of all safety codes and standards at their Distributors' premises as well as implementation of LPG sale price.

Source: OGRA's LPG Production and Distribution Policy

Distribution | Gas

Rating Scale

- PACRA rates four players in the gas distribution sector - two are in natural gas distribution; one is a natural gas distribution and marketing company; and one is an LNG importer.
- The rating scale used below is from AAA to BBB-.



Source: PACRA Internal Database

SWOT Analysis

Strengths

- Natural Gas is a clean, safe, efficient and environmentally friendly fuel
- There are few players operating in the sector
- Demand for gas is continually rising
- Capital intensive sector – Low entry barriers
- Stringent regulatory approvals required to enter the market
- Indigenous production – low cost

Weaknesses

- Structural reforms requiring huge investments
- Greater reliance on imports
- Rising demand supply gap
- Limited regassification capacity at import stage

Threats

- Rising circular debt
- Increased exposure to exchange rate risk due to rising reliance on imports; dwindling forex reserves
- Increase in gas theft, transmission and distribution losses
- Declining local natural gas reserves
- Russian-Ukraine conflict increasing the competitiveness of LNG imports

Opportunities

- Upcoming supply side projects to facilitate imports and reduce demand supply gap
- Rising demand
- Long term import contracts at favourable rates
- Increase in exploration activities

Distribution | Gas

Outlook | Negative

- Natural gas, being a cheap and environment friendly energy source, has always been the first priority of both households and other consumers. In line with the rising population and increasing economic activity the demand of natural gas is also increasing, whereas the local production is not enough to cater the demand. Pakistan started importing of RLNG and the share of import in total gas consumption is increasing since then.
- The supply of LNG remains at risk due to Pakistan losing out in a bidding war to Europe for LNG cargoes in June 2022. This was the third tender to be lost by the country since November 2021. Other risk factors include the Russian-Ukraine conflict suspending LNG supply, which is spiraling LNG prices upwards; rising crude oil prices; limited import sources due to the aforementioned conflict; dwindling forex reserves available for importing the costly LNG; and a depreciating PKR to USD increasing the projected cost of LNG imports (3QFY22: QoQ increase was ~3% and SPLY increase was ~69%).
- OGDC, PPL, MARI and UEP are the largest producers of natural gas in the country. However, Pakistan's reliance on imported energy is increasing with the passage of time. At present, the country meets around ~80% of oil and ~25% of gas consumption through imports, which forms a substantial part of the import bill. Even though gas is still the dominant domestic energy source, very few sizeable discoveries have been made in more than a decade with domestic production declining to ~3.5 Bcfd from a plateau of ~4 Bcfd, which was maintained for many years up till 2018-19.
- Amid an absence of any big discoveries in recent periods the overall gas reserves of the country have shrunk by ~45% from FY08 to FY21 and continue a downward path.
- PSO and Pakistan LNG Limited are the only importers of natural gas in the country wherein combined regassification capacity of both the regassification units of the country is ~1200 MMCFD. It is strategically important to increase the overall regassification capacity of the country to cope up with rising imports of RLNG, which have increased by ~39.9% in 10MFY22 and will continue to do so to meet domestic consumption needs in winter and industrial demand (contribution of RLNG to Pakistan's electricity capacity has increased from ~19.7% to ~23.9% in the 10MFY22 period.)
- Due to its significance in meeting consumption needs, stalled LNG imports will impact power generation and economic growth going forward.
- The circular debt of the gas distribution sector is also increasing and, if not addressed, has the potential to significantly dent the sector's ability to deliver to its consumer which, in turn, will have a serious implication for the overall economic growth of the country.
- LPG, which is a key fuel source for the poor, is rapidly increasing in price (over the past four months, prices have increased by ~7%). A drop in local production, due to depleting local gas resources, and more costly imports, due to a devaluing PKR, are the main factors fueling the price rise. As the share of import increases, LPG marketing companies will be forced to sell at higher prices and the June 2022 reduction in price cannot be sustained.

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